

МЕДИЦИНА И ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ

2025, ТОМ 10, № 4

НАУЧНО-ПРАКТИЧЕСКИЙ ЖУРНАЛ ДЛЯ ВРАЧЕЙ

РЕДАКЦИОННАЯ КОЛЛЕГИЯ

Главный редактор

Василий Иванович Орел — з.д.н., д.м.н., профессор, Санкт-Петербургский государственный педиатрический медицинский университет (г. Санкт-Петербург, Российская Федерация)

Заместители главного редактора

Вадим Кузьмич Юрьев — з.д.н., д.м.н., профессор, Санкт-Петербургский государственный педиатрический медицинский университет (г. Санкт-Петербург, Российская Федерация)

Галина Львовна Микиртичан — д.м.н., профессор, Санкт-Петербургский государственный педиатрический медицинский университет (г. Санкт-Петербург, Российская Федерация)

Технический редактор

Любовь Николаевна Лисенкова — к.и.н., доцент, Санкт-Петербургский государственный педиатрический медицинский университет (г. Санкт-Петербург, Российская Федерация)

Члены редколлегии

Сергей Федорович Багненко — академик РАН, д.м.н., профессор, Первый Санкт-Петербургский государственный медицинский университет им. акад. И.П. Павлова (г. Санкт-Петербург, Российская Федерация)
Иван Константинович Романович — академик РАН, д.м.н., профессор, Санкт-Петербургский научно-исследовательский институт радиационной гигиены имени профессора П.В. Рамзаева (г. Санкт-Петербург, Российская Федерация)

Наталья Валентиновна Полунина — академик РАН, д.м.н., профессор, Российский национальный исследовательский медицинский университет им. Н.И. Пирогова (г. Москва, Российская Федерация)

Александр Павлович Щербо — член-кор. РАН, д.м.н., профессор, Медицинский центр Корпорации РМІ (г. Санкт-Петербург, Российская Федерация)

Юрий Станиславович Александрович — д.м.н., профессор, Санкт-Петербургский государственный педиатрический медицинский университет (г. Санкт-Петербург, Российская Федерация)

Валерий Юрьевич Альбицкий — з.д.н., д.м.н., профессор, Национальный НИИ общественного здоровья им. Н.А. Семашко (г. Москва, Российская Федерация)

Евгений Леонидович Борщук — д.м.н., профессор, Оренбургский государственный медицинский университет (г. Оренбург, Российская Федерация)

Анас Анварович Гильманов — д.м.н., профессор, Казанский государственный медицинский университет (г. Казань, Российская Федерация)

Николай Иванович Вишняков — з.д.н., д.м.н., профессор, Первый Санкт-Петербургский государственный медицинский университет им. акад. И.П. Павлова (г. Санкт-Петербург, Российская Федерация)

Игорь Викторович Зимин — д.и.н., профессор, Первый Санкт-Петербургский государственный медицинский университет им. акад. И.П. Павлова (г. Санкт-Петербург, Российская Федерация)

Рецензируемый научно-практический журнал «Медицина и организация здравоохранения».

© СПбГПМУ, 2025

Основан в 2016 году в Санкт-Петербурге.

ISSN 2658-4212 (Print)
ISSN 2658-4220 (Online)

Выпускается 4 раза в год.

Журнал реферируется РЖ ВИНТИ.

Журнал находится в открытом доступе (Open Access).

Издатели, учредители:

Федеральное государственное бюджетное образовательное учреждение высшего образования «Санкт-Петербургский государственный педиатрический медицинский университет» Минздрава России (адрес: 194100, Санкт-Петербург, Литовская ул., д. 2)

Фонд НОИ «Здоровые дети — будущее страны» (адрес: 197371, Санкт-Петербург, ул. Парашютная, д. 31, к. 2, кв. 53).

Журнал зарегистрирован Федеральной службой по надзору в сфере связи, информационных технологий и массовых коммуникаций (РОСКОМНАДЗОР) ПИ № ФС77-74238 от 02 ноября 2018 г.

Журнал входит в Перечень ведущих научных журналов и изданий ВАК, в которых должны быть опубликованы основные результаты диссертаций на соискание ученых степеней кандидата и доктора наук (Распоряжение № 427-р от 09.12.2020).

Электронная версия:

<https://ojs3.gpmu.org/index.php/medorg>,
<http://elibrary.ru>

Проект-макет: Титова Л.А.

Выпускающий редактор: Титова Л.А.

Технический редактор: Барышева А.Ю.

Корректор: Кривоносилова К.В.

Верстка: Попова Я.В.

Адрес редакции: 194100, Санкт-Петербург, ул. Литовская ул., д. 2;
тел./факс: (812) 295-31-55;
e-mail: medorgspb@yandex.ru

Статьи просьба направлять по адресу: medorgspb@yandex.ru;
<https://ojs3.gpmu.org/index.php/medorg>
Формат 60 × 90/8. Усл.-печ. л. 18,5.
Тираж 100 экз. Распространяется бесплатно. Оригинал-макет изготовлен ФГБОУ ВО СПбГПМУ Минздрава России.

Отпечатано ФГБОУ ВО СПбГПМУ Минздрава России. 194100, Санкт-Петербург, ул. Литовская, д. 2.
Заказ 132. Дата выхода 18.03.2026.

На обложке: операционная хирургической клиники Института охраны материнства и младенчества, 1920-е годы. В настоящее время — хирургический корпус СПбГПМУ.

Статьи, опубликованные в журнале «Медицина и организация здравоохранения», распространяются по лицензии «С указанием авторства» — Creative Commons Attribution 4.0 License (CC BY 4.0). Пользователи вправе копировать, распространять в любом виде и формате в любых целях и адаптировать материалы статьи (перерабатывать, видоизменять, создавать новые произведения) при соблюдении следующих условий: оформление ссылки на оригинальную публикацию в журнале «Медицина и организация здравоохранения», указание на внесение изменений (в случае адаптации).

Анатолий Григорьевич Кучер — д.м.н., профессор,
Первый Санкт-Петербургский государственный
медицинский университет им. акад. И.П. Павлова
(г. Санкт-Петербург, Российская Федерация)

Владимир Станиславович Лучкевич — з.д.н.,
д.м.н., профессор, Северо-Западный государственный
медицинский университет им. И.И. Мечникова
(г. Санкт-Петербург, Российская Федерация)

Ирина Ивановна Могилева — к.ф.н., доцент,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Руслан Абдуллаевич Насыров — д.м.н., профессор,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Павел Владимирович Павлов — д.м.н., доцент,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Юрий Валентинович Петренко — к.м.н., доцент,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Андрей Николаевич Редько — д.м.н., профессор,
Кубанский государственный
медицинский университет
(г. Краснодар, Российская Федерация)

Анатолий Гаврилович Сердюков — д.м.н., профессор,
Астраханский государственный
медицинский университет
(г. Астрахань, Российская Федерация)

РЕДАКЦИОННЫЙ СОВЕТ

Вячеслав Афанасьевич Аверин — д.м.н., профессор,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Вячеслав Михайлович Болотских — д.м.н.,
Научно-исследовательский институт акушерства,
гинекологии и репродуктологии им. Д.О. Отта
(г. Санкт-Петербург, Российская Федерация)

Владимир Всеволодович Бржеский — д.м.н., профессор,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Анатолий Андреевич Будко — д.м.н., профессор,
Военно-медицинский музей
(г. Санкт-Петербург, Российская Федерация)

Жозеф Гласа — д.м.н., профессор,
Словацкий медицинский университет в Братиславе
(г. Братислава, Словакия)

Северин Вячеславович Гречаный — д.м.н., доцент,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Валентина Ивановна Гузева — д.м.н., профессор,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Наталья Тимофеевна Ерегина — д.и.н., доцент,
Ярославский государственный медицинский университет
(г. Ярославль, Российская Федерация)

Марк Зильберман — к.м.н., доцент,
Центр врожденных пороков сердца для взрослых
(г. Бостон, США)

Алмас Азгарович Имамов — д.м.н., профессор,
Казанский государственный медицинский университет
(г. Казань, Российская Федерация)

Андрей Вячеславович Ким — д.м.н., профессор,
Городская поликлиника № 37
(г. Санкт-Петербург, Российская Федерация)

Лариса Валерьяновна Кочорова — д.м.н., профессор,
Первый Санкт-Петербургский государственный
медицинский университет
им. акад. И.П. Павлова
(г. Санкт-Петербург, Российская Федерация)

Ольга Иосифовна Кубарь — д.м.н., профессор,
Санкт-Петербургский научно-исследовательский институт
эпидемиологии и микробиологии имени Пастера
(г. Санкт-Петербург, Российская Федерация)

Константин Вадимович Павелце — д.м.н., профессор,
Городская Мариинская больница
(г. Санкт-Петербург, Российская Федерация)

Гордана Пелчич — д.м.н., доцент, Центр здравоохранения
Приморско-Горанского уезда (г. Риека, Хорватия)

Виктор Геннадьевич Пузырев — к.м.н., доцент,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Виталий Анатольевич Резник — д.м.н., доцент,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Роберт Реннебом — д.м.н., профессор,
Клиника Кливленда (г. Кливленд, США)

Василий Михайлович Середа — д.м.н., профессор,
Санкт-Петербургский государственный университет
(г. Санкт-Петербург, Российская Федерация)

Галина Анатольевна Суслова — д.м.н., профессор,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Владимир Николаевич Тимченко — д.м.н., профессор,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

Салим Бахшоевич Чолоян — д.м.н., профессор,
Оренбургский государственный медицинский университет
(г. Оренбург, Российская Федерация)

Назира Хамзиновна Шарафутдинова — д.м.н., профессор,
Башкирский государственный медицинский университет
(г. Уфа, Российская Федерация)

Флориан Штегер — д.м.н., профессор,
Институт истории, философии и медицинской этики
(г. Ульм, Германия)

Елена Владимировна Эсауленко — д.м.н., профессор,
Санкт-Петербургский государственный педиатрический
медицинский университет
(г. Санкт-Петербург, Российская Федерация)

MEDICINE AND HEALTH CARE ORGANIZATION

2025, VOLUME 10, N 4 SCIENTIFIC AND PRACTICAL JOURNAL FOR DOCTORS

EDITORIAL BOARD

Editor-in-Chief

Vasily I. Orel — Honored Scientist, Dr. Sci. (Med.),
Professor, Saint Petersburg State
Pediatric Medical University
(Saint Petersburg, Russian Federation)

Deputy Editor-in-Chief

Vadim K. Yuryev — Honored Scientist, Dr. Sci. (Med.),
Professor, Saint Petersburg State
Pediatric Medical University
(Saint Petersburg, Russian Federation)
Galina L. Mikirtichan — Dr. Sci. (Med.),
Professor, Saint Petersburg State
Pediatric Medical University
(Saint Petersburg, Russian Federation)

Technical Editor

Lyubov N. Lisenkova — Cand. Sci. (History),
Assoc. Professor, Saint Petersburg State
Pediatric Medical University
(Saint Petersburg, Russian Federation)

Members of the Editorial Board

Sergey F. Bagnenko — Academician of the RAS,
Dr. Sci. (Med.), Professor, Pavlov First Saint Petersburg
State Medical University
(Saint Petersburg, Russian Federation)

Ivan K. Romanovich — Academician of the RAS,
Dr. Sci. (Med.), Professor, Saint Petersburg
Research Institute of Radiation Hygiene
named after Professor P.V. Ramzaev
(Saint Petersburg, Russian Federation)

Natalia V. Polunina — Academician of the RAS,
Dr. Sci. (Med.), Professor,
Russian National Research
Medical University named after N.I. Pirogov
(Moscow, Russian Federation)

Alexander P. Shcherbo — Corresponding Member of the RAS,
Dr. Sci. (Med.), Professor,
PMI Corporation Medical Center
(Saint Petersburg, Russian Federation)

Yuriy S. Aleksandrovich — Dr. Sci. (Med.), Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)

Valery Yu. Albitskiy — Honored Scientist,
Dr. Sci. (Med.), Professor, National Research Institute
of Public Health named after N.A. Semashko
(Moscow, Russian Federation)

Yevgeniy L. Borshchuk — Dr. Sci. (Med.), Professor,
Orenburg State Medical University
(Orenburg, Russian Federation)

Anas A. Gilmanov — Dr. Sci. (Med.), Professor,
Kazan State Medical University
(Kazan, Russian Federation)

Nikolay I. Vishnyakov — Honored Scientist,
Dr. Sci. (Med.), Professor,
Pavlov First Saint Petersburg State Medical University
(Saint Petersburg, Russian Federation)

Igor V. Zimin — Dr. Sci. (History), Professor,
Pavlov First Saint Petersburg State
Medical University
(Saint Petersburg, Russian Federation)

Peer-reviewed scientific and practical journal Medicine and Health Care Organization.

© SPbSPMU, 2025

Founded in 2016 in Saint Petersburg.

ISSN 2658-4212 (Print)

ISSN 2658-4220 (Online)

Issued 4 times a year.

The journal is refereed by RJ VINITI.

The journal is Open Access.

Publishers, founders:

Federal State Budgetary Educational
Institution of Higher Education "Saint
Petersburg State Pediatric Medical
University" of the Ministry of Health of
the Russian Federation
(Address: 2 Litovskaya str, Saint Petersburg
194100 Russian Federation)

NOI Foundation "Healthy Children —
the Future of the Country"
(Address: 31, bldg. 2, apt. 53
Parashyutnaya str., Saint Petersburg
197371 Russian Federation)

The journal is registered by the Federal
Service for Supervision of Communications,
Information Technology, and Mass Media
(ROSKOMNADZOR)
PI N FS77-74238 November 02, 2018.

*The Journal is in the **List of the leading
academic journals and publications
of the Supreme Examination
Board (VAK)** publishing the results
of doctorate theses
(Order N 427-r dated 9.12.2020).*

Electronic version:

<https://ojs3.gpmu.org/index.php/medorg>,
<http://elibrary.ru>

Layout project: Titova L.A.

Commissioning editor: Titova L.A.

Technical editor: Barysheva A.Yu.

Proof-reader: Krivonosikova K.V.

Layout: Popova Ya.V.

Address for correspondence:

2 Litovskaya str., Saint Petersburg
194100, Russian Federation.
Tel/Fax: +7 (812) 295-31-55.
E-mail: medorgspb@yandex.ru

Please send articles to:

medorgspb@yandex.ru;
<https://ojs3.gpmu.org/index.php/medorg>

Format 60×90/8. Cond.-printed sheets 18,5.
Circulation 100. Distributed for free.

The original layout is made Saint
Petersburg State Pediatric Medical
University.

Printed by Saint Petersburg State
Pediatric Medical University.

2 Litovskaya str., Saint Petersburg
194100 Russian Federation.

Order 132. Release date 18.03.2026.

*On the cover: The operating room of
the surgical clinic of the Institute for
Maternal and Child Welfare, 1920s.
Currently, it is the surgical building
of the St. Petersburg State Pediatric
Medical University.*

"Medicine and Health Care Organization"
is an open access journal which means
that everybody can read, download, copy,
distribute, print, search, or link to the
full texts of these articles in accordance
with Creative Commons Attribution 4.0
License (CC BY 4.0).

Anatoliy G. Kucher — Dr. Sci. (Med.), Professor,
Pavlov First Saint Petersburg State
Medical University (Saint Petersburg, Russian Federation)
Vladimir S. Luchkevich — Honored Scientist, Dr. Sci. (Med.),
Professor, North-Western State Medical University
named after I.I. Mechnikov
(Saint Petersburg, Russian Federation)
Irina I. Mogileva — Cand. Sci. (Philol.), Assoc. Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)
Ruslan A. Nasyrov — Dr. Sci. (Med.), Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)

Pavel V. Pavlov — Dr. Sci. (Med.), Assoc. Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)
Yuriy V. Petrenko — Cand. Sci. (Med.),
Assoc. Professor, Saint Petersburg State
Pediatric Medical University
(Saint Petersburg, Russian Federation)
Andrey N. Redko — Dr. Sci. (Med.), Professor,
Kuban State Medical University
(Krasnodar, Russian Federation)
Anatoliy G. Serdyukov — Dr. Sci. (Med.), Professor,
Astrakhan State Medical University
(Astrakhan, Russian Federation)

EDITORIAL COUNCIL

Vyacheslav A. Averin — Dr. Sci. (Med.), Professor,
Saint Petersburg State
Pediatric Medical University
(Saint Petersburg, Russian Federation)
Vyacheslav M. Bolotskih — Dr. Sci. (Med.),
Research Institute of Obstetrics, Gynecology
and Reproductology named after D.O. Ott
(Saint Petersburg, Russian Federation)
Vladimir V. Brzheshkiy — Dr. Sci. (Med.), Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)
Anatoly A. Budko — Dr. Sci. (Med.), Professor,
Military Medical Museum
(Saint Petersburg, Russian Federation)
Jozef Glasa — Dr. Sci. (Med.), Professor,
Slovak Medical University in Bratislava
(Bratislava, Slovakia)
Severin V. Grechaniy — Dr. Sci. (Med.), Assoc. Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)
Valentina I. Guzeva — Dr. Sci. (Med.), Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)
Natalia T. Eregina — Dr. Sci. (History), Assoc. Professor,
Yaroslavl State Medical University
(Yaroslavl, Russian Federation)
Mark Zilberman — Cand. Sci. (Med.), Assoc. Professor,
Adult Congenital Heart Center
(Boston, USA)
Almas A. Imamov — Dr. Sci. (Med.), Professor,
Kazan State Medical University
(Kazan, Russian Federation)
Andrey V. Kim — Dr. Sci. (Med.), Professor,
City clinic No. 37
(Saint Petersburg, Russian Federation)
Larisa V. Kochorova — Dr. Sci. (Med.), Professor,
Pavlov First Saint Petersburg State
Medical University
(Saint Petersburg, Russian Federation)

Olga I. Kubar' — Dr. Sci. (Med.), Professor,
Saint Petersburg Research Institute of Epidemiology
and Microbiology named after Pasteur
(Saint Petersburg, Russian Federation)
Konstantin V. Pavelets — Dr. Sci. (Med.), Professor,
City Mariinsky Hospital
(Saint Petersburg, Russian Federation)
Gordana Pelcic — Dr. Sci. (Med.), Assoc. Professor,
Primorsko-Goransky County Health Center
(Rijeka, Croatia)
Victor G. Puzyrev — Cand. Sci. (Med.), Assoc. Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)
Vitaliy A. Reznik — Dr. Sci. (Med.), Assoc. Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)
Robert Rennebohm — Dr. Sci. (Med.), Professor,
Cleveland Clinic (Cleveland, USA)
Vasilii M. Sereda — Dr. Sci. (Med.), Professor,
Saint Petersburg State University
(Saint Petersburg, Russian Federation)
Galina A. Suslova — Dr. Sci. (Med.), Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)
Vladimir N. Timchenko — Dr. Sci. (Med.), Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)
Salim B. Choloyan — Dr. Sci. (Med.), Professor,
Orenburg State Medical University
(Orenburg, Russian Federation)
Nazira H. Sharafutdinova — Dr. Sci. (Med.), Professor,
Bashkir State Medical University
(Ufa, Russian Federation)
Florian Steger — Dr. Sci. (Med.), Professor,
Institute of History, Philosophy and Medical Ethics
(Ulm, Germany)
Elena V. Esaulenko — Dr. Sci. (Med.), Professor,
Saint Petersburg State Pediatric Medical University
(Saint Petersburg, Russian Federation)

CONTENTS

СОДЕРЖАНИЕ

Anniversary of the Editor-in-Chief.....	7	Юбилей главного редактора.....	7
---	---	--------------------------------	---

HEALTHCARE ORGANIZATION

Original papers

G.L. Mikirtichan, I.A. Savina

On the 100th anniversary of the Saint Petersburg State Pediatric Medical University

The role of Alexander Nikolaevich Antonov in the founding of the Leningrad Institute for the Protection of Motherhood and Infancy — the Saint Petersburg State Pediatric Medical University, in the development of neonatology and the organization of child healthcare 8

R.M. Rennebohm

The Children's Hospital Public Economy Model 29

*A.M. Sarana, N.I. Vishnyakov,
I.G. Nagnojnaya, E.V. Smirnova*

On the issue of certification of Saint Petersburg healthcare system specialists (history, analysis and current trends; certification of doctors in the specialty “Healthcare organization and public health”) 35

*V.I. Orel, M.P. Korolev, E.I. Babikov,
N.A. Guryeva, V.I. Smirnova*

Modern possibilities of endoscopy, prospects and ways of development 50

O.S. Vakhlova, N.A. Roslaya

Evaluation of the clinical effectiveness of IVF protocols within the framework of compulsory medical insurance programs 61

*E.Yu. Vlasova, M.E. Lozovskaya,
G.G. Karasev, Yu.A. Yarovaya,
K.P. Yulina, A.R. Sapozhnikova*

Comprehensive assessment of the effectiveness of sanatorium treatment for tuberculosis in children 74

ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ

Оригинальные статьи

Г.Л. Микиртичан, И.А. Савина

К 100-летию Санкт-Петербургского государственного педиатрического медицинского университета

Роль Александра Николаевича Антонова в основании Ленинградского института охраны материнства и младенчества — Санкт-Петербургского государственного педиатрического медицинского университета, развитии неонатологии и организации детского здравоохранения..... 8

Р.М. Реннебом

Общественно-ориентированная экономическая модель детского здравоохранения..... 29

*А.М. Сарана, Н.И. Вишняков,
И.Г. Нагнойная, Е.В. Смирнова*

К вопросу об аттестации специалистов системы здравоохранения Санкт-Петербурга (история, анализ и современные тенденции; аттестация врачей по специальности «Организация здравоохранения и общественное здоровье») 35

*В.И. Орел, М.П. Королёв, Э.И. Бабилов,
Н.А. Гурьева, В.И. Смирнова*

Современные возможности эндоскопии, перспективы и пути развития 50

О.С. Вахлова, Н.А. Рослая

Оценка клинической эффективности протоколов ЭКО в рамках программ обязательного медицинского страхования 61

*Е.Ю. Власова, М.Э. Лозовская,
Г.Г. Карасев, Ю.А. Яровая,
К.П. Юлина, А.Р. Сапожникова*

Комплексная оценка эффективности санаторного лечения туберкулеза у детей 74

PUBLIC HEALTH

Original paper

*R.F. Gaifullina, G.M. Muhutdinova,
I.F. Fayzullin, E.R. Valeeva, N.V. Stepanova,
A.A. Imamov, R.R. Zalyalov, D.D. Khamitov*

Patterns of mortality causes, concerning gender characteristics of the working-age population of the Republic of Tatarstan 83

HYGIENE

Original papers

*A.V. Levanchuk, O.I. Kopytenkova,
O.V. Mironenko, E.A. Fedorova*

Methodological approaches to hygienic assessment of public health risk..... 94

*A.V. Vodovатов, Yu.N. Kapryrina,
A.S. Klimenkova, O.A. Andzhigaeva,
V.I. Serova, K.K. Panuntseva, V.G. Puzyrev*

Assessment of the contribution of the natural background to the annual effective dose of the staff of the radiology diagnostic rooms at the Saint Petersburg State Pediatric Medical University..... 102

BIOETHICS

Original paper

E.V. Pestereva, T.V. Kaurova

Uncertainty in the framework of cancer case..... 110

HISTORY OF MEDICINE

Original papers

E.I. Kalikinskaya

V.F. Voyno-Yasensky (Saint Luke) as an organizer of healthcare during the Great Patriotic War of 1941–1945..... 119

*G.L. Mikirtichan, L.N. Lisenkova, D.A. Fedorov,
S.S. Komarov, V.I. Makeeva, K.A. Pavlenko*

No statute of limitations: postmemory of Nazi crimes. For the 80th anniversary of the Nuremberg trial..... 129

INFORMATION

Rules for authors 143

ОБЩЕСТВЕННОЕ ЗДОРОВЬЕ

Оригинальная статья

*Р.Ф. Гайфуллина, Г.М. Мухутдинова,
И.Ф. Файзуллин, Э.Р. Валеева, Н.В. Степанова,
А.А. Имамов, Р.Р. Залялов, Д.Д. Хамитов*

Закономерности формирования смертности трудоспособного населения Республики Татарстан с учетом гендерных особенностей 83

ГИГИЕНА

Оригинальные статьи

*А.В. Леванчук, О.И. Копытенкова,
О.В. Мироненко, Е.А. Федорова*

Методические подходы к гигиенической оценке риска здоровью населения..... 94

*А.В. Водоватов, Ю.Н. Капырина,
А.С. Клименкова, О.А. Анджигаета,
В.И. Серова, К.К. Панунцева, В.Г. Пузырев*

Оценка вклада природного фона в годовую эффективную дозу персонала кабинетов лучевой диагностики клиники Санкт-Петербургского государственного педиатрического медицинского университета..... 102

БИОЭТИКА

Оригинальная статья

Е.В. Пестерева, Т.В. Каурова

Неопределенность в ситуации онкологического заболевания..... 110

ИЗ ИСТОРИИ МЕДИЦИНЫ

Оригинальные статьи

Е.И. Каликинская

В.Ф. Войно-Ясенецкий (святитель Лука) как организатор здравоохранения в годы Великой Отечественной войны 1941–1945 гг. 119

*Г.Л. Микиртичан, Л.Н. Лисенкова, Д.А. Федоров,
С.С. Комаров, В.И. Макеева, К.А. Павленко*

Без срока давности: постпамять о нацистских преступлениях. К 80-летию Нюрнбергского процесса 129

ИНФОРМАЦИЯ

Правила для авторов 143

ANNIVERSARY OF THE EDITOR-IN-CHIEF



Dear Vasily Ivanovich!

As a 1983 graduate of the Leningrad Pediatric Medical Institute, you are celebrating your 70th birthday as an Honored Scientist of the Russian Federation, winner of the All-Russian competition “Golden Names of Higher Education”, Chief External Specialist for Medical and Pharmaceutical Education of the Ministry of Health of the Russian Federation in the Northwestern Federal District, Doctor of Medical Sciences, Professor, Vice Rector for Academic Affairs and Head of the Department of Social Pediatrics and Health Care Organization at the Faculty of Postgraduate and Continuing Professional Education of St. Petersburg State Pediatric Medical University, Editor-in-Chief of the journal “Medicine and Health Care Organization”, member of the National Academy of Juvenology, the International Academy of Sciences of Ecology, Human and Nature Safety, and the Russian Academy of Natural Sciences, and a Distinguished Health Care Worker. In 2025, you were awarded the high state honor of the Order of Friendship.

You are an experienced and energetic leader who has repeatedly demonstrated the ability to resolve the most complex and challenging tasks promptly and professionally. In every situation, you exemplify resilience, strength of character, and dedication.

Your exceptional professionalism, extensive experience and knowledge, commitment to tradition, strong sense of responsibility, and exacting standards combined with your thoughtful and compassionate attitude toward others have earned you well-deserved authority and deep respect.

I sincerely wish you many more years of energy, a youthful spirit, reliability, resilience, and continued professional success.

May your life always be warmed by the love of your family and the sincere words of devoted friends and colleagues. May success, good health, prosperity, and well-being always accompany you. May many more remarkable achievements and brilliant victories lie ahead.

*With sincere respect and gratitude,
Rector Dmitry Olegovich Ivanov*

HEALTHCARE ORGANIZATION

ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ

Original paper

UDC 929+616-051+355.01+347.63+616-053.2+314.4+331.108.2

<https://doi.org/10.56871/MHCO.2026.45.66.001>

On the 100th anniversary of the Saint Petersburg State Pediatric Medical University

The role of Alexander Nikolaevich Antonov in the founding of the Leningrad Institute for the Protection of Motherhood and Infancy — the Saint Petersburg State Pediatric Medical University, in the development of neonatology and the organization of child healthcare

Galina L. Mikirtichan, Irina A. Savina

Saint Petersburg State Pediatric Medical University, 2 Litovskaya str., Saint Petersburg, 194100, Russian Federation

For citation: Mikirtichan G.L., Savina I.A. The role of Alexander Nikolaevich Antonov in the founding of the Leningrad Institute for the Protection of Motherhood and Infancy — the Saint Petersburg State Pediatric Medical University, in the development of neonatology and the organization of child healthcare. *Medicine and Health Care Organization*. 2025;10(4):8–28. <https://doi.org/10.56871/MHCO.2026.45.66.001>.

Received: 12.10.2025

Revised: 02.12.2025

Accepted: 28.01.2026

ABSTRACT. The article is dedicated to A.N. Antonov (1884–1947) — one of the initiators and founders of the Leningrad Institute for the Protection of Motherhood and Infancy (PMI, from 1935 — Leningrad Pediatric Medical Institute (LPMI), now Saint Petersburg State Pediatric Medical University (SPbSPMU)), a prominent pediatrician, neonatologist, theorist, and organizer of the protection of motherhood and infancy. In 1921, A.N. Antonov, together with Z.O. Michnik and V.O. Mochan, developed the project for the PMI Institute, which was opened in 1925 and where he worked until 1947. Actively involved in building healthcare system on new foundations, A.N. Antonov made a significant contribution to the theory and practice of the PMI system, the development of new forms and methods of work for institutions for women and children, which contributed to the improving of the quality of medical and preventive care and reducing cases of morbidity and mortality. These innovations were adopted not only in Leningrad but throughout the country. Among them are the substantiation of the main directions of activity for outpatient institutions for women and children: antenatal fetal protection, patronage of pregnant women and sanitary-educational patronage of children, recommendations for proper infant feeding and care, etc. He paid special attention to the health of girls as future mothers, being the first to develop a program and organize classes aimed at fostering a conscious attitude towards future maternal responsibilities. A.N. Antonov also made a significant contribution to the training of secondary and junior medical personnel. As a pediatrician, A.N. Antonov was at the forefront of neonatology, studying the anatomical and physiological characteristics of newborns, feeding problems, and was one of the first in the country to research issues concerning erythroblastosis in children, the significance of the new blood factor Rh in neonatal pathology, the role of vitamin K in the prevention of hemorrhagic disease, and others. Remaining in besieged Leningrad, he continued to work at LPMI, doing everything necessary with his colleagues to save children. Summarizing the unique experience of working with newborns during the most difficult days of 1941–1942, he presented a clinical and statistical characteristics of newborns during the Leningrad blockade period. A number of A.N. Antonov's works testify to his valid contribution to the history of pediatrics and the protection of motherhood and childhood, historical demography, and bibliographical studies. He was an active member of the Leningrad Society of Pediatricians, the Council for Medical and Preventive Care for Children of the Ministries of Health of the USSR and RSFSR, and a participant in all-Union pediatric congresses and meetings on maternal and child health.

KEYWORDS: Alexander Nikolaevich Antonov, protection of motherhood and infancy, PMI, Leningrad Institute of PMI, Leningrad Pediatric Medical Institute (LPMI), Saint Petersburg State Pediatric Medical University (SPbSPMU), personnel training, child and maternal mortality, forms and methods of work of institutions for women and children, health of girls as future mothers, physiology and pathology of newborns

Funding. This study was not supported by any external sources of funding.

✉ Galina L. Mikirtichan. E-mail: glm306@yandex.ru

© Mikirtichan G.L., Savina I.A., 2025

К 100-летию Санкт-Петербургского государственного педиатрического медицинского университета

Роль Александра Николаевича Антонова в основании Ленинградского института охраны материнства и младенчества — Санкт-Петербургского государственного педиатрического медицинского университета, развитии неонатологии и организации детского здравоохранения

Галина Львовна Микиртичан, Ирина Александровна Савина

Санкт-Петербургский государственный педиатрический медицинский университет, 194100, г. Санкт-Петербург, ул. Литовская, д. 2, Российская Федерация

Для цитирования: Микиртичан Г.Л., Савина И.А. Роль Александра Николаевича Антонова в основании Ленинградского института охраны материнства и младенчества — Санкт-Петербургского государственного педиатрического медицинского университета, развитии неонатологии и организации детского здравоохранения. *Медицина и организация здравоохранения*. 2025;10(4):8–28. <https://doi.org/10.56871/МНСО.2026.45.66.001>.

Поступила: 12.10.2025

Одобрена: 02.12.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. Статья посвящена А.Н. Антонову (1884–1947) — одному из инициаторов и основателей Ленинградского института охраны материнства и младенчества (ОММ, с 1935 г. — Ленинградский педиатрический медицинский институт (ЛПМИ), ныне Санкт-Петербургский государственный педиатрический медицинский университет (СПбГПМУ)), видному ученому-педиатру, неонатологу, теоретику и организатору охраны материнства и младенчества. В 1921 г. А.Н. Антонов совместно с З.О. Мичник и В.О. Мочаном разработал проект Института ОММ, открывшегося в 1925 г., в котором работал до 1947 г. Активно включившись в строительство здравоохранения на новых основах, А.Н. Антонов внес существенный вклад в теорию и практику системы ОММ, разработку новых форм и методов работы учреждений для женщин и детей, способствующих повышению качества лечебно-профилактической помощи и снижению заболеваемости и смертности, получивших распространение не только в Ленинграде, но и во всей стране. Среди них обоснование главных направлений деятельности амбулаторных учреждений для женщин и детей: антенатальная охрана плода, патронаж беременных и санитарно-просветительный патронаж детей, рекомендации по правильному вскармливанию ребенка и уходу за ним и др. Он обратил особое внимание на здоровье девочек как будущих матерей, впервые разработал программу и организовал занятия с целью формирования у них сознательного отношения к будущим материнским обязанностям. Большой вклад внес А.Н. Антонов в подготовку среднего и младшего медицинского персонала. Как ученый-педиатр А.Н. Антонов стоял у истоков неонатологии, изучал анатомо-физиологические особенности новорожденных, проблемы вскармливания, одним из первых в стране исследовал вопросы эритробластозов у детей, значения нового фактора крови Rh в патологии новорожденных, роли витамина К в профилактике геморрагической болезни и др. Оставаясь в блокированном Ленинграде, он продолжал работать в ЛПМИ, вместе со своими коллегами делая все необходимое для спасения детей. Обобщая уникальный опыт

✉ Галина Львовна Микиртичан. E-mail: glm306@yandex.ru

© Микиртичан Г.Л., Савина И.А., 2025

работы с новорожденными детьми в самые тяжелые дни 1941–1942 гг., он представил клинико-статистическую характеристику новорожденных периода блокады Ленинграда. Ряд работ А.Н. Антонова свидетельствуют о его вкладе в историю педиатрии и охраны материнства и детства, историческую демографию, библиографоведение. Он был активным членом Ленинградского общества детских врачей, Совета по лечебно-профилактической помощи детям министерств здравоохранения СССР и РСФСР, участником всесоюзных педиатрических съездов, совещаний по охране материнства и детства.

КЛЮЧЕВЫЕ СЛОВА: Александр Николаевич Антонов, охрана материнства и младенчества, ОММ, Ленинградский институт ОММ, Ленинградский педиатрический медицинский институт (ЛПМИ), Санкт-Петербургский государственный педиатрический медицинский университет (СПбГПМУ), подготовка кадров, детская и материнская смертность, формы и методы работы учреждений для женщин и детей, здоровье девочек как будущих матерей, физиология и патология новорожденных детей

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

As we mark the 100th anniversary of the Saint Petersburg State Pediatric Medical University (SPbSPMU), we pay tribute to the individuals whose efforts led to its founding and successful development. Among them, Alexander Nikolaevich Antonov (1884–1947) holds a worthy place. He was one of the initiators and founders of the Leningrad Institute for the Protection of Motherhood and Infancy (known from 1935 as the Leningrad Pediatric Medical Institute LPMI, now the Saint Petersburg State Pediatric Medical University), as well as a prominent pediatrician, neonatologist, and theorist and organizer of maternal and infant welfare.

Today, the name of Alexander Nikolaevich Antonov is little known to pediatricians and organizers of medical and preventive care for children. Nevertheless, his work in the fields of pediatrics and maternal and infant welfare deserves attention and places him alongside such major figures of Russian pediatrics and healthcare as V.P. Lebedeva, A.A. Kisel, G.N. Speransky, M.S. Maslov, A.F. Tur, and others.

In 1910, A.N. Antonov graduated from the Military Medical Academy in St. Petersburg, where he studied in the same cohort as Mikhail Stepanovich Maslov, who later became a leading pediatrician.

Immediately after graduating, A.N. Antonov, as a junior physician of the 155th Infantry Regiment, was sent to the Caucasus, to the settlement of Sarakamysh near the city of Kars¹ [1]. Military service held little appeal for him; he was far more interested in the growing public movement for the protection of motherhood and infancy, which aimed to address issues of organizing care for mothers and children and to develop measures to combat child mortality. The statistics were staggering: in 1910, infant mortality in St. Petersburg was 261 per 1,000 live births; in Moscow, 296; in Vienna, 166; in Berlin, 161; in Rome, 122; in London, 105; in Paris, 99; and in Amsterdam, 76 per 1,000 [2].

In 1913, A.N. Antonov became a resident physician at the “Drop of Milk” institution under the Union for Combating Child Mortality. This Union was a public charitable organization founded in 1904 on the initiative of Ural zemstvo physician N.A. Russkikh (1857–1916), who had thoroughly

studied child mortality, and prominent pediatrician Professor N.P. Gundobin (1860–1908). “Drop of Milk” institutions first emerged in Europe and then in Russia at the beginning of the 20th century. Their primary goal was to supply sterilized milk and formula to infants unable to breastfeed — essentially functioning as milk kitchens. However, Russia's advantage was that each such institution provided regular medical follow-up for the child and counseling for the mother on proper child-rearing and infant feeding [3]. During World War I, Antonov was drafted into the army, serving as a junior physician of the 87th Infantry Regiment, stationed in the Arakcheev barracks in Novgorod Governorate [4].

Upon returning to Petrograd in 1917, he remained faithful to his interests and his chosen specialty of pediatrics, taking a position as assistant head of the sanitary education department of the All-Russian Guardianship for the Protection of Motherhood and Infancy (VPOMM), where the October Revolution found him.

The VPOMM was founded in 1913 on the initiative of eminent pediatrician K.A. Rauchfuss and represented Russia's largest public-state organization, operating under imperial patronage. It was envisaged that the government would play the leading role in the Guardianship's activities; however, charitable efforts came to predominate and depended on local public and private initiative. According to the VPOMM Charter, the organization's purpose was “to reduce child mortality and promote the growth of a healthy population in Russia by protecting the health of women during pregnancy, childbirth, and immediately thereafter, as well as by protecting the health of young children, especially infants” [5]. The VPOMM's tasks included establishing shelters for mothers and children, counseling centers, milk kitchens, children's hospitals, maternity shelters, and similar facilities. One of its main objectives was to disseminate sound concepts and proper skills in infant care and feeding, as well as to organize permanent and traveling exhibitions, museums, lectures, and courses. It also aimed to publish printed materials on maternal and infant welfare.

Furthermore, Article 4 of the Charter stipulated that a Central Institute of Maternal and Infant Welfare be established within the VPOMM. K.A. Rauchfuss worked out its aims and tasks, as well as the structure and functions of each department, down to the finest detail. He also outlined the main areas of activity, including

¹ The city of Kars was captured by Russian troops in November 1877 following a swift assault and, under the Treaty of San Stefano in 1878, was ceded to Russia. Until 1917, it served as the center of the Kars Oblast of the Russian Empire. In 1918, it became part of Turkey.

the scientific, clinical, and educational domains and their integration. As Rauchfuss envisioned: “The Institute shall serve as a scientific and educational institution for the theoretical and practical study of infant care, the study of the causes of infant diseases and their prevention and treatment, as well as a statistical and reference institution on all issues relating to child mortality and its control” [5].

Despite his short time at the Guardianship, every day was meaningful for Alexander Nikolaevich. There he gained unique knowledge, expanded his understanding of many aspects of maternal and infant welfare, and worked alongside outstanding advocates for children's health. Among them were lawyer P.I. Lyublinsky, pediatricians and child healthcare organizers P.S. Medovikov, V.O. Mochan, Z.O. Michnik, A.V. Popova, prominent statistician S.A. Novoselsky, and many others who later became active architects of the Soviet system of maternal and infant welfare.

That same year, he passed his qualifying examinations at the Clinical Institute of Grand Duchess Elena Pavlovna for Postgraduate Physician Training and began research for his future dissertation. The institute was known after 1917 as the Leningrad State Institute for Postgraduate Physician Training, then from 1992 as the Saint Petersburg Medical Academy of Postgraduate Education, and from 2011 as the North-Western State Medical University named after I.I. Mechnikov.

After the 1917 revolution, protecting the health of women and children and combating high morbidity and infant and maternal mortality became a state priority. A.N. Antonov immediately became involved in building the Soviet system of maternal and infant welfare and in organizing medical and preventive care for children on new foundations. Following the dissolution of the VPOMM, from 1918 he worked as a resident pediatrician at the Mariinsky Maternity Hospital (known as the Schroeder Maternity Hospital, located on Petrograd Side at 13 Maly Prospekt; it operated until 1995 as Maternity Hospital No. 3 of Leningrad). A.N. Antonov organized the work of the newborn unit, opened a consultation center for infants with a milk kitchen, a unit for pregnant and breastfeeding mothers, and the first birth control counseling center [6].

At the Mariinsky Maternity Hospital, a Midwifery School for training midwives had been operating since 1871, which after the 1917 revolution was transformed into courses for nurses. It

was at these courses that Alexander Nikolaevich began his teaching career, delivering a course on dietetics and hygiene of early childhood (Fig. 1).

From 1918 to 1931, he also served as a resident at the Vasileostrovsky Maternal and Infant Welfare Center No. 15, headed by Zinaida Osipovna Michnik (1878–1942), a prominent organizer of outpatient pediatric care. This model comprehensive outpatient facility served children up to three years of age, offering a pediatric consultation center with access to a pediatrician and specialists, a milk kitchen, and other services. It also served mothers, offering a women's consultation center, social and legal advice, and a venereologist's clinic. Many new forms of pediatric care initiated by Antonov and Michnik were tested at this Center (Fig. 2).

Beginning in 1919, at the same Center, Antonov directed the courses for nurses and nannies in maternal and infant welfare that he had organized. It was here that his teaching talent emerged. These highly popular courses became known as “Antonov's courses”. During the 1920s, he also taught at a paramedic-midwifery school and other institutions for mid-level medical personnel, work he never declined. He synthesized his teaching experience and formulated proposals for training mid-level personnel — nurses for the rapidly growing network of



Fig. 1. Alexander Nikolaevich Antonov (1884–1947)¹

Рис. 1. Александр Николаевич Антонов (1884–1947)

¹ Photos 1, 2, 3, and 5 from the museum collections of Saint Petersburg State Pediatric Medical University.



Fig. 2. Maternity and Child Protection Center No. 15 of the Vasileostrovsky District. From left to right: Chief Physician Zinaida Osipovna Michnik, physician and specialist in pediatric nutrition Vera Borisovna Kiseleva¹, Head of the Nursing Courses for the Protection of Motherhood and Infancy (PMI) courses Alexander Nikolaevich Antonov

Рис. 2. Пункт ОММ № 15 Василеостровского района. Слева направо: главный врач Зинаида Осиповна Мичник, врач, специалист в области детского питания Вера Борисовна Киселева, заведующий курсами сестер ОММ Александр Николаевич Антонов

maternal and infant welfare institutions — and developed a methodologically sound, detailed curriculum for theoretical and practical training, taking into account the financial and organizational realities of the time [7].

From 1923 to 1935, A.N. Antonov directed the Mother and Child Home. His work in various children's institutions gave him a deep understanding of the challenges involved in improving the organization of care for children. During

these years, maternal and infant welfare acquired a state character, its institutionalization began, a legislative framework was established, and public participation in addressing maternal and infant welfare issues intensified. There was an urgent need for scientific substantiation and critical evaluation of proposed maternal and infant welfare measures, as well as for mutual exchange of experience and ideas. All of this gave rise to the Scientific Society for the Protection of Motherhood and Infancy, organized on the initiative of V.O. Mochan in 1920 in Petrograd–Leningrad. According to the Society's charter, its aim was the study and scientific development of issues relating to: 1) the sanitary, social, and legal protection of motherhood and infancy; 2) child mortality and its control, as well as related issues of demography and statistics; further objectives included 3) the physiology and pathology of infancy; 4) the health improvement and socio-legal protection of the younger generation. The Society brought together the most active workers in maternal and infant welfare of that time — including Professor F.A. Walter, Professor P.I. Lyublinsky, Dr. D.A. Paryshev, Dr. A.V. Popova, Professor V.V. Pavsky, Professor L.G. Lichkus, Professor V.O. Mochan, and Associate Professor (docent) Z.O. Michnik, among others — and motivated

¹ Kiseleva Vera Borisovna (1884–1948?) was a pediatrician and specialist in pediatric nutrition. After the opening of the Institute of Maternal and Infant Welfare, she worked there as a nutrition instructor. During the siege, she worked in the nutrition department and headed a food station. Both the department staff and she personally were greatly credited with developing and preparing nutritional formulas for children using natural products during times of milk shortage. They showed great attention and inventiveness in diversifying the taste of food and creating new recipes for infant feeding, taking into account the age and condition of the child. Collaboration with A.N. Antonov continued throughout their years of work at the Leningrad Pediatric Medical Institute; he was the editor of her books, which went through several editions in 1926–1930, 1939, and others: Kiseleva V.B. Children's Kitchen. Preparation of Food for Children from 6 Months to 3 Years (241 Recipes). Edited and with an introduction by Associate Professor A. Antonov. Leningrad: Priboi; 1926.

them to engage in scientific research on maternal and infant welfare issues. A.N. Antonov repeatedly presented reports at meetings of the Society, which existed until 1930 [8].

Even earlier, at the end of 1918, the Council for Maternal and Infant Welfare was established in Petrograd on the initiative of the Health Commissariat Board of the Union of Communes of the Northern Region¹ and Health Commissar E.P. Pervukhin. Until 1921, this Council carried out theoretical and scientific development of measures in the field of maternal and infant welfare. The Council for Maternal and Infant Welfare included prominent pediatricians Professors S.A. Ostrogorsky, V.O. Mochan, Z.O. Michnik, A.V. Popova, F.F. Gaze, and M.L. Abelman, as well as leading obstetricians and gynecologists D.O. Shirshov, L.G. Lichkus, L.L. Okinchits, and A.M. Shuster. It also included renowned jurists F.A. Walter, P.I. Lyublinsky, and N.S. Timashev, along with other specialists representing various commissariats. In March 1919, the Council received the authority of a governing body and took charge of all maternity and children's institutions in the city, with particular attention given to children's consultation centers. In addition, important reforms were implemented in maternity shelters: newborn units were established, and pediatricians were added to the staff.

In January 1919, the Council raised with the Health Commissariat the issue of teaching a special course on child care and maternal and child hygiene in higher educational institutions [9]. The development of the curriculum for such a course was undertaken by A.N. Antonov, who by that time had already established himself as one of the most competent specialists in this field.

At one of the Council's meetings, Z.O. Michnik presented a plan for the development of maternal and infant welfare in which one of the key points was the establishment of a scientific institute and model institutions [10]. This idea was supported by the Council members. A.N. Antonov and V.O. Mochan actively participated in developing the institute's project. In August 1921, A.N. Antonov delivered a report entitled "The Institute for the Protection of Motherhood and Infancy and Its Tasks" at a meeting of the Scientific Council for Maternal and Infant Welfare. Having studied the

pre-revolutionary work of the VPOMM on the creation of such an institute, he concluded that "in the current era of extensive social reconstruction, which also encompasses the field of maternal and infant welfare, the need for establishing such an institution is felt much more acutely than eight years ago, when the Guardianship put forward its project" [11]. In his report, Antonov defined the name of the future institute, formulated its program, and presented its structure, aims, and tasks: "The activities of the Institute for the Protection of Motherhood and Infancy — as this scientific and educational institution must be called — should develop in two directions. In the purely scientific sphere, the institute's task is to comprehensively study all issues related to the protection of mother and child; in the practical sphere, to organize model institutions and train personnel of various categories for maternal and infant welfare institutions, primarily, of course, physicians, organizers, and directors of these institutions" [11].

In that same year, 1921, the project for the Institute of Maternal and Infant Welfare was submitted to the Petrograd Provincial Health Department. However, the difficult conditions in Petrograd in the early 1920s, resulting from the aftermath of the Civil War, delayed the decision to establish the Institute for some time.

The commission for the establishment of the Institute of Maternal and Infant Welfare included A.N. Antonov, V.O. Mochan, Z.O. Michnik, Professors F.A. Walter, L.T. Lichkus, L.L. Okinchits, M.S. Maslov, P.I. Lyublinsky, and others. They became the first organizers of the Institute and participated in the subsequent development of the main directions of its activities. The Institute of Maternal and Infant Welfare began its work in January 1924 under the direction of V.O. Mochan, and on January 7, 1925, the Scientific and Practical Institute of Maternal and Infant Welfare was officially opened (from 1935, the Leningrad Pediatric Medical Institute, now SPbSPMU)². Alexander Nikolaevich was immediately elected Secretary of the Scientific Council (a position he held until 1940). He repeatedly proposed initiatives related to improving the training of physicians and nurses, formulating and developing the Institute's scientific problems, opening new departments and defining their tasks, improving working conditions for medical personnel, and other pressing issues³.

¹ The Union of Communes of the Northern Region was a regional association of Soviets that existed in the Russian Soviet Federative Socialist Republic (RSFSR) from May 1918 to February 1919, established after the relocation of central party and Soviet bodies from Petrograd to Moscow.

² Central State Archive of Saint Petersburg (TsGA SPb), fund 4301, inventory 1, file 2044, sheet 3.

³ Ibid., fund 4337, inventory 1, file 13, sheets 2–7, 12, 27.



Fig. 3. Physicians attending advanced training courses with instructors from the Leningrad Institute for the Protection of Motherhood and Infancy (1926). Second row, left to right: second — Yu.N. Sadykova?, third — P.I. Lyublinsky, fourth — V.O. Mochan, Director of the Institute, fifth — P.S. Medovikov, sixth — A.V. Popova?, seventh — L.I. Erlich, eighth — V.I. Morev. Fourth row, second from right — A.N. Antonov

Рис. 3. Слушатели курсов усовершенствования врачей с преподавателями Ленинградского института ОММ (1926). Второй ряд слева направо: вторая — Ю.Н. Садыкова?, третий — П.И. Люблинский, четвертый — В.О. Мочан, директор Института, пятый — П.С. Медовиков, шестая — А.В. Попова?, седьмой — Л.И. Эрлих, восьмой — В.И. Морев. Четвертый ряд второй справа — А.Н. Антонов

He worked in the pediatric clinics of LPMI under the direction of A.F. Tur and simultaneously as an associate professor at the Department of Social Hygiene of Women and Children, established in 1928 and headed by the Director of the Institute of Maternal and Infant Welfare, Yu.A. Mendeleva [12]. He conducted extensive research, delivered lectures, and led classes in continuing medical education and postgraduate physician training courses, as well as in courses for nurses, and later taught students at LPMI. For several years, he chaired the Pedagogical Commission of the Institute of Maternal and Infant Welfare. The Commission developed and approved curricula and course programs for the advanced training of physicians and nurses in maternal and infant welfare, identified children's institutions for practical training, and performed other related functions¹ (Fig. 3).

In 1927, a Scientific Advisory Bureau was established under the Council of the Institute of Maternal and Infant Welfare, headed by A.N. Antonov, MD, Associate Professor. This Bureau

played an important role in maintaining direct contact with physicians who had received training at the Institute. Its tasks included providing information on scientific, medical, and organizational aspects of maternal and child health to physicians, as well as to all other persons working in this field of healthcare. The Bureau's staff offered advice and guidance, and developed plans and programs relating to: a) the content and scientific development of material on maternal and infant welfare issues; b) the scientific organization of observation in all types of maternal and infant welfare institutions; c) the proper and most effective organization of work in newly established institutions; d) legal issues arising in the course of work of maternal and infant welfare institutions. They also addressed personnel training, various bibliographic references, guidance on literary sources, and similar matters. Inquiries came both from the center and from the distant peripheries of the Union [13].

Furthermore, from 1928, he was also in charge of the postgraduate section at the Leningrad Institute of Maternal and Infant Welfare. By 1935, LPMI had 12 postgraduate students, and by 1940,

¹ Ibid., fund 4301, inventory 1, file 2701, sheets 700, 700 verso, 701, 701 verso.

70. During these same years, he taught at the Institute of Preschool Education and, from 1925, at the Leningrad Institute for Postgraduate Physician Training, in the Department of Pediatrics headed by Professor Petr Sergeevich Medovikov (1873–1941). Medovikov was a prominent pediatrician and phthisiologist, one of the first staff members of the Leningrad Institute of Maternal and Infant Welfare, and the organizer of the first department of childhood tuberculosis in the USSR, established at LPMI. At the Leningrad Institute for Postgraduate Physician Training, Alexander Nikolaevich was first hired as an instructor, then as a privat-docent (a university lecturer without a chair) in the Department of Pediatrics, and in 1937 he moved to the Department of Physiology and Children's Dietetics. It was there, in 1924, that he defended his dissertation entitled “Rural Summer Nurseries in Russia and Their Significance for the Protection of Infancy”.

It was precisely in the pre-war period that the main theoretical foundations were laid and new principles and methods of work for the protection of women's and children's health were put into practice. A.N. Antonov can rightly be considered one of the ideologists and theorists of maternal and infant welfare in our country. As early as 1919, when in his view this concept had “not yet fully crystallized and its scope had not yet been definitively determined”, he offered the following definition: “By the protection of motherhood and infancy, we should understand the totality of legislative, sanitary, and social measures aimed at creating the most favorable conditions for the health and life of the mother and child during the period of physiological connection between them, i.e., during pregnancy, childbirth, and breastfeeding. It goes without saying that the life and health of the mother and child are subject to a wide variety of influences not only during this period, which generally lasts about two years ...” [11]. In 1929, he viewed the concept of “protection of motherhood and infancy” more broadly, understanding it as “the totality of socio-legal and socio-hygienic measures aimed at creating the most favorable living conditions for the mother and child during the period of physiological connection between them, i.e., during pregnancy, childbirth, and breastfeeding”, and included in this concept the proposition that the protection of motherhood and infancy should begin not from the moment of conception, but even earlier: “in every growing girl and young woman we must see a future mother, and accordingly, care for their physical

health and their preparation for the performance of their future maternal duties must be included ... in the scope of maternal and infant welfare. On the other hand, the demands of life have forced us to expand the concept of 'infant welfare' to include not only the protection of infants but also of young children (from 1 to 3 years of age)” [14].

Regardless of the institution in which Alexander Nikolaevich worked, he always felt a need to share his knowledge with young physicians, nurses, and other medical personnel. Everywhere he was the organizer of special courses in maternal and infant welfare. His remarkable lectures always drew large audiences and were highly successful. Over the years of his teaching activity, many young Soviet physicians and nurses acquired and improved their qualifications in the fields of pediatrics and maternal and infant welfare. Alexander Nikolaevich correctly assessed the enormous role of nurses and nannies in preventive and therapeutic work with children. He believed that the success of children's medical and preventive institutions depended to a large extent on the quality of their work and knowledge. Delivering lectures and conducting classes for physicians, nurses, and students continued throughout his entire working life and was permeated with enthusiasm, a creative approach, love for his work, and care for his listeners. According to A.F. Tur, Alexander Nikolaevich was “a great master of the pedagogical process”; his lectures, interesting in form, “were distinguished by great substance and exceptional clarity and simplicity of presentation” [15].

In 1929, A.N. Antonov published a manual for physicians entitled “Protection of Motherhood and Infancy”, based on his lectures. This was the first such manual for physicians working in maternal and infant welfare across the vast territory of our country. In the preface, he wrote: “My listeners — physicians attending courses at the State Institute for Postgraduate Physician Training and the Leningrad Institute of Maternal and Infant Welfare — have repeatedly expressed the wish that I publish the materials I usually use when delivering lectures. I promised to do so at the first opportunity, and I am now keeping that promise” [14].

While gathering information for the book, Alexander Nikolaevich undertook an enormous amount of work, carefully collecting historical materials on the development of maternal and infant welfare in Russia and abroad. He studied numerous Russian and foreign sources, reviewing virtually all Russian medical and philanthropic periodical

and non-periodical literature from its inception at the end of the 18th century up to the 1920s. The results of this work included not only the aforementioned manual for physicians, containing the first essay in our literature on the organization of maternal and infant welfare in foreign countries, but also the first bibliography of works on maternal and infant welfare, which had been lacking. He wrote: "I do not regret the time and effort spent on this painstaking work. I consider several quite unexpected and highly interesting literary finds to be sufficient reward, as they have made it possible to add several details to the overall picture of the development of infant welfare in pre-revolutionary Russia. It goes without saying that all measures for infant welfare in pre-revolutionary Russia are now of only historical interest to us, since state protection of motherhood and infancy in the USSR, advancing by leaps and bounds, is a child of the October Revolution and owes both its existence and its development to it" [14].

When publishing his book "Protection of Motherhood and Infancy", he understood that not all problems of this complex medical and social field had been addressed in this edition, explaining that "these shortcomings are a natural consequence of the book having been written by a single author rather than a team of specialists" [14].

In addition to addressing issues of the history and theory of the maternal and infant welfare system in Russia, A.N. Antonov persistently sought to provide a scientific basis for the practice of contemporary maternal and infant welfare measures. His works reflected a desire to study these issues using historical analysis, statistics, and scientifically conducted clinical observation.

The problems of infant and maternal mortality were always within his sphere of interest, and several of his works, based on identifying and analyzing the causes of these phenomena, were devoted to this topic. An example is his work "The Reduction of Infant Mortality in Leningrad as a Result of the Activities of Maternal and Infant Welfare Centers" (1925), in which he examined the complex of factors leading to the decline in this indicator and substantiated the main one: 80% of all pregnant women and infants in Leningrad passed through maternal and infant welfare centers, where systematic preventive and health education work was constantly conducted [16].

In 1931, A.N. Antonov published a monograph on this problem entitled "Infant and Young Child Mortality, Its Causes and Measures for Its

Control" (1931). As in all his works, the book presents information on the history of the subject under study from the 17th century onward. It also analyzes and systematizes extensive material available in Russian and foreign literature on child mortality, including statistical data, and includes a bibliographic index of Russian literature on child mortality compiled by him, covering the periods before and after 1918. Alexander Nikolaevich also addressed the terminology of child mortality. During the years when the book was being written and for decades afterward, the concept of child mortality included mortality of children under one year of age. A.N. Antonov believed that "child mortality" should refer to mortality between the ages of 0 and 15 years (the age from birth to puberty, which was then considered childhood). He proposed calling mortality in the first month of life neonatal — this neologism had not yet entered Russian scientific terminology at the time — and "to denote intrauterine mortality", he wrote, "I will use a term that has already gained citizenship in Western literature — antenatal mortality, contrasting it with postnatal mortality, i.e., mortality after birth" [17]. However, in the book, he uses the term "child mortality" in the generally accepted understanding of the time — as mortality from 0 to 1 year of age.

In the monograph "Infant and Young Child Mortality, Its Causes and Measures for Its Control", Alexander Nikolaevich included an article by Professor V.V. Pavsky (1893–1934), a Soviet statistician and demographer who worked at the Leningrad Institute of Maternal and Infant Welfare and was a founder of statistics in the field of maternal and infant welfare. The article was entitled "Methods of Measuring Child Mortality at Ages 0–1 Years". In addition, one of the founders of sanitary and demographic statistics, S.A. Novoselsky (1872–1953), familiarized himself with the content of the book, provided valuable guidance to the author, and permitted him to use some of his materials that had not yet been published. A.N. Antonov expressed his gratitude to these two distinguished scholars.

In this book, he also included a chapter on maternal mortality, as he believed that "antenatal mortality and maternal mortality share many common causes, and moreover, maternal mortality has a definite influence on neonatal and postnatal mortality" [17]. This chapter by A.N. Antonov and his 1928 article "On Maternal Mortality" were among the first in our literature on this issue

[18]. He also presented a report on this topic at the Fourth All-Union Congress on Maternal and Infant Welfare, held in Moscow from June 1 to 7, 1929.

With his characteristic thoroughness, Alexander Nikolaevich discussed the causes of maternal mortality, presenting statistics from various countries. He examined the dependence of the mortality rate on maternal age, birth order and number of deliveries, marital status, rural or urban residence, family economic status, maternal health and complications during pregnancy, the performance of obstetric operations, and other factors. All of this provides grounds to consider A.N. Antonov one of the founders of historical demography.

A.N. Antonov not only formulated the meanings, ideas, and tasks of maternal and infant welfare and communicated them to his audience, but also actively participated in their practical implementation. He examined in detail the main components of the work of various institutions — children's and women's consultation centers, nurseries — and demonstrated their significance as measures for combating child mortality, particularly in rural areas. Several of his works were devoted to this topic, and he presented a seminal report entitled “Protection of Infancy in the Village” at the Second All-Russian Conference on Maternal and Infant Welfare in Moscow in 1924 [19].

Alexander Nikolaevich actively developed the system of antenatal infant welfare as an important factor in reducing mortality during the first weeks of life. He identified measures for protecting the health of pregnant women as the most important condition, and chief among them was ensuring access to appropriate medical, socio-hygienic, and socio-legal care. In his view, “the decisive influence on child mortality is exerted not by biological but by social factors. Among these, we must place in first place the family's economic situation and the method of infant feeding; in second place, family culture and housing conditions, since both depend on the family's economic circumstances” [20]. He also insisted on the introduction of such a form of work as home visiting for pregnant women, believing that “home visiting for pregnant women is as natural a complement to consultations for pregnant women and mothers as health education home visiting for infants complements the work of infant consultation centers. Thanks to home visiting, it is possible to significantly expand and deepen the activities of consultations for pregnant women”. The goal pursued by home visiting for pregnant women, he wrote, “is to

reduce maternal mortality from childbirth and postpartum diseases and mortality during the first weeks of life” [21].

Several of A.N. Antonov's works were devoted to the main organizational forms of outpatient facilities for women and children — children's and women's consultation centers. In this area, he collaborated with Zinaida Osipovna Michnik, a founder of outpatient pediatric care in Russia dating back to the pre-revolutionary period. With complete objectivity and fairness, Z.O. Michnik and A.N. Antonov can be called theorists and practitioners of outpatient care for mothers and children up to three years of age. Their joint work was highly successful. The methods they developed for the operation of outpatient facilities became standard practice in these facilities throughout the USSR. These methods included health education home visiting for infants, strategies for attracting mothers with newborns to consultation centers, methods for systematic follow-up of children under one year of age both at home and at consultation centers, promotion of breastfeeding, regulation of mothers' visits to consultation centers, and other approaches. Of great methodological importance were the detailed instructions for home visiting nurses, which clearly defined their functional responsibilities [22, 23].

Two works by A.N. Antonov devoted to the prevention of abortion deserve special attention: “Birth Control Consultation Centers as a Measure for Combating Abortion” (1926) and “Two Years of Activity of a Birth Control Consultation Center” (1929) [24, 25]. Such a consultation center was organized on the initiative of A.N. Antonov and Z.O. Michnik by the Maternal and Infant Welfare Department of the Leningrad Provincial Health Department in February 1926, at Maternal and Infant Welfare Center No. 15 on Vasilievsky Island, where Alexander Nikolaevich worked. The tasks of this consultation center were: 1) to provide assistance to women who, for various reasons, could not or did not wish to become pregnant at a given time; 2) to provide assistance to women who wished to become mothers but, for various reasons, could not conceive. During the two years of the center's operation, under conditions of the decriminalization of abortion, methods of educating women on contraception were developed, and more effective social support for pregnant women was organized.

From the very first steps of his work in the field of protecting women's and children's health,

A.N. Antonov showed a particularly keen interest in the health education work of physicians and nurses in maternal and infant welfare as one of the main components of the work of children's institutions. He correctly assessed the enormous practical importance of this area of activity within the overall system of measures. These measures were aimed at reducing child morbidity and mortality, preparing women for motherhood, and ensuring proper care and feeding of infants and young children, among other goals. At the same time, he recommended that medical workers use various methods of popularizing knowledge about the child, both time-tested and new, which he developed and presented in detailed recommendations for physicians and nurses working in maternal and infant welfare institutions. An example is his brochure "Health Education Work in Maternal and Infant Welfare", which went through editions in 1925, 1926, and 1928 [26]. Among the new methods of health education work, mention should be made of the "infant competition", held for the first time in our country in Petrograd in 1920 on the initiative of Alexander Nikolaevich and Zinaida Osipovna Michnik at the Vasileostrovsky Maternal and Infant Welfare Center No. 15. The competition involved normally developing healthy children who were under the systematic supervision of the children's consultation center. Mothers whose children had the best health indicators received prizes — a medal and a certificate of commendation — and many were also given child care items. The competition emphasized the role of systematic medical and nursing supervision and the importance of consultation centers for raising a healthy child [26]. The goal of this new form of health education was also to provide material assistance to mothers. Based on the experience of Leningrad, similar competitions were subsequently held in other cities.

In 1930 (2nd edition, 1932), the "Manual for the Maternal and Infant Welfare Nurse" was published, containing essential information on the physiology and pathology of pregnancy and childbirth, the specifics of child development, feeding guidelines, infectious diseases in children, therapeutic techniques, first aid in accidents, and other topics. The appendices included the laws in force at that time on the protection of the rights and interests of women and children in the USSR, as well as various instructions and regulations, reference cards, and sample talks for

pregnant women and practical training sessions on child care. A.N. Antonov defined the purpose of preparing such a publication for the maternal and infant welfare nurse as follows: "Deprived of constant medical assistance and guidance, she is often forced in her daily work to give advice, instructions, or even take justified actions that sometimes go far beyond the scope of her immediate duties in the protection of mother and child. She cannot make diagnoses and should not attempt to treat. But she must be able to provide first aid in the event of a sudden illness of the mother or child and in accidents; she must give necessary instructions regarding isolation and precautions in cases of suspected infectious disease, and so on" [27]. The "Manual for the Nurse" also drew attention to the ethics of conduct: "Home visits by the nurse should by no means be of a formal nature. Through gentle treatment, patience, constant readiness to provide assistance, and genuine interest in the needs of the mother and child, the nurse must earn the mother's trust, which is the key to the fruitful work of maternal and infant welfare nurses" [27].

In 1930, A.N. Antonov published a short manual entitled "Artificial Feeding of Infants" (1930), and in 1934 (2nd edition, 1937), his guide "Hygiene and Dietetics of Early Childhood" was released to assist physicians and nurses studying in maternal and infant welfare courses.

A.N. Antonov devoted much attention to the health of girls as future mothers. He originated the idea of introducing training for schoolgirls in the fundamentals of early childhood hygiene. He developed this idea in a number of articles, and it received full approval from the Fourth All-Union Congress of Pediatricians in 1927. His work "Preparing Girls for Motherhood" raised the issue of the need to teach girls child care while still in secondary school. In Antonov's view, widespread maternal practices of child rearing, child care, and infant feeding were based on "instinct", superstition, and prejudice rather than on elementary knowledge. These practices, he believed, determined the high infant mortality rates. The foundation of all maternal and infant welfare measures should be the desire to instill in women a conscious attitude toward fulfilling their maternal duty. It was also essential to provide them with a certain body of knowledge without which proper infant rearing is impossible. He understood that teaching an adult woman the basics of motherhood was by no means an easy task, as she was already burdened with the

knowledge she had acquired during her girlhood and childhood: "How can a mother believe the doctor that a baby does not need or is even harmed by swaddling clothes, a pacifier, or a cradle, if in her past she has become accustomed to them, has grown attached to them, if her early childhood memories are associated with these objects?" [28]. He believed that girls should be prepared for motherhood while still at school and taught child care. To this end, in the 1920s, he conducted such classes in schools in Staraya Russa and Leningrad, the first of their kind in the country. A.N. Antonov developed a curriculum consisting of 10 sessions, with no more than 10–12 girls aged 7 to 12 years in each group. The girls were shown various child care techniques and were asked to immediately practice them on dolls. Girls of this age in large families (of which there were many at that time) looked after their younger siblings, which helped them become better at caring for infants. Subsequently, classes with schoolgirls were conducted by maternal and infant welfare nurses under the supervision of A.N. Antonov.

For older girls (aged 15–16), 8 sessions were conducted according to a special curriculum that included questions on the social significance of child mortality, women's hygiene, infant hygiene, the main laws on the protection of mother and child, and the role of various maternal and infant welfare institutions. A.N. Antonov considered the main tasks of these sessions to be: "...first, to provide the girl with a certain amount of practical knowledge on maternal hygiene and child care, and second, to make an effort to develop in school-age girls a conscious attitude toward their future maternal responsibilities" [28].

A.N. Antonov attached great importance to health education work with mothers, which he began conducting as early as 1919, when he prepared a program outline for systematic lectures for pregnant women and mothers, delivered at children's consultation centers. Subsequently, this lecture course began to be given at "motherhood schools" affiliated with children's outpatient clinics and women's consultation centers.

In Antonov's view, "Health education work in the field of maternal and infant welfare should be conducted in two directions. On the one hand, it is necessary to awaken interest in maternal and infant welfare issues among the broad masses in order to involve as many people as possible in active work. On the other hand, it is equally necessary to widely disseminate information on maternal and child hygiene among the masses, to teach women, especially mothers, proper

infant feeding and child care, to combat harmful prejudices and superstitions, and to instill useful skills" [26]. Along with popular literature, lectures, and talks, he recommended distributing brochures and leaflets written in simple, understandable language to mothers, organizing exhibitions on maternal and infant welfare and so-called children's weeks, and using health education posters.

A.N. Antonov, together with Z.O. Michnik, wrote a popular scientific guide for mothers that went through four editions: the first three were published in 1925, 1928 (5,000 copies), and 1929 (10,000 copies) under the title "Mother and Child", and the 4th edition, published in 1937, the most complete, was entitled "Mother and Infant". The book contains information on the female body and its physiology, pregnancy and childbirth, and child care up to the age of three years according to age, including care for newborns and premature infants. It provides detailed recommendations on infant feeding (breastfeeding, mixed, and artificial feeding) and describes the normal development of a child up to three years of age and the principles of child-rearing. It characterizes maternal and infant welfare institutions where child health monitoring is conducted and assistance for various medical conditions can be provided. The work concludes with a chapter entitled "The Rights of Pregnant Women and Mothers under the Laws of the USSR". At the beginning of the book, the authors addressed their readers: "In Lieu of a Preface. This book is intended for young and inexperienced mothers. We would very much like it to become their advisor and friend. In every mother's life, there are moments when various doubts arise, when anxiety takes hold, when she wants to receive an explanation, advice, or help. If our book helps a young mother in such a difficult moment, we will consider that our efforts were not in vain" [29]. Undoubtedly, this popular guide for mothers, compiled by him together with Z.O. Michnik, enabled many mothers to become acquainted with the rules of hygienic child care.

In his works, A.N. Antonov directly addressed working mothers, explaining what a working woman needed to know about pregnancy, childbirth, and child care. He published brochures on this topic under the same title in 1928 and 1929 [30]. Another of Antonov's health education works, "The Mother's Primer: Infant Care and Feeding", was published in 1944, 1945, 1946, and 1948. He also authored a number of other popular science articles published in various journals.

Having become a recognized specialist in the field of maternal and infant welfare, Alexander Nikolaevich repeatedly put forward various proposals for the further development and improvement of maternal and infant welfare services, not only in Leningrad but throughout the country. As a speaker, he actively participated in all-union conferences on maternal and infant welfare, all-Russian congresses of pediatricians, meetings of the Leningrad Society for Maternal and Infant Welfare and the Leningrad Scientific Society of Pediatricians, and other events.

A.N. Antonov was an experienced clinical pediatrician. Working at the Institute of Maternal and Infant Welfare alongside A.F. Tur, one of the founders of Russian neonatology, and being his closest colleague, Alexander Nikolaevich also stood at the origins of neonatology. He studied in detail the anatomical and physiological characteristics of newborns, including changes in weight and height in newborn infants during the first days of life. He also examined the duration of weight loss and the average weight loss depending on the amount of milk consumed by the infant. A number of Antonov's works from 1923, 1924, 1925, and 1934 were devoted to this topic [31, 32]. His works on the physiology and pathology of lactation in women deserve mention ("The Effect of Fasting on Lactation", "Galactorrhea in Nursing Mothers", "On the Effect of Ultraviolet Irradiation on Lactation"). Of particular note are his works on dietetics and infant physiology, carried out in the 1940s. These include the results of his own observations and extremely informative and substantive reviews: on intrauterine respiratory movements of the fetus (1941), on epidemic diarrhea of the newborn (1941), on the causes of certain developmental defects (1948), on rickets, and others [33–36]. In 1946, Antonov's monograph "The Newborn Infant" was published (Leningrad, 1946).

During the Great Patriotic War of 1941–1945 and the Siege of Leningrad, Alexander Nikolaevich remained in Leningrad, continuing to work in the hospital clinics of the Leningrad Pediatric Medical Institute and heading the newborn unit. In 1942, he was elected Professor of the Department of Hospital Pediatrics at LPMI, headed by A.F. Tur. Together with the staff of the department and the institute, they endured all the trials and hardships of the siege, suffered from alimentary dystrophy, and lost loved ones. However, they considered it their duty to treat, save,

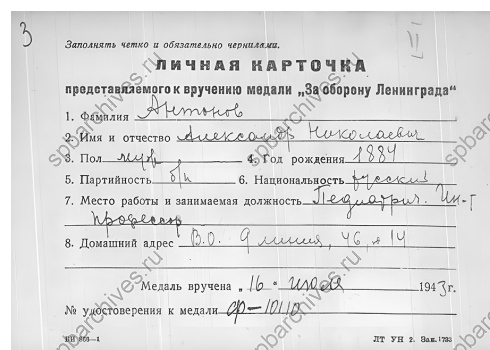


Fig. 4. Personal card of A.N. Antonov on the awarding of the medal "For the Defense of Leningrad" (1943)

Рис. 4. Личная карточка А.Н. Антонова о вручении ему медали «За оборону Ленинграда» (1943)

help, consult, teach, conduct research, and instill hope. On February 15, 1943, he was awarded the title of Honored Physician of the RSFSR, and on July 10, 1943, he received the Medal "For the Defense of Leningrad"¹ (Fig. 4).

Alexander Nikolaevich actively participated in the work of the Scientific Society of Pediatricians, which continued to function in besieged Leningrad and attracted dozens of physicians to its meetings. He also served on the Council for Curative and Preventive Care for Children of the Ministries of Health of the USSR and the RSFSR.

A.N. Antonov carefully studied the health status of newborn infants during the most severe period of the siege. It is known that in 1942–1943, the city's population consisted primarily of women. Their lot was meager, barely life-sustaining nutrition; heavy physical labor, often unfamiliar to them; night shifts on rooftops during frequent air raids; and existence in cold, unheated rooms, among other hardships. All these conditions adversely affected the health of Leningrad women, particularly the course and outcomes of pregnancy, the course of labor, intrauterine fetal development, and the physical condition of newborns during the siege period. A.N. Antonov testified: "Children born at the end of 1941 and the first half of 1942 to severely emaciated mothers were, for the most part, of low birth weight and exhibited extremely poor viability. Their mothers, as a rule, had very little milk, and therefore many newborns had to be supplemented with artificial formulas prepared from substitutes for cow's milk as early as the first days of life" [37].

¹ Ibid., fund R-7384, inventory 38, file 81, sheet 46; file 884-1, sheet 177.

At the beginning of the war, the newborn clinic at LPMI, which had a capacity of 120 children, was located in the four-story building of the obstetric and gynecological unit. During air raids, the newborns, placed on gurneys, were taken by elevator from the third floor to a bomb shelter specially equipped for them in the basement. However, in late autumn of 1941, as A.N. Antonov wrote, due to the failure of the central heating system, the obstetric clinic, having reduced the scope of its work, was moved to another premises that could be heated by makeshift stoves. This was a single ward for 15–20 children, but “the stove was too small to heat the children's ward, it often emitted smoke, there was too little firewood, and moreover, it was often damp. The temperature in the ward was usually very low (frequently dropping to 12–10 °C, and during the period of January 23–26, 1942, fell to 5–4 °C). The staff (physician, nurses) worked in their gowns worn over their outdoor clothing and in felt boots. The physical examination of the child or the nurse changing the child's swaddling clothes posed a threat of hypothermia. Hypothermia also threatened the child in the corridor and in the mothers' wards, where the child was taken for feeding, and where the temperature was even lower. The lack of hot water bottles and the inability to repair those that had broken down, the shortage of hot water (the water supply was not functioning, and water could only be heated in the ward on the makeshift stove) — all this further worsened the situation. Unsurprisingly, during this period, a significant number of newborns died from such conditions as scleroderma, sclerema, and pneumonia” [37].

Summarizing his experience of working with newborns during the siege, A.N. Antonov presented a detailed clinical and statistical characterization of newborns in the siege of Leningrad. His conclusions were as follows:

- “1. The severe degrees of quantitative and qualitative starvation experienced by Leningrad women during the siege affected the course and outcomes of their pregnancies and the condition of the newborn infant.
2. During the period of particularly profound starvation (the first half of 1942), the still-birth rate more than doubled compared to normal (to 5.6%), and the proportion of premature infants reached unprecedentedly high levels (41.2%).
3. The number of high-birth-weight full-term infants sharply decreased, while, conversely,

ly, the number of low-birth-weight infants sharply increased.

4. The average birth weight of full-term infants in the first half of 1942 decreased by 500–600 g compared to the first half of 1941.
5. The physiological weight loss lasted longer than usual, and the average weight loss was greater than usual.
6. Among the clinical features of newborn infants, the following deserve mention: a) generally reduced viability of newborns, b) pronounced physiological erythema, which often persisted for a long time in some infants, c) very rarely observed toxic erythema of the newborn, d) very rarely observed physiological engorgement of the breasts, e) unusually frequently observed craniotabes (congenital softening of the cranial bones).
7. The morbidity rate among newborns during this period was unusually high (32.3%), which should be partly attributed to their low viability. Among the diseases, the leading causes were scleroderma and sclerema, followed by pneumonia.
8. Newborn mortality, particularly in the first half of 1942, reached unprecedentedly high levels — 9% among full-term infants and 30.8% among premature infants — which should also be attributed to the low viability of many of them.
9. Even under severe degrees of starvation, a woman's ability to lactate is preserved; however, milk production sharply decreases, and the lactation period is significantly shortened.
10. While not fundamentally objecting to the existing view that the fetus behaves as a parasite in relation to the maternal organism, based on our data we can assert that the state of its host — the maternal organism — is far from indifferent to the 'parasite fetus', and that severe degrees of quantitative and qualitative starvation of the mother sharply affect fetal development and newborn viability” [37].

We know with certainty that the staff of LPMI did everything necessary to save the lives of newborns and premature infants [38].

A.N. Antonov submitted his article for publication in *The Journal of Pediatrics*, an international journal published monthly since 1932 by Elsevier [39]. The article generated considerable resonance and attracted the attention of many researchers in demography and history, nutrition specialists, and experts in obstetrics, pediatrics,

neonatology, genetics, and other fields. Foreign authors have cited Antonov's article over 350 times in publications up to 2023.

In 1944, a short monograph by A.N. Antonov entitled "Feeding and Care of the Young Child" was published, one of his many works on child dietetics [36].

As is well known, one of the leading research areas at the Department of Hospital Pediatrics of LPMI, headed by A.F. Tur, was childhood hematology. In the 1930s–1940s, studies on the morphology, physiology, and pathology of the blood system were conducted by A.N. Antonov, M.A. Zinger, R.B. Gefter, V.I. Lubenskaya, F.A. Lokshina, M.V. Miller-Shabanova, R.Ya. Mittelman, and others. A.N. Antonov authored one of the first works in the USSR on the topic "Erythroblastosis of the Newborn", published in 1940. He carried out extensive research and presented it in the form of a very detailed review of the world literature (138 sources, mostly from 1920 to 1940) on the then poorly understood issue of erythroblastosis of the newborn. He described this condition as a "triad of clinically completely heterogeneous but pathogenetically apparently very similar diseases" — referring to edema, anemia, and jaundice of the newborn [40]. Until the 1930s, this condition, termed erythroblastosis of the newborn or fetal erythroblastosis, had not been identified as a nosological entity. Knowledge of its etiology and pathogenesis was lacking. It is now known as hemolytic disease of the fetus and newborn, caused by incompatibility between the blood of the fetus and the mother with respect to erythrocyte antigens, most commonly the Rhesus system.

A.N. Antonov prepared his work and submitted it for publication in 1940, before the publication of the famous study by American researchers K. Landsteiner and A. Wiener on the Rh factor later that same year [41]. Alexander Nikolaevich continued to work in this direction, preparing a monograph during the siege. In 1947, he published a work entitled "Hemotherapy in Pediatrics in Light of the Discovery of the Rh Blood Factor". In it, he analyzed publications that had appeared since the discovery of the Rh factor, including descriptions of blood transfusion practices over the preceding years, paying special attention to whether the authors had taken into account the presence or absence of the Rh factor in this procedure. He noted that not all authors conducted appropriate monitoring during blood transfusions or

hemotherapy and called on physicians to routinely determine the Rh factor in patients and to take it into account in any blood transfusion. He strongly advised physicians to be particularly attentive to this procedure in girls: "We must view every girl as a future mother, and therefore it is necessary to establish as a rule the examination of all girls and young women for the Rh factor before transfusions or intramuscular blood injections. Those who prove to be Rh-negative must receive Rh-negative blood for transfusions" [42].

A.N. Antonov was one of the first in the country to study vitamin K. He authored a detailed review on the topic "Vitamin K and Its Use in Hemorrhagic Diseases of the Newborn", prepared during the siege and published in the journal "Pediatriya" in 1943 [43]. This was one of the first publications in Soviet literature and the first in pediatric literature. As is well known, vitamin K, whose deficiency causes hemorrhagic disease of the newborn, was isolated in 1939. This was achieved by Danish biochemist Carl Peter Henrik Dam (1895–1976), a professor at the University of Copenhagen, together with Swiss biochemist Paul Karrer (1889–1971), a Nobel Prize laureate in Chemistry in 1937. C.P. Dam was the first to use synthesized vitamin K for the treatment of newborns. In 1943, he received the Nobel Prize for the discovery and elucidation of the chemical structure of vitamin K, the only Nobel laureate in history to receive the prize for the discovery of a specific vitamin [44]. In 1943, a group of Soviet biochemists led by Academician A.V. Palladin synthesized a water-soluble analog of vitamin K (K_3 , vikasol). It was rapidly introduced into clinical practice, as it demonstrated high efficacy in patients with vitamin K deficiency.

A.N. Antonov's contribution to the study of blood pathology in newborns was confirmed after his death. On November 14, 1951, a joint meeting of the Leningrad Society of Pediatricians and the Society of Obstetricians and Gynecologists, together with the Institute of Blood Transfusion, was held in Leningrad. The meeting was chaired by M.S. Maslov, Full Member of the USSR Academy of Medical Sciences, Honored Scientist, Professor. The meeting discussed issues related to the Rh factor and its significance in the work of obstetricians and pediatricians. Other topics included the exchange transfusion method for hemolytic disease of the newborn and hemolytic anemia of the newborn (clinical presen-

tation, treatment, and long-term outcomes). At this meeting, A.F. Tur, Corresponding Member of the USSR Academy of Medical Sciences, Honored Scientist of the RSFSR, Professor, addressed the gathering and reminded those present of the role of the recently deceased Professor A.N. Antonov in the fight against hemolytic diseases of the newborn. He also drew attention to Antonov's position regarding the need for increased attention to the Rh factor and the necessity of monitoring this parameter. A.F. Tur noted with regret that "the issue of the Rh factor is still undeservedly underestimated by many. Only severe forms of erythroblastosis are recognized in maternity hospitals, while mild forms are overlooked — and it is these that subsequently lead to severe disability. Early exchange blood transfusion will undoubtedly reduce mortality and subsequent disability in children. Blood testing in newborns should be performed more frequently; this will help diagnose erythroblastosis earlier" [45].

A.N. Antonov published over 80 scientific works on various issues of maternal and infant welfare, including the physiology and pathology of the newborn period, infant feeding, hematology, and other topics. A characteristic feature of all his scientific works is their relevance and practical value for the daily work of physicians and nurses. It should be noted here that Alexander Nikolaevich was a recognized specialist in compiling bibliographic indexes of Russian and foreign literature on pediatrics, neonatology, and maternal and infant welfare. Bibliographic sections are present in his monographs. A bibliographic list of Russian works on maternal and infant welfare for 1924 was published in the journal "Maternal and Infant Welfare" in 1925 (No. 1). A list for 1925 appeared in the "Journal for the Study of Early Childhood" (1926, Vol. IV, No. 4). In A.F. Tur's textbook "Physiology and Pathology of Newborn Infants" (1936 and 1947, 2nd edition), the bibliographic index on neonatology was compiled by A.N. Antonov (Fig. 5).

In addition, he was a compiler and editor of scientific collections published by the institute. Of particular note are the publications issued for the anniversaries of the Leningrad Institute of Maternal and Infant Welfare (later LPMI): the 10th (1925–1935), 15th (1925–1940), and 20th anniversaries (1945). As the editor of these publications, he collected and summarized a large amount of



Fig. 5. A.N. Antonov. 1940

Рис. 5. А.Н. Антонов. 1940-е гг.

material on the practical, pedagogical, research, and organizational work of the institute during these periods. He also edited other scientific collections of LPMI, serving on their editorial boards.

Alexander Nikolaevich was the editor-in-chief of the journal "Maternal and Infant Welfare", which was published in 1925, unfortunately, only three issues in total. The editorial board included V.O. Mochan, P.I. Lyublinsky, and other scholars. They likely chose this title in memory of a publication with the same name issued by the VPOMM in 1916–1918. From 1929, A.N. Antonov served continuously as a member of the editorial board and as the executive secretary of the journal "Issues of Pediatrics, Pedology, and Maternal and Infant Welfare" (from 1936, "Issues of Pediatrics and Maternal and Infant Welfare"), published by the Leningrad Institute of Maternal and Infant Welfare — LPMI.

A.N. Antonov's intensive scientific, teaching, and social activities during the grim days of the Siege of Leningrad took a toll on his health. He passed away on October 17, 1947, after a brief severe illness, still in the prime of his creative thought and full of plans. All who knew Alexander Nikolaevich emphasized the diversity of his interests and the fruitful results of his medical and scientific activities. They also noted his tireless energy in developing new forms of maternal and infant welfare, and his readiness to share his rich experience and knowledge with physicians, nurses, and all those working in the field of pediatrics and maternal and child health.

A.F. Tur, who worked with Alexander Nikolaevich for many years, called him a leading Soviet pediatrician and one of the founders of maternal and infant welfare in our country: “Until the end of his life, Alexander Nikolaevich remained a steadfast fighter for children's health; he was characterized by enthusiasm in his work and a drive to resolve controversial and difficult problems of maternal and child welfare. His works will always be used by researchers in the field of maternal and infant welfare, in the field of newborn physiology and pathology, and in matters of nutrition and upbringing of young children” [15].

The name of Alexander Nikolaevich Antonov is forever inscribed in the history of SPbSPMU. He belongs to the constellation of those scientists and organizers of maternal and infant welfare who, through their efforts, energy, and ideas, defined an era. They stood at the origins of the Pediatric University and contributed to its establishment and successful development.

ADDITIONAL INFORMATION

Authors' contribution. Mikirtichan G.L. — conceptualized or developed the research idea, collected data, analyzed and summarized literature, wrote the original text, and edited the manuscript; Savina I.A. — collected data, analyzed and revised the text, and selected illustrative materials.

All authors read and approved the final version before publication.

Competing interests. The authors declare that they have no competing interests.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Микиртичан Г.Л. — концептуализация или разработка идеи исследования, сбор данных, анализ и обобщение данных литературы, написание оригинального текста и редактирование текста рукописи; Савина И.А. — сбор данных, анализ и доработка текста, подбор иллюстративных материалов.

Все авторы прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

REFERENCES

1. Russian Medical List: Lists of Physicians, Veterinarians, Dentists, Pharmacists, and Pharmacies. For 1912: ... as of April 20, 1912. Petrograd: Administration of the Chief Medical Inspector of the Ministry of Internal Affairs, 1809–1916; 1912. (In Russian).
2. Novoselsky S.A. Infant Mortality in Leningrad in 1924. *Ohrana Materinstva i Mladenchestva*. 1925;(1):48–51. (In Russian).
3. Mikirtichan G.L. Development of polyclinic care for children in Petersburg — Petrograd — Leningrad. PhD thesis. Moscow; 1981. (In Russian).
4. Russian Medical List: Lists of Physicians, Veterinarians, Dentists, Pharmacists, and Pharmacies. For 1916... as of May 1, 1916. Petrograd: Administration of the Chief Medical Inspector of the Ministry of Internal Affairs, 1809–1916; 1916. (In Russian).
5. Rauchfuss K.A. All-Russian trusteeship for the protection of motherhood and infancy. Saint Petersburg: State Printing House; 1914. (In Russian).
6. Lyublinsky P.I. A.N. Antonov. (On the 25th anniversary of medical practice). *Voprosy pediatrii, pedologii i okhrany materinstva i detstva*. 1935;VII(6):403–405. (In Russian).
7. Antonov A.N. On the issue of training mid-level personnel for the protection of motherhood and infancy. *Izvestiya Komissariata Zdravookhraneniya Petrogradskoy Trudovoy Kommuny*. 1919;7-12:59–63. (In Russian).
8. Antonov A.N. Ten years of activity of the scientific society for the protection of motherhood and infancy in Leningrad (1920–1929). *Pediatrics*. 1940;(5):77–78. (In Russian).
9. Bazanov V.A. Protection of motherhood and Infancy in Petrograd in the first years of Soviet power (1918–1919). 1972;4:78–82. (In Russian).
10. Mikirtichan G.L. Management of the protection of motherhood and childhood in Petrograd (November 1917 — March 1919). In: *Okhrana Zdorov'ya Zhenshchin i Detey*. Leningrad; 1978. P. 27–33. (In Russian).
11. Antonov A.N. The institute for the protection of motherhood and infancy and its tasks. Report at the scientific council for the protection of motherhood and infancy, August 1921. *Turkestanian Medical Journal*. 1925;4(1):46–55. (In Russian).
12. Tur A.F. A.N. Antonov. (On the thirtieth anniversary of scientific, pedagogical, medical, and public activity). *Voprosy Pediatrii i Okhrany Materinstva i Detstva*. 1941;13(2):116–123. (In Russian).
13. *Trudy Leningradskogo Pediatricheskogo Meditsinskogo Instituta* XV. 1925–1940. Leningrad; 1940. P. 64. (In Russian).
14. Antonov A.N. Maternal and child health. Leningrad; 1929. (In Russian).

15. Tur A.F. Professor A.N. Antonov. Obituary. *Voprosy Pediatritii i Okhrany Materinstva i Detstva*. 1948;XVI(1):57–58. (In Russian).
16. Antonov A.N. Reduction of infant mortality in Leningrad as a result of the activities of maternity and infancy protection centers. *Okhrana Materinstva i Mladenchestva*. 1925;1(1):51–56. (In Russian).
17. Antonov A.N. Mortality of infants and young children, its causes and measures of control. With an appendix of the article by Prof. V.V. Paevsky “Methodology for measuring child mortality in the age group 0–1 year”. Leningrad-Moscow: State Medical Publishing House; 1931. (In Russian).
18. Antonov A.N. On Maternal Mortality. *Zdravookhraneniye*. 1928;(1):62–75. (In Russian).
19. Antonov A.N. Protection of infancy in the village. Trudy Vtorogo Vserossiyskogo Soveshchaniya po Okhrane Materinstva i Mladenchestva v Moskve, 4.04-8.04.1923 g. *Zhurnal po Izucheniyu Rannego Detskogo Vozrasta*. 1924;II(1-2):198–206. (In Russian).
20. Antonov A.N. Antenatal and postnatal protection of infancy. *Meditsina*. 1929;(8):7. (In Russian).
21. Antonov A.N. On the patronage of pregnant women. *Zhurnal po Izucheniyu Rannego Detskogo Vozrasta*. 1928;VI(3):275–278. (In Russian).
22. Antonov A.N. Health education and outreach for infants in Vasilevsky Island (Leningrad). *Zhurnal po Izucheniyu Rannego Detskogo Vozrasta*. 1925;III(2):184–187. (In Russian).
23. Antonov A.N. Health education and outreach for infants. Leningrad: Prakticheskaya meditsina; 1925. (In Russian).
24. Antonov A.N. Consultations on birth regulation as a measure to combat abortion. *Profilakticheskaya Meditsina*. 1926;(12):61–67. (In Russian).
25. Antonov A.N. Two years of activity of the birth control consultation. *Zdravookhraneniye*. 1929;(1):76–81. (In Russian).
26. Antonov A.N. Sanitary and educational work for the protection of motherhood and infancy. Leningrad: Prakticheskaya meditsina; 1925. (In Russian).
27. Antonov A.N. A companion for the maternity and infancy protection nurse. Moscow — Leningrad: Ogiz — State Medical Publishing House; 1932. (In Russian).
28. Antonov A.N. Preparing a girl for motherhood. Leningrad: Publishing House of the Scientific Research Institute for the Protection of Motherhood and Infancy; 1929. (In Russian).
29. Antonov A.N., Michnik Z.O. Mother and Child. Moscow — Leningrad: Biomedgiz. Leningrad Branch; 1937. (In Russian).
30. Antonov A.N. The Working mother: what a working woman should know about pregnancy, childbirth, and childcare. 2nd ed. Moscow — Leningrad: State Medical Publishing House; 1930. (In Russian).
31. Antonov A.N. On the Question of weight changes in newborns in the first days of life. duration of weight loss and average weight loss. *Pediatriya*. 1924;VIII(5-6):336–347. (In Russian).
32. Antonov A.N. The law of weight gains in healthy infants and its practical application. *Voprosy Pediatritii, Pedologii i Okhrany Materinstva i Detstva*. 1934;(2):77–88. (In Russian).
33. Antonov A.N. On Intrauterine Fetal Breathing Movements. *Voprosy Pediatritii, Pedologii i Okhrany Materinstva i Detstva*. 1941;XIII(2):119–124. (In Russian).
34. Antonov A. N. On epidemic diarrhea of newborn infants. *Voprosy Pediatritii, Pedologii i Okhrany Materinstva i Detstva*. 1941;XIII(5):293–300. (In Russian).
35. Antonov A. N. On the causes of some congenital developmental defects. *Voprosy Pediatritii, Pedologii i Okhrany Materinstva i Detstva*. 1948;XVI(1):49–53. (In Russian).
36. Antonov A.N. Feeding and care of infants. Leningrad: Medgiz. Leningrad Branch; 1944. (In Russian).
37. Antonov A.N. Newborns during the Leningrad Siege (1942). (On the influence of maternal starvation on the newborn infant). *Voprosy Pediatritii, Pedologii i Okhrany Materinstva i Detstva*. 1947;XV(2):26–38. (In Russian).
38. Tur A.F. Daily regimen and nutrition of children during wartime and blockade. In: Pediatrics during the Siege of Leningrad. Collection 1. Alimentary dystrophies and avitaminoses in children. Leningrad: Medgiz — Leningrad Branch; 1944. P. 20–30. (In Russian).
39. Antonov A.N. Children born during the siege of Leningrad in 1942. *The Journal of Pediatrics*. 1947;30(3):250–259.
40. Antonov A.N. Erythroblastosis of newborns. *Voprosy Pediatritii, Pedologii i Okhrany Materinstva i Detstva*. 1940;XII(4):127–150. (In Russian).
41. Landsteiner K., Wiener A.S. An agglutinable factor in human blood recognized by immune sera for rhesus blood. *Proc Soc Exp Biol Med*. 1940;(43):223–225.
42. Antonov A.N. Hemotherapy in pediatrics in light of the teaching on the Rh blood factor. *Voprosy Pediatritii, Pedologii i Okhrany Materinstva i Detstva*. 1947;XV(1):29–33. (In Russian).
43. Antonov A.N. Vitamin K and its application in hemorrhagic diseases of newborns. *Pediatriya*. 1943;4:69–79. (In Russian).
44. Ivanov D.O. History of the study of hemorrhagic disease of newborns. *Pediatrician*. 2017;8(4):118–125. (In Russian). <https://doi.org/10.17816/PED84118-125>.
45. Zaitseva G.I. Joint meeting of the Leningrad Society of Pediatricians and the Society of Obstetricians and Gynecologists in conjunction with the Blood Transfusion Institute. November 14, 1951. *Voprosy Pediatritii, Pedologii i Okhrany Materinstva i Detstva*. 1952;XX(1):60–61. (In Russian).

ЛИТЕРАТУРА

1. Российский медицинский список: списки врачей, ветеринаров, зубных врачей, фармацевтов и аптек. На 1912 год: ... по сведениям на 20 апреля 1912 г. Петроград: Упр. гл. врачебного инспектора М-ва внутренних дел, 1809–1916; 1912.
2. Новосельский С.А. Смертность грудных детей в Ленинграде в 1924 г. *Охрана материнства и младенчества*. 1925;(1):48–51.
3. Микиртичан Г.Л. Развитие поликлинической помощи детям в Петербурге — Петрограде — Ленинграде. Автореф. дис. ... канд. мед. наук. М.; 1981.
4. Российский медицинский список: списки врачей, ветеринаров, зубных врачей, фармацевтов и аптек. На 1916 год ... по сведениям на 1 мая 1916 г. Петроград: Упр. гл. врачебного инспектора М-ва внутренних дел, 1809–1916; 1916.
5. Раухфус К.А. Всероссийское попечительство об охране материнства и младенчества. СПб.: Гос. тип.; 1914.
6. Люблинский П.И. А.Н. Антонов. (К 25-летию врачебной деятельности). Вопросы педиатрии, педологии и охраны материнства и детства. 1935;VII(6): 403–405.
7. Антонов А.Н. К вопросу о подготовке среднего персонала по охране материнства и младенчества. *Известия Комиссариата Здравоохранения Петроградской трудовой коммуны*. 1919;7-12:59–63.
8. Антонов А.Н. Десять лет деятельности Научного общества охраны материнства и младенчества в Ленинграде (1920–1929). *Педиатрия*. 1940;(5): 77–78.
9. Базанов В.А. Охрана материнства и детства в Петрограде в первые годы советской власти (1918–1919). 1972;4:78–82.
10. Микиртичан Г.Л. Руководство делом охраны материнства и детства в Петрограде (ноябрь 1917 — март 1919). В кн.: Охрана здоровья женщин и детей. Л.; 1978. С. 27–33.
11. Антонов А.Н. Институт охраны материнства и младенчества и его задачи. Доклад в Ученом Совете Охраны материнства и младенчества, август 1921 г. *Туркестанский медицинский журнал*. 1925;4(1): 46–55.
12. Тур А.Ф. А.Н. Антонов. (К тридцатилетию научной, педагогической, врачебной и общественной деятельности). *Вопросы педиатрии и охраны материнства и детства*. 1941;13(2):116–123.
13. Труды Ленинградского педиатрического медицинского института. XV. 1925–1940. Л.; 1940.
14. Антонов А.Н. Охрана материнства и младенчества. Л.; 1929.
15. Тур А.Ф. Профессор А.Н. Антонов. Некролог. *Вопросы педиатрии и охраны материнства и детства*. 1948;XVI(1):57–58.
16. Антонов А.Н. Понижение смертности грудных детей в Ленинграде, как результат деятельности пунктов охраны материнства и младенчества. *Охрана материнства и младенчества*. 1925;1(1):51–56.
17. Антонов А.Н. Смертность грудных и малых детей, ее причины и меры борьбы. С прил. статьи проф. В.В. Павевского «Методика измерения детской смертности в возрасте 0–1 года». Л.-М.: Гос. мед. изд-во; 1931.
18. Антонов А.Н. О материнской смертности. *Здравоохранение*. 1928;(1):62–75.
19. Антонов А.Н. Охрана младенчества в деревне. Труды Второго Всероссийского Сопещения по Охране Материнства и Младенчества в Москве, 4.04–8.04.1923 г. *Журнал по изучению раннего детского возраста*. 1924;II(1-2):198–206.
20. Антонов А.Н. Антенатальная и постнатальная охрана младенчества. *Медицина*. 1929;(8):7.
21. Антонов А.Н. О патронаже беременных. *Журнал по изучению раннего детского возраста*. 1928;VI(3):275–278.
22. Антонов А.Н. Санитарно-просветительский патронаж грудных детей на Васильевском Острове (Ленинград). *Журнал по изучению раннего детского возраста*. 1925;III(2):184–187.
23. Антонов А.Н. Санитарно-просветительский патронаж грудных детей. Л.: Практическая медицина; 1925.
24. Антонов А.Н. Консультации по регулированию деторождений как мера борьбы с абортom. *Профилактическая медицина*. 1926;(12):61–67.
25. Антонов А.Н. Два года деятельности консультации по регулированию рождаемости. *Здравоохранение*. 1929;(1):76–81.
26. Антонов А.Н. Санитарно-просветительная работа по охране материнства и младенчества. Л.: Практическая медицина; 1925.
27. Антонов А.Н. Спутник сестры охраны материнства и младенчества. М.-Л.: Огиз — Гос. мед. изд-во; 1932.
28. Антонов А.Н. Подготовка девочки к материнству. Л.: изд-во НПИОММ; 1929.
29. Антонов А.Н., Мичник З.О. Мать и дитя. Л.-М.: Биомедгиз, Ленинградское отделение; 1937.
30. Антонов А.Н. Работница мать: Что должна знать работница о беременности, родах и уходе за ребенком. 2-е изд. М.-Л.: Гос. мед. изд-во; 1930.
31. Антонов А.Н. К вопросу об изменении веса у новорожденных в первые дни жизни. Продолжительность падения веса и величина средней потери веса. *Педиатрия*. 1924;VIII(5-6):336–347.
32. Антонов А.Н. Закон весовых прибавок здорового грудного ребенка и его практическое приложение.

- Вопросы педиатрии, педологии и охраны материнства и детства*. 1934;(2):77–88.
33. Антонов А.Н. О внутриутробных дыхательных движениях плода. *Вопросы педиатрии и охраны материнства и детства*. 1941;XIII(2):119–124.
 34. Антонов А.Н. Об эпидемическом поносе новорожденных детей. *Вопросы педиатрии и охраны материнства и детства*. 1941;XIII(5):293–300.
 35. Антонов А.Н. К вопросу о причинах происхождения некоторых врожденных дефектов развития. *Вопросы педиатрии и охраны материнства и детства*. 1948;XVI(1):49–53.
 36. Антонов А.Н. Вскармливание ребенка раннего возраста и уход за ним. Л.: Медгиз, Ленинградское отделение; 1944.
 37. Антонов А.Н. Новорожденные периода блокады Ленинграда (1942 г.). (К вопросу о влиянии голодания беременной на новорожденного ребенка). *Вопросы педиатрии и охраны материнства и детства*. 1947;XV(2):26–38.
 38. Тур А.Ф. Режим жизни и питания детей в условиях войны и блокады. В кн.: *Вопросы педиатрии в дни блокады Ленинграда*. Сборник 1. Алиментарные дистрофии и авитаминозы у детей. Л.: Медгиз, Ленинградское отделение; 1944. С. 20–30.
 39. Antonov A.N. Children born during the siege of Leningrad in 1942. *The Journal of Pediatrics*. 1947;30(3):250–259.
 40. Антонов А.Н. Эритроblastоз новорожденных. *Вопросы педиатрии и охраны материнства и детства*. 1940;XII(4):127–150.
 41. Landsteiner K., Wiener A.S. An agglutinable factor in human blood recognized by immune sera for rhesus blood. *Proc Soc Exp Biol Med*. 1940;(43):223–225.
 42. Антонов А.Н. Гемотерапия в педиатрии в свете учения о факторе крови Rh. *Вопросы педиатрии и охраны материнства и детства*. 1947;XV(1):29–33.
 43. Антонов А.Н. Витамин К и его применение при геморрагических заболеваниях новорожденных. *Педиатрия*. 1943;(4):69–79.
 44. Иванов Д.О. История изучения геморрагической болезни новорожденных. *Педиатр*. 2017;8(4):118–125. <https://doi.org/10.17816/PED84118-125>.
 45. Зайцева Г.И. Объединенное заседание Ленинградского общества детских врачей и Общества акушеров-гинекологов совместно с Институтом переливания крови. 14 ноября 1951 г. *Вопросы педиатрии охраны материнства и детства*. 1952;XX(1):60–61.

AUTHORS' INFO

✉ **Galina L. Mikirtichan** — Dr. Sci. (Med.), Professor, Head of the Department of Humanities and Bioethics. E-mail: glm306@yandex.ru; <https://orcid.org/0009-0007-7913-4325>; SPIN: 3208-9066
Irina A. Savina — Director of the Saint Petersburg State Pediatric Medical University Museum. E-mail: iasavina@yandex.ru; <https://orcid.org/0009-0007-3925-3696>; SPIN: 5110-4676

ОБ АВТОРАХ

✉ **Галина Львовна Микиртичан** — д.м.н., профессор, заведующая кафедрой гуманитарных дисциплин и биоэтики. E-mail: glm306@yandex.ru; <https://orcid.org/0009-0007-7913-4325>; SPIN: 3208-9066
Ирина Александровна Савина — директор Музея Санкт-Петербургского государственного педиатрического медицинского университета. E-mail: iasavina@yandex.ru; <https://orcid.org/0009-0007-3925-3696>; SPIN: 5110-4676

Original paper

© CC BY 4.0

UDC 338.46+614.212+616-053.2+159.923.2:17
<https://doi.org/10.56871/MHCO.2026.29.89.002>

The Children's Hospital Public Economy Model

Robert M. Rennebohm

Saint Petersburg State Pediatric Medical University, 2 Litovskaya str., Saint Petersburg, 194100, Russian Federation

For citation: Rennebohm R.M. The Children's Hospital Public Economy Model. *Medicine and Health Care Organization*. 2025;10(4):29–34. <https://doi.org/10.56871/MHCO.2026.29.89.002>.

Received: 23.09.2025

Revised: 28.11.2025

Accepted: 28.01.2026

ABSTRACT. In the XIX century, the great French writer and philosopher Victor Hugo in his immortal novel *Les Misérables* introduced a profound idea of Social Beauty. He believed humanity could build a world grounded in justice, compassion, and cooperation. Though it may appear today as little more than a dream, this ideal has been brought to life in certain children's hospitals. The article shares these experiences with warmth and insight, reflecting the author's fifty years of experience in medical practice around the world. The purpose of this article is to explain the Children's Hospital Public Economy Model (CHPEM) and its underlying principles. More than a conventional economic model, it is a philosophical and conceptual system that integrates ethical and human-centered principles, fostering hospitals as living, compassionate, and sustainable organizations. CHPEM enables hospitals to function as caring, resilient institutions, guiding them to prioritize both effective treatment and the dignity and meaningful life of every individual. The CHPEM is an altruistic, democratic, publicly-funded, geographic/population-based, collaborative social and economic model whose primary concern is to meet the needs of children in a most kind and appropriately efficient way. It is guided by an accurate and positive view of Human Nature. It is cost-based, rather than price-based. It is led by altruistic natural leaders who among other positive attributes are the least corruptible among us. These leaders present an appropriate annual budget to the public and the public's government. The salaried staff are motivated by moral incentive, as opposed to monetary incentive. The entire network of children's hospitals is guided by an altruistic spirit and work ethic and an emphasis on accountability, fairness, and trust. The CHPEM is dedicated to the fundamental principles of science, medicine, ethics, and democracy. It generates Social Beauty and provides a most precious freedom.

KEYWORDS: Social Beauty, Public economy, Children's Hospital Public Economy Model, CHPEM, Children's Hospitals, appropriate budget-based, altruistic natural leaders, moral incentive, every child matters

Funding. This study was not supported by any external sources of funding.

✉ Robert M. Rennebohm. E-mail: rmrennebohm@gmail.com

© Rennebohm R.M., 2025

Оригинальная статья

<https://doi.org/10.56871/МНСО.2026.29.89.002>

Общественно-ориентированная экономическая модель детского здравоохранения

Роберт Мартин Реннебом

Санкт-Петербургский государственный педиатрический медицинский университет, 194100, г. Санкт-Петербург, ул. Литовская, д. 2, Российская Федерация

Для цитирования: Реннебом Р.М. Общественно-ориентированная экономическая модель детского здравоохранения. *Медицина и организация здравоохранения*. 2025;10(4):29–34. <https://doi.org/10.56871/МНСО.2026.29.89.002>.

Поступила: 23.09.2025

Одобрена: 28.11.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. В середине XIX века великий французский писатель и мыслитель Виктор Гюго в своем бессмертном романе «Отверженные» поделился идеей об идеальном обществе, назвав ее «красотой общественного строя». Он верил, что человечество способно построить мир, основанный на справедливости, сострадании и взаимопомощи. Сегодня кажется, что это лишь мечта. Однако описанный В. Гюго идеал воплотился в жизнь в некоторых детских больницах, о которых с удивительной теплотой и проникновенностью рассказывает автор статьи, опираясь на свою пятидесятилетнюю практику по всему миру. Цель настоящей статьи — представить структуру и принципы функционирования общественно-ориентированной экономической модели детского здравоохранения (ОЭМДЗ). Несмотря на название, это не только экономическая модель в узком смысле, но и целостная философско-концептуальная система, в которой заложены не просто правила управления, но и глубокие этические и человеческие принципы. Это своего рода инструкция к тому, как должна работать больница, если ее целью становится не только лечение, но и поддержание достоинства и смысла жизни каждого человека. Модель представляет собой социально-экономическую систему, основанную на принципах альтруизма, демократического управления и государственного финансирования, адаптированную к конкретным географическим и демографическим условиям, основная цель которой — удовлетворение потребностей детей на основе милосердия и эффективной помощи. Ее экономическая составляющая использует финансирование по объективно необходимым затратам. Управление осуществляется специалистами с выраженными лидерскими качествами и высокой нравственной мотивацией, которые формируют годовой бюджет медицинского учреждения и обеспечивают его открытую отчетность перед обществом и государством. Таким образом, ОЭМДЗ базируется на основополагающих принципах научной достоверности, доказательной медицины, этических норм и демократических ценностей. Она способствует формированию социальной среды, в которой реализуется красота общественного строя и создаются условия для уважения, заботы и безусловной ценности каждого ребенка.

КЛЮЧЕВЫЕ СЛОВА: красота общественного строя, общественная экономика, общественно-ориентированная экономическая модель детского здравоохранения, ОЭМДЗ, детская больница, целесообразное бюджетное планирование, альтруистичные руководители, нравственная мотивация, ценность каждого ребенка

Источник финансирования. Автор заявляет об отсутствии внешнего финансирования при проведении исследования.

✉ Роберт Мартин Реннебом. E-mail: rmrenneboh@gmail.com

© Реннебом Р.М., 2025

CHARACTERISTICS OF THE CHILDREN'S HOSPITAL PUBLIC ECONOMY MODEL

Since the 1940s, Academic Pediatricians throughout the world have practiced an altruistic Public Economy Model (the Children's Hospital Public Economy Model, or CHPEM) and have developed a loose, informal Collaborative International Network of Public Children's Hospitals that practice the CHPEM. This model resulted in great Social Beauty within children's Hospitals [1]. In North America the CHPEM has been best exemplified in Canada (at least during the Social Beauty ERA), as will be described in a moment [1].

The CHPEM is a *needs-based* model that starts with the question, "*What do children need?*" For example, children need primary care clinics, pediatric sub-specialists, various levels of hospital care, clinical and basic science research, and an educational system to train pediatricians (and other health care workers) and share new knowledge.

The next question is "*What is the best way to organize the above needs-meeting effort?*" One answer has been the development of a large collaborative network of independent-but-closely-linked, geographic/population-based academic pediatric medical centers — consisting of public children's hospitals affiliated with public medical schools. This has been exemplified in Canada, where it was recognized that each large metropolitan area needed a medical school-affiliated children's hospital, and it was decided to publicly fund these medical schools and hospitals. In Canada, each children's hospital is Public and is staffed with sufficient types and numbers of academic pediatricians to meet the needs of the population of children in that particular geographic area, including surrounding rural areas. All of these public children's hospitals are associated with a public medical school (e.g., the University of Alberta College of Medicine) and are funded by Provincial governments.

Each Children's Hospital within the Canadian Collaborative Network of Provincial Public Children's Hospitals operates according to a *cost-based, budget-based, altruistic* economic model. There is no interest in "making money" [1]. That is not the purpose of these hospitals. Their purpose is to responsibly meet the needs in their geographic/population area, not to make a profit. The hospitals are guided by *moral incentive, not monetary incentive* [1].

A key to the success of the CHPEM and the national network of children's hospitals that practices this model is the CHPEM's emphasis on

populating positions of leadership with exemplary "*altruistic natural leaders*" [1]. Altruistic natural leaders have an innate and practiced ability to lead with exemplary kindness, altruism, empathy, *trustworthiness*, fairness, competence, wisdom, charisma, *incorruptibility*, humility, and effectiveness. These greatly admired natural leaders are asked by their colleagues to please serve as leaders. Accordingly, the provincial governments can trust the budget requests made by these leaders.

Each Children's Hospital is funded according to an *appropriate budget* presented by the Children's Hospital to the public and the Provincial government. The natural leaders of the Children's Hospital base the budget on actual *appropriate costs*, including appropriate salaries for physicians, nurses and other employees who are asked to perform appropriate workloads with appropriate efficiency [1]. All physicians are on *salaries*; there is *no fee-for-service billing*. Because the Provincial government knows that the children's hospital is led by exemplary altruistic natural leaders, the Provincial government trusts (within reason) that the hospital leadership is presenting an appropriate budget, and trusts that the hospital leadership is committed to running the Hospital in an appropriately efficient way — neither skimping too much, nor being too extravagant. *The definition of "appropriate" is democratically determined*, with input from all concerned, including patients/parents. The entire network of children's hospitals is guided by an *altruistic spirit and work ethic* and an emphasis on accountability, fairness, and trust. Another term for this economic model would be an "*Appropriate Budget Economic Model*".

Philosophically, the *foundational understandings* upon which the Children's Hospital Public Economy Model (CHPEM) is based are [1]:

- A *positive*, comprehensive understanding of *Human Nature* that emphasizes the *spectrum* of human behavioral capacities that *we all have*, and emphasizes that the social and economic milieu can either upregulate the expression of our non-altruistic capacities and down-regulate expression of our capacities for altruistic behaviors (as is the case with corporate capitalism) or do the opposite, up-regulate expression of our altruistic capacities and down-regulate expression of our capacities for non-altruistic behaviors (as is the case with the CHPEM) [1, 2].
- An understanding that "*moral incentive*" is a sufficient motivating factor and that "*monetary incentive*" is neither essential nor desirable [1].

- An understanding that it is best to fill positions of leadership with “*altruistic natural leaders*” who have demonstrated exemplary altruism, honesty, kindness, and incorruptibility — as opposed to filling positions of leadership with those who are inclined to upregulate expression of their non-altruistic capacities [1, 2].
- A positive, accurate understanding of *the true nature and role of “competition”*, particularly the understanding that the word “competition” comes from the Latin “*com petere*”, which means “to seek (new heights) *together*” [1].
- An understanding that “monetary incentive” and capitalism’s perverted version of competition are not necessary for *innovation and creativity* [1].
- An understanding that private free enterprise and free market activity are not essential for a successful social and economic model. Instead, a different kind of freedom might be the most precious of all — *the freedom to enjoy widespread upregulation of the expression of human altruistic behavioral capacities — upregulation in oneself and in society as a whole* [1]. This “precious freedom” is provided by a public economy, but not by a capitalist economy.

When practiced well, the CHPEM creates an abundance of Social Beauty and A Most Precious Freedom within the hospital [1].

Another key to the success of the CHPEM and the national network of children’s hospitals is that the public Children’s Hospitals within this national network *collaborate* and coordinate with one another to improve care for children. There is no cut-throat competition or empire-building. To the contrary, the goal is to help each other become better. Unnecessary duplication of services is minimized. Each children’s hospital shares its expertise and new knowledge with all other children’s hospitals. Regular local, provincial, national, and international educational conferences are scheduled to share information. There is *no such thing as “intellectual property rights”*. The academic pediatricians write articles and gladly share their new research insights freely, via medical journals and conferences. They do not sell their knowledge, nor do the recipients buy it. Health care, medical knowledge, and medical expertise are not considered “commodities” for sale; they are considered public property to which the public has a right to free access. Health care is viewed as a Human Right. A physician’s opportunity and ability to serve is considered to be his/her privilege and honor.

Importantly, all children’s hospitals in the network are committed to practicing the fundamental principles of science, medicine, ethics, and democracy [3]. For example, *data must be collected in an honest, scientifically-sound fashion* and must be honestly presented and honestly explained. All plausible hypotheses need to be honored. *Thorough patient education* must be offered, and the proper process of *informed consent* must be strictly followed. (I emphasize these principles because they have been grossly violated during management of the COVID-19 pandemic — see Notes on COVID-19 on www.notesfromthesocialvlinic.org).

This same needs-based, cost-based, budget-based, altruistic, collaborative economic model has been practiced by academic pediatricians throughout the world for decades — though not necessarily in as pure and excellent a fashion as in Canada. For example, in the USA there is a mix of public and private children’s hospitals.

Note. Unfortunately, over the past 25 years, or so, children’s hospitals, including those in Canada, have become increasingly corporatized, at the administrative level, particularly in the USA. This corporatization has brought a new leadership model to many children’s hospitals. Altruistic natural leaders have been considered a “poor fit” and have been replaced by corporate-minded leaders. Monetary incentive, revenue generation, maximization of fee-for-service billing, cut-throat competition, empire-building, and other corporate behaviors and priorities have been emphasized and have replaced altruistic goals and behaviors. Furthermore, unhealthy and inaccurate social understandings (about Human Nature, e.g.) have been imposed [1]. This has threatened opportunities for altruistic pediatricians and pediatric nurses to practice the CHPEM and has threatened the very survival of the CHPEM. As explained in a companion article, the CHPEM has, therefore, existed in two different eras — the *altruistic era* (Social Beauty era) and the *corporate era* [1]. The CHPEM flourished during the altruistic era but is now struggling for its survival during the corporate era.

Especially during the altruistic era of the CHPEM, academic pediatricians throughout the world have altruistically worked together to raise the level of pediatric knowledge and quality of care. International conferences are held for this purpose. International pediatric medical journals have been developed, through which the world’s pediatricians freely share their knowledge and research. Physicians from Canada interact with children’s hospitals in other countries to mutually share experiences and knowledge and mutually improve each other. There is no such thing as exploiting money-making opportunities in other countries. Canadian Children’s Hospitals, e.g., have no interest in creating an international empire of children’s hospitals designed to

make profits off of patients in other countries. Within the international academic pediatrics community there is no counterpart to the transnational corporations, like Exxon, General Electric, Apple, etc.

With the Children's Hospital Public Economy Model (CHPEM) there is no need for international "free trade" agreements — because nothing is being traded for profit. Knowledge and expertise are generously and freely "traded" only in the sense of mutually sharing what is needed for the benefit of Humanity.

A good example of the value and efficiency of this collaborative public economy model, especially during the altruistic era of the CHPEM, is the progress made in treating childhood leukemia. In the 1970s pediatric hematologists/oncologists at public children's hospitals in the USA and Canada pioneered the development of a Multi-Center Collaborative Research Effort to advance progress in treating leukemia. Thanks to this altruistic collaborative Public Effort, the mortality rate for Acute Lymphocytic Leukemia (ALL) went from 90% in the early 1970s to less than 10% by the year 2000. The knowledge gained has been freely shared with pediatric hematologists throughout the world. Not only has this collaborative Public Activity been extraordinarily successful, but it has also been a necessary approach to the problem — i.e., such success probably would not have occurred without this collaborative Public Effort, at least not as quickly and efficiently. For decades, pediatricians in all specialties have, similarly, freely and selflessly collaborated and shared their research and knowledge with other pediatricians, nationally and internationally.

At this point it is important to emphasize that with the CHPEM *each individual children's hospital is independent and is encouraged to develop in its own creative way, according to its unique local conditions*. Although the CHPEM strongly encourages collaboration, there is *no central authority* that dictates how all members of the network are to think, operate, or behave. *The CHPEM is a decentralized model that encourages local decision-making and local innovation* [1]. Although there is no central authority, there is, however, a strong central unifying spirit — the altruistic spirit and the specific underlying philosophical principles of the CHPEM, including its commitment to honoring the fundamental principles of Science, Medicine, Ethics, and Democracy [1, 3].

So, for decades, Academic Pediatricians, particularly in Canada, especially during the altruistic era of the CHPEM, have demonstrated the success and value of the CHPEM, including the feasibility and value

of developing a Collaborative *National* Network of Public Children's Hospitals, and a Collaborative *International* Network of National Public Children's Hospitals. For decades, Children's Hospitals throughout the world have been practicing a needs-based, cost-based, appropriate budget-based, altruistic economic model. *This model (the CHPEM) has not simply been developed in theory, it has actually been practiced, for decades, and has proven to be of great benefit to the world's children, at an affordable price for societies*. Academic pediatricians, especially in Canada, have already proven the value of this model, especially during the Altruistic Era. They have also experienced the adverse effects of the corporatization of children's hospitals, during the Corporate Era, as discussed in a companion article [1].

Furthermore, the vast majority of Academic Pediatricians have found this Academic Pediatrics Economic Model (the CHPEM) to be very meaningful, gratifying, and emancipating. The vast majority would not wish to have approached their work in any other way. They like the Public Economy Model, including the opportunity and freedom it provides to enjoy expressing their altruistic capacities. They have enjoyed the freedom to plan and act altruistically [1]. They have treasured this "Selfless Freedom". In fact, they have been greatly disturbed by the increasing encroachment of a private corporate business mentality into the administrative workings of pediatric institutions (particularly in the USA). That corporate mentality has been increasingly down-sizing (even punishing) altruism, over-extending physicians, and adversely transforming behaviors within our children's hospitals, particularly at leadership levels. The altruism and Selfless Freedom of pediatricians has been under assault (at least in the USA), and children are suffering because of it. (See the companion essay, "*The Social Beauty of Children's Hospitals*" which compares the "Social Beauty Era to the «Corporatized Era»" [1].)

APPLICATION OF THE CHPEM TO THE GENERAL ECONOMY — DEVELOPMENT OF INDEPENDENT-BUT- COLLABORATIVE PUBLIC ECONOMIES

If Canada can develop and successfully practice a *public* pediatric health care system (and a similar system for adults) that is based on a Public Economy model, *why can't Canada develop other essential industries and a general economy based on the same model?* And why can't this happen in other countries, and globally.

In Canada, the National Network of Children's Hospitals has been entirely a public network and, thereby, has exemplified what a Public Economy could look like, if all essential sectors of the general economy were to emulate the Children's Hospital Public Economy Model (the CHPEM) — i.e., if “Vast Fields of Public Activity (a phrase coined by Victor Hugo¹) were to be created. In short, the General Public Economy in Canada could resemble a collaborative network of *children's hospital-like* public activities — regarding philosophy, spirit, principles, leadership, behavior, over-all organization, and logistics [1, 4].

In another article, the *option* of developing a *Collaborative International Network of Unique Independent, Creative, Self-Determined, Self-Reliant, Democratic National Public Economies* to replace current “Mean Arrangements of Man” (another phrase coined by Victor Hugo) is discussed, including concerns and fears that people may have about the mere thought of a “Public Economy” [1].

ADDITIONAL INFORMATION

The author read and approved the final version before publication.

Competing interests. The author declares the absence of obvious and potential conflicts of interest related to the publication of this article.

ОБ АВТОРАХ

✉ Robert M. Rennebohm — MD, PhD, Dr. Sci. (Med.), Professor, Visiting Professor at Department of Hospital Pediatrics. E-mail: rmrennebohm@gmail.com; <https://orcid.org/0000-0001-8619-0447>

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Автор прочитал и одобрил финальную версию перед публикацией.

Конфликт интересов. Автор декларирует отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

ЛИТЕРАТУРА / REFERENCES

1. Rennebohm R. Showing Seeds of Social Beauty [Internet]. Information portal: Notes From the Social Clinic, 2024. Available at: <https://notesfromthesocialclinic.org/sowing-seeds-of-social-beauty-full-manuscript> (accessed: 10.12.2025).
2. Rennebohm R. Human Nature — A Graphic Depiction — Sowing the Seeds for Public Economy and Social Beauty [Internet]. Information portal: Notes From the Social Clinic, 2024. Available at: <https://notesfromthesocialclinic.org/human-nature-a-graphic-depiction-sowing-the-seeds-for-public-economy-and-social-beauty> (accessed: 10.12.2025).
3. Rennebohm R. Eight Fundamental Principles of Science and Medicine [Internet]. Information portal: Notes From the Social Clinic. 2023. Available at: <https://notesfromthesocialclinic.org/eight-fundamental-principles-of-science-and-medicine> (accessed: 10.12.2025).
4. Hugo V. *Les Misérables*. New York: Penguin Books; 1982.

AUTHORS' INFO

✉ Роберт Мартин Реннебом — д.м.н., профессор, почетный профессор кафедры госпитальной педиатрии. E-mail: rmrennebohm@gmail.com; <https://orcid.org/0000-0001-8619-0447>

¹ The phrases “Social Beauty”, “Vast Fields of Public Activity”, and “Mean Arrangements of Man” appear in Victor Hugo's 1962 novel *Les Misérables*. Victor Hugo appears to have coined these phrases. I have not seen them written or used in any forms of communication other than by Victor Hugo in *Les Misérables*.

Original paper

UDC 614.2:331.108.43(470-23)

<https://doi.org/10.56871/MHCO.2026.48.48.003>

On the issue of certification of Saint Petersburg healthcare system specialists (history, analysis and current trends; certification of doctors in the specialty “Healthcare organization and public health”)

Andrey M. Sarana¹, Nikolay I. Vishnyakov², Irina G. Nagnojnaya³, Elena V. Smirnova³

¹ Saint Petersburg Health Committee, 1 Malaya Sadovaya str., Saint Petersburg, 191023, Russian Federation

² Pavlov First Saint Petersburg State Medical University, 6/8 L'va Tolstogo str., 197022, Russian Federation

³ Medical Information and Analytical Center, 30 Shkapina str., 198095, Russian Federation

For citation: Sarana A.M., Vishnyakov N.I., Nagnojnaya I.G., Smirnova E.V. On the issue of certification of Saint Petersburg healthcare system specialists (history, analysis and current trends; certification of doctors in the specialty “Healthcare organization and public health”). *Medicine and Health Care Organization*. 2025;10(4):35–49. <https://doi.org/10.56871/MHCO.2026.48.48.003>.

Received: 03.11.2025

Revised: 15.12.2025

Accepted: 28.01.2026

ABSTRACT. Introduction. In order to improve the quality of medical and preventive care in the healthcare system the Government of the Russian Federation is taking certain steps aimed both at improving the level of professional training of medical personnel and at increasing incentives for advanced training of medical professionals. Admission of doctors to practical work is possible only after they have successfully fulfilled the mandatory accreditation procedure; a system of continuing medical education has been implemented. At the same time, a voluntary system for assessing the qualifications of both doctors and nursing staff has been introduced — certification for obtaining a qualification category regulated by the Ministry of Health. **Aim** — to analyze the expert activity on the certification of specialists with higher medical education in the historical aspect and its current state; to make a thorough study of the certification of doctors in the specialty “Healthcare organization and public health” for 2024 in order to develop recommendations for improving certification activities in the urban health care system organizations. **Materials and methods.** In order to study the formation and development of the legislative framework for certification of medical workers, the laws and orders of the Ministry of Health of the Russian Federation reflecting the organization of the certification of doctors in the XXI century were analyzed. The work of 31 attestation commissions of the St. Petersburg Health Committee was analyzed, in which 16213 doctors were certified, including 541 doctors specializing in health organization and public health (“HP HO”) for 5 years. Moreover, all the attestation cases (134) of healthcare organizers for 2024 have been studied and analyzed. **Results and discussions.** The history of certification of medical workers in Russia goes back for more than 65 years. Using the example of the work of the attestation commission in the specialty “HP HO” for 2024, the main trends of this procedure have been identified. Such characteristics of certified specialists as their position, place of work, gender, age, work experience in an organizational specialty, academic degree, and others are considered. Special attention was paid to the issues of professional development and test results. Thus, higher scores (90 and above) were obtained by the heads of medical institutions and organizations with proper training in their specialty (residency, academic degree), who regularly upgrade their qualifications according to the “classical program” (144 hours) in medical universities and research centers. The expert activity of the reviewer was analyzed based on the reports of the attested persons alongside the analysis of comments. The structure and work of the expert commission on the specialty “HP HO” are highlighted in detail. Of all those certified in this specialty in 2024, 10.4% were assigned the II qualification category, 23.1% of the I category, and 66.5% of the highest

✉ Nikolay I. Vishnyakov. E-mail: orgzdrav@mail.ru

© 2025 by the authors

category. Along with solving a number of organizational problems of the certification procedure for doctors (Medical Information and Analytical Center electronic information systems have been installed to optimize the conditions for submitting documents by doctors, as well as to improve the effectiveness of expert groups), the problems of involving medical professionals in the certification procedure remain being insufficiently solved. **Conclusion.** Certification of medical personnel is one of the ways of state control over the quality of specialist training. Attestation is not considered to be a substitute for the accreditation procedure, which is a mandatory element of admission to professional activity. A qualification category is a practical assessment of a specialist's performance and level of qualification. Among the problems of certification, a group of organizational problems should be highlighted, the quality of training and advanced training of doctors, encouraging medical professionals to participate in certification in order to improve the level of medical and preventive care in general, and other issues outlined in the article.

KEYWORDS: certification, specialists, doctors-organizers of healthcare, professional development

Funding. This study was not supported by any external sources of funding.

<https://doi.org/10.56871/MHCO.2026.48.48.003>

К вопросу об аттестации специалистов системы здравоохранения Санкт-Петербурга (история, анализ и современные тенденции; аттестация врачей по специальности «Организация здравоохранения и общественное здоровье»)

Андрей Михайлович Сарана¹, Николай Иванович Вишняков²,
Ирина Геннадьевна Нагнойная³, Елена Владимировна Смирнова³

¹ Комитет по здравоохранению Санкт-Петербурга, 191023, г. Санкт-Петербург, ул. Малая Садовая, д. 1, Российская Федерация

² Первый Санкт-Петербургский государственный медицинский университет имени академика И.П. Павлова, 197022, г. Санкт-Петербург, ул. Льва Толстого, д. 6/8, Российская Федерация

³ Медицинский информационно-аналитический центр, 198095, г. Санкт-Петербург, ул. Шкапина, д. 30, Российская Федерация

Для цитирования: Сарана А.М., Вишняков Н.И., Нагнойная И.Г., Смирнова Е.В. К вопросу об аттестации специалистов системы здравоохранения Санкт-Петербурга (история, анализ и современные тенденции; аттестация врачей по специальности «Организация здравоохранения и общественное здоровье»). *Медицина и организация здравоохранения*. 2025;10(4):35–49. <https://doi.org/10.56871/MHCO.2026.48.48.003>.

Поступила: 03.11.2025

Одобрена: 15.12.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. Введение. В Российской Федерации в системе здравоохранения в целях повышения качества оказания медико-профилактической помощи государство предпринимает определенные шаги, направленные как на улучшение уровня профессиональной подготовки медицинских кадров, так и на усиление стимулов к повышению квалификации медицинских специалистов. Допуск медиков к практической работе возможен только после прохождения ими обязательной процедуры аккредитации; внедрена система непрерывного медицинского образования. Одновременно введена добровольная система оценки квалификации как врачей, так и среднего медицинского персонала, регулируемая Минздравом России, — аттестация на получение квалификационной категории. **Цель** — проанализировать экспертную деятельность по аттестации специалистов с высшим медицинским образованием в историческом аспекте и в современной ситуации; углубленно изучить аттестацию врачей по специальности «Организация здравоохранения и общественное здоровье» за 2024 год для разработки рекомендаций по совершенствованию аттестационной деятельности в системе городского здравоохранения. **Материалы и методы.** В целях изучения становления и развития законодательной базы аттестации медицинских работников были проанализированы законы и приказы Министерства здравоохранения Российской Федерации, отражающие организацию аттестации врачей в XXI веке. Проанализирована работа 31 аттестационной комиссии Комитета по здравоохранению Санкт-Петербурга, в которых прошли аттестацию 16 213 врачей, в том числе 541 врач по специальности «Организация здравоохранения и общественное здоровье» («ОЗ ОЗ») за 5 лет. Причем углубленно изучены все аттестационные дела (134) врачей — организаторов здравоохранения за 2024 год. **Результаты и обсуждения.** История аттестации медицинских работников в России насчитывает более 65 лет. На примере работы аттестационной комиссии по специальности «ОЗ ОЗ» за 2024 год выявлены основные тенденции этой процедуры. Рассмотрены такие характеристики

✉ Николай Иванович Вишняков. E-mail: orgzdrav@mail.ru

© Коллектив авторов, 2025

аттестованных специалистов, как занимаемая должность, место работы, пол, возраст, стаж работы по организационной специальности, наличие ученой степени и др. Особое внимание было уделено вопросам повышения квалификации и результатам тестирования. Так, более высокие баллы (90 и выше) по итогам тестирования получили руководители медицинских учреждений и организаций, имеющих хорошую подготовку по специальности (ординатура, ученая степень), регулярно повышающие свою квалификацию по «классической» программе (144 ч) в медицинских вузах и научных центрах. Была проанализирована экспертная деятельность рецензента по отчетам аттестуемых с анализом замечаний. Подробно освещена структура и работа экспертной комиссии по специальности «ОЗ ОЗ». Из всех аттестованных по этой специальности за 2024 год II квалификационная категория была присвоена 10,4%, I категория — 23,1%, а высшая категория — 66,5%. Наряду с решением ряда организационных проблем процедуры аттестации врачей (установлены электронные информационные системы Медицинского информационно-аналитического центра для оптимизации условий подачи документов врачами, а также для повышения результативности работы экспертных групп) остаются недостаточно решенными проблемы вовлеченности медицинских работников в процедуру аттестации. **Заключение.** Аттестация медицинского персонала является одним из способов государственного контроля над качеством подготовки специалистов. Аттестация не подменяет процедуру аккредитации, которая является обязательным элементом допуска к профессиональной деятельности. Квалификационная категория — это практическая оценка результатов деятельности специалиста и уровня его квалификации. Среди проблем аттестации следует выделить группу организационных проблем, качество подготовки и повышения квалификации врачей, стимулирование медицинских работников к участию в аттестации в целях повышения уровня медико-профилактической помощи в целом и другие вопросы, изложенные в статье.

КЛЮЧЕВЫЕ СЛОВА: аттестация, врачи — организаторы здравоохранения, повышение квалификации

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

INTRODUCTION

In our country, the population's need for accessible, high-quality medical care requires both improving the training of new personnel and strengthening incentives for the continuing professional development of practicing medical specialists. The state is taking certain steps. First, medical professionals are now permitted to practice only after undergoing accreditation (instead of the previous certification system). Second, a system of Continuing Medical and Pharmaceutical Education (CME, known in Russia as NMO) has been introduced to ensure the level of knowledge and skills required for this accreditation. In addition to mandatory accreditation, there is another competency assessment mechanism regulated by the Ministry of Health of the Russian Federation — certification of physicians and mid level specialists for a qualification category. This mechanism operates on a voluntary basis. This certification aligns with the concept of continuing professional development. Its main objectives are twofold. First, to stimulate the professional growth and responsibility of medical professionals for the quality of their duty performance. Second, to stratify them according to their level of professionalism for better staff allocation by granting access to more complex work, including leadership positions. As stipulated in Article 72 of the Law “On the Fundamentals of Protecting the Health of Citizens in the Russian Federation” (No. 323 FZ of November 21, 2011)¹, this certification gives individuals the right, after completing the required examination procedures, to obtain a category (second, first, or highest) and to qualify for corresponding salary supplements.

AIM

The aim of the study was to develop recommendations for improving certification activities in the city healthcare system based on an analysis of expert assessments of the certification of specialists with higher medical education, including physicians in the specialty “Healthcare Organization and Public Health”.

MATERIALS AND METHODS

In order to study the formation and development of the legislative framework of modern

Russia in the field of certification of medical workers, the following were analyzed:

- the Law of the Russian Federation No. 324 FZ of November 21, 2011 “On the Fundamentals of Protecting the Health of Citizens in the Russian Federation”;
- the main orders of the Ministry of Health of the Russian Federation reflecting the organization of certification in Russia in the 21st century, including: Order No. 314 of August 9, 2001 “On the Procedure for Obtaining a Qualification Category”²; Order No. 808n of July 25, 2011 “On the Procedure for Obtaining Qualification Categories by Medical and Pharmaceutical Workers”³; Order No. 240n of April 23, 2013 “On the Procedure and Timing for Medical and Pharmaceutical Workers to Undergo Certification to Obtain a Qualification Category”⁴; Order No. 394n of April 30, 2020 “Special Features of Medical and Pharmaceutical Workers Undergoing Certification to Obtain a Qualification Category”⁵; Order No. 41n of February 2, 2021 “On Special Features of Medical and Pharmaceutical Workers Undergoing Certification to Obtain a Qualification Category in 2021”⁶; Order No. 1083n of November 22, 2021 “On the Procedure and Timing for Medical and Pharmaceutical Workers to Undergo Certifi-

² Order No. 314 of the Ministry of Health of the Russian Federation of November 9, 2001 “On the Procedure for Obtaining a Qualification Category”. Available at: <https://base.garant.ru/4177721/> (accessed: November 15, 2025).

³ Order No. 808n of the Ministry of Health and Social Development of the Russian Federation of July 25, 2011 “On the Procedure for Obtaining Qualification Categories by Medical and Pharmaceutical Workers”. Available at: <https://www.garant.ru/products/ipo/prime/doc/12090108/> (accessed: November 15, 2025).

⁴ Order No. 240n of the Ministry of Health of the Russian Federation of April 23, 2013 “On the Procedure and Timing for Medical and Pharmaceutical Workers to Undergo Certification to Obtain a Qualification Category”. Available at: <https://base.garant.ru/70412100/> (accessed: November 15, 2025).

⁵ Order No. 394n of the Ministry of Health of the Russian Federation of April 30, 2020 “Special Features of Medical and Pharmaceutical Workers Undergoing Certification to Obtain a Qualification Category”. Available at: <https://base.garant.ru/73976163/> (accessed: November 15, 2025).

⁶ Order No. 41n of the Ministry of Health of the Russian Federation of February 2, 2021 “On Special Features of Medical and Pharmaceutical Workers Undergoing Certification to Obtain a Qualification Category in 2021”. Available at: <https://www.garant.ru/products/ipo/prime/doc/400184898/> (accessed: November 15, 2025).

¹ Federal Law No. 323 FZ of November 21, 2011 “On the Fundamentals of Protecting the Health of Citizens in the Russian Federation” (as amended). Available at: <https://minzdrav.gov.ru/documents/7025> (accessed: November 15, 2025).

cation to Obtain a Qualification Category”¹; Order No. 59n of February 7, 2022 “On Special Features of Medical and Pharmaceutical Workers Undergoing Certification to Obtain a Qualification Category”²; Order No. 458n of August 31, 2023 “On Approving the Procedure and Timing for Medical and Pharmaceutical Workers to Undergo Certification to Obtain a Qualification Category”³;

- Order No. 332 r of August 26, 2016 of the Health Committee of Saint Petersburg “On Approving the Regulations on the Remuneration of Employees of State Healthcare Institutions of Saint Petersburg”⁴.

In addition, to study the history and comparison of the certification procedure in our country, certain legislative acts of the Soviet period were reviewed.

The status, achievements, and some problems of physician certification were analyzed based on a study of the work of 31 certification commissions (referred to as “attestation commissions” in the abstract and in the tables below) established by the Health Committee of Saint Petersburg over recent years. Certification activities in the specialty “Healthcare Organization and Public Health” (HOPH; referred to as “HP HO” in the abstract) were examined in greater depth.

Over five years (2020–2024), the certification files of 541 specialists who underwent certification in the specialty “HOPH” were studied, as well as annual reports on certification results.

All certification files for 2024 (134 files) were studied in greater depth. These included certification sheets of specialists, reports on professional activities, copies of accreditation certificates, copies of documents confirming academic degrees (if any), and extracts from employment records confirming position and length of service in the specialty being certified.

In addition, all minutes of meetings of the Expert Group in the specialty “HOPH” for 2024 were analyzed.

The results obtained were analyzed using parametric statistics methods (calculation of extensive indicators, reliability of differences between means, etc.).

RESULTS AND DISCUSSION

Certification for a qualification category has its roots in the Soviet healthcare system, and its introduction into practice was a unique social innovation. However, recently the number of medical specialists holding a category has been declining, and criticism has emerged within the medical community regarding the loss or, at the very least, weakening of its intended purpose [1].

The history of certification of medical and pharmaceutical workers to obtain a qualification category spans more than 65 years. Categories were introduced into the national healthcare system in the early 1960s [2]. They were awarded based on length of service in the specialty, the volume and quality of work results, completion of specialization courses, advanced training and other forms of professional development (including on the job training), published works, and other criteria. When awarding categories, it was recommended to observe their sequence, i.e., progression through the steps of professional growth, while the flow of candidates was regulated because the Ministry of Health had budget limitations for these purposes [3].

In 1964, a system of professional categories for physicians was adopted, the main provisions of which were regulated by the “Regulations on the Certification of Medical Specialists”, which established the first and highest physician categories. Obtaining and renewing categories was voluntary, and the state provided material incentives for

¹ Order No. 1083n of the Ministry of Health of the Russian Federation of November 22, 2021 “On the Procedure and Timing for Medical and Pharmaceutical Workers to Undergo Certification to Obtain a Qualification Category”. Available at: <https://www.garant.ru/products/ipo/prime/doc/403037045/> (accessed: November 15, 2025).

² Order No. 59n of the Ministry of Health of the Russian Federation of February 7, 2022 “On Special Features of Medical and Pharmaceutical Workers Undergoing Certification to Obtain a Qualification Category”. Available at: <https://www.garant.ru/products/ipo/prime/doc/403401536/> (accessed: November 15, 2025).

³ Order No. 458n of the Ministry of Health of the Russian Federation of August 31, 2023 “On Approving the Procedure and Timing for Medical and Pharmaceutical Workers to Undergo Certification to Obtain a Qualification Category”. Available at: <https://www.garant.ru/products/ipo/prime/doc/407680878/> (accessed: November 15, 2025).

⁴ Order No. 332-r of the Health Committee of Saint Petersburg of August 26, 2016 “On Approving the Regulations on the Remuneration of Employees of State Healthcare Institutions of Saint Petersburg”. Available at: http://zdrav.spb.ru/media/komzdrav/documents/document/file/rasp_332-r.pdf (accessed: November 15, 2025).

medical workers holding a category. In turn, heads of medical organizations gained a fairly effective management tool.

In 1970, the second professional category was introduced into the regulatory framework for certification, as well as certification of mid level medical personnel. In the 1980s, the Ministry of Health undertook measures to introduce not only voluntary but also mandatory certification of specialists. This mandatory certification was abolished in 1995. In 2001, Order No. 314 of the Ministry of Health of the Russian Federation of August 9, 2001 "On the Procedure for Obtaining Qualification Categories" came into force. Under this order, the main principles for awarding categories remained assessment of the report and an interview. In 2011, Order No. 808n of the Ministry of Health and Social Development of the Russian Federation of July 25, 2011 "On the Procedure for Obtaining Qualification Categories by Medical and Pharmaceutical Workers" came into force. This order regulated the activities of certification commissions in more detail and more clearly compared to previous documents. From 2013, the procedure and timing for medical workers to undergo certification to obtain a qualification category were regulated by Order No. 240n of the Ministry of Health of the Russian Federation of April 23, 2013 "On the Procedure and Timing for Medical and Pharmaceutical Workers to Undergo Certification to Obtain a Qualification Category". In 2021, Order No. 1083n of the Ministry of Health of the Russian Federation of November 22, 2021 "On the Procedure and Timing for Medical and Pharmaceutical Workers to Undergo Certification to Obtain a Qualification Category" came into force. Under this order, certification of medical and pharmaceutical workers to obtain a qualification category was suspended until January 1, 2023. The only exceptions were certification for the award of a category for the first time and for obtaining a higher category (paragraph 1 of Order No. 59n of the Ministry of Health of the Russian Federation of February 7, 2022 "On Special Features of Medical and Pharmaceutical Workers Undergoing Certification to Obtain a Qualification Category"). In accordance with Order No. 59n, the validity period of qualification categories was extended by 12 months when their validity expired between January 1 and December 31, 2022 (paragraph 3). The validity period of awarded categories was also extended by 12 months. These categories had pre-

viously been extended between February 1, 2020, and January 1, 2021 in accordance with Order No. 394n of the Ministry of Health of the Russian Federation of April 30, 2020 "Special Features of Medical and Pharmaceutical Workers Undergoing Certification to Obtain a Qualification Category". This extension was then further prolonged until January 1, 2022 in accordance with Order No. 41n of the Ministry of Health of the Russian Federation of February 2, 2021 "On Special Features of Medical and Pharmaceutical Workers Undergoing Certification to Obtain a Qualification Category in 2021".

Currently, certification of medical and pharmaceutical workers is regulated by Order No. 458n of the Ministry of Health of the Russian Federation of August 31, 2023 "On Approving the Procedure and Timing for Medical and Pharmaceutical Workers to Undergo Certification to Obtain a Qualification Category".

The certification rules have been repeatedly revised towards greater standardization. These rules include testing according to approved programs, expert assessment of a qualification paper, and an interview. Requirements for certification commissions have been tightened, and access to certification for early career professionals has been expanded: three years of experience are required to obtain the second category, five years for the first category, and seven years for the highest category.

Order No. 458n of the Ministry of Health of the Russian Federation introduced other changes in addition to the length of service requirement for the specialty. Specifically, it is now possible to apply for a higher category no earlier than two years after the previous category was awarded. In addition, the report may include data from one year that had already been assessed for the existing category and two subsequent years that had not been assessed for certification purposes. The requirements for the report on professional activities have been expanded. In addition to assessing proficiency in modern methods of diagnosis and treatment, the report now must cover prevention, rehabilitation, medical diagnostic techniques in the field of professional activity, and forms of self education used by the specialist. The requirements for each qualification category (second, first, and highest) have been specified in detail. The requirements for members of expert groups of certification commissions have also been updated. An application for certification can be submitted regardless of the length of

time worked at an institution, as well as during parental leave. If a specialist has worked for several employers during the reporting period, several certified reports from different employers may be submitted. A specialist holding a qualification category must submit documents to the commission no later than 91 working days before the category expires. Specialists with higher non medical education have been added (certification is based on the position held). Graduates of foreign educational institutions may obtain a category only if they have work experience in the Russian Federation on the same general basis as citizens of the Russian Federation.

In recent years, certification has motivated only a small proportion of medical personnel — specifically, those for whom it resulted in positive changes either in the nature of their work (more interesting and meaningful duties, career advancement) or in their level of remuneration [4].

The decline in the number of specialists participating in certification can be attributed to changes in the system of material incentives. The abolition of the Unified Tariff Schedule and the transition to new systems of remuneration (NSR) in the public sector altered the role of salary supplements for holding a category. The introduction of the NSR was intended to increase the share of incentive payments in total remuneration and to tie them more closely to current work performance. Sociological studies have shown that the supplement for a category has become negligible compared to incentive payments [5].

Disincentivization of professional growth is the primary factor underlying the dysfunction of the certification institution. Following the abolition of the Unified Tariff Schedule and the transition to the new remuneration system for public sector employees on December 1, 2008, heads of medical institutions were granted the authority to manage payroll and reward the most qualified employees. The previously mandatory and fixed supplements for a qualification category began to be paid as incentive payments, the amount of which became determined at the local level. How effective have these new material incentives been in encouraging medical personnel to participate in certification? The transition to the new remuneration system and the introduction of effective contracts — implemented as part of the Presidential May Decrees — have largely led to a loss of the former significance of bonuses for a category. Although recommended bonus amounts relative to the official salary are specified in regulatory documents, the actual payments reported by experts during interviews were very small. Assessing the situation in their medical organizations, they spoke of the reluctance of most colleagues to “bother with certification” [6].

Currently, in Saint Petersburg, salary supplements for qualification categories for medical and pharmaceutical workers are regulated by Order No. 332 r of the Health Committee of Saint Petersburg of August 26, 2016 “On Approving the Regulations on the Remuneration of Employees of State Healthcare Institutions of Saint Petersburg”. This order establishes a qualification

Table 1

Distribution of certified specialists with higher education in the attestation commissions of St. Petersburg by year (from 2020 to 2024) in %

Таблица 1

Распределение аттестованных специалистов с высшим образованием в аттестационных комиссиях КЗ СПб по годам (с 2020 по 2024 гг.) в %

Год Year	Аттестованные специалисты Certified specialists			
	общее число total number		по специальности «Общественное здоровье и здравоохранение» in the specialty “Public health and healthcare”	
	абс. число (человек) total number (people)	%	абс. число (человек) total number (people)	%
2020	501	3,1	13	2,4
2021	3088	19,0	108	20,0
2022	2451	15,1	101	18,7
2023	5797	35,8	185	34,2
2024	4376	27,0	134	24,7
Итого Total	16 213	100,0	541	100,0

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

coefficient of 0.33 of the base salary for the highest category, 0.20 for the first category, and 0.10 for the second category.

The second most significant reason for the decline in the number of medical and pharmaceutical workers participating in certification is high workload and lack of time. The increased work intensity characteristic of modern healthcare has worsened conditions for preparing for and participating in assessment procedures [1].

Over five years (2020–2024), a total of 16,213 specialists with higher education were certified by the certification commissions of the Health Committee of Saint Petersburg, including 541 specialists in the specialty “Healthcare Organization and Public Health”. Table 1 shows the distribution of certified specialists by year.

As can be seen from Table 1, the same patterns are observed among both all certified specialists and those certified in the specialty “HOPH”. The lowest proportion of certified specialists was recorded in 2020 — the peak of the COVID 19 pandemic and the moratorium on certification commission activities. The highest proportion was recorded in 2023 (38.8% and 34.2%) following the lifting of the moratorium. The high proportion in 2024 can also be explained by “pent up demand” for obtaining certification categories, as it was impossible to obtain them during the pandemic years.

Among the 31 expert groups within the certification commissions of the Health Committee of Saint Petersburg, a certification commission for the specialty “HOPH” has been functioning for many years. This commission certifies heads of medical organizations and institutions, their deputies, heads of departments and divisions, heads of organizational and methodological units and medical statistics units, as well as medical methodologists and medical statisticians. During the period studied, the permanent membership of the commission included the following individuals. The Chairs of the Commission were the Chair of the Health Committee of Saint Petersburg, the First Deputy Chair, and the Deputy Chair. Other members included the Chief Freelance Specialist for Healthcare Organization and Public Health of the Health Committee of Saint Petersburg, who is also Head of the Department of Public Health and Healthcare at Pavlov First Saint Petersburg State Medical University, Doctor of Medical Sciences, Professor. The commission also included the Head of the Department of Information and Technical Support for the Prepa-

ration of Certification of Specialists in the Saint Petersburg Healthcare System, Medical Methodologist at the Saint Petersburg State Budgetary Healthcare Institution “Medical Information and Analytical Center”, as well as the Director of the same institution. Other members were the Head of the Civil Service and Personnel Division of the Health Committee of Saint Petersburg, as well as the Head of the Department of Medical Care Organization, Leading Researcher at the Federal State Budgetary Institution “Children's Scientific and Clinical Center for Infectious Diseases of the Federal Medical and Biological Agency of Russia” (DNKTsIB), Professor at the Department of Pediatrics of the North-Western State Medical University named after I.I. Mechnikov, Doctor of Medical Sciences. The commission also included the Chief Physician of the Saint Petersburg State Public Health Institution “City Blood Transfusion Station”.

In addition, in various years, the membership of the certification commission for the specialty “HOPH” included (variable composition): the Head of the Department of Orthopedic Dentistry and Materials Science with a Course in Orthodontics at Pavlov First Saint Petersburg State Medical University, Doctor of Medical Sciences, Professor. Other members included the Chief Freelance Specialist in Pediatrics of the Health Committee of Saint Petersburg, Doctor of Medical Sciences, Professor. The commission also included the Chief Freelance Specialist in Psychiatry of the Health Committee of Saint Petersburg, Chief Physician of the Saint Petersburg State Public Health Institution “City Psychiatric Hospital No. 3 named after I.I. Skvortsov-Stepanov”, Doctor of Medical Sciences, Professor; and the Chief Physician of the Saint Petersburg State Budgetary Healthcare Institution “City Polyclinic No. 56”. Thus, the composition of the certification commission reflects various aspects of the work of physician organizers of healthcare and is capable of providing a qualified, objective, and comprehensive assessment of this work.

The reduction in the number of commission members (to 10 people in 2024) was necessitated by the need to optimize and intensify the certification work for heads of medical organizations.

To characterize and analyze the results of the commission's work in the specialty “HOPH”, we comprehensively studied various parameters of certification activities for 2024 using a special program. A total of 159 applications for certification and obtaining a qualification category

were submitted to the certification commission during the year. However, 25 applicants (15.7%) were refused acceptance of their documents for various reasons. The reasons for refusal were as follows:

- insufficient length of service (to obtain the second qualification category, at least three years of experience in the specialty are required; for the first category, at least five years; and for the highest category, at least seven years) — 35% of refusals;
- violation of the document submission period (less than two years or less than five years had passed since the previous category was awarded) — 25% of refusals;;
- the position held did not correspond to the specialty “HOPH” — 20% of refusals;
- an incomplete set of documents was provided — 20% of refusals.

Among those admitted to the testing stage (134 individuals), the majority were specialists holding the following positions: deputy chief physician — 40.3%; a substantial group of those certified consisted of medical methodologists, medical statisticians, heads of organizational and methodological departments, and heads of medical statistics units — 29.1%; in third place were chief physicians (directors) — 26.9%; the remaining specialists represented other positions that may be certified in healthcare organization — 3.7%.

In terms of sex and age distribution, women accounted for 56.7% of those certified. The predominant age groups were 46–55 years (37.3%) and 56–65 years (26.1%). Only 4.5% of those certified in healthcare organization were under 35 years of age, which is understandable given the length of service required in the specialty “HOPH”. At the same time, nearly 25% of those certified were over 65 years old.

Encouragingly, more than one third of those certified (34.3%) held an academic degree: 24.6% were Candidates of Medical Sciences (a research degree roughly equivalent to a PhD), and 9.7% were Doctors of Medical Sciences (a higher research degree beyond the PhD, specific to the Russian system). Among chief physicians, 61.1% held an academic degree (38.9% Candidates and 22.2% Doctors of Medical Sciences). Among deputy chief physicians, 27.7% held an academic degree (22% Candidates and 5.7% Doctors of Medical Sciences). Such a high proportion of heads of medical institutions and organizations with academic degrees clearly reflects the strong

qualifications of managerial personnel, as well as their ability to analyze using both managerial experience and scientific approaches and methods.

Regarding work experience, 70.9% (more than two thirds) of certified specialists had worked in the specialty “Healthcare Organization” for 6 to 25 years, including one third (29.1%) for 16 to 25 years. Nearly one in ten (9.7%) had worked in the specialty for over 25 years. Among chief physicians, the vast majority (75%) had worked in an organizational specialty for 6 to 25 years, and almost 14% had done so for over 25 years. The work experience of deputy chief physicians was shorter: 70% had worked in an organizational position for up to 15 years, including more than one quarter (26.4%) for up to 5 years; 22.6% had worked for 16 to 25 years, and 7.4% for over 25 years. These age characteristics of managers and their deputies are quite natural, as deputy chief physicians often serve as candidates for higher managerial positions.

The place of work of those certified is also noteworthy. Thus, 46.3% (almost half) worked in outpatient and polyclinic facilities; slightly fewer (38.1%) worked in inpatient facilities; 3.0% worked in the emergency medical care system; and 12.6% worked in other settings (sanatoriums, etc.).

As noted earlier, the first stage of certification requires those admitted to complete test assignments. The testing procedure is well established and conducted online. Candidates must answer 60 test questions within 60 minutes. In 2020, the staff of the Department of Public Health and Healthcare with a Course in Health Economics and Management at Pavlov First Saint Petersburg State Medical University developed 393 tests. These are divided into two parts. The first

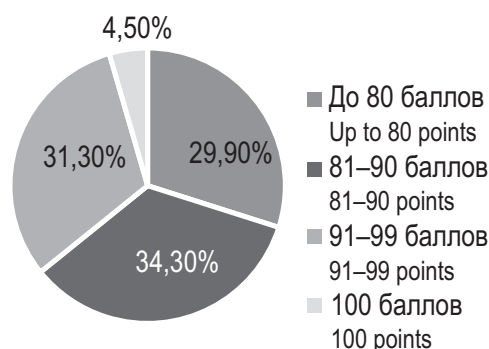


Fig. 1. Distribution of certified specialists according to the test results (the figure is developed by the authors)

Рис. 1. Распределение аттестованных специалистов по результатам тестирования (рисунок разработан авторами)

Table 2

Distribution of certified specialists of different positions based on the results of the tests taken (as a percentage of the total)

Таблица 2

Распределение аттестованных специалистов разных должностей по итогам сданных тестов (в % к итогу)

Должность Post	Результаты тестирования Test results			
	до 80 баллов up to 80 points	81–90 баллов 81–90 points	91–100 баллов 91–100 points	итого total
Главные врачи (директора) и их заместители Chief Medical Officers (Directors) and their deputies	16,0	41,5	42,5	100,0
Врачи-методисты и врачи-статистики Methodologists and statisticians	63,6	15,2	21,2	100,0
Итого Total	29,9	34,3	35,8	100,0

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

part covers general questions on “Healthcare Organization and Public Health”. It includes six sections: population health, legal foundations of healthcare in the Russian Federation, legal foundations of municipal activities, general issues of medical care organization, health insurance organization, and quality control of medical care. The first part consists of 61 tests.

The second part of the test assignments for certification in the specialty “Healthcare Organization and Public Health” is titled “Test Assignments Concerning the Activities of Various Medical Organizations”. It consists of 11 sections: primary health care; specialized, including high tech, medical care; obstetric and gynecological care; preventive care for children; medical care for tuberculosis, mental disorders, etc. The second part includes 332 tests. The tests are supplemented and updated annually.

The following criteria for evaluating test results have been adopted: if 70% of answers are correct, the candidate is considered to have passed the testing stage and may be admitted to the next stage of certification — an interview with the relevant certification commission.

The results of our analysis of testing outcomes are presented in Figure 1.

Heads of medical organizations (chief physicians and their deputies) performed significantly better on the tests than medical statisticians and medical methodologists (Table 2).

Among candidates with an academic degree (Candidate and Doctor of Medical Sciences), there were significantly more ($p < 0.05$) correct answers (91–100) — 41.3%, whereas among candidates without an academic degree, this figure was only 33.4%. In light of these test results,

we examined issues related to the continuing professional development of candidates during the five year period preceding their certification commission. It is known that continuing education courses (144 hours) delivered at medical universities and state research centers provide more “classical” training in various aspects of healthcare organization and public health. This includes medical statistics methods widely used in practical healthcare to analyze the performance of medical personnel, organization, etc. It also covers the legal foundations of health protection and appropriate methods for studying population health, including modern approaches to reducing mortality and increasing birth rates. In addition, it addresses new approaches to preventive health checkups: screening of reproductive age citizens to assess reproductive health, follow up observation of working citizens, and follow up observation of combat veterans. New directions in the activities of outpatient and inpatient facilities, emergency medical care, and specialized types of medical care are also studied. The same applies to new regulations on disability assessment and compulsory health insurance. Economic issues in healthcare, medical marketing, and management are also covered.

Only 54.5% of certified specialists had completed continuing professional development courses (144 hours) at medical universities and research centers. Another 11.9% combined university based training with short term specialized courses and cycles offered by various limited liability companies (LLCs), autonomous non profit organizations (ANOs), and other entities. Meanwhile, one third (33.6%) of certified specialists submitted documents showing that they had taken only short term courses provided by LLCs,

ANOs, and other commercial structures. Analysis of test results revealed that those who had followed the “classical” 144 hour training programs at universities and research centers performed significantly better than those who had taken various short term commercial courses. In the first group, 43.6% scored above 91 points on the test, compared to only 31% in the second group (commercial courses; $p < 0.05$).

After passing the testing stage, the candidate's personal file, including a report on their activities over the past three years, is submitted for an expert opinion to the Chief Freelance Specialist for Healthcare Organization and Public Health.

After expert review, the vast majority of certification files are forwarded to the certification commission with the conclusion that the candidate “meets” the relevant qualification category. However, each year, 2–3% of all reviewed files are either returned for revision, supplementation, or correction, or are rejected for various reasons — most commonly because the three year activity report does not align with the category applied for. Frequent expert comments include insufficient proficiency in medical statistics methods commonly used in practical healthcare, lack of analysis of the submitted factual data, inability to clearly formulate conclusions and future objectives, and other observations. Long term expert experience indicates that three year activity reports are better prepared by candidates who have completed residency training and continuing professional development courses (144 hours) at medical universities and state research centers.

The final stage of certification is an interview with the expert commission in the special-

ty “HOPH”. Candidates are asked questions that primarily relate to their direct professional activities, their personal achievements during the reporting period, and the achievements of the organization where they work. Based on the results of the 2024 interviews with the “HOPH” certification commission, only 3 individuals (2.2%) were not certified, for various reasons.

Of all those certified, 10.4% were awarded the second qualification category, 23.1% received the first category, and 66.5% received the highest category. The proportion receiving the highest category was greatest among chief physicians — 82.4%. While no chief physicians held the second category, among medical statisticians and methodologists, 18.2% (one in six) did (Table 3).

Overall, in Saint Petersburg's city medical institutions and organizations as of early 2025, just over half (54.7%) of chief physicians (directors) and their deputies held qualification categories: 78.7% held the highest category, 18.2% the first, and 3.1% the second. Clearly, further efforts are needed to engage more managers, their deputies, heads of organizational and methodological departments, and medical statisticians in continuous professional development — both by improving the quality of specialist training and by strengthening incentives for their professional advancement.

At the same time, obtaining a category today no longer always offers the same benefits for professional growth that provides “access” to more skilled work, representing another factor contributing to the dysfunction of the certification institution. Thus, as noted earlier, certification has ceased to play as significant a role in the system

Table 3

Distribution of certified doctors by assigned qualification categories in the specialty “Healthcare organization and public health” for 2024 (as a percentage of the total)

Таблица 3

Распределение аттестованных врачей по присвоенным квалификационным категориям по специальности «Организация здравоохранения и общественное здоровье» за 2024 г. (в % к итогу)

Должность Post	Категория Category			
	II	I	высшая higher school	ИТОГО total
Главный врач (директор) Chief Medical Officer (Director)	—	17,6	82,4	100,0
Заместители главного врача Deputy Chief Medical Officer	15,0	31,0	54,0	100,0
Врачи-методисты, врачи-статистики Methodologists, statisticians	18,2	22,8	59,0	100,0
Итого Total	10,4	23,1	66,5	100,0

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

of motivations oriented toward professional career advancement as it once did.

Experts also identified a decline in interest among both senior and immediate supervisors regarding their staff's participation in certification as a factor contributing to low physician engagement. In some cases, category candidates cited well documented instances where management not only failed to support them but actively obstructed the process — by refusing to let them take the test, declining to sign the written report, and other actions. Consequently, administrative oversight of timely certification has weakened, and the responsibility for initiating category acquisition or renewal has increasingly shifted to the specialists themselves. This finding is consistent with the results of several studies [7, 8].

To resolve organizational issues in the certification process, the Medical Information and Analytical Center (MIAC) — particularly its Department of Information and Technical Support — along with the Health Committee of Saint Petersburg, are taking steps to improve and optimize document submission for specialists. They also aim to make expert group meetings more effective and convenient. Specifically, in February 2017, the Department introduced an “Electronic Queue” terminal, which helped manage visitor flows (document submission, certification result issuance, and specialist consultations). In September 2017, the MIAC launched the “Distance Learning” electronic resource for healthcare specialists in Saint Petersburg (dist.edu.spbmiac.ru). Since 2020, specialists have been taking computer based tests in their certified specialty remotely. In September 2023, the MIAC developed and implemented the information system “Certification of Medical Workers of Saint Petersburg”. This system enables scheduling of document submissions for certification, tracking of document progress and certification results, and automatic report generation. For the convenience of specialists, an information resource has also been created at zdrav.spb.ru (the official website of the Health Committee — Territorial Certification Commission). This resource provides up to date information on the procedure and deadlines for document submission, document templates, and certification outcomes.

CONCLUSION

Certification of medical personnel represents one of the state's mechanisms for controlling the quality of specialist training. Obtaining a quali-

fication category is a right, not an obligation, of medical workers.

Certification does not replace the accreditation procedure, which is a mandatory requirement for admission to professional practice. A qualification category provides a practical assessment of a specialist's performance and skill level, bringing financial rewards and enhancing the standing of both the individual specialist and their medical organization.

Thus, our analysis allows us to highlight the positive aspects of certification for healthcare professionals. The adoption of unified methodological approaches proposed by the Ministry of Health of the Russian Federation would help optimize this important work. An expert opinion serves as a solid foundation for improving the effectiveness of certification commissions amid healthcare reform, where accuracy and impartiality are increasingly valuable. Moreover, the certification methodology must rely on clear regulatory frameworks covering all aspects of a specialist's work — organizational, legal, and economic. Ultimately, a qualification category recognizes a specialist's practical achievements and attests to their professionalism, bringing both material rewards and enhanced prestige to the medical professional and their organization alike.

The analysis of certification experience in the specialty “HOPH” has revealed not only certain achievements but also serious problems, many of which are characteristic of physician certification in other specialties. Currently, 31 expert commissions operate across all major medical specialties within Saint Petersburg's medical worker certification system. Key problems include organizational issues, the quality of physician training and continuing professional development, incentives for medical workers to participate in certification to improve the overall standard of medical and preventive care, as well as other matters discussed in this article. Resolving these problems would help achieve the outcomes originally established and developed within the certification system for medical personnel in Russian healthcare.

ADDITIONAL INFORMATION

Authors' contribution. Vishnyakov N.I. — writing and editing the text, and developing proposals for implementation; Nagnoina I.G., Smirnova E.V. — collecting and processing the

material, statistical processing, searching for material on the history, and editing the text; Sarana A.M. — concept of the article, editing the text, and developing proposals for implementation.

All authors read and approved the final version before publication.

Competing interests. The authors declare that they have no competing interests.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Вишняков Н.И. — написание и редактирование текста, разработка предложений по внедрению; Нагнойная И.Г., Смирнова Е.В. — сбор и обработка материала, статистическая обработка, поиск материала по истории, редактирование текста; Сарана А.М. — концепция статьи, редактирование текста, разработка предложений по внедрению.

Все авторы прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтных интересов, связанных с публикацией настоящей статьи.

REFERENCES

- Kolennikova O.A. Reasons for the dysfunction of the institution of certification of medical specialists. *Population*. 2023;26(3):158–169. (In Russian). <https://doi.org/10.19181/population.2023.26.3.13>. EDN: SYDKII.
- Resolution of the Central Committee of the CPSU and the Council of Ministers of the USSR of 14.01.1960 No. 58 “On measures to further improve medical care and health protection of the population of the USSR”. In: Decisions of the Party and Government on Economic Issues. In 5 vol. Collection of reports over 50 years. Vol. 4. 1953–1961. Moscow: Politizdat; 1968. P. 634–645. (In Russian).
- Resolution of the Central Committee of the CPSU, the Council of Ministers of the USSR and the All-Union Central Council of Trade Unions of July 15, 1964 No. 620 “On increasing the wages of workers in education, health care, housing and public utilities, trade and public catering, and other sectors of the national economy directly serving the population”. In: Decisions of the Party and Government on Economic Issues. In 5 volumes. Collection of reports over 50 years. Vol. 5. 1962–1965. Moscow: Politizdat; 1968. P. 479–483. (In Russian).
- Misharin V.M., Kochubey A.V. Pilot survey of physicians on the system of assigning professional grades. *Extreme Medicine*. 2023;25(3):146–150. (In Russian). <https://doi.org/10.47183/mes.2023.035>.
- Alekseeva N.U., Gajdarov G.M., Pchela L.P., Makarov S.V. Sociological aspects of efficacy of payment new system in health care establishment. *Sibirskiy meditsinskiy zhurnal*. 2010;(2):86–90. (In Russian).
- Shishkin S.V., Temnitsky A.L. The role of certification of health workers in labor motivation. *Public Administration Issues*. 2019;(2):141–167. (In Russian).
- Kolennikova O.A., Toksanbaeva M.S. Factors of dysfunction of institutes for assessing the qualifications of medical specialists. *Health Care of the Russian Federation*. 2021;65(5):467–476. (In Russian). <https://doi.org/10.47470/0044-197X-2021-65-5-467-476>.
- Fanta I.V., Shustova T.I. The results of the appraisal of doctors otolaryngologists hospitals of Saint Petersburg. *Russian Otorhinolaryngology*. 2018;93(2):123–130. (In Russian). <https://doi.org/10.18692/1810-4800-2018-2-123-130>.

ЛИТЕРАТУРА

- Коленникова О.А. Причины дисфункции института аттестации медицинских специалистов. *Народонаселение*. 2023;26(3):158–169. <https://doi.org/10.19181/population.2023.26.3.13>. EDN: SYDKII.
- Постановление ЦК КПСС и Совета Министров СССР от 14.01.1960 г. № 58 «О мерах по дальнейшему улучшению медицинского обслуживания и охраны здоровья населения СССР». В кн.: Решения партии и правительства по хозяйственным вопросам. В 5 т. Сборник докладов за 50 лет. Т. 4. 1953–1961 гг. М.: Политиздат; 1968. С. 634–645.
- Постановление ЦК КПСС, Совета Министров СССР и ВЦСПС от 15 июля 1964 г. № 620 «О повышении заработной платы работников просвещения, здравоохранения, жилищно-коммунального хозяйства, торговли и общественного питания, и других отраслей народного хозяйства, непосредственно обслуживающих население». В кн.: Решения партии и правительства по хозяйственным вопросам. В 5 т. Сборник докладов за 50 лет. Т. 5. 1962–1965 гг. М.: Политиздат; 1968. С. 479–483.
- Мишарин В.М., Кочубей А.В. Пилотный опрос врачей о системе присвоения квалификационных категорий. *Медицина экстремальных ситуаций*. 2023;25(3):146–150. <https://doi.org/10.47183/mes.2023.035>.
- Алексеева Н.Ю., Гайдаров Г.М., Пчела Л.П., Макаров С.В. Социологическое исследование эффективности внедрения новой системы оплаты труда в уч-

- реждениях здравоохранения. *Сибирский медицинский журнал*. 2010;(2):86–90.
6. Шишкин С.В., Темницкий А.Л. Роль аттестации медицинских работников в повышении трудовой мотивации. *Вопросы государственного и муниципального управления*. 2019;(2):141–167.
7. Коленикова О.А., Токсанбаева М.С. Факторы дисфункции институтов оценки квалификации медицинских специалистов. *Здравоохранение Российской Федерации*. 2021;65(5):467–476. <https://doi.org/10.47470/0044-197X-2021-65-5-467-476>.
8. Фанта И.В., Шустова Т.И. Итоги аттестации врачей-оториноларингологов лечебно-профилактических учреждений Санкт-Петербурга. *Российская оториноларингология*. 2018;93(2):123–130. <https://doi.org/10.18692/1810-4800-2018-2-123-130>.

AUTHORS' INFO

Andrey M. Sarana — Cand. Sci. (Med.), Chairman of the Health Committee of Saint Petersburg.

E-mail: asarana@mail.ru;

<https://orcid.org/0000-0003-3198-8990>; SPIN: 7922-2751

✉ **Nikolay I. Vishnyakov** — Dr. Sci. (Med.), Professor, Head of the Department of Public Health and Public Health with a course in Economics and Health Management, Honored Scientist of the Russian Federation.

E-mail: orgzdrav@mail.ru;

<https://orcid.org/0000-0001-9362-4514>; SPIN: 6875-6896

Irina G. Nagnojnaya — Head of the Department of Information Technology Support for the purpose of preparing the certification of specialists in the Saint Petersburg healthcare system.

E-mail: nagnoynayai@spbmias.ru;

<https://orcid.org/0009-0007-2283-9092>

Elena V. Smirnova — a physician-methodologist of the Department of Information Technology Support for the purpose of preparing the certification of specialists in the Saint Petersburg healthcare system.

E-mail: smirelvi@mail.ru;

<https://orcid.org/0009-0000-9815-1015>

ОБ АВТОРАХ

Андрей Михайлович Сарана — к.м.н., председатель Комитета по здравоохранению Санкт-Петербурга.

E-mail: asarana@mail.ru;

<https://orcid.org/0000-0003-3198-8990>; SPIN: 7922-2751

✉ **Николай Иванович Вишняков** — д.м.н., профессор, заведующий кафедрой общественного здоровья и здравоохранения с курсом экономики и управления здравоохранением, заслуженный деятель науки РФ. E-mail: orgzdrav@mail.ru;

<https://orcid.org/0000-0001-9362-4514>; SPIN: 6875-6896

Ирина Геннадьевна Нагнойна — заведующий отделом информационно-технического обеспечения в целях подготовки аттестации специалистов системы здравоохранения Санкт-Петербурга.

E-mail: nagnoynayai@spbmias.ru;

<https://orcid.org/0009-0007-2283-9092>

Елена Владимировна Смирнова — врач-методист отдела информационно-технического обеспечения в целях подготовки аттестации специалистов системы здравоохранения Санкт-Петербурга.

E-mail: smirelvi@mail.ru;

<https://orcid.org/0009-0000-9815-1015>

Original papers

UDC 616-053.2+616-072.1+616.329-007.271

<https://doi.org/10.56871/MHCO.2026.16.62.004>

Modern possibilities of endoscopy, prospects and ways of development

Vasiliy I. Orel, Mikhail P. Korolev, Eduard I. Babikov,
Natalia A. Guryeva, Victoria I. Smirnova

Saint Petersburg State Pediatric Medical University, 2 Litovskaya str., Saint Petersburg, 194100, Russian Federation

For citation: Orel V.I., Korolev M.P., Babikov E.I., Guryeva N.A., Smirnova V.I. Modern possibilities of endoscopy, prospects and ways of development. *Medicine and Health Care Organization*. 2025;10(4):50–60. <https://doi.org/10.56871/MHCO.2026.16.62.004>.

Received: 28.10.2025

Revised: 28.11.2025

Accepted: 28.01.2026

ABSTRACT. The first practices of using endoscopy date back to the early XIX century, while in Russia it developed in parallel with Western countries. High-tech systems are successfully implemented in modern Russia, virtual, robotic and capsule endoscopic techniques are developing. Modern challenges in the use of endoscopy and their solutions: 1) low availability of technologies — creation of more accessible systems, international assistance programs; 2) personnel shortage — creation of training centers, online training; 3) risks of complications — compliance with standards, real-time monitoring; 4) infection safety: use of disposable components, automated sterilization systems; 5) diagnostic limitations — implementation of new visualization technologies and artificial intelligence; 6) ethical aspects — informed consent, documentation of procedures; 7) Lack of innovation: phased implementation of new technologies through pilot projects. The participants of the conference “Current Issues in Endoscopy”, held in St. Petersburg on March 26–29, 2025, highlighted existing problems in the field of endoscopy and shared their experiences in overcoming them. The conference program was diverse, including lectures, workshops, and real-time demonstrations. The particular achievements in gastroenterology, thoracic surgery, oncology were discussed. New technologies were presented: ultra-high resolution, capsule endoscopy, robotic systems. The conference emphasized the importance of a systematic approach to the development of the industry and the role of innovations in the future of medicine.

KEYWORDS: endoscopy, scientific and practical conference, endoscopic coagulation, endoscopy during pregnancy, esophageal strictures

Funding. This study was not supported by any external sources of funding.

✉ Eduard I. Babikov. E-mail: dr.babikov@mail.ru

© 2025 by the authors

<https://doi.org/10.56871/МНСО.2026.16.62.004>

Современные возможности эндоскопии, перспективы и пути развития

Василий Иванович Орел, Михаил Павлович Королёв, Эдуард Ильдарович Бабилов, Наталья Алексеевна Гурьева, Виктория Игоревна Смирнова

Санкт-Петербургский государственный педиатрический медицинский университет, 194100, г. Санкт-Петербург, ул. Литовская, д. 2, Российская Федерация

Для цитирования: Орел В.И., Королёв М.П., Бабилов Э.И., Гурьева Н.А., Смирнова В.И. Современные возможности эндоскопии, перспективы и пути развития. *Медицина и организация здравоохранения*. 2025;10(4):50–60. <https://doi.org/10.56871/МНСО.2026.16.62.004>.

Поступила: 28.10.2025

Одобрена: 28.11.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. Первые практики применения эндоскопии относятся к началу XIX века, в России она развивалась параллельно с западными странами. Сегодня Россия использует высокотехнологичные комплексы, развивается виртуальная, роботизированная и капсульная эндоскопия. Современные вызовы применения эндоскопии и пути их решения таковы: 1) малая доступность технологий — создание широкодоступных систем, международные программы помощи; 2) кадровый дефицит — разработка тренажерных центров, онлайн-обучение; 3) риски осложнений — соблюдение стандартов, мониторинг в реальном времени; 4) инфекционная безопасность — использование одноразовых компонентов, автоматизированных систем стерилизации; 5) диагностические ограничения — внедрение новых технологий визуализации и искусственного интеллекта; 6) этические аспекты — информированное согласие, документирование процедур; 7) дефицит инноваций — поэтапное внедрение новых технологий через пилотные проекты. Участники конференции «Актуальные вопросы эндоскопии», состоявшейся в Санкт-Петербурге 26–29 марта 2025 года, поднимали существующие проблемы в области эндоскопии и делились своим опытом их преодоления. Программа конференции носила разноформатный характер, включая лекции, мастер-классы, демонстрации в реальном времени. Обсуждались достижения в гастроэнтерологии, хирургии, онкологии, педиатрии. Представлены новые технологии: ультравысокое разрешение, капсульная эндоскопия, роботизированные системы. Конференция подчеркнула важность системного подхода к развитию отрасли и роль инноваций в будущем медицины.

КЛЮЧЕВЫЕ СЛОВА: эндоскопия, научно-практическая конференция, эндоскопическая коагуляция, эндоскопия при беременности, стриктуры пищевода

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

✉ Эдуард Ильдарович Бабилов. E-mail: dr.babikov@mail.ru

© Коллектив авторов, 2025

INTRODUCTION

Endoscopy is one of the most important diagnostic and therapeutic methods in medicine, allowing doctors to examine internal organs without the need for major surgery. Its history spans several centuries.

The 16th All-Russian Scientific and Practical Conference “Current Issues in Endoscopy” took place in St. Petersburg on March 26–29, 2025, and brought together participants from Russia, Belarus, and 14 other countries. In total, more than 2,000 participants were registered (Fig. 1). The conference was a significant event for the medical community, bringing together leading specialists in the fields of endoscopy, gastroenterology, oncology, and surgery. The event was distinguished by its high level of organization, the relevance of its topics, and a rich scientific program.

Thanks to the conference, the domestic medical community once again received a powerful impetus for development and the exchange of experience in one of the most rapidly advancing fields of modern medicine. The event brought together leading Russian and international specialists, scientists, practicing physicians, and representatives of the medical industry.

ENDOSCOPY AROUND THE WORLD

The first ideas for examining the internal cavities of the human body emerged as far back as ancient times; however, the actual development of endoscopy began in the 19th century.

In 1806, the German physician Philipp Bozzini created a “light guide” — the prototype of the modern endoscope [1, 2]. His device, equipped with a candle and mirrors, allowed visualization of body cavities. He was even awarded a prize by the Vienna Medical Society for this invention.

The next major step was taken in 1853: French surgeon Antoine Jean Desormes developed a more sophisticated device for examining the bladder [3]. And in 1868, German physician Adolf Kussmaul performed the first gastroscopy: inspired by the story of a magician who could swallow swords, he used a rigid gastroscope to examine the stomach.

The 20th century marked a revolutionary period in the development of endoscopy:

in 1932, Rudolf Schindler developed a semi-flexible gastroscope [4];

in 1957, Hiroshi Kuroda and his colleagues in Japan created the first fiber-optic endoscope based on fiber-optic technology [5];

in the 1960s, endoscopy began to be actively used for biopsies and later for minimally invasive surgeries.

Today’s endoscopes are equipped with high-resolution video cameras, LED lighting, and 3D visualization capabilities, enabling precise and safe procedures.

As part of the 16th All-Russian Scientific and Practical Conference “Endoscopy — The Future of Medicine,” a pre-conference event titled “EndoBRICS” was held (BRICS is an intergovernmental organization established in 2006 and, as of 2025, comprising 10 countries: Brazil, Russia, India,



Fig. 1. Participants of the conference “Current Issues in Endoscopy” (photos by the authors)

Рис. 1. Участники конференции «Актуальные вопросы эндоскопии» (фото авторов)



Fig. 2. Reports made by foreign experts as part of the “EndoBRICS” pre-course (photos by the authors)

Рис. 2. Выступления иностранных специалистов в рамках прекурса «ЭндоBRICS» (фото авторов)

China, South Africa, Egypt, Iran, the UAE, Ethiopia, and Indonesia), featuring presentations by leading endoscopy specialists from China, India, and Egypt (Fig. 2).

ENDOSCOPY IN RUSSIA

In Russia, endoscopy began to develop rapidly in the late 19th and early 20th centuries. The first gastroscopy experiments were conducted by Russian scientists almost simultaneously with their Western colleagues.

Professor P.A. Herzen, the founder of Russia's oncology service, made a significant contribution to the development of domestic endoscopy. In the 1920s and 1930s, he used endoscopic methods to diagnose tumors.

After World War II, in the 1950s and 1960s, endoscopy in the USSR entered a new phase of development: Japanese-made fiberendoscopes began to be used, and domestic designs soon followed. The first endoscopy departments were established in major clinics in Moscow, Leningrad, and other cities [6].

In the 1970s and 1980s, endoscopy was actively introduced into oncology, gastroenterology, pulmonology, surgery, and pediatrics. Domestic devices appeared, enabling biopsies and minimally invasive surgeries. An important milestone was the establishment of specialized departments and training centers for endoscopy.

Currently, Russia has high-tech endoscopic systems, virtual endoscopy is developing, and new techniques are being actively introduced, including robotic and capsule endoscopy.



Fig. 3. Mikhail P. Korolev (photos by the authors)

Рис. 3. Михаил Павлович Королёв (фото авторов)

MIKHAIL PAVLOVICH KOROLEV

One of the leading specialists in the field of endoscopy today is Mikhail Pavlovich Korolev — Doctor of Medical Sciences, professor, surgeon, and endoscopist of the highest category, and a recognized expert in the field of urgent surgery and emergency endoscopy (Fig. 3). Mikhail Pavlovich headed the Department of General Surgery with a course in endoscopy at St. Petersburg State Pediatric Medical University (SPbSPMU) for 29 years.

Mikhail Pavlovich holds key positions in the professional community: he is the honorary chairman of the Russian Endoscopic Society (REndS), heads the St. Petersburg branch of the Russian Society of Surgeons, and is also the honorary chairman of the N.I. Pirogov Surgical Society.

M.P. Korolev is the founder and long-standing head of the scientific committee of the country's largest scientific and practical conference, "Current Issues in Endoscopy", which has become an important platform for the exchange of knowledge among specialists in the field of modern endoscopy.

For over 50 years, Mikhail Pavlovich has dedicated himself to working at the Mariinsky Hospital in St. Petersburg, where he pioneered the introduction of technologies such as ultrasound diagnostics, laparoscopic surgery, and endoscopic procedures. He has performed thousands of successful surgical procedures, conducted millions of diagnostic examinations, and earned the gratitude of hundreds of patients from all corners of Russia.

Professor Korolev's scientific work covers a wide range of topics: he is the author of eight monographs, a member of the editorial boards of three specialized scientific journals, a member of the Ministry of Industry and Trade's expert commission on medical technology, and a member of the State Duma's expert council in this field.

MODERN ENDOSCOPY: CHALLENGES AND SOLUTIONS

Despite impressive technological advances, endoscopy remains a field of medicine faces a number of systemic challenges. During the conference, the key challenges faced by specialists were identified, and possible solutions were proposed.

1. Lack of access to modern technologies [7]

Problem: Advanced endoscopic systems with high resolution, 3D visualization, and robotic

control are available only to a limited number of clinics. The high cost of the equipment makes it virtually unattainable for institutions in developing countries and regional hospitals, creating disparities in the quality of diagnosis and treatment.

Solutions:

- developing and promoting more affordable systems without compromising image quality;
- international aid programs to equip institutions in resource-limited countries;
- manufacturing budget models with basic functions for widespread use.

2. Staff shortages and training levels [8]

Problem: Endoscopy requires high qualifications, yet many regions face a shortage of trained specialists, and practical training is often limited due to a lack of simulators and access to modern equipment.

Solutions:

- establishment of simulation training centers with realistic simulators;
- introduction of a mandatory certification system and regular recertification;
- expanding access to online courses, webinars, and training platforms featuring international experts.

3. Risk of complications [8]

Problem: Even with minimal invasiveness, endoscopic procedures carry potential complications — perforations, bleeding, and infections. The high cost of error requires constant improvement of safety protocols.

Solutions:

- strict adherence to standards and algorithms for performing procedures;
- use of real-time monitoring and early detection systems for complications;
- conducting preoperative risk stratification taking into account the patient's individual characteristics;
- developing, in collaboration with surgeons, new methods for diagnosing and treating complications.

4. Infection control [9]

Problem: The difficulty of achieving complete sterilization of reusable endoscopes remains one of the main causes of iatrogenic infections. Violations of reprocessing protocols can lead to the transmission of pathogens.

Solutions:

- introduction of disposable endoscopes or components when indicated;

- use of automated washing and sterilization systems;
- ongoing training of medical staff on hygiene standards.

5. Diagnostic limitations [10]

Problem: Endoscopy always allows for the detection of pathology at an early stage, especially in the presence of flat or subepithelial lesions. The lack of gastrointestinal (GI) cancer screening in the Russian Federation increases the risk of late diagnosis of oncological and inflammatory diseases.

Solutions:

- introduction of auxiliary imaging technologies (NBI, OCT, endo-ultrasound);
- use of artificial intelligence for real-time recognition of pathological areas;
- development of sensitive biomarkers and “optical biopsy” methods;
- implementation of GI cancer screening in the Russian Federation.

6. Ethical and legal aspects [10]

Problem: An increase in the number of interventions is accompanied by a rise in patient complaints. This is caused by both actual complications and insufficient awareness of the risks involved in procedures.

Solutions:

- formalizing the informed consent process with a clear explanation of possible consequences;
- mandatory documentation of all stages of the procedure;
- creating an atmosphere of open discussion of complications within the team to improve quality and reduce the recurrence of errors.

7. Integration of innovative technologies [11]

Problem: Future technologies — capsule endoscopy (a method of examining the gastrointestinal tract in which the patient swallows a small video capsule that then passes through the digestive tract, taking images), artificial intelligence, and robotics — are already available, but their widespread adoption is limited by financial, organizational, and regulatory barriers.

Solutions:

- phased integration of new systems through pilot projects;
- public and private support for clinics participating in digital transformation;
- collaboration with IT companies and engineers to adapt technologies to real-world clinical challenges.

CONFERENCE SCIENTIFIC PROGRAM AND RELEVANT TOPICS

It is worth noting the variety of presentation formats — ranging from plenary sessions and section presentations to master classes and demonstrations. This allowed participants not only to learn about the latest scientific advances but also to see modern technologies and techniques in action (Fig. 4).

The conference program covered the entire spectrum of modern trends in endoscopic diagnostics and treatment. Participants discussed:

- the latest advances in gastroenterological and bronchopulmonary endoscopy;
- the integration of artificial intelligence technologies into the interpretation of endoscopic images;
- minimally invasive methods for treating oncological diseases;
- new approaches to training and certifying specialists.

Particular attention was paid to the safety and quality of endoscopic examinations, the prevention of complications, and standards for patient preparation.

A LOOK TO THE FUTURE

The conference slogan — “Endoscopy: The Future of Medicine” — fully reflected its theme. Unique technologies were presented, including:

- ultra-high-resolution endoscopic systems;
- next-generation capsule endoscopy;

- robotic systems for high-precision diagnostics and surgery;
- AI-based software solutions for automatic mucosal assessment.

Conference participants emphasized that endoscopy will play a key role in the early detection of cancer and the development of minimally invasive surgery.

YOUNG PROFESSIONALS AND EDUCATION

Special emphasis was placed on supporting young professionals. The opportunity to interact directly with experts, discuss clinical cases, and participate in hands-on sessions provided valuable experience for novice physicians.

The conference featured research paper competitions as well as educational sessions aimed at students, residents, and novice physicians: on March 26, the final round of the 2nd All-Russian Student Endoscopy Olympiad took place (Fig. 5), on March 27 and 28, live broadcasts from operating rooms titled “Live Endoscopy” were held (moderators on the first day — M.P. Korolev, E.D. Fedorov, Y.G. Starkov, V.V. Veselov, K.V. Shishin; moderators on the second day — M.P. Korolev, E.D. Fedorov, Y.G. Starkov, S.A. Budzinsky, M.Yu. Agapov) (Fig. 6), educational sessions were held as part of the Endoscopy Academy, and a training zone was operational thanks to the support of sponsoring companies.

Such initiatives contribute to the development of a new generation of high-class endoscopists. A poster presentation competition was held for young physicians, dedicated to the founder of



Fig. 4. Master class in a remote format (photos by the authors)

Рис. 4. Мастер-класс в дистанционном формате (фото авторов)



Fig. 5. II All-Russian Student Endoscopy Olympiad (photos by the authors)

Рис. 5. II Всероссийская студенческая олимпиада по эндоскопии (фото авторов)



Fig. 6. Moderators of the conference “Current Issues in Endoscopy”: K.V. Shishin — MD, PhD, Head of the Endoscopy Department, Moscow Clinical Research Center, Moscow Healthcare Department; Yu.G. Starkov — MD, PhD, Professor, Member of the Board of the Russian Society of Surgeons, the Russian Society of Endoscopic Surgery named after V.D. Fedorov, and the Russian Endoscopic Society; Deputy Chief Surgeon and Endoscopist of the Russian Ministry of Health; Head of the Surgical Endoscopy Department, A.V. Vishnevsky National Medical Research Center of Surgery, Moscow; E.D. Fedorov — MD, PhD, Professor. Chief Researcher, Department of Hospital Surgery No. 2 with the Research Laboratory of Surgical Gastroenterology and Endoscopy, Pirogov Russian National Research Medical University, Russian Ministry of Healthcare, based at G.M. Savelyeva City Clinical Hospital No. 31, Moscow Healthcare Department, Advisor to the Scientific and Practical Council of the Ministry of Health of the Russian Federation, Moscow; M.P. Korolev — Conference Chair, MD, PhD, Full Professor, Professor of the Department of General Surgery with a Course in Endoscopy at Saint Petersburg State Pediatric Medical University, Honorary Chairman of the Russian Endoscopic Society, Honorary Chairman of the Endoscopic Section of the N.I. Pirogov Surgical Society of Saint Petersburg, Chairman of the Saint Petersburg Branch of the Russian Society of Surgeons, Saint Petersburg (photos by the authors)

Рис. 6. Модераторы конференции «Актуальные вопросы эндоскопии»: К.В. Шишин — д.м.н., заведующий отделом эндоскопии ГБУЗ «Московский клинический научный центр ДЗМ», г. Москва; Ю.Г. Старков — д.м.н., профессор, член правления Российского общества хирургов, Российского общества эндоскопической хирургии России им. В.Д. Федорова, Российского эндоскопического общества, заместитель главного хирурга и эндоскописта Минздрава России, заведующий хирургическим эндоскопическим отделением ФГБУ «НМИЦ хирургии им. А.В. Вишневского» Минздрава России, г. Москва; Е.Д. Федоров — д.м.н., профессор, главный научный сотрудник кафедры госпитальной хирургии № 2 с НИЛ хирургической гастроэнтерологии и эндоскопии «РНИМУ им. Н.И. Пирогова» Минздрава России на базе «ГКБ № 31 им. академика Г.М. Савельевой» ДЗМ, советник научно-практического совета Минздрава России, г. Москва; М.П. Королёв — председатель конференции, д.м.н., профессор, профессор кафедры общей хирургии с курсом эндоскопии СПбГПМУ, почетный председатель Российского эндоскопического общества, почетный председатель эндоскопической секции хирургического общества им. Н.И. Пирогова Санкт-Петербурга, председатель Санкт-Петербургского отделения РОХ, г. Санкт-Петербург (фото авторов)

endoscopy in the Russian Federation, Professor A.S. Balalykin.

PARTICIPATION OF THE ST. PETERSBURG STATE PEDIATRIC MEDICAL UNIVERSITY IN THE CONFERENCE

At the 16th All-Russian Scientific and Practical Conference “Current Issues in Endoscopy,” the St. Petersburg State Pediatric Medical University presented three papers in the following categories: “Gastric Endoscopy”, “Pancreatobiliary Endoscopy”, and “Pediatric Endoscopy.”

In the “Gastric Endoscopy” section, the paper “Analysis of Gastric Mucosal Coagulation Results

in an Experiment Using Various Modes” was presented by a team of authors including R.G. Avanesyan, L.Z. Khafizova, M.P. Koroleva, D.S. Rusanova, Sh.A. Shodieva, and N.S. Chernova [12]. The authors addressed a pressing issue — the instability of clip fixation following endoscopic hemostasis, which can lead to recurrent bleeding. The introduction of the study states that “a significant drawback of the method is the frequent migration and dislodgement of the clip after manipulation due to insufficiently deep insertion of the prongs”. This calls into question the reliability of a purely mechanical approach, especially in the context of an acute ulcerative defect.

What is particularly valuable is that the authors did not limit themselves to theoretical assumptions but conducted experiments on both isolated organs

and living organisms, which significantly increases the reliability of the results. The comparison of the SOFT COAG and FORCED COAG modes was carried out methodologically soundly. The choice of exposure time is noteworthy: “the coagulation time was visually determined to be 5 seconds, as optimal for the severity of the effect without excessive tissue destruction”.

The results obtained in the histological analysis convincingly demonstrated the advantages of the SOFT COAG mode, which ensures sufficient clip adhesion and moderate tissue damage: “damage in some areas extends to the layer of oblique fibers of the muscular layer... the circular and longitudinal layers are intact”, which allows hemostasis to be achieved without the risk of deep necrosis.

At the same time, the FORCED COAG mode, as noted, leads to “total destruction of the entire gastric wall”, including the muscular and serous layers. This is an extremely important observation, highlighting the high likelihood of complications when using a more aggressive mode.

The wording of the conclusion deserves special attention, as the authors made a clear practical emphasis: “the most optimal duration of clip application during mechanical hemostasis is 5 seconds in SOFT COAG mode”. This practical knowledge can be directly applied in clinical practice, especially in complex cases, such as in patients with pancreatitis complicated by ulcerative bleeding.

Thus, the study presented a compelling investigation combining experimental data and clinical relevance, enriched the endoscopist's toolkit, and paved the way for more effective and safer combined hemostasis.

The “Pancreatobiliary Endoscopy” section featured presentations by D.S. Rusanov, Fedotov L.E., Antipova M.V., Klimov A.V., Komarova A.D., and Kупenkov M.N. with their paper “ERCP in Pregnant Women — An Alternative Approach to Intraoperative Visualization of the Bile Ducts” [13]. The presentation drew interest due to the relevance of the topic, the boldness in seeking alternatives to radiological methods, and the clear presentation of clinical data. The authors addressed one of the most delicate and clinically complex issues — the necessity of performing invasive procedures on the biliary tract in pregnant women, where it is crucial to preserve not only the mother's health but also the safety of the fetus.

The authors addressed a real clinical dilemma: on the one hand, endoscopic retrograde cholan-

giopancreatography (ERCP) remains the “gold standard” for treating choledocholithiasis; on the other hand, the procedure itself carries risks: “it increases the rate of miscarriages and preterm births to 7.1%, as well as the risk of antenatal fetal injury to 15.9%”. These findings prompted the search for and development of alternative methods, one of which — intraoperative transabdominal ultrasound imaging — was presented by colleagues from St. Petersburg State Pediatric Medical University.

The use of real-time ultrasound (US) during ERCP in pregnant women appears not only logical but also an innovative step. The report described how “during selective choledochal cannulation, the guidewire was clearly visualized in the common bile duct as a hyperechoic linear shadow,” which allows for the elimination of X-ray imaging without compromising accuracy or control over the stages of the procedure. This technical achievement seems particularly important against the backdrop of a growing trend toward minimizing radiation exposure.

The clinical data is also interesting — the cases, though few in number, demonstrate the method's viability. Particularly impressive is the case of the successful evacuation of a large, 15-millimeter calculus, during which “turbid bile mixed with pus was actively flowing from the orifice of the major duodenal papilla”, indicating a complicated course — acute cholangitis. Nevertheless, the procedure was successful.

Attention to detail and careful observation were also evident in the description of side effects. The authors candidly report that one patient with a stent experienced elevated amylase levels, requiring emergency stent removal. Such transparency enhances confidence in the results and demonstrates that the method warrants further study but is already applicable in clinical practice.

The presentation left the impression of a conscientious, clinically oriented study offering a realistic and safe alternative to traditional approaches for a vulnerable patient population. The use of intraoperative ultrasound during ERCP in pregnant women appears to be a promising area deserving of further research and implementation in clinical practice.

It is, of course, difficult to imagine the “Pediatric Endoscopy” section without presentations by specialists from St. Petersburg State Pediatric Medical University. A paper with the poetic

title “The String of My Soul: Early Endoscopic Correction of Post-Surgical Esophageal Strictures” by authors A.G. Vasilieva, V.A. Kalashnikova, and N.S. Yakushenko was presented at the conference [14]. The report made a strong impression not only due to its clinical significance but also because of the profound humanity with which the authors approached the problem. It combined high professional competence, accumulated practical experience, and a subtle understanding of the psychological and social factors influencing the course of the disease in children.

From the very first lines, it is clear how relevant the topic is: “chemical burns rank first among esophageal diseases in childhood”, and it is particularly alarming that “in recent years, there has been an increase in chemical burns of the esophagus in children”, with cases projected to rise by as much as 4.5 times by 2024 compared to 2021. These are not just statistics — they are a call to rethink approaches to the treatment and prevention of the severe consequences of such injuries.

Particular attention should be paid to the shift in the treatment paradigm: from late intervention to early endoscopic correction. This approach allows us to avoid waiting for the development of severe fibrosis and progressive dysphagia, as was the case in the first clinical case, where a girl suffered from difficulty swallowing for five years. This patient’s story is deeply moving: emotional distress, the loss of her mother, and a lack of complaints or attention to symptoms led to advanced stenosis, which was diagnosed only incidentally during a routine endoscopic video gastroduodenoscopy (EGDS). The endoscopic findings — “three thick fibrous cords... partially obstructing the lumen” — make a grave impression. However, thanks to emergency string bougienage, it was possible to overcome the stenosis and significantly improve the patient’s condition after the very first procedure.

The second clinical case is an example of timely and competently organized care for severe alkali burns of the esophagus and stomach. Here, it is particularly important that treatment was initiated immediately and included the full range of necessary therapies: hormonal, antibacterial, infusion, and hyperbaric. This allowed the mucous membrane to be prepared for the start of bougienage as early as the 23rd day, and then, thanks to a clearly structured regimen — progressing from frequent to maintenance procedures — to achieve the formation of a patent scar and restoration of swallowing function.

The algorithm proposed by the authors is noteworthy: “1st month — 8 times, 2nd month — 6–4 times...”, with a gradual transition to infrequent maintenance sessions. It is important that the emphasis is placed on individualizing the regimen: “the choice of the interval between sessions... may vary”. This demonstrates a mature clinical approach that takes into account the specific course of the disease in each child.

The final conclusion of the study is also highly valuable: “a dilated ‘catheter-induced’ scar... is more preferable”, as it allows avoiding aggressive repeat interventions and ensures “adequate nutrition”, which is so essential for a growing organism. The high efficacy of the method mentioned — 97% over the past 5 years — confirms its practical viability.

Thus, the report made a profound emotional impression — not only as a description of clinical practice, but also as a reflection of the medical team’s responsibility, attentiveness, and professionalism. The work commands respect and represents a valuable contribution to the treatment of such severe, yet — as the authors’ experience demonstrates — overcome consequences of chemical burns in children.

INTRODUCTION

Endoscopy is undergoing rapid technological advancement, and its success depends on the community’s ability to respond to challenges in a systematic, ethical, and technologically sound manner.

The 16th All-Russian Scientific and Practical Conference “Current Issues in Endoscopy” served not only as a platform for exchanging knowledge and experience but also as a powerful stimulus for the development of new directions in endoscopic practice.

The event strengthened professional ties between countries, set a high standard for scientific and practical discussion, and confirmed that endoscopy is the future of modern medicine.

ADDITIONAL INFORMATION

Authors' contribution. V.I. Orel, M.P. Korolev, N.A. Guryeva, V.I. Smirnova — searching for literary sources, information processing, writing the article text, editing; E.I. Babikov — searching for literary sources, information processing, writing the article text.

All authors read and approved the final version before publication.

Competing interests. The authors declare that they have no competing interests.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. В.И. Орел, М.П. Королёв, Н.А. Гурьева, В.И. Смирнова — поиск литературных источников, обработка информации, написание текста статьи, редактирование; Э.И. Бабилов — поиск литературных источников, обработка информации, написание текста статьи.

Все авторы прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

REFERENCES

1. Ramai D., Zakhia K., Etienne D., Reddy M. Philipp Bozzini (1773–1809): The earliest description of endoscopy. *J Med Biogr.* 2019;26(2):137–141. <https://doi.org/10.1177/0967772018755587>.
2. Janssen D.F. Who named and built the Désormeaux endoscope? The case of unacknowledged opticians Charles and Arthur Chevalier. *J Med Biogr.* 2021;29(3):176–179. <https://doi.org/10.1177/09677720211018975>.
3. Loriaux D.L. Adolf Kussmaul (1822–1902). A biographical history of endocrinology. 2016; 128–129. <https://doi.org/10.1002/9781119205791.ch31>.
4. Engel R.M.E. Philipp Bozzini — The Father of Endoscopy. *J Endourol.* 2003;17(10):859–862. <https://doi.org/10.1089/089277903772036145>.
5. Shamsudhin N., Zverev V.I., Keller H., Pane S., Egolf P.W., Nelson B.J., Tishin A.M. Magnetically guided capsule endoscopy. *Medical Physics.* 2017;44(8):91–111. (In Russian). <https://doi.org/10.1002/mp.12299>.
6. Kravtsov M.N. Historical aspects of video endoscopic surgery of the lumbar spine. *Russian Journal of Spine Surgery.* 2021;18(1):70–77. (In Russian). <https://doi.org/10.14531/ss2021.1.70-77>.
7. Lim S.G. Advances and challenges in gastrointestinal endoscopy: a comprehensive review. *J Innov Med Technol.* 2023;1(1):10–14. <https://doi.org/10.61940/jimt.230008>.
8. Kaan H.L., Ho K.Y. Clinical adoption of robotics in endoscopy: Challenges and solutions. *JGH Open.* 2020;4(5):790–794. <https://doi.org/10.1002/jgh3.12412>.
9. Nelson D., Muscarella L. Current issues in endoscope reprocessing and infection control during gastrointestinal

endoscopy. *World J Gastroenterol.* 2006;12(25):3953–3964. <https://doi.org/10.3748/wjg.v12.i25.3953>.

10. Ramoni D., Scuricini A., Carbone F., Liberale L., Montecucco F. Artificial intelligence in gastroenterology: Ethical and diagnostic challenges in clinical practice. *World J Gastroenterol.* 2025;31(10):102725. <https://doi.org/10.3748/wjg.v31.i10.102725>.
11. Cao Q., Deng R., Pan Y., Liu R., Chen Y., Gong G., Zou J., Yang H., Han D. Robotic wireless capsule endoscopy: recent advances and upcoming technologies. *Nature Communications.* 2024;15(1):4597. <https://doi.org/10.1038/s41467-024-49019-0>.
12. Avanesyan R.G., Khafizov L.Z., Korolev M.P., Rusanov D.S., Shodiev Sh.A., Chernova N.S. Analysis of the results of gastric mucosa coagulation in an experiment using various modes. Collection of articles of the 16th All-Russian Scientific and Practical Conference “Topical Issues of Endoscopy”. Saint Petersburg; 2025. P. 55–58. (In Russian).
13. Rusanov D.S., Fedotov L.E., Antipova M.V., Klimov A.V., Komarova A.D., Kuprenkova M.N. ERCP in pregnant women — an alternative view of intraoperative visualization of the bile ducts. Collection of articles of the 16th All-Russian Scientific and Practical Conference “Topical Issues of Endoscopy”. Saint Petersburg; 2025. P. 140–141. (In Russian).
14. Vasilyeva A.G., Kalashnikova V.A., Yakushenko N.S. The string of my soul. Early endoscopic correction of post-burn esophageal strictures. Collection of articles from the 16th All-Russian scientific and practical conference “Topical issues of endoscopy”. (In Russian); 2025. P. 289–290. (In Russian).

ЛИТЕРАТУРА

1. Ramai D., Zakhia K., Etienne D., Reddy M. Philipp Bozzini (1773–1809): The earliest description of endoscopy. *J Med Biogr.* 2019;26(2):137–141. <https://doi.org/10.1177/0967772018755587>.
2. Janssen D.F. Who named and built the Désormeaux endoscope? The case of unacknowledged opticians Charles and Arthur Chevalier. *J Med Biogr.* 2021;29(3):176–179. <https://doi.org/10.1177/09677720211018975>.
3. Loriaux D.L. Adolf Kussmaul (1822–1902). A biographical history of endocrinology. 2016; 128–129. <https://doi.org/10.1002/9781119205791.ch31>.
4. Engel R.M.E. Philipp Bozzini — The Father of Endoscopy. *J Endourol.* 2003;17(10):859–862. <https://doi.org/10.1089/089277903772036145>.
5. Шамсудхин Н., Зверев В.И., Келлер Х., Пейн С., Эгольф П.В., Нельсон Б.Дж., Тишин А.М. Магнитно-управляемая капсульная эндоскопия. *Медицинская физика.* 2017;44(8):91–111. <https://doi.org/10.1002/mp.12299>.

6. Кравцов М.Н. Исторические аспекты видеоэндоскопической хирургии поясничного отдела позвоночника. *Хирургия позвоночника и связанные с ней исследования*. 2021;18(1):70–77. <http://doi.org/10.14531/ss2021.1.70-77>.
7. Lim S.G. Advances and challenges in gastrointestinal endoscopy: a comprehensive review. *J Innov Med Technol*. 2023;1(1):10–14. <https://doi.org/10.61940/jimt.230008>.
8. Kaan H.L., Ho K.Y. Clinical adoption of robotics in endoscopy: Challenges and solutions. *JGH Open*. 2020;4(5):790–794. <https://doi.org/10.1002/jgh3.12412>.
9. Nelson D., Muscarella L. Current issues in endoscope reprocessing and infection control during gastrointestinal endoscopy. *World J Gastroenterol*. 2006;12(25):3953–3964. <https://doi.org/10.3748/wjg.v12.i25.3953>.
10. Ramoni D., Scuricini A., Carbone F., Liberale L., Montecucco F. Artificial intelligence in gastroenterology: Ethical and diagnostic challenges in clinical practice. *World J Gastroenterol*. 2025;31(10):102725. <https://doi.org/10.3748/wjg.v31.i10.102725>.
11. Cao Q., Deng R., Pan Y., Liu R., Chen Y., Gong G., Zou J., Yang H., Han D. Robotic wireless capsule endoscopy: recent advances and upcoming technologies. *Nature Communications*. 2024;15(1):4597. <https://doi.org/10.1038/s41467-024-49019-0>.
12. Аванесян Р.Г., Хафизов Л.З., Королев М.П., Русанов Д.С., Шодиев Ш.А., Чернова Н.С. Анализ результатов коагуляции слизистой оболочки желудка в эксперименте с использованием различных режимов. Сборник статей 16-й Всероссийской научно-практической конференции «Актуальные вопросы эндоскопии». Санкт-Петербург; 2025. С. 55–58.
13. Русанов Д.С., Федотов Л.Е., Антипова М.В., Климов А.В., Комарова А.Д., Купренкова М.Н. ЭРХПГ беременным — альтернативный взгляд на интраоперационную визуализацию желчных протоков. Сборник статей 16-й Всероссийской научно-практической конференции «Актуальные вопросы эндоскопии». Санкт-Петербург; 2025. С. 140–141.
14. Васильева А.Г., Калашникова В.А., Якушенко Н.С. Струна души моей. Ранняя эндоскопическая коррекция послеожоговых стриктур пищевода. Сборник статей 16-й Всероссийской научно-практической конференции «Актуальные вопросы эндоскопии». Санкт-Петербург; 2025. С. 289–290.

AUTHORS' INFO

Vasiliy I. Orel — Dr. Sci. (Med.), Professor, Vice-Rector for Academic Affairs, Head of the Department of Social Pediatrics and Healthcare Organization of the Faculty of Postgraduate and Continuing Professional Education, Honored Scientist of the Russian Federation. E-mail: viorel56@list.ru;

<https://orcid.org/0000-0001-6098-3449>, SPIN: 8882-8738

Mikhail P. Korolev — Dr. Sci. (Med.), Professor, Professor of the Department of General Surgery with a Course in Endoscopy. E-mail: korolevmp@yandex.ru; <https://orcid.org/0000-0001-5061-0139>; SPIN: 9966-8125

✉ **Eduard I. Babikov** — an intern at the Department of Social Pediatrics and Healthcare Organization at the Faculty of Postgraduate and Continuing Professional Education. E-mail: dr.babikov@mail.ru; <https://orcid.org/0009-0006-0507-2005>

Natalia A. Guryeva — Cand. Sci. (Med.), Associate Professor, Associate Professor at the Department of Social Pediatrics and Healthcare Organization at the Faculty of Postgraduate and Continuing Professional Education. E-mail: docent-mitrich@mail.ru; <https://orcid.org/0009-0003-5778-0079>; SPIN: 8111-3775

Victoria I. Smirnova — Cand. Sci. (Med.), Associate Professor, Associate Professor at the Department of Social Pediatrics and Healthcare Organization at the Faculty of Postgraduate and Continuing Professional Education. E-mail: 9096776@mail.ru; <https://orcid.org/0000-0002-3741-3592>; SPIN: 5742-3187

ОБ АВТОРАХ

Василий Иванович Орел — д.м.н., профессор, проректор по учебной работе, заведующий кафедрой социальной педиатрии и организации здравоохранения ФП и ДПО, заслуженный деятель науки РФ. E-mail: viorel56@list.ru; <https://orcid.org/0000-0001-6098-3449>, SPIN: 8882-8738

Михаил Павлович Королёв — д.м.н., профессор, профессор кафедры общей хирургии с курсом эндоскопии. E-mail: korolevmp@yandex.ru; <https://orcid.org/0000-0001-5061-0139>; SPIN: 9966-8125

✉ **Эдуард Ильдарович Бабиков** — ординатор кафедры социальной педиатрии и организации здравоохранения ФП и ДПО. E-mail: dr.babikov@mail.ru; <https://orcid.org/0009-0006-0507-2005>

Наталья Алексеевна Гурьева — к.м.н., доцент, доцент кафедры социальной педиатрии и организации здравоохранения ФП и ДПО. E-mail: docent-mitrich@mail.ru; <https://orcid.org/0009-0003-5778-0079>; SPIN: 8111-3775

Виктория Игоревна Смирнова — к.м.н., доцент, доцент кафедры социальной педиатрии и организации здравоохранения ФП и ДПО. E-mail: 9096776@mail.ru; <https://orcid.org/0000-0002-3741-3592>; SPIN: 5742-3187

Original papers

UDC 618.177-089.888.11+364.013+614.2

<https://doi.org/10.56871/MHCO.2026.36.13.005>

Evaluation of the clinical effectiveness of IVF protocols within the framework of compulsory medical insurance programs

*Olesya S. Vakhlova^{1, 2}, Natalya A. Roslaya²*¹ Family Medicine Center, 1/3 Nachdiv Vasilyev str., Ekaterinburg, 620043, Russian Federation² Ural State Medical University, 3 Repina str., Ekaterinburg, 620014, Russian Federation

For citation: Vakhlova O.S., Roslaya N.A. Evaluation of the clinical effectiveness of IVF protocols within the framework of compulsory medical insurance programs. *Medicine and Health Care Organization*. 2025;10(4):61–73.
<https://doi.org/10.56871/MHCO.2026.36.13.005>.

Received: 15.10.2025

Revised: 09.12.2025

Accepted: 28.01.2026

ABSTRACT. Introduction. Assisted reproductive technologies are considered to be the most prominent biomedical technologies worldwide, influencing demographic indicators. There is no unified approach to insurance strategy in the field of assisted reproductive technologies in world practice. In the Russian Federation, since 2016, compulsory medical insurance funds have been defined as a source of funding. Since 2019, the national project “Demography” provides for the possibility of carrying out the in vitro fertilization procedure at the expense of the basic compulsory medical insurance program. **Aim** — to assess the effectiveness of in vitro fertilization programs at the expense of compulsory medical insurance funds. **Materials and methods.** The study was based on statistical reports from the assisted reproductive technologies departments of JSC Family Medicine Center (Yekaterinburg) on in vitro fertilization programs at the expense of compulsory medical insurance in the period 2014–2023. Electronic clinical and statistical records of 10,243 patients were analyzed. The analysis criteria were the women’s age, the number of in vitro fertilization attempts, the frequency of embryo transfers in in vitro fertilization cycles, and the frequency of clinical pregnancies. The statistical analysis was performed using the STATISTICA software package, version 10.0 (StatSoft Inc., Original Articles, USA). The description of the statistical analysis of the material was carried out in accordance with the requirements of the SAMPL guidelines. **Results.** Between 2014 and 2023, an increase in the number of women of older reproductive age (40 years and older) seeking pregnancy planning using in vitro fertilization has been noted. The effectiveness of *in vitro* fertilization programs in the older age group was significantly lower compared to women of the younger reproductive age group. The proportion of women with low ovarian reserve averaged 32%. The effectiveness of small-cell in vitro fertilization programs in the group of women under 35 was significantly higher than in women aged 40 and older. The probability of clinical pregnancy decreased by 2.6 times (OR=2.613 [2.194–3.112]), if the woman’s age exceeded 40 years. The use of donor oocytes did not prove to increase the pregnancy rate. The effectiveness of in vitro fertilization cycles significantly decreased ($p < 0.001$) with an increase in the frequency of 4 or more programs. The tactics of transferring one embryo did not lead to a decrease in the clinical pregnancy rate ($p = 0.321$). **Conclusion.** The criteria for the clinical effectiveness of the in vitro fertilization programs under compulsory medical insurance are proved to be presented by the woman’s age under 40 years, high and normal ovarian reserve, the number of in vitro fertilization attempts of no more than 3; tactics aimed at transferring one embryo.

KEYWORDS: in vitro fertilization, IVF, compulsory health insurance, infertility, assisted reproductive technologies, ART

Funding. The authors declare that they have no external funding for the study.

✉ Olesya S. Vakhlova. E-mail: dr.vakhlova@mail.ru

© Vakhlova O.S., Roslaya N.A., 2025

<https://doi.org/10.56871/МНСО.2026.36.13.005>

Оценка клинической эффективности протоколов ЭКО в рамках программ обязательного медицинского страхования

Олеся Сергеевна Вахлова^{1, 2}, Наталья Алексеевна Рослая²

¹ Центр семейной медицины, 620043, г. Екатеринбург, ул. Начдива Васильева, д. 1, корп. 3, Российская Федерация

² Уральский государственный медицинский университет, 620014, г. Екатеринбург, ул. Репина, д. 3, Российская Федерация

Для цитирования: Вахлова О.С., Рослая Н.А. Оценка клинической эффективности протоколов ЭКО в рамках программ обязательного медицинского страхования. *Медицина и организация здравоохранения*. 2025;10(4):61–73. <https://doi.org/10.56871/МНСО.2026.36.13.005>.

Поступила: 15.10.2025

Одобрена: 09.12.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. Введение. Вспомогательные репродуктивные технологии считаются важнейшими биомедицинскими технологиями во всем мире, оказывающими влияние на демографические показатели. Единый подход к страхованию в области вспомогательных репродуктивных технологий в мировой практике отсутствует. В Российской Федерации с 2016 г. в качестве источника финансирования определены средства обязательного медицинского страхования. С 2019 г. национальным проектом «Демография» предусмотрена возможность проведения процедуры экстракорпорального оплодотворения за счет базовой программы обязательного медицинского страхования. **Цель исследования** — оценить эффективность программ экстракорпорального оплодотворения за счет средств обязательного медицинского страхования. **Материалы и методы.** Материалами для исследования стали данные статистических отчетов отделений вспомогательных репродуктивных технологий АО «Центр семейной медицины» (г. Екатеринбург) по программам экстракорпорального оплодотворения за счет средств обязательного медицинского страхования в период 2014–2023 гг. Проанализированы электронные клинико-статистические карты 10 243 пациенток. Критериями анализа были возраст женщин, количество попыток экстракорпорального оплодотворения, частота переносов эмбрионов в циклах экстракорпорального оплодотворения, частота наступления клинической беременности. При статистическом анализе использовали пакет прикладных статистических программ STATISTICA, версия 10,0 (StatSoft Inc., Original Articles, США). Описание статистического анализа материала проводилось в соответствии с требованиями руководства САМПЛ. **Результаты.** В период 2014–2023 гг. отмечено увеличение обращаемости женщин старшего репродуктивного возраста (40 лет и более) для планирования беременности при помощи экстракорпорального оплодотворения. Эффективность программ экстракорпорального оплодотворения в старшей возрастной группе была значимо ниже в сравнении с женщинами молодого репродуктивного возраста. Доля женщин с низким овариальным резервом составляла в среднем 32%. Эффективность в малоклеточных программах экстракорпорального оплодотворения в группе женщин до 35 лет была значимо выше, чем у женщин 40 лет и старше. Вероятность наступления клинической беременности снижалась в 2,6 раза (ОШ=2,613 [2,194–3,112]), если возраст женщины превышал 40 лет. Использование ооцитов донора не увеличивало частоту наступления беременности. Результативность циклов экстракорпорального оплодотворения значимо снижалась ($p < 0,001$) при увеличении кратности проведения четырех программ и более. Тактика по переносу одного эмбриона не приводила к снижению частоты наступления беременности ($p = 0,321$). **Выводы.** Критериями клинической эффективности программ экстракорпорального оплодотворения обязательного медицинского страхования являются возраст женщины менее 40 лет, высокий и нормальный овариальный резерв, количество попыток программ экстракорпорального оплодотворения не более трех, тактика, направленная на перенос одного эмбриона.

КЛЮЧЕВЫЕ СЛОВА: экстракорпоральное оплодотворение, ЭКО, обязательное медицинское страхование, бесплодие, вспомогательные репродуктивные технологии, ВРТ

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

✉ Олеся Сергеевна Вахлова. E-mail: dr.vakhlova@mail.ru

© Вахлова О.С., Рослая Н.А., 2025

INTRODUCTION

Infertility is a significant socio-demographic public health issue that requires intensive strategic solutions [1–3]. In 2009, the World Health Organization defined infertility as a “disease”, seeking to refute the assumption that its treatment is optional [4]. Approximately 18 million people worldwide suffer from infertility [5]. The rising prevalence of infertility globally is associated with numerous factors: age, acute and chronic somatic diseases, infectious and inflammatory diseases of the reproductive tract, genetic factors, and previous surgical interventions [6–9].

Reproductive technologies (RT) are considered among the most important biomedical technologies worldwide, influencing demographic indicators; they are the most effective methods for overcoming infertility, while raising numerous social, ethical, and legal issues in the field of reproductive medicine [2, 3, 6, 10–13]. In vitro fertilization (IVF), as one of the main RT methods, is included in state-guaranteed programs in many countries around the world [12].

There is no uniform approach to RT insurance in global practice. Full or partial insurance coverage for RT costs exists in Russia, the United States, Europe, Japan, South Korea, and Australia. In the Middle East, China, and Greece, certain forms of medical insurance for RT exist, but they are subject to restrictions and strict government oversight [1]. In countries such as France, Germany, Sweden, Belgium, Australia, Serbia, and South Korea, there are schemes providing full insurance coverage for the costs of infertility diagnosis and treatment at public expense [1, 2, 5]. In a number of countries, the age of women participating in RT programs is regulated: in the U.S. — up to 37 years old, in Turkey — up to 39 years old, in Belgium and Iran — up to 42 years old, and in Serbia — up to 45 years old [1, 5, 14]. The United Kingdom provides all infertility testing and treatment services for women aged 18–39 and insurance coverage for three full IVF cycles; for women aged 40–42, coverage is provided for one cycle [2, 5]. In Israel, the costs of all necessary RT procedures are covered for couples wishing to have two children [1]. Limits on the number of IVF cycles

covered by public health insurance exist in many countries: in the U.S. — up to 6 IVF attempts; in the Czech Republic — 1 attempt; in Slovenia — up to 4; in Belgium — up to 6 cycles; and in the Netherlands — up to 3 IVF cycles [1, 2, 4, 5, 15]. In many countries, there is no health insurance coverage for RT, but there is government support for specialized medical centers to increase public access to infertility treatment [1]. In Portugal, RT procedures performed in a public hospital are reimbursed at 100%, but medications are reimbursed at only 40% [2]. In Japan, couples can receive up to \$2,700 for their first IVF attempt and up to \$1,350 for the second and each subsequent attempt [1]. In Iran and Turkey, the government covers 20 to 80% of the costs for diagnosis and treatment; in Iran, the United Arab Emirates, Vietnam, and Malaysia, the government provides financial support for the development of fertility centers for low-income citizens [1, 5]. A system of subsidies for RT programs is in place in Turkey and Egypt [1, 5]. In Chile and Colombia, reimbursement for RT costs is regulated by government and nongovernmental organizations [1]. In India, the number of companies offering insurance for RT is growing [1]. As a result, in many middle- and low-income countries, government funding for infertility treatment is either limited, non-existent, or excluded from insurance coverage; consequently, patients bear the costs of treatment themselves, making these technologies expensive, inaccessible, and leading to inequities in treatment [5, 10].

Different approaches to covering the costs of infertility treatment influence the number of children born through RT [2]. When patients pay for RT services out of pocket, priority is given to transferring two embryos in order to maximize the chance of having twins in a single pregnancy. When RT programs are publicly funded, priority is given to transferring a single embryo, which reduces obstetric risks, increases the chances of a normal pregnancy, and leads to the birth of a full-term, healthy child [1, 4, 10, 16]. Single-embryo transfer is mandated in Sweden. In the United States and Russia, single-embryo transfer is a priority [10].

In the Russian Federation (RF), state-funded IVF programs have been in place since 2007;

since 2013, they have been included in the state-guaranteed program for the free provision of medical care to citizens; and since 2016, Mandatory Health Insurance (MHI) [3, 12, 13, 16]. Since 2018, a program for the transfer of cryopreserved embryos has been available under the MHI [12]. This approach has increased the accessibility of RT for the population [3, 13, 17]. The introduction of IVF programs into practical healthcare is enshrined in Article 55 of Federal Law No. 323-FZ of November 21, 2011, “On the Fundamentals of Health Protection of Citizens in the Russian Federation”¹. The details are specified in sectoral documents of the Ministry of Health of the Russian Federation, which regulate the conditions for admitting patients to these programs [1, 12]. The regional compulsory medical insurance program includes the provision of a basic IVF program; however, the order does not provide for discrimination based on age or family composition, nor does it regulate restrictions on the number of IVF cycles performed at the expense of MHI funds [1–3]. In 2019, the national “Demography”², project was approved, which provides, among other things, for the possibility of undergoing IVF procedures at the expense of the basic compulsory medical insurance program [2, 3, 13].

Over the past decades, there has been a persistent trend toward intentionally delaying motherhood, which leads to physiological loss of fertility and an increase in the rate of infertility, ultimately contributing to the aging of the population. At the same time, cultural and social factors can serve as barriers to access to infertility treatment services [5, 14, 18]. Consequently, there is a growing influx of older patients seeking IVF treatment, for whom the likelihood of achieving pregnancy — even with IVF — is low [18]. An increase in the average maternal age may lead to a rise in the number of IVF cycles, but not to an increase in live birth rates [10]. According to data from the Russian Association of Human Reproduction (RAHR) registry for 2022, the average success rate of IVF cycles in women under 35 years of

age was 24%, and in women over 40 years of age, 9.3%³. According to U.S. studies, the success rate of IVF programs reaches 55% for women under 35 and 4.3% for women over 42 [14].

A “poor” ovarian response to stimulation, a decline in ovarian reserve, and a decrease in oocyte quality with age are the main factors that negatively impact the clinical efficacy of IVF [14, 18, 19]. According to the global literature, the proportion of patients with a “poor” response accounts for approximately 33% of all patients in RT programs, while the pregnancy rate in such cases reaches up to 20%, and up to 30% of programs may be terminated due to a lack of oocytes or arrested embryo division [18]. Factors contributing to reduced oocyte quality in women of advanced reproductive age include mitochondrial dysfunction, oxidative damage, and abnormal gene expression. Embryos derived from such oocytes are typically of low quality, exhibit reduced implantation potential, and carry a high risk of aneuploidy [14, 18]. According to Cimadomo’s study, 45 years of age should be considered the maximum age threshold for IVF using autologous oocytes [14]. The probability of detecting a euploid blastocyst after age 45 is close to zero; therefore, any cycle using autologous oocytes after age 45 can be considered low-efficacy and should not be encouraged [14, 19]. Women over the age of 42 are at a higher risk of spontaneous abortion and obstetric complications compared to younger women [14].

AIM

The aim of the study is to evaluate the effectiveness of IVF programs covered by mandatory health insurance.

MATERIALS AND METHODS

A retrospective study was performed to evaluate the clinical effectiveness of IVF programs funded by the Mandatory Health Insurance (MHI) system during the period 2014–2023. Data were obtained from statistical reports of the RT departments at “Center for Family Medicine” (Ekaterinburg). Electronic clinical and

¹ Federal Law of November 21, 2011 No. 323-FZ (as amended on July 23, 2025) “On the Fundamentals of Health Protection of Citizens in the Russian Federation.” Available at: <https://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=LAW&n=502639&dst=100001#QvJRMUUFQMSPUKeB> (accessed: October 1, 2025).

² Demography: National Project. Available at: <https://xn--80aapampemcchfmo7a3c9ehj.xn--plai/projects/demografiya/> (accessed: October 1, 2025).

³ Russian Association of Human Reproduction. Available at: <https://www.rahr.ru/index.php> (accessed: October 1, 2025).

statistical records of 10,243 patients were analyzed. The analysis criteria included the following parameters: women's age, number of IVF attempts, frequency of embryo transfers in IVF cycles, and pregnancy rate (PR). Age groups up to 35 years, 36–39 years, and 40 years and older were analyzed. The number of IVF attempts was categorized into ranks: 1, 2, 3, 4, and more. A number of oocytes retrieved up to and including 5 was considered an indicator of a low-yield cycle.

For statistical analysis, the STATISTICA software package, version 10.0 (StatSoft Inc., Original Articles, USA), was used. To describe quantitative parametric variables, the mean and standard deviation (M(SD)) were calculated; for non-parametric variables, the median (M) was calculated along with the Q1–Q3 quartiles (25–75th percentiles). Qualitative indicators are presented as absolute (n) and relative (%) values (n/total (%)). For the comparative analysis of qualitative nominal variables, Pearson's χ^2 test was used; a p-value of <0.05 was considered statistically significant. To assess associations, the odds ratio was used with the calculation of confidence intervals (OR, 95% CI) [20]. The description of the statistical analysis of the biomedical research data was conducted in accordance with the requirements of the "Statistical Analysis and Methods in Published Literature (SAMPL)" guidelines [21].

RESULTS

The average age of female patients participating in the compulsory medical insurance IVF programs was 34.3 ± 4.54 years, with a mean of 34.0 (31.0–38.0) years, a minimum of 21.0 years, and a maximum of 50.0 years; this value remained stable over the 2014–2023 period. However, from 2019 to 2023, there was a significant decrease in the number of women under 35 years of age seeking treatment: from 671/1062 (63.2%) to 380/698 (54.4%), $p < 0.001$, accompanied by an increase in patients in the 36–39 age group: from 265/1062 (24.9%) to 216/698 (31%), $p = 0.006$, and a trend toward an increase in the number of women aged 40 and older — from 126/1062 (11.9%) to 102/698 (14.6%), $p = 0.093$ — in the compulsory medical insurance IVF programs (Fig. 1).

An analysis of the success rate in IVF programs under the compulsory medical insurance system among women by age, using only autologous oocytes, revealed that with increasing age, the proportion of programs using exclusively autologous oocytes decreased significantly and uniformly: 98.6; 95.5, and 85.5% for groups 1, 2, and 3 in Table 1, $p < 0.001$ when comparing all age groups; the frequency of embryo transfer using the patient's own biological material decreased significantly in the older reproductive group (40 years and older) compared to the group

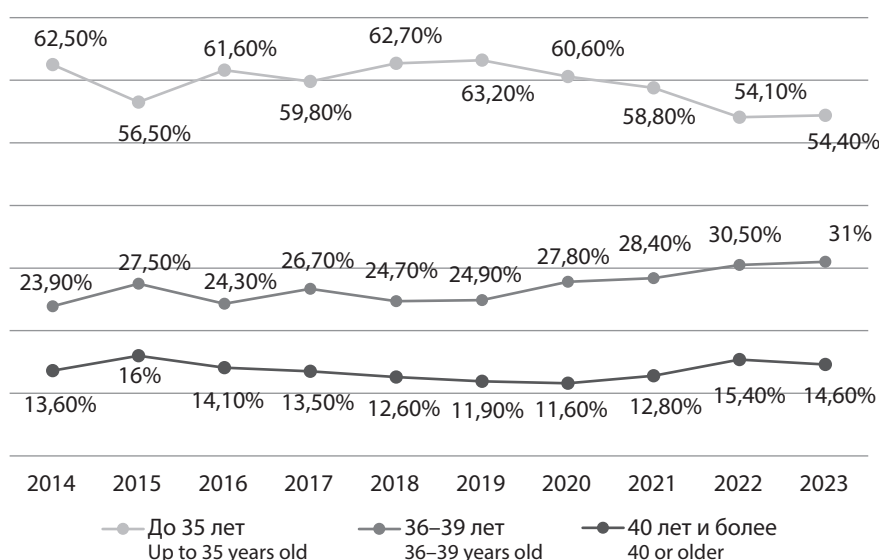


Fig. 1. Dynamics of changes in the age structure of women in in vitro fertilization programs in the period 2014–2023 (the figure is prepared by the authors based on data from their own research)

Рис. 1. Динамика изменения возрастной структуры женщин в программах экстракорпорального оплодотворения в период 2014–2023 гг. (рисунок подготовлен авторами по результатам собственного исследования)

under 35 years of age ($p < 0.04$); implantation and the onset of clinical pregnancy were significantly lower in the older reproductive group ($p < 0.001$) (Table 1). It was found that in IVF programs under the Mandatory Health Insurance system using only autologous oocytes, the probability of achieving a clinical pregnancy decreases by a factor of 2.6 if the woman is over 40 years of age ($OR = 2.613 [2.194-3.112]$).

An analysis of the number of IVF attempts among women in the compulsory medical insurance programs between 2014 and 2023 showed that the proportion of women with one, two, and three IVF attempts remained unchanged over the 10-year period: 65.9% and 63.3% in 2014 and 2023, respectively, $p = 0.278$; 20.5% and 21.4%, $p = 0.677$; 8.9% and 8.1%, $p = 0.578$. At the same time, the proportion of women with four IVF

Table 1

Pregnancy rate in *in vitro* fertilization programs under compulsory medical insurance using only autologous embryos depending on the woman's age

Таблица 1

Частота наступления беременности в программах экстракорпорального оплодотворения обязательного медицинского страхования с использованием только аутологичных эмбрионов в зависимости от возраста женщины

Показатель Indicator	Возраст			p (χ²)
	≤35 лет ≤35 years old, n=6135	36–39 лет 36–39 years old, n=2720	≥40 лет ≥40 years old, n=1388	
	Количество/всего (%) No / total (%)			
	1	2	3	
Количество программ Number of programs	6051/6135 (98,6%)	2597/2720 (95,5%)	1243/1388 (89,5%)	1–2 <0,001, 1–3 <0,001 2–3 <0,001
Количество переносов эмбрионов Number of embryo transfers	4291/6051 (70,9%)	1821/2597 (70,1%)	845/1243 (68%)	1–2=0,457, 1–3 <0,04, 2–3=0,179
Частота наступления беременности Pregnancy rate	1823/4291 (42,5%)	635/1821 (34,9%)	173/845 (20,5%)	1–2 <0,001, 1–3 <0,001 2–3 <0,001

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

Table 2

Pregnancy rate depending on the number of *in vitro* fertilization attempts

Таблица 2

Частота наступления беременности в зависимости от количества попыток экстракорпорального оплодотворения

Количество попыток Number attempts	Количество женщин Number of women	Перенос в целом (аутологичный + + донорскими ооцитами) Transfer in general (autologous and donor oocytes)	Частота наступления беременности в целом Pregnancy rate in general	Перенос аутологичных эмбрионов Autologous embryo transfer	Частота наступления беременности с аутологичными эмбрионами Pregnancy rate with autologous embryos
1	5443	3812/5443 (70%)	1500/3812 (39,4%)	3749/5359 (70%)	1472/3749* (39,3%)
2	2606	1875/2606 (72%)	705/1875 (37,6%)	1818/2528 (71,9%)	685/1818* (37,7%)
3	1267	892/1267 (70,4%)	317/892 (35,5%)	841/1205 (69,8%)	300/841* (35,7%)
≥4	927	646/927 (69,7%)	207/646 (32%)	549/799 (68,7%)	174/549* (31,7%)
p (χ^2)		1:2=0,078 1:3=0,797 1:4=0,831 2:3=0,318 2:4=0,191 3:4=0,718	1:2=0,204 1:3=0,036 1:4=0,001 2:3=0,294 2:4=0,012 3:4=0,154	1:2=0,076 1:3=0,911 1:4=0,475 2:3=0,181 2:4=0,082 3:4=0,608	1:2=0,255 1:3=0,054 1:4=0,001 2:3=0,319 2:4=0,011 3:4=0,127

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

* $p(\chi^2) > 0,05$ for pregnancy rate in general and pregnancy rate with autologous embryos. * $p(\chi^2) > 0,05$ для частоты наступления беременности в целом и частоты наступления беременности с аутологичными эмбрионами.

attempts increased significantly — from 4.7% to 7.2%, $p=0.030$.

An analysis was conducted of pregnancy rates depending on the number of attempts in the compulsory medical insurance IVF programs. The frequency of embryo transfer in the IVF cycle as a whole (using both the patient's own gametes and donor oocytes) and in the cycle involving embryo transfer using only the patient's own gametes did not differ depending on the number of MHI-funded IVF cycles performed (Table 2). The highest rates of implantation and clinical pregnancy were observed in the first and second IVF attempts, which were significantly higher compared to the third and fourth attempts. Thus, the lowest clinical pregnancy rate was observed in the fourth attempt and beyond, both overall and when using exclusively autologous oocytes (Table 2).

No differences were found in the rate of clinical pregnancy among women using only their own oocytes versus those using donor oocytes in addition: the cumulative pregnancy rate over a 10-

year period was 37.8% (2,631/6,957) when using only autologous biological material and 37.8% (2,729/7,225) when additionally using donor biological material. Furthermore, the pregnancy rate with both autologous and donor biomaterial did not differ depending on the number of IVF cycles performed (see Table 2). The rate of embryo transfer cancellations (Table 3) in programs with the additional use of donor oocytes and in programs using only autologous oocytes did not differ depending on the number of IVF attempts performed under the compulsory medical insurance program. The data obtained indicate that programs using donor oocytes do not contribute to the clinical efficacy of IVF-ICSI protocols.

The proportion of low-follicle punctures remained roughly the same over 10 years — ranging from 1/5 to 1/3 of all IVF cycles performed (Table 4, Fig. 2).

An assessment of outcomes in low-follicle (up to 5 follicles) IVF protocols revealed a correlation between pregnancy rates and women's

Table 3

Frequency of embryo transfer cancellations in *in vitro* fertilization programs depending on the use of donor oocytes

Таблица 3

Частота отмены переноса эмбриона в программах экстракорпорального оплодотворения в зависимости от использования ооцитов донора

Номер попытки Number attempts	Отмена переноса Cancel transfer, Количество/всего (%) No / total (%)		p (χ^2)
	в целом (собственные ооциты + + ооциты донора) in general (own oocytes + donor oocytes)	с аутологичным биоматериалом with autologous biomaterial	
1	1631 / 5443 (30%)	1610 / 5359 (30%)	0,930
2	731 / 2606 (28%)	710 / 2528 (28,1%)	0,978
3	375 / 1267 (29,6%)	364 / 1205 (30,2%)	0,741
4	281 / 927 (30,3%)	250 / 799 (31,3%)	0,662

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

Table 4

Small-cell punctures in compulsory medical insurance programs

Таблица 4

Малоклеточные пункции в программах обязательного медицинского страхования

Год Year	Количество/всего (%) No / total (%)	Год Year	Количество/всего (%) No / total (%)
2014	320 / 985 (32,5%)	2019	353 / 1062 (33,2%)
2015	219 / 1086 (20,2%)	2020	301 / 1005 (29,9%)
2016	375 / 1286 (29,2%)	2021	224 / 725 (30,9%)
2017	418 / 1424 (29,3%)	2022	191 / 695 (27,5%)
2018	278 / 1277 (21,8%)	2023	225 / 698 (32,2%)
Итого / Total: 2904 / 10243 (28,4%)			

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

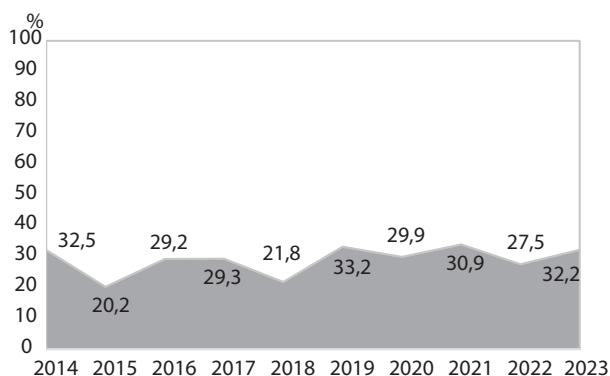


Fig. 2. The share of small cell punctures in the structure of all conducted in vitro fertilization programs under the compulsory medical insurance in the period from 2014 to 2023 (the figure is prepared by the authors)

Рис. 2. Доля малоклеточных пункций в структуре всех проведенных программ экстракорпорального оплодотворения обязательного медицинского страхования в период с 2014 по 2023 гг. (рисунок подготовлен авторами)

age: pregnancy rates in low-follicle protocols were significantly higher among women under 40 years of age (Table 5). It was found that the probability of achieving a clinical pregnancy in low-follicle IVF protocols was 2.6 times lower if the woman's age exceeded 40 years — 95% CI=2.636 [1.96–3.54].

Analysis of the pregnancy rate in low-dose protocols depending on the number of IVF attempts under the Mandatory Medical Insurance program showed no differences and stood at 28.9% (253/874) for a single attempt, 32.8% (141/430) for two attempts, 30.2% (68/225) for three attempts, and 27.6% (45/163) for four attempts. This generally indicates the low effectiveness of low-dose protocols.

An analysis of the compulsory medical insurance IVF programs during 2014–2023 revealed a clear decrease in the proportion of two-

Table 5

Pregnancy rates in small-cell protocols with transfer of only autologous embryos depending on age

Таблица 5

Частота наступления беременности в малоклеточных протоколах с переносом только аутологичных эмбрионов в зависимости от возраста

Возраст, лет Age, years		Количество переносов эмбрионов Number of embryo transfers	Частота наступления беременности Pregnancy rates
		Количество/всего (%) No / total (%)	
≤35	1	734 / 1047 (70,1%)	253 / 734 (34,5%)
36–39	2	583/877 (66,5%)	193/583 (33,1%)
≥40	3	375/578 (64,8%)	61/375 (16,3%)
p (χ^2)		1:2=0,089; 1:3=0,031; 2:3=0,530	1:2=0,604; 1:3=0,001; 2:3=0,001

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

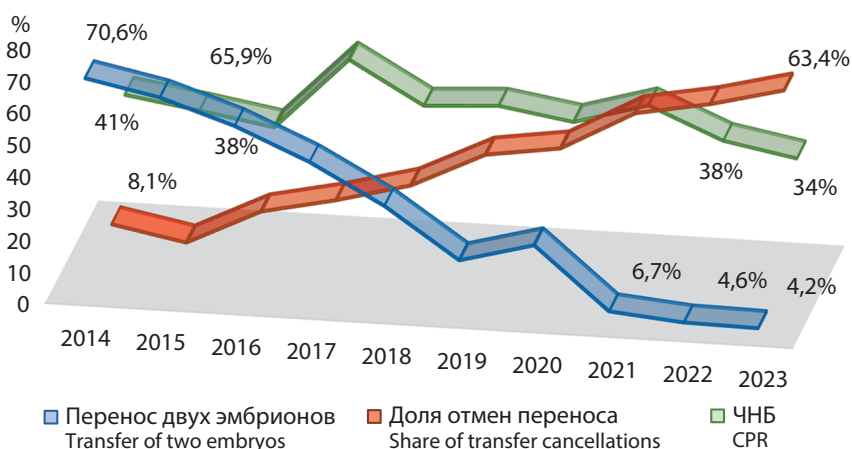


Fig. 3. Dynamics of changes in clinical approaches in in vitro fertilization programs for the period 2014–2023. CPR — clinical pregnancy rate (the figure is prepared by the authors based on data from their own research)

Рис. 3. Динамика изменения клинических подходов в программах экстракорпорального оплодотворения за период 2014–2023 гг. ЧНБ — частота наступления беременности (рисунок подготовлен авторами по результатам собственного исследования)

embryo transfers (from 630/892 (70.6%) to 28/670 (4.2%), $p=0.001$) with a simultaneous increase in the frequency of transfer cancellations in the IVF cycle (from 72/892 (8.1%) to 425/670 (63.4%), $p=0.001$). However, the pregnancy rate using only autologous biomaterial did not change significantly: in 2014 — 337/820 (41.1%), in 2023 — 92/245 (37.5%), $p=0.321$ (Fig. 3).

DISCUSSION

In vitro fertilization, as one of the primary RT technologies, is included in state-guaranteed programs in many countries around the world [12]. In the Russian Federation, since 2016, the Mandatory Health Insurance fund has been designated as the source of state funding for IVF programs [3, 12, 13, 16]. In 2019, the Russian government approved the national “Demography” project, which includes an initiative to fund IVF programs through the Mandatory Health Insurance system, with the ultimate goal of increasing the birth rate [2, 3, 13]. Increased state funding for IVF programs, higher utilization rates among women of relatively young reproductive age (up to 34 or 40 years old), and a reduction in religious restrictions will help maximize the demographic impact of RT [10]. At the same time, state support for RT technologies necessitates thorough preparation for planning RT programs, including differentiated approaches to patient selection for enrollment in mandatory health insurance IVF programs to ensure their successful implementation. From 2002 to 2022, according to data from the RAHR registry, the number of IVF cycles performed increased from 10,994 to 172,602, indicating high demand for these programs. Since 2020, Order No. 803n of the Russian Ministry of Health dated July 31, 2020, “On the Procedure for the Use of Assisted Reproductive Technologies, Contraindications, and Restrictions on Their Application” has been in effect, which regulates ovarian reserve parameters for inclusion in the compulsory medical insurance IVF programs (anti-Müllerian hormone 1.2 ng/mL or higher and 5 or more antral follicles); this document does not impose any age restrictions¹. However, a woman’s age is of

key importance for predicting the effectiveness of an IVF program, as it is associated with the morphogenetic quality of oocytes, a physiological decline in ovarian reserve, and a higher prevalence of somatic pathology. According to several studies, oocyte quality declines rapidly from the age of 35, which is a risk factor for the development of fetal genetic abnormalities [14, 18, 19].

In many countries worldwide, IVF programs covered by public health insurance have age restrictions up to 37–45 years, which is due to the low success rates of IVF cycles in this age group, increased obstetric and perinatal risks, and the resulting higher economic costs [14, 19]. The results obtained in our study indicate that during the period 2014–2023, there was a trend toward an increase in the number of women of advanced reproductive age seeking to plan a pregnancy using IVF. This is generally associated with the global trend of consciously postponing motherhood to a later period, as well as the popularization and development of RT programs. It was shown that the success rate of IVF programs in the older age group was 20.5% and was significantly lower compared to women of young reproductive age. The proportion of women with low ovarian reserve remained stable during the analyzed period and averaged 32%. At the same time, the success rate in low-cycle IVF programs among women under 35 was significantly higher compared to that among women in the older age group (40 years and older). Thus, the probability of achieving a clinical pregnancy decreased by a factor of 2.6 ($OR=2.613$ [2.194–3.112]) if the woman’s age exceeded 40 years, both in the group with normal ovarian reserve and in low-follicle IVF programs ($OR=2.636$ [1.96–3.54]).

The additional use of vitrified donor oocytes in IVF programs covered by compulsory medical insurance did not increase the pregnancy rate. On the one hand, this can be explained by the use of a small number of oocytes (up to 6) due to the high cost of donor material; on the other hand, by the association with patients’ complicated obstetric-gynecological and somatic status. At the same time, this once again underscores the priority of selecting women for public health insurance IVF programs with normal and high ovarian reserve in order to achieve pregnancy with autologous embryos.

An unsuccessful IVF program necessitates repeating the procedure. Based on the experience of several countries, limits have been set on

¹ Order of the Ministry of Health of the Russian Federation dated July 31, 2020 No. 803n “On the Procedure for the Use of Assisted Reproductive Technologies, Contraindications and Limitations to Their Use” (registered on October 19, 2020 No. 60457). Available at: <http://publication.pravo.gov.ru/Document/View/0001202010190041> (accessed: October 1, 2025)

the number of IVF cycles covered by the state budget — ranging from one to six cycles [1, 2, 4, 5, 15]. In the Russian Federation, Federal Law No. 323 does not regulate the number of attempts at state-funded IVF, which provides women with unlimited opportunities to achieve motherhood through RT programs. However, our data indicate that there is no increase in the success rate of IVF cycles with an increase in the number of attempts (more than four cycles). It follows that when planning public health insurance IVF programs, the number of attempts should be limited to no more than three, especially for women in the older age group, particularly since an increase in the number of attempts entails higher economic costs for implementing public health insurance IVF programs.

With the development of RT, approaches to conducting IVF programs have evolved, making them safer. According to data from the corporation “CSM” (Ekaterinburg), since 2014 there has been a decrease in the proportion of two-embryo transfers and an increase in the number of cycles with canceled transfers. These measures were aimed at reducing the risk of complications in IVF programs and ensuring a more physiological course of pregnancy. We have shown that when implementing such measures, the pregnancy rate with single-embryo transfer did not change significantly ($p=0.321$), even with an increase in the proportion of women in the older age group. This finding underscores the priority of single-embryo transfer as a criterion for the clinical effectiveness of public health insurance-funded IVF programs.

RT holds significant potential for increasing the contribution to fertility rates [10, 11]. Ensuring universal access to infertility treatment technologies and implementing state programs funded by the compulsory medical insurance system is important for the healthcare system [5]. A strategy aimed at the prevention and timely treatment of infertility is an investment in creating a productive and economically active generation for the country [5, 11].

CONCLUSION

An analysis of the effectiveness of IVF programs funded by the Mandatory Health Insurance system for the period 2014–2023 revealed the following:

- an inverse relationship was identified between the effectiveness of MHI-funded IVF programs and women’s age;

- an age criterion of under 40 years may serve as one of the selection factors when referring patients to MHI-funded IVF programs; the additional use of vitrified donor oocytes in MHI-funded IVF programs does not increase the pregnancy rate, which determines the priority of including women with high and normal ovarian reserve in the planning and implementation of MHI-funded IVF programs;
- repeating baseline attempts (4 or more) in MHI-funded IVF programs does not lead to an increase in the clinical pregnancy rate; when planning MHI-funded IVF programs, the number of attempts should be limited to no more than three, especially for women in the older age group;
- a strategy aimed at transferring a single embryo should be prioritized in IVF programs, as it does not reduce the pregnancy rate, prevents the development of obstetric complications, and ensures a more physiological course of pregnancy.

ADDITIONAL INFORMATION

Authors' contribution. The authors jointly developed the concept and purpose of the study. Vakhlova O.S. analyzed the primary medical documentation using descriptive and analytical statistics and formulated the conclusions. All authors read and approved the final version before publication.

Competing interests. The authors declare that they have no conflicts of interest related to the publication of this article.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Авторами совместно проведена разработка концепции и цели исследования. Вахловой О.С. осуществлен анализ первичной медицинской документации с применением методов описательной и аналитической статистики, сформулированы выводы. Все авторы прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы заявляют об отсутствии конфликтов интересов, связанных с публикацией настоящей статьи.

REFERENCES

1. Symaniuk E.E., Bashmakova N.V., Polyakova I.G., Itskovich M.M. Features of health insurance for reproductive health: recent trends in world and national practice. *Russian Journal of Human Reproduction*. 2021;27(2):33–40. (In Russian). <https://doi.org/10.17116/repro20212702133>.
2. Krylov V.A. Overview of global IVF reimbursement practices. *Pharmacoeconomics: Theory and Practice*. 2021;9(4):12–16. (In Russian). <https://doi.org/10.30809/phe.4.2021.2>.
3. Zheleznyakova I.A., Volkova O.A., Fedyaev D.V., Plakhonik O.S., Mazurov A.M., Lazareva M.L., Kotsenbina E.V. Improving the model of payment for medical care for infertility using assisted reproductive technologies in the program of state guarantees of free medical care to citizens for 2023 and 2024–2025. *Medical Technologies. Assessment and Choice*. 2023;45(2):23–31. (In Russian). <https://doi.org/10.17116/medtech20234502123>.
4. Kawwass J.F., Penzias A.S., Adashi E.Y. Fertility — a human right worthy of mandated insurance coverage: the evolution, limitations, and future of access to care. *Fertil Steril*. 2021;115(1):29–42. <https://doi.org/10.1016/j.fertnstert.2020.09.155>.
5. Morshed-Behbahani B., Lamyian M., Joulaei H., Rashidi B.H., Montazeri A. Infertility policy analysis: a comparative study of selected lower middle- middle- and high-income countries. *Global Health*. 2020;16(1):104. <https://doi.org/10.1186/s12992-020-00617-9>.
6. Njagi P., Groot W., Arsenijevic J., Dyer S., Mburu G., Kiarie J. Financial costs of assisted reproductive technology for patients in low- and middle-income countries: a systematic review. *Hum Reprod Open*. 2023;2023(2):hoad007. <https://doi.org/10.1093/hropen/hoad007>.
7. Carini F., Margherita Mazzola, Gagliardo C., Scaglione M., Giammanco M., Tomasello G. Inflammatory bowel disease and infertility: analysis of literature and future perspectives. *Acta Biomed*. 2021;92(5):e2021264. <https://doi.org/10.23750/abm.v92i5.11100>.
8. Szubert M., Koziróg E., Olszak O., Krygier-Kurz K., Kazmierczak J., Wilczynski J. Adenomyosis and infertility — review of medical and surgical approaches. *Int J Environ Res Public Health*. 2021;18(3):1235. <https://doi.org/10.3390/ijerph18031235>.
9. Munro M.G. Uterine polyps, adenomyosis, leiomyomas, and endometrial receptivity. *Fertil Steril*. 2019;111(4):629–640. <https://doi.org/10.1016/j.fertnstert.2019.02.008>.
10. Isupova O.G. Assisted reproductive technologies: new opportunities. *Demograficheskoe obozrenie*. 2017;4(1):35–64. (In Russian). EDN: ZGFNJJL.
11. Yagudina R.I., Kulikov A.Y., Tishchenko D.G. Pharmacoeconomic analysis of long-term effects of more widespread use of in vitro fertilization in infertility treatment at the regional and federal level from the standpoint of society at large in the Russian Federation. *Pharmacoeconomics: Theory and Practice*. 2017;5(1):41–46. (In Russian). <https://doi.org/10.30809/phe.1.2017.29>.
12. Krivolesova T.A. Analysis of the provision of assisted reproductive technologies in the implementation of the program of state guarantees of free medical care. *Saratov Journal of Medical Scientific Research*. 2022;18(2):250–255. (In Russian). EDN: SEUNSU.
13. Songolova E.N. Control of IVF accounting according to compulsory medical insurance. In: *Health Statistics of Modern times: Proceedings of the Second Congress of Medical Statisticians of Moscow*. Moscow; 2020: 84–86. (In Russian). EDN: SJSQHH.
14. Havrljenko J., Kopitovic V., Pjevic A.T., Milatovic S., Pavlica T., Andric N., Pogrmic-Majkic K. The prediction of IVF outcomes with autologous oocytes and the optimal MII Oocyte/embryo number for live birth at advanced maternal age. *Medicina (Kaunas)*. 2023;59(10):1799. <https://doi.org/10.3390/medicina59101799>.
15. Boulet S.L., Kawwass J., Session D., Jamieson D.J., Kissin D.M., Grosse S.D. US State-level infertility insurance mandates and health plan expenditures on infertility treatments. *Matern Child Health J*. 2019;23(5):623–632. <https://doi.org/10.1007/s10995-018-2675-y>.
16. Dankova I.V., Yakornova G.V., Malgina G.B., Mazurov D.O., Chermyaninova O.V., Bychkova S.V., Fassahova A.F., Smirnova E.E. ART monitoring program under the Compulsory Health Insurance (CHI): first results. *Russian Journal of Human Reproduction*. 2017;23(4):65–70. (In Russian). <https://doi.org/10.17116/repro201723465-70>.
17. Malyshkina A.I., Pesikin O.N., Kuligina M.V. The evaluation of efficiency of application of axillary reproductive technologies on the territorial level. *Probl Sotsialnoi Gig Zdravookhraneniia i Istor Med*. 2019;27(4):394–398. (In Russian). <https://doi.org/10.32687/0869-866X-2019-27-4-394-398>.
18. Rudakova E.B., Fedorova E.A., Sergeeva I.V. Is it possible to help patients of older reproductive age implement their reproductive function within the framework of IVF and PE programs backed by state support? *Medical Council*. 2018;(7):116–124. (In Russian). <https://doi.org/10.21518/2079-701X-2018-7-116-124>.
19. Cakmak H. When is the right time to stop autologous in vitro fertilization treatment in poor responders? *Fertil Steril*. 2022;117(4):682–687. <https://doi.org/10.1016/j.fertnstert.2022.02.027>.

20. Kelmanson I.A. Principles of evidence-based pediatrics. Saint Petersburg: Foliant; 2004. (In Russian).
21. Lang T., Altman D. Basic statistical reporting for articles published in clinical medical journals: the sampl guidelines. *Medical Technologies. Assessment and Choice*. 2014;(1):10–15. (In Russian). EDN: TIXQTT.
9. Munro M.G. Uterine polyps, adenomyosis, leiomyomas, and endometrial receptivity. *Fertil Steril*. 2019;111(4):629–640. <https://doi.org/10.1016/j.fertnstert.2019.02.008>.

ЛИТЕРАТУРА

1. Сыманюк Э.Э., Башмакова Н.В., Полякова И.Г., Ицкович М.М. Особенности медицинского страхования репродуктивного здоровья: современные тенденции в мировой практике. *Проблемы репродукции*. 2021;27(2):33–40. <https://doi.org/10.17116/repro20212702133>.
2. Крылов В.А. Обзор мировых практик возмещения технологии экстракорпорального оплодотворения. *Фармакоэкономика: теория и практика*. 2021;9(4):12–16. <https://doi.org/10.30809/phe.4.2021.2>.
3. Железнякова И.А., Волкова О.А., Федяев Д.В., Плaxотник О.С., Мазуров А.М., Лазарева М.Л., Коценбина Е.В. Методика совершенствования модели оплаты медицинской помощи при бесплодии с использованием вспомогательных репродуктивных технологий в рамках реализации Программы государственных гарантий бесплатного оказания гражданам медицинской помощи на 2023 год и на плановый период 2024–2025 годов. *Медицинские технологии. Оценка и выбор*. 2023;45(2):23–31. <https://doi.org/10.17116/medtech20234502123>.
4. Kawwass J.F., Penzias A.S., Adashi E.Y. Fertility — a human right worthy of mandated insurance coverage: the evolution, limitations, and future of access to care. *Fertil Steril*. 2021;115(1):29–42. <https://doi.org/10.1016/j.fertnstert.2020.09.155>.
5. Morshed-Behbahani B., Lamyian M., Joulaei H., Rashidi B.H., Montazeri A. Infertility policy analysis: a comparative study of selected lower middle- middle- and high-income countries. *Global Health*. 2020;16(1):104. <https://doi.org/10.1186/s12992-020-00617-9>.
6. Njagi P., Groot W., Arsenijevic J., Dyer S., Mburu G., Kiarie J. Financial costs of assisted reproductive technology for patients in low- and middle-income countries: a systematic review. *Hum Reprod Open*. 2023;2023(2):hoad007. <https://doi.org/10.1093/hropen/hoad007>.
7. Carini F., Margherita Mazzola, Gagliardo C., Scaglione M., Giammanco M., Tomasello G. Inflammatory bowel disease and infertility: analysis of literature and future perspectives. *Acta Biomed*. 2021;92(5):e2021264. <https://doi.org/10.23750/abm.v92i5.11100>.
8. Szubert M., Koziróg E., Olszak O., Krygier-Kurz K., Kazmierczak J., Wilczynski J. Adenomyosis and infertility — review of medical and surgical approaches. *Int J Environ Res Public Health*. 2021;18(3):1235. <https://doi.org/10.3390/ijerph18031235>.
9. Munro M.G. Uterine polyps, adenomyosis, leiomyomas, and endometrial receptivity. *Fertil Steril*. 2019;111(4):629–640. <https://doi.org/10.1016/j.fertnstert.2019.02.008>.
10. Исупова О.Г. Вспомогательные репродуктивные технологии: новые возможности. *Демографическое обозрение*. 2017;4(1):35–64. EDN: ZGFNJJL.
11. Ягудина Р.И., Куликов А.Ю., Тищенко Д.Г. Фармакоэкономический анализ отдаленных последствий более широкого использования экстракорпорального оплодотворения в лечении бесплодия на региональном и федеральном уровнях с позиции общества в целом в Российской Федерации. *Фармакоэкономика: теория и практика*. 2017;5(1):41–46 <https://doi.org/10.30809/phe.1.2017.29>.
12. Криволесова Т.А. Анализ предоставления вспомогательных репродуктивных технологий при реализации программы государственных гарантий бесплатного оказания медицинской помощи. *Саратовский научно-медицинский журнал*. 2022;18(2):250–255. EDN: SEUNSU.
13. Сонголова Е.Н. Контроль учета ЭКО по ОМС. В кн.: Статистика здравоохранения нового времени: Материалы Второго съезда медицинских статистиков Москвы. Москва; 2020. С. 84–86. EDN: SJSQHN.
14. Havrljenko J., Kopitovic V., Pjevic A.T., Milatovic S., Pavlica T., Andric N., Pogrmic-Majkic K. The prediction of IVF outcomes with autologous oocytes and the optimal MII Oocyte/embryo number for live birth at advanced maternal age. *Medicina (Kaunas)*. 2023;59(10):1799. <https://doi.org/10.3390/medicina59101799>.
15. Boulet S.L., Kawwass J., Session D., Jamieson D.J., Kissin D.M., Grosse S.D. US State-level infertility insurance mandates and health plan expenditures on infertility treatments. *Matern Child Health J*. 2019;23(5):623–632. <https://doi.org/10.1007/s10995-018-2675-y>.
16. Данькова И.В., Якорнова Г.В., Мальгина Г.Б., Мазуров Д.О., Чермянинова О.В., Бычкова С.В., Фассахова А.Ф., Смирнова Е.Е. Программа мониторинга вспомогательных репродуктивных технологий в рамках обязательного медицинского страхования: первые итоги. *Проблемы репродукции*. 2017;23(4):65–70. <https://doi.org/10.17116/repro201723465-70>.
17. Малышкина А.И., Песикин О.Н., Кулигина М.В. Оценка эффективности применения вспомогательных репродуктивных технологий на территориальном уровне. *Проблемы социальной гигиены, здравоохранения и истории медицины*. 2019;27(4):394–398. <https://doi.org/10.32687/0869-866X-2019-27-4-394-398>.
18. Рудакова Е.Б., Федорова Е.А., Сергеева И.В. Можно ли помочь пациенткам старшей возрастной группы

- с реализацией репродуктивной функции в программах ЭКО и ПЭ в рамках государственной поддержки? *Медицинский совет*. 2018;(7):116–124. <https://doi.org/10.21518/2079-701X-2018-7-116-124>.
19. Cakmak H. When is the right time to stop autologous in vitro fertilization treatment in poor responders? *Fertil Steril*. 2022;117(4):682–687. <https://doi.org/10.1016/j.fertnstert.2022.02.027>.
20. Кельмансон И.А. Принципы доказательной педиатрии. Санкт-Петербург: Фолиант; 2004.
21. Ланг Т., Альтман Д. Основы описания статистического анализа в статьях, публикуемых в биомедицинских журналах. Руководство «статистический анализ и методы в публикуемой литературе (САМПЛ)». *Медицинские технологии. Оценка и выбор*. 2014;(1):10–15. EDN: TIXQTT.

AUTHORS' INFO

✉ **Olesya S. Vakhlova** — Cand. Sci. (Med.), Head of the Department of Assisted Reproductive Technologies JSC “Family Medicine Center”; Assistant Professor of Obstetrics and Gynecology with a course in Medical Genetics. E-mail: dr.vakhlova@mail.ru; <https://orcid.org/0000-0001-5069-8177>; SPIN: 9785-7530

Natalya A. Roslaya — Dr. Sci. (Med.), Professor. E-mail: naroslava@gmail.com; <https://orcid.org/0000-0001-9076-9742>; SPIN: 8327-2997.

ОБ АВТОРАХ

✉ **Олеся Сергеевна Вахлова** — к.м.н., заведующий отделением вспомогательных репродуктивных технологий АО «Центр семейной медицины»; ассистент кафедры акушерства и гинекологии с курсом медицинской генетики Уральского государственного медицинского университета. E-mail: dr.vakhlova@mail.ru; <https://orcid.org/0000-0001-5069-8177>; SPIN: 9785-7530

Наталья Алексеевна Рослая — д.м.н., профессор. E-mail: naroslava@gmail.com; <https://orcid.org/0000-0001-9076-9742>; SPIN: 8327-2997

Original papers

UDC 614.39-053.2+616-002.5-036.82+615.82/.84+614.2+338.46
<https://doi.org/10.56871/MHCO.2026.35.13.006>

Comprehensive assessment of the effectiveness of sanatorium treatment for tuberculosis in children

Elena Yu. Vlasova¹, Marina E. Lozovskaya², Gennadii G. Karasev¹,
Yuliya A. Yarovaya², Ksenia P. Yulina², Anna R. Sapozhnikova²

¹ Pushkinsky Children's Tuberculosis Sanatorium, 2/1 Parkovaya str., Pushkin, Saint Petersburg, 196602, Russian Federation

² Saint Petersburg State Pediatric Medical University, 2 Litovskaya str., Saint Petersburg, 194100, Russian Federation

For citation: Vlasova E.Yu., Lozovskaya M.E., Karasev G.G., Yarovaya Yu.A., Yulina K.P., Sapozhnikova A.R.

Comprehensive assessment of the effectiveness of sanatorium treatment for tuberculosis in children. *Medicine and Health Care Organization*. 2025;10(4):74–82. <https://doi.org/10.56871/MHCO.2026.35.13.006>.

Received: 18.11.2025

Revised: 25.12.2025

Accepted: 28.01.2026

ABSTRACT. Introduction. The sanatorium stage is an important component of the comprehensive therapy and rehabilitation of children with tuberculosis and individuals from risk groups. To evaluate its effectiveness, a systematic approach is required that takes into account the dynamics of a set of clinical and functional indicators. **The aim of the research** — to test a comprehensive assessment table for determining the effectiveness of the sanatorium stage of treatment at the Federal State Budgetary Institution Children's Tuberculosis Sanatorium “Pushkinsky” of the Ministry of Health of Russia (DTS). This table was developed jointly by the Department of Phthisiology of the Federal State Budgetary Educational Institution of Higher Education Saint Petersburg State Pediatric Medical University and the Federal State Budgetary Institution DTS “Pushkinsky” of the Ministry of Health of Russia. **Materials and methods.** Analysis of medical records of patients undergoing rehabilitation at the sanatorium with diagnoses of “respiratory tuberculosis” and “latent tuberculosis infection” was carried out, and treatment effectiveness was assessed using a special table, where key indicators were assessed in points upon admission and discharge. As a result, the effectiveness coefficient was calculated: the quotient of the sum of points upon admission divided by the sum of points upon discharge. Treatment included medication (chemotherapy) and non-medication methods (halotherapy, ionotherapy, exercise therapy, massage, and physical therapy). **Results.** The use of an assessment table allowed for standardized assessment of treatment outcomes. Based on the effectiveness coefficient, four outcome categories were identified: “significant improvement”, “improvement”, “unchanged”, and “worsening”. The analysis revealed positive dynamics in most of the assessed parameters in patients in both groups.

KEYWORDS: patients of the sanatorium, children, tuberculosis, latent tuberculosis infection, sanatorium treatment, rehabilitation, treatment efficacy

Funding. This study was not supported by any external sources of funding.

✉ Yuliya A. Yarovaya. E-mail: yulia_yarovaya@mail.ru

© 2025 by the authors

<https://doi.org/10.56871/МНСО.2026.35.13.006>

Комплексная оценка эффективности санаторного лечения туберкулеза у детей

Елена Юрьевна Власова¹, Марина Эдуардовна Лозовская², Геннадий Геннадьевич Карасев¹, Юлия Анатольевна Яровая², Ксения Павловна Юлина², Анна Романовна Сапожникова²

¹ Детский туберкулезный санаторий «Пушкинский», 196602, г. Санкт-Петербург, г. Пушкин, ул. Парковая, д. 2/1, Российская Федерация

² Санкт-Петербургский государственный педиатрический медицинский университет, 194100, г. Санкт-Петербург, ул. Литовская, д. 2, Российская Федерация

Для цитирования: Власова Е.Ю., Лозовская М.Э., Карасев Г.Г., Яровая Ю.А., Юлина К.П., Сапожникова А.Р. Комплексная оценка эффективности санаторного лечения туберкулеза у детей. *Медицина и организация здравоохранения*. 2025;10(4):74–82. <https://doi.org/10.56871/МНСО.2026.35.13.006>.

Поступила: 18.11.2025

Одобрена: 25.12.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. Введение. Санаторный этап является важным компонентом комплексной терапии и реабилитации детей, больных туберкулезом, и лиц из групп риска. Для оценки его эффективности необходим системный подход, учитывающий динамику совокупности клинико-функциональных показателей. **Цель исследования.** На базе ФГБУ «Детский туберкулезный санаторий “Пушкинский”» Минздрава России (ДТС) провести апробацию комплексной оценочной таблицы для определения эффективности санаторного этапа лечения, разработанную совместно кафедрой фтизиатрии ФГБОУ ВО СПбГПМУ Минздрава России и ФГБУ ДТС «Пушкинский» Минздрава России. **Материалы и методы.** Проведены анализ медицинских карт пациентов, проходивших реабилитацию в санатории с диагнозами «туберкулез органов дыхания» и «латентная туберкулезная инфекция», оценка эффективности лечения с помощью специальной таблицы, где ключевые показатели оценивались в баллах при поступлении и выписке. В результате высчитывался коэффициент эффективности: частное от деления суммы баллов при поступлении на сумму баллов при выписке. Лечение включало медикаментозные (химиотерапия) и немедикаментозные (галотерапия, ионотерапия, лечебная физкультура, массаж, физиотерапия) методы. **Результаты.** Использование оценочной таблицы позволило стандартизировать оценку результатов лечения. На основе коэффициента эффективности были выделены четыре категории результатов: «значительное улучшение», «улучшение», «без перемен» и «ухудшение». Анализ показал положительную динамику большинства оцениваемых параметров у пациентов обеих групп.

КЛЮЧЕВЫЕ СЛОВА: пациенты санатория, дети, туберкулез, латентная туберкулезная инфекция, санаторное лечение, реабилитация, эффективность лечения

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

✉ Юлия Анатольевна Яровая. E-mail: yulia_yarovaya@mail.ru

© Коллектив авторов, 2025

INTRODUCTION

Tuberculosis remains one of the most significant medical and social challenges facing global public health¹. The specific features of the immunopathogenesis of tuberculosis infection in childhood, the tendency to develop complicated forms of the disease, and the high frequency of residual changes after cure underscore the urgency of finding the most effective approaches to rehabilitation and follow-up care for this patient population [1]. The foundation of tuberculosis treatment is long-term, multi-drug chemotherapy, the success of which depends not only on timely diagnosis and the appropriate selection of a treatment regimen, but also on the conditions under which it is administered [2]. In this context, sanatorium-based rehabilitation is traditionally regarded as a crucial element of comprehensive therapy, providing the opportunity for continuous monitoring of chemotherapy administration and the implementation of intensive general restorative and pathogenetic treatment in a favorable ecological environment [3, 4].

Sanatorium rehabilitation is an important stage in the comprehensive therapy of children with tuberculosis following hospitalization, after surgical intervention, and for those in high-risk groups for tuberculosis.

Rehabilitation in pediatric phthisiology is conducted for two groups of patients:

1) children at high risk of tuberculosis — those infected with *Mycobacterium tuberculosis* with latent tuberculosis infection and children from tuberculosis hotspots;

2) children with active tuberculosis and those who have recovered from tuberculosis².

The sanatorium phase is aimed at the treatment, rehabilitation, and prevention of tuberculosis in this patient population.

Sanatorium treatment offers the best opportunity for comprehensive medical rehabilitation, provided that the facilities themselves are ade-

quately prepared and patients are referred there based on medical indications.

The advantages of the sanatorium phase of rehabilitation include the ability to develop and implement a comprehensive rehabilitation program, including psychological support and patient education [7].

However, there is currently no unified, standardized approach to evaluating the effectiveness of this rehabilitation phase. Traditional assessment, based on the analysis of isolated clinical or laboratory-instrumental indicators, is often fragmentary and subjective in nature and does not reflect the comprehensive, multi-component dynamics of the patient's condition resulting from the application of the entire complex of rehabilitation measures [5]. This complicates the comparative analysis of treatment outcomes, the planning of individualized rehabilitation programs, and the objective assessment of the quality of care provided. Internationally, there is also a growing recognition of the importance of a comprehensive assessment of treatment outcomes that goes beyond bacterial cure and includes parameters of functional status and quality of life, which is particularly relevant in pediatric practice [2, 6].

Assessing the outcomes of sanatorium rehabilitation is difficult because there are no universally recognized criteria for concepts such as “significant improvement”, “improvement”, “no change”, and “worsening”, which are commonly used to characterize the effectiveness of rehabilitation measures.

Often, the impact of sanatorium rehabilitation treatment is assessed by physicians arbitrarily and lacks an evidence-based foundation. Since rehabilitation in a tuberculosis sanatorium is comprehensive, its evaluation must be based on a set of indicators reflecting the dynamics of various organs and systems in the child or adolescent, that is, it must be of an integrated nature.

AIM

Conducting a pilot study of a comprehensive assessment of the effectiveness of the sanatorium phase of rehabilitation using an assessment table developed jointly by the Federal State Budgetary Institution “Pushkinsky Children's Tuberculosis Sanatorium” of the Ministry of Health of Russia and the Department of Phthisiology at the St. Petersburg State Medical University (SPbSPMU) of

¹ World Health Organization. Global Tuberculosis Report 2023. Geneva: World Health Organization; 2023. Available at: <https://www.who.int/publications/i/item/9789240083851> (accessed: November 5, 2025).

² Order of the Ministry of Health of the Russian Federation dated October 23, 2019 No. 878 “On Approval of the Procedure for Organizing Medical Rehabilitation for Children.” Available at: <http://publication.pravo.gov.ru/Document/View/0001201912240050> (accessed: October 20, 2025).

the Ministry of Health of Russia, and the implementation of the comprehensive treatment effectiveness assessment table into the daily practice of phthisiologists at tuberculosis sanatoriums to improve the quality of rehabilitation care provided.

MATERIALS AND METHODS

To achieve this objective, a retrospective analysis was conducted of 120 medical records of patients aged 11–17 who underwent rehabilitation at the Federal State Budgetary Institution “Pushkinsky Children’s Tuberculosis Sanatorium” of the Russian Ministry of Health in 2023–2024. The patient cohort consisted of 75 boys and 45 girls.

All 120 patients were divided into two equal groups, with 60 patients in each. The first group consisted of 60 patients with respiratory tuberculosis in the continuation phase of chemotherapy and clinically cured. The second group included 60 patients with latent tuberculosis infection (LTI). A comprehensive rehabilitation program, including preventive anti-tuberculosis treatment, was developed for them.

For both groups, at all stages — from admission to discharge — a comprehensive approach to rehabilitation was applied, combining pharmacological and non-pharmacological methods. Pharmacological treatment included chemotherapy (maintenance or preventive), while non-pharmacological support consisted of a wide range of procedures: halotherapy, air ionization therapy, phytotherapy, therapeutic exercise, massage, breathing exercises, oxygen therapy, physical therapy, and other restorative techniques.

The main research method was an assessment table developed in collaboration with the Department of Phthisiology at SPbSPMU, which allowed for the quantitative (in points) evaluation of key parameters upon admission and discharge, followed by the calculation of an integral efficacy coefficient. Statistical data analysis was performed using methods of variational statistics and descriptive statistics in Microsoft Excel 2019, including the construction of histograms, the determination of mean values, and standard deviations (σ), which were used to define the confidence intervals for the effectiveness coefficient (three-sigma rule).

The table assesses the dynamics of 10 indicators, such as symptoms of intoxication, phy-

sical development (percentile assessment), separately — body weight, peripheral lymph node reaction, recombinant tuberculin test (RTT), imaging data, including multislice computed tomography (MSCT), assessment of pulmonary function (PF), clinical and biochemical blood test data, and the status of chronic infection foci.

For each indicator, gradations are established, which are scored in points. For example, a hyperergic RTT test is scored as 5 points, a pronounced normergic reaction as 4 points, a moderate reaction as 3 points, a mild reaction as 2 points, and a negative reaction as 1 point.

Each indicator is assessed twice: upon admission and prior to the patient’s discharge. As a result, an effectiveness coefficient (EC) was calculated: the quotient of the sum of points at admission divided by the sum of points at discharge, which was used to evaluate the results.

The control limits for the EC were calculated using the three-sigma method, whereby:

- the mean EC value was $M=1.57$; $1\sigma=0.21$;
- “significant improvement” — 1.79 and above;
- “improvement” — 1.78–1.15;
- “no change” — 1.14–0.94;
- “deterioration” — 0.93 and below.

The table was filled out as follows (Fig. 1): scores were entered into the “before” and “after” columns, then the coefficient was calculated as the quotient of the sum of scores upon admission divided by the sum of scores upon discharge.

RESULTS

The study analyzed 120 tables from the medical records of children undergoing rehabilitation at the sanatorium. Pre- and post-treatment scores were evaluated, total pre- and post-treatment scores were calculated, and the effectiveness coefficient was determined according to the described method.

An evaluation of the treatment outcomes at the sanatorium demonstrated the high effectiveness of the measures taken (Fig. 2). A “significant improvement” was recorded in 19% of the children. An “improvement” was noted in 77% of the children, indicating a positive trend. In 3% of children, the condition remained largely unchanged (“no change”), which may be due to the short duration of the stay. In 1% of children, a “worsening” was recorded, which is also associated with

Оценка эффективности лечения

Признаки	5 баллов	4 балла	3 балла	2 балла	1 балл
признаки туб. интоксикации:					
Температура	субфебр.	субфебр.	норм.	норм.	норм.
оценка поступл. / выписка	/	/	/	/	/
Аппетит	снижен постоянно	непостоянный (весовые прибавки отсутствуют)	избирательный (весовые прибавки непостоянные)	хороший (весовые прибавки постоянные)	отличный (весовые прибавки постоянные)
оценка поступл. / выписка	/	/	/	/	/
Прочие симптомы интоксикации: недомогание слабость бледность	присутствует	4 признака	2-3 признака	1 признак	нет
оценка поступл. / выписка	/	/	/	/	/
Физ.развитие/масса тела (центильный интервал)	Дисгармоничное/отклон. от ср. на 2-3 кор., прибавки веса нет	Дисгармоничное/отклон. от ср. на 2-3 кор., есть прибавка веса	гармоничное/отклон. от ср. на 1 кор., прибавки веса нет	гармоничное/средн. (4кор.) прибавки веса нет	гармоничное/есть прибавка веса
оценка поступл. / выписка	/	/	/	/	/
Чувствительность по данным иммунологических проб	Гиперергическая	нормергическая выраженная по пробе с АТР	умеренная по пробе с АТР	слабо выраженная по пробе с АТР	нормергическая RM, проба с АТР отр.
оценка поступл. / выписка	/	/	/	/	/
Динамика Rg, МСКТ	РГ признаки активности	снижение активности ф.	ф. уплотнения ф. нач. кальцинации	стабилизация (фиброз, кальцинаты)	патологии нет
оценка поступл. / выписка	/	/	/	/	/
Реакция периф. лимфоузлов	выражена	выражена умеренно	микрополиадения	пальпируются в 4-х гр.	не выражена
оценка поступл. / выписка	/	/	/	/	/
Динамика гемограммы	СОЭ увел. на 5 и более мм/ч от N, лейкоцитоз с палочкояд. сдвигом 10% и более	СОЭ увел. не более 5 мм/ч, лимфопения до 5% от N, лейкоцитоз незначит.	СОЭ увел. незначительно	норма, верхняя/нижняя граница нормы	норма
оценка поступл. / выписка	/	/	/	/	/
Гемоглобин	снижен на > 10г/л	снижен на 6-10 г/л	снижен на 1-5 г/л	норма, нижняя	норма
оценка поступл. / выписка	/	/	/	/	/
Биохимия	выраженные изменения	умеренные изменения	незначительные изменения	норма, верхняя/нижн	норма
оценка поступл. / выписка	/	/	/	/	/
Функция внешнего дыхания	значит. нарушения	умерен. нарушения	легкие нарушения	оч. легкие нарушен.	норма
оценка поступл. / выписка	/	/	/	/	/
Обострение очагов хр. неспец. инф.	обострение	стихание обострения	нестойкая ремиссия	стойкая ремиссия	хр. очагов нет
оценка поступл. / выписка	/	/	/	/	/
Общий итог поступл. /выписка	/	/	/	/	/

Fig. 1. Evaluation table (the figure is prepared by the authors using their own data)

Рис. 1. Оценочная таблица (рисунок подготовлен авторами по собственным данным)

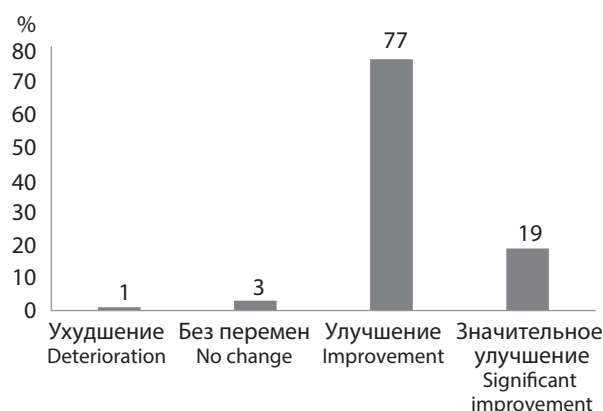


Fig. 2. General results of treatment in the sanatorium (the figure is developed by the authors)

Рис. 2. Общие результаты санаторного лечения (рисунок разработан авторами)

the short duration of the stay and, in some cases, with non-compliance with the treatment regimen.

The effectiveness table allowed for the analysis of trends in individual indicators most significant for a specific child. Thus, during the study, trends in RTT test results, weight gain, and PFT were examined.

For all three indicators studied, “improvement” was predominant among 120 patients. One in five children showed “significant improvement” in the RTT test and PFT. At the same time, in several children these indicators remained “unchanged” (in 15% of cases), and “deterioration” was extremely rare (in 2% of patients). This requires individual vigilance regarding such children to prevent activation of the disease process.

An analysis of the medical records of children treated for tuberculosis revealed a generally positive treatment trend (Table 1).

An assessment of the dynamics of the RTT test revealed that in the majority of children (90%), a decrease in sensitivity to the allergen was observed. At the same time, in 20% of them, the RTT tests became negative, which corresponded to “significant improvement”. In 7% of children, the results of the RTT test were “unchanged”. In 3% of patients, a “worsening” was recorded, manifested as an increase in sensitivity according to the RTT test results.

A positive trend is also evident in weight dynamics: 90% of the children began to gain weight, with 10% of them showing a substantial increase (“significant improvement”). Weight remained stable (“no change”) in 8% of children, while a slight decrease in body weight (“deterioration”) was noted in 2% of patients.

Table 1
Evaluation of the effectiveness of treatment of patients with respiratory tuberculosis

Таблица 1

Оценка эффективности лечения пациентов с туберкулезом органов дыхания

Показатели Indicators	Значительное улучшение (абс./ %) Significant improvement (abs./ %)	Улучшение (абс./ %) Improvement (abs./ %)	Без перемен (абс./ %) No change (abs./ %)	Ухудшение (абс./ %) Deterioration (abs./ %)
Проба с аллергеном туберкулезным рекомбинантным Test with recombinant tuberculosis allergen, n=60	12/20	42/70	4/7	2/3
Функция внешнего дыхания Function of external respiration, n=60	11/18	39/65	9/15	1/2
Масса тела Weight, n=60	6/10	48/80	5/8	1/2

Таблица составлена авторами / The table is prepared by the authors

Table 2
Evaluation of the effectiveness of treatment of patients with latent tuberculosis infection

Таблица 2

Оценка эффективности лечения пациентов с латентной туберкулезной инфекцией

Показатели Indicators	Значительное улучшение (абс./ %) Significant improvement (abs./ %)	Улучшение (абс./ %) Improvement (abs./ %)	Без перемен (абс./ %) No change (abs./ %)	Ухудшение (абс./ %) Deterioration (abs./ %)
Проба с аллергеном туберкулезным рекомбинантным Test with recombinant tuberculosis allergen, n=60	12/20	44/73	3/5	1/2
Функция внешнего дыхания Function of external respiration, n=60	17/28	39/65	3/5	1/2
Масса тела Weight, n=60	13/21	42/70	4/7	1/2

Таблица составлена авторами / The table is prepared by the authors

The assessment of cardiac function also confirms the general trend: improvement was recorded in 83% of children (including “significant improvement” in 18%). In 15%, the indicators remained the same (“no change”), and “deterioration” was observed in only 2%.

Analysis of treatment outcomes in children with LTI (Table 2) revealed that among the 60 children examined, 20% showed a “significant improvement” in RTT test results, i.e., the test became negative. In 73% of patients, “improvement” (decreased sensitivity to RTT) was observed; in 5%, the results remained unchanged, which is associated with the short duration of treatment. In 2% of children, “deterioration” occurred, manifested as increased sensitivity.

Regarding weight gain, the assessment of treatment efficacy showed “significant improvement” in 21% of children, while “improvement” was noted in 70%. In 7% of children, weight remained at the same level (“no change”), which may also be related to the short duration of observation, while 2% of children experienced a decrease in body weight (“worsening”).

Regarding PFT (pulmonary function tests) indicators, 28% of children showed “significant improvement”, 65% showed “improvement”, and in 5% the results remained “unchanged”. In 2% of children, PFT impairment became more pronounced, which was classified as “deterioration”. These data highlight positive trends in treatment,

although they also indicate the need for further monitoring of some patients.

The most pronounced positive trends in PFT results were observed in children who had no local manifestations of tuberculosis. We believe this is due to the absence of morphological changes in lung tissue in the presence of only LTI. As for the trends in RTT test results and weight gain, a similar trend was observed in both groups.

A comprehensive assessment of the effectiveness of rehabilitation for all 120 children, presented as a distribution curve, is shown in Figure 3. It can be seen that the graph has a “bell-shaped” curve, indicating a distribution of data that is close to normal. The three-sigma rule in statistics states that in most cases, the values of a variable fall within three standard deviations of the mean. About 68% of the values fall within the interval “mean $\pm$ 1 standard deviation”. In our study, $M \pm 1\sigma$ “improvement” — 1.78–1.15 — was observed in 77% of children;

About 95% of the values fall within the interval “mean $\pm$ 2 standard deviations”. Almost all values (about 99.7%) fall within the range of the mean $\pm$ 3 standard deviations.

Statistical analysis revealed that only the “deterioration” value below the lower limit within three standard deviations constitutes an outlier. This deviation is anomalous and therefore warrants attention. One possible reason for this may be the lack of effect from the therapeutic measures

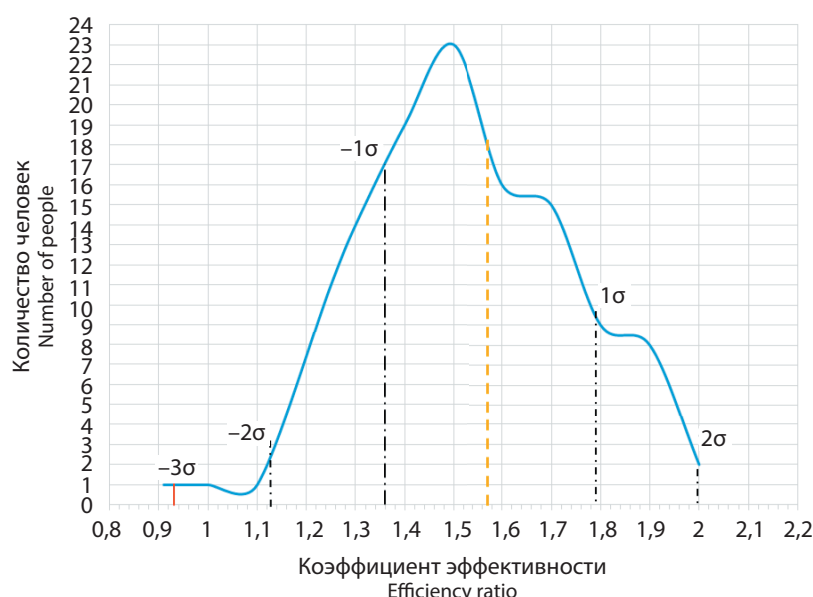


Fig. 3. Treatment effectiveness (the figure is developed by the authors)

Рис. 3. Эффективность лечения (рисунок разработан авторами)

being implemented for these patients due to their individual characteristics (likely an undiagnosed comorbid condition). Thus, by using three standard deviations, it is possible to identify potential problems at an early stage and take corrective actions to improve the effectiveness of rehabilitation. The choice of evaluation criteria is logical and consistent with statistical patterns.

CONCLUSION

1. The use of a structured assessment form helps minimize subjective evaluation of a patient's clinical condition, as it focuses on strictly defined and objectively measurable indicators.

2. This tool ensures the collection of more accurate and representative data suitable for comparative analysis. A key advantage of the method is the ability to compare the patient's condition between admission and discharge from the sanatorium.

3. The implementation of a systematic approach contributes to the optimization of planning for the treatment and rehabilitation process. Consistent and standardized assessment of the dynamics of key clinical and functional parameters creates a basis for making informed management decisions aimed at improving the quality of rehabilitation care provided.

4. Continuous monitoring of changes in various clinical, laboratory, and functional indicators within a unified system ensures timely adjustments to the individual treatment and rehabilitation program. Thus, the use of an assessment table not only formalizes the process but also facilitates a more flexible and personalized approach to the management of each patient.

ADDITIONAL INFORMATION

Authors' contribution. Study concept and design — M.E. Lozovskaya, E.Yu. Vlasova. Collection of material: A.R. Sapozhnikova, E.Yu. Vlasova, G.G. Karasev. Material processing — E.Yu. Vlasova, Yu.A. Yarovaya, G.G. Karasev, A.R. Sapozhnikova. Text writing — M.E. Lozovskaya, E.Yu. Vlasova. Compiling a list of references — K.P. Yulina. Statistical evaluation of data — M.E. Lozovskaya, E.Yu. Vlasova, Yu.A. Yarovaya. Scientific editing by M.E. Lozovskaya.

All authors read and approved the final version before publication.

Competing interests. The authors declare that they have no competing interests.

Consent for publication. Written consent was obtained from legal representatives of the patients for publication of relevant medical information within the manuscript.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Концепция и дизайн исследования — М.Э. Лозовская, Е.Ю. Власова. Сбор материала: А.Р. Сапожникова, Е.Ю. Власова, Г.Г. Карасев. Обработка материала — Е.Ю. Власова, Ю.А. Яровая, Г.Г. Карасев, А.Р. Сапожникова. Написание текста — М.Э. Лозовская, Е.Ю. Власова. Составление списка литературы — К.П. Юлина. Статистическая оценка данных — М.Э. Лозовская, Е.Ю. Власова, Ю.А. Яровая. Научное редактирование — М.Э. Лозовская.

Все авторы прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы сообщают об отсутствии конфликта интересов.

Информированное согласие на публикацию. Авторы получили письменное согласие законных представителей пациентов на публикацию медицинских данных.

REFERENCES

1. Korol' O.I., Lozovskaya M.E. Tuberculosis in children and adolescents. Saint Petersburg; 2005. (In Russian).
2. Thomas B.E., Shanmugam P., Malaisamy M., Oving S., Suresh C., Subbaraman R. et al. Psycho-socio-economic issues challenging multidrug resistant tuberculosis patients: a systematic review. *PLoS One*. 2016;11(1):e0147397. <https://doi.org/10.1371/journal.pone.0147397>.
3. Lozovskaya M.E., Osipova M.A., Suslova G.A., Bykova V.V., Karasev G.G., Bykova A.I. New organizational aspects of sanatorium care and rehabilitation of children and adolescents infected with tuberculosis. *Tuberculosis and Lung Diseases*. 2017;95(1):22–26. (In Russian). <https://doi.org/10.21292/2075-1230-2017-95-1-22-26>.
4. Zorkaltseva E.Yu., Pugacheva S.V. Effectiveness of preventive anti-tuberculosis treatment of children in a specialized sanatorium and outpatient settings. Experience from Irkutsk Oblast. *Tuberculosis and Lung Diseases*. 2025;103(1):68–73. (In Russian). <https://doi.org/10.58838/2075-1230-2025-103-1-68-73>.
5. Osubko I.V., Myakisheva T.V., Avdeeva T.G. Criteria for the effectiveness of tuberculosis treatment at the sana-

torium stage. *Palliative Medicine and Rehabilitation*. 2010;(1):24–26. (In Russian).

6. Bauer M., Leavens A., Schwartzman K. Health-related quality of life and tuberculosis: a longitudinal cohort study. *Health Qual Life Outcomes*. 2020;18(1):375. <https://doi.org/10.1186/s12955-015-0250-4>.
7. Latent tuberculosis infection in children: clinical guidelines. Russian Society of Phthisiologists, National Association of Non-Commercial Organizations of Phthisiologists “Association of Phthisiologists”. Moscow; 2024. Available at: <https://rof-tb.ru/structure/> (accessed: 20.10.2025). (In Russian).

ЛИТЕРАТУРА

1. Король О.И., Лозовская М.Э. Туберкулез у детей и подростков. СПб.; 2005.
2. Thomas B.E., Shanmugam P., Malaisamy M., Ovung S., Suresh C., Subbaraman R. et al. Psycho-socio-economic issues challenging multidrug resistant tuberculosis patients: a systematic review. *PLoS One*. 2016;11(1):e0147397. <https://doi.org/10.1371/journal.pone.0147397>.
3. Лозовская М.Э., Осипова М.А., Суслова Г.А., Быкова В.В., Карасев Г. Г., Быкова А.И. Новое в органи-

зации санаторно-реабилитационной помощи детям и подросткам с туберкулезной инфекцией. *Туберкулез и болезни легких*. 2017;95(1):22–26. <https://doi.org/10.21292/2075-1230-2017-95-1-22-26>.

4. Зоркальцева Е.Ю., Пугачева С.В. Эффективность профилактического противотуберкулезного лечения детей в специализированном санатории и амбулаторно. Опыт Иркутской области. *Туберкулез и болезни легких*. 2025;103(1):68–73. <https://doi.org/10.58838/2075-1230-2025-103-1-68-73>.
5. Осубко И.В., Мякишева Т.В., Авдеева Т.Г. Критерии эффективности лечения туберкулеза на санаторном этапе. *Паллиативная медицина и реабилитация*. 2010;(1):24–26.
6. Bauer M., Leavens A., Schwartzman K. Health-related quality of life and tuberculosis: a longitudinal cohort study. *Health Qual Life Outcomes*. 2020;18(1):375. <https://doi.org/10.1186/s12955-015-0250-4>.
7. Латентная туберкулезная инфекция у детей: клинические рекомендации. Российское общество фтизиатров, Национальная ассоциация некоммерческих организаций фтизиатров «Ассоциация фтизиатров». М.; 2024. Доступно по: <https://rof-tb.ru/structure/> (дата обращения: 20.10.2025).

AUTHORS' INFO

Elena Yu. Vlasova — Cand. Sci. (Med.), Deputy Chief Physician for Medical Affairs. E-mail: bleu@mail.ru; <https://orcid.org/0009-0006-0281-7454>; SPIN: 1899-7287

Marina E. Lozovskaya — Dr. Sci. (Med.), Professor, Head of the Department of Phthisiology. E-mail: lozovskaja-marina@rambler.ru; <https://orcid.org/0000-0001-5777-278X>; SPIN: 7650-6392

Gennadii G. Karasev — Cand. Sci. (Med.), Chief Physician. E-mail: gendy@live.ru; <https://orcid.org/0009-0004-7479-8091>; SPIN: 8032-9550

✉ **Yuliya A. Yarovaya** — Cand. Sci. (Med.), Associate Professor, Department of Phthisiology. E-mail: yulia_yarovaya@mail.ru; <https://orcid.org/0000-0001-8700-9267>; SPIN: 6426-4734

Ksenia P. Yulina — Senior Laboratory Assistant, Department of Phthisiology. E-mail: skp_98@mail.ru; <https://orcid.org/0009-0004-5503-4002>; SPIN: 8996-7438

Anna R. Sapozhnikova — Clinical Resident, Department of Phthisiology. E-mail: manya.manskaya@yandex.ru; <https://orcid.org/0009-0001-5895-4144>

ОБ АВТОРАХ

Елена Юрьевна Власова — к.м.н., заместитель главного врача по медицинской части. E-mail: bleu@mail.ru; <https://orcid.org/0009-0006-0281-7454>; SPIN: 1899-7287

Марина Эдуардовна Лозовская — д.м.н., профессор, заведующая кафедрой фтизиатрии. E-mail: lozovskaja-marina@rambler.ru; <https://orcid.org/0000-0001-5777-278X>; SPIN: 7650-6392

Геннадий Геннадьевич Карасев — к.м.н., главный врач. E-mail: gendy@live.ru; <https://orcid.org/0009-0004-7479-8091>; SPIN: 8032-9550

✉ **Юлия Анатольевна Яровая** — к.м.н., доцент, кафедра фтизиатрии. E-mail: yulia_yarovaya@mail.ru; <https://orcid.org/0000-0001-8700-9267>; SPIN: 6426-4734

Ксения Павловна Юлина — старший лаборант, кафедра фтизиатрии. E-mail: skp_98@mail.ru; <https://orcid.org/0009-0004-5503-4002>; SPIN: 8996-7438

Анна Романовна Сапожникова — клинический ординатор, кафедра фтизиатрии. E-mail: manya.manskaya@yandex.ru; <https://orcid.org/0009-0001-5895-4144>

Original papers

UDC [616-036.8-055.1/.2+314.42+314.144]-470.41

<https://doi.org/10.56871/MHCO.2026.85.85.007>

Patterns of mortality causes, concerning gender characteristics of the working-age population of the Republic of Tatarstan

Rushanya F. Gaifullina¹, Guzel M. Muhutdinova², Ilnaz F. Fayzullin¹, Emiliya R. Valeeva¹, Natalya V. Stepanova¹, Almas A. Imamov², Ramil R. Zalyalov², Denis D. Khamitov³

¹ Kazan (Volga Region) Federal University, 18 Kremlevskaya str., Kazan, Republic of Tatarstan, 420008, Russian Federation

² Kazan State Medical University, 49 Butlerov str., Kazan, Republic of Tatarstan, 420012, Russian Federation

³ Republican Clinical Oncology Dispensary of the Ministry of Health of the Republic of Tatarstan named after Professor M.Z. Sigal, 29 Sibirsky Trakt str., Kazan, Republic of Tatarstan, 420029, Russian Federation

For citation: Gaifullina R.F., Muhutdinova G.M., Fayzullin I.F., Valeeva E.R., Stepanova N.V., Imamov A.A., Zalyalov R.R., Khamitov D.D. Patterns of mortality causes, concerning gender characteristics of the working-age population of the Republic of Tatarstan. *Medicine and Health Care Organization*. 2025;10(4):83–93. <https://doi.org/10.56871/MHCO.2026.85.85.007>.

Received: 08.10.2025

Revised: 10.11.2025

Accepted: 28.01.2026

ABSTRACT. Background. Significant interregional differences in mortality rates among gender groups of the population from the main classes of causes of death determine the importance of research in the constituent entities of the Russian Federation for establishing priority areas for its reduction and the development of socio-demographic policy measures. **Aim.** To study mortality patterns, taking into account gender characteristics, among the urban and rural populations of the Republic of Tatarstan. **Materials and methods.** A comparative analysis of mortality rates for the rural and urban populations of the Republic of Tatarstan was conducted using statistical reporting data from the Republican Medical Information and Analytical Center of the Territorial Office of the Federal State Statistics Service for the Republic of Tatarstan for 2014–2023. The dynamics of these phenomena were assessed using the coefficient of determination (R^2). Data processing and analysis were performed using Microsoft Office application packages and the specialized statistical program SPSS STATISTICA 17.0. **Results.** An analysis of indicators for the study period in the Republic of Tatarstan shows that mortality rates among the working-age population in both gender groups are higher in rural areas than in urban areas, with higher rates for men than for women. In the structure of mortality from all causes, diseases of the circulatory system, neoplasms, and endocrine diseases occupy the top ranks. An analysis of mortality among men and women revealed that the average long-term rate for working-age women is significantly higher than for men. Over the specified period, mortality among women increased by 17.5% in urban areas and by 12% in rural areas. **Conclusions.** The study results demonstrate the need for more effective measures aimed at reducing mortality among the working-age population at the regional level, as well as for assessing their effectiveness and systematically monitoring them. Improving the accessibility of healthcare facilities and regional medical care for the rural population is an important area for determining healthcare system priorities for increasing life expectancy, taking into account the composition of gender groups.

KEYWORDS: causes of mortality, gender differences, working-age population, urban population, rural population, men, women

Funding. The work was carried out at the expense of a grant from the Academy of Sciences of the Republic of Tatarstan, provided to young candidates of science (postdocs) for the purpose of defending a doctoral dissertation, performing research work, and performing work functions in scientific and educational organizations of the Republic of Tatarstan within the framework of the state program of the Republic of Tatarstan “scientific and technological development of the Republic of Tatarstan”.

✉ Guzel M. Muhutdinova. E-mail: guzman76@mail.ru

© 2025 by the authors

<https://doi.org/10.56871/MHCO.2026.85.85.007>

Закономерности формирования смертности трудоспособного населения Республики Татарстан с учетом гендерных особенностей

Рушанья Фаритовна Гайфуллина¹, Гузель Мансуровна Мухутдинова², Ильназ Фанисович Файзуллин¹, Эмилия Рамзиевна Валеева¹, Наталья Владимировна Степанова¹, Алмас Азгарович Имамов², Рамиль Равилевич Залялов², Денис Динарович Хамитов³

¹ Казанский (Приволжский) федеральный университет, 420008, г. Казань, ул. Кремлевская, д. 18, Республика Татарстан, Российская Федерация

² Казанский государственный медицинский университет, 420012, г. Казань, ул. Бутлерова, д. 49, Республика Татарстан, Российская Федерация

³ Республиканский клинический онкологический диспансер Министерства здравоохранения Республики Татарстан имени профессора М.З. Сигала, 420029, г. Казань, ул. Сибирский тракт, д. 29, Республика Татарстан, Российская Федерация

Для цитирования: Гайфуллина Р.Ф., Мухутдинова Г.М., Файзуллин И.Ф., Валеева Э.Р., Степанова Н.В., Имамов А.А., Залялов Р.Р., Хамитов Д.Д. Закономерности формирования смертности трудоспособного населения Республики Татарстан с учетом гендерных особенностей. *Медицина и организация здравоохранения*. 2025;10(4):83–93. <https://doi.org/10.56871/MHCO.2026.85.85.007>.

Поступила: 08.10.2025

Одобрена: 10.11.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. Введение. Существенные межрегиональные различия показателей смертности гендерных групп населения от основных классов причин смерти определяют значимость исследований в субъектах Российской Федерации для установления приоритетных направлений по ее снижению и развитию мер социально-демографической политики. **Цель** — исследование закономерностей смертности с учетом гендерных особенностей городского и сельского населения Республики Татарстан (РТ). **Материалы и методы.** Сравнительный анализ показателей смертности сельского и городского населения РТ проводили по данным статистических отчетных форм Республиканского медицинского информационно-аналитического центра территориального органа Федеральной службы государственной статистики по РТ за 2014–2023 гг. Динамику явлений оценивали по величине коэффициента детерминации (R^2). Обработку и анализ данных проводили с использованием программ Microsoft Office и статистической программы SPSS STATISTICA 17.0. **Результаты.** Анализ показателей за период исследования на территории РТ свидетельствует, что смертность трудоспособного населения в обеих гендерных группах в сельской местности выше аналогичного показателя для городского населения, при этом у мужчин выше, чем у женщин. В структуре смертности от всех причин первые ранговые места занимают болезни системы кровообращения, новообразования и болезни эндокринной системы. По результатам анализа смертности среди мужчин и женщин выявлено, что среднемноголетний показатель у женщин трудоспособного возраста существенно выше, чем у мужчин. За указанный период смертность у женщин выросла в городской местности на 17,5%, в сельской — на 12%. **Выводы.** Необходимо внедрять более эффективные мероприятия, направленные на снижение смертности населения трудоспособного возраста на региональном уровне, оценку их эффективности и проводить систематический мониторинг. Повышение доступности учреждений здравоохранения и территориальной медицинской помощи для сельского населения — одно из важных направлений определения приоритетов системы здравоохранения по увеличению ожидаемой продолжительности жизни с учетом состава гендерных групп населения.

КЛЮЧЕВЫЕ СЛОВА: причины смертности, гендерные различия, трудоспособное население, городское население, сельское население, мужчины, женщины

Источник финансирования. Работа выполнена за счет гранта Академии наук Республики Татарстан, предоставленного молодым кандидатам наук (постдокам) с целью защиты докторской диссертации, выполнения научно-исследовательских работ, а также выполнения трудовых функций в научных и образовательных организациях Республики Татарстан в рамках государственной программы Республики Татарстан «Научно-технологическое развитие Республики Татарстан».

✉ Гузель Мансуровна Мухутдинова. E-mail: guzman76@mail.ru

© Коллектив авторов, 2025

INTRODUCTION

The mortality rate is the most important indicator of the population's medical, social, demographic, and economic well-being [1].

The Concept of Demographic Policy of the Russian Federation (RF) defines the main objectives of stabilizing the population size, creating conditions for its growth, improving public health, reducing mortality rates, as well as improving quality of life and increasing life expectancy¹ [2]. The national projects "Health" and "Healthcare," aimed at modernizing the healthcare system, improving people's health and quality of life, and enhancing the social well-being of society, have significantly contributed to the achievement of the RF's demographic policy goals.

Despite positive trends toward a decline in mortality among the working-age population in the period prior to the COVID-19 pandemic (2018 and 2019) [3], an analysis of current mortality data for men and women in the age group under study "indicates that negative trends persist and that Russia lags behind a number of countries"^{2, 3} [3]. According to the World Health Organization (WHO), primary efforts should be directed toward reducing the burden of morbidity, mortality, and disability caused by preventable and avoidable noncommunicable diseases (NCD). At the same time, the set of actions and measures must be adapted at the regional and national levels, taking into account regional specifics and in accordance with legislation and priorities⁴.

In the Russian Federation, life expectancy (LE) is low compared to developed countries, "due to high mortality from external causes and from diseases of the circulatory system (DCS)"⁵ [4, 5]. Currently, the Russian Federation ranks 32nd in Europe in terms of mortality rates, while the Republic

of Tatarstan (RT) ranks 18th among the regions of the Russian Federation [4, 5].

At the final meeting of the RT Ministry of Health on "The Results of the Republic of Tatarstan's Healthcare System in 2024," it was announced that RT ranks first in the Volga Federal District (VFD) in terms of low rates of overall mortality and natural decrease per 1,000 population, at 11.27 and -2.5, respectively, and ranks 22nd among the constituent entities of the Russian Federation in terms of mortality and 20th in terms of natural decrease. Despite the rise in mortality in the Republic of Tatarstan, the life expectancy of the republic's population increased to 74.59 years, allowing it to maintain its leading position in the Volga Federal District and 15th place in the Russian Federation (life expectancy in the Volga Federal District is 72.02 years; in the Russian Federation, 73.11 years). In the structure of overall mortality, cardiovascular diseases (CVD) rank first at 39.8% (450.6 per 100,000 population), followed by mortality from neoplasms (16.5%), and mortality from external causes (8%)⁶.

The National Project "Healthcare" (2019) focused on modifiable risk factors for NCD, such as smoking, alcoholism, and poor diet⁷. The latter, according to foreign and domestic authors, directly influences the development of NCD [6, 7], including cardiovascular diseases [8], which remain the leading cause of death in the Russian Federation and the Republic of Tatarstan⁸ [9, 10].

AIM

The aim is to conduct a study of mortality trends among the working-age urban and rural populations of the Republic of Tatarstan, taking gender differences into account, from 2014 to 2023.

MATERIALS AND METHODS

An assessment and analysis of mortality rates among the working-age rural and urban

¹ Ministry of Health of the Russian Federation. National Project "Healthcare". Available at: <https://minzdrav.gov.ru> (accessed: September 10, 2025)..

² Federal State Statistics Service. Demographic Indicators of the Russian Federation. Available at: <https://rosstat.gov.ru> (accessed: September 10, 2025).

³ World Health Organization. Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020. Available at: <https://apps.who.int/iris/handle/10665/94384> (accessed: September 10, 2025).

⁴ Ibid.

⁵ Federal State Statistics Service. Demographic Indicators of the Russian Federation. Available at: <https://rosstat.gov.ru> (accessed on 10.09.2025).

⁶ Ministry of Health of the Republic of Tatarstan. Report on the results of the healthcare system of the Republic of Tatarstan in 2024. Kazan. Available at: <https://minzdrav.tatarstan.ru> (accessed: 10.09.2025).

⁷ Ministry of Health of the Russian Federation. National Health Project. Available at: <https://minzdrav.gov.ru> (accessed: 10.09.2025).

⁸ Ministry of Health of the Republic of Tatarstan. Report on the results of the healthcare system of the Republic of Tatarstan in 2024. Kazan. Available at: <https://minzdrav.tatarstan.ru> (accessed: 10.09.2025).

populations of the Republic of Tatarstan was conducted based on data from the Federal State Statistics Service of the Russian Federation and the Ministry of Health of the Republic of Tatarstan regarding the number of medical death certificates issued during the period 2014–2023, in accordance with the regulatory documents in effect during the respective periods: until 2021 — Forms No. 106/u-08 and No. 106-2/u-08, approved by Order No. 782n of the Ministry of Health and Social Development of the Russian Federation dated December 26, 2008; from 2021 — Forms No. 106/u and

No. 106-2/u, approved by Order of the Ministry of Health of the Russian Federation No. 352n dated April 15, 2021.

Data processing and analysis were performed using Microsoft Office software packages and the specialized statistical software SPSS STATISTICA 17.0.

RESULTS

An analysis of long-term trends in mortality rates among the working-age population of the Republic of Tatarstan indicates an upward

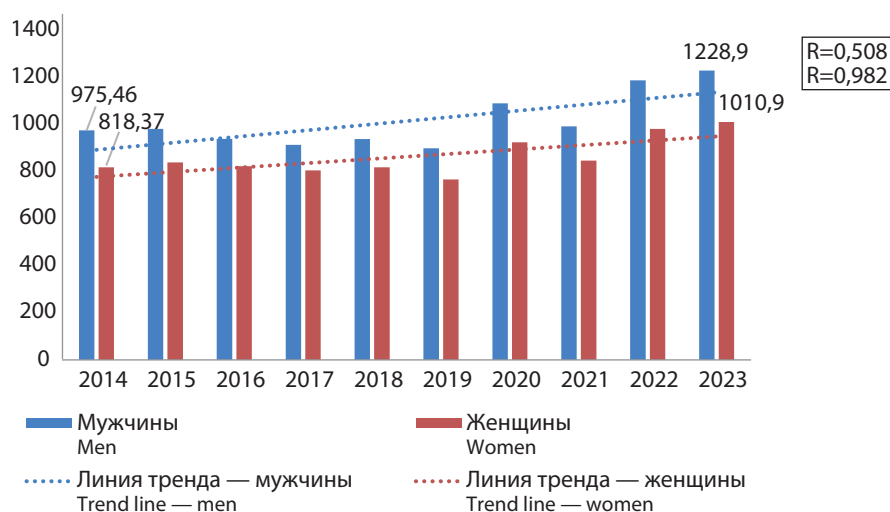


Fig. 1. General dynamics of mortality among men and women in urban areas of the Republic of Tatarstan from 2014 to 2023 per 100,000 population (the figure is prepared by the authors based on data from their own research)

Рис. 1. Общая динамика смертности среди мужчин и женщин в городской местности Республики Татарстан с 2014 по 2023 гг. на 100 тыс. населения (рисунок подготовлен авторами по результатам собственного исследования)

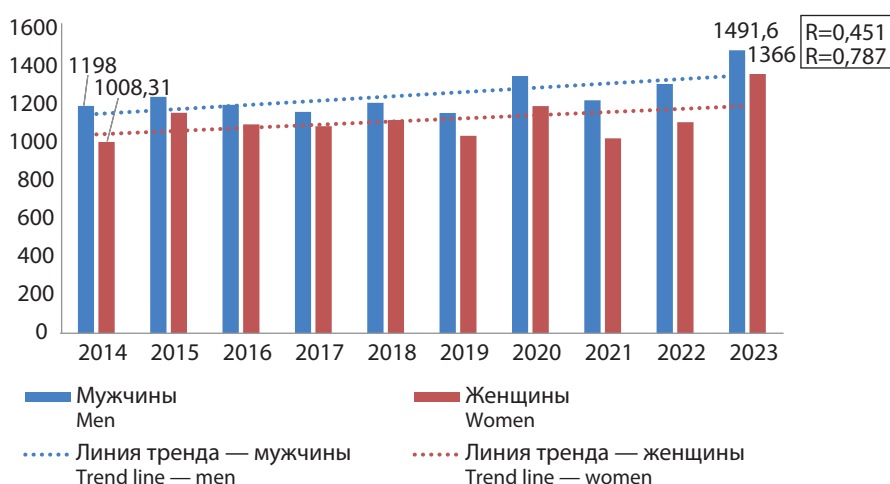
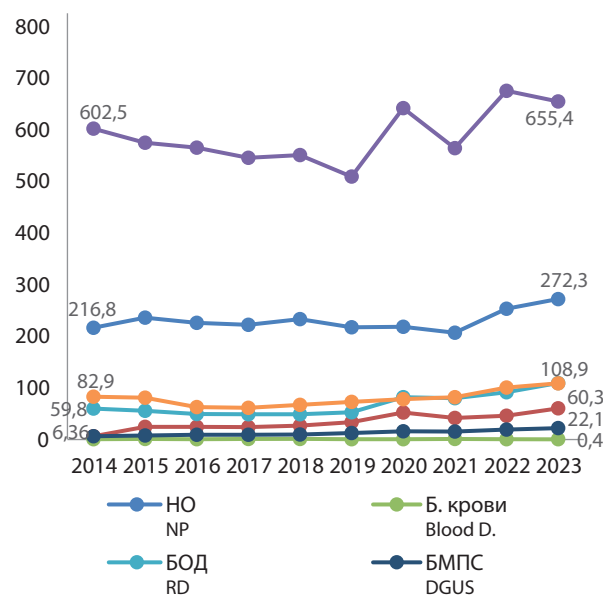


Fig. 2. General dynamics of mortality among men and women in rural areas of the Republic of Tatarstan from 2014 to 2023 per 100,000 population (the figure is prepared by the authors based on data from their own research)

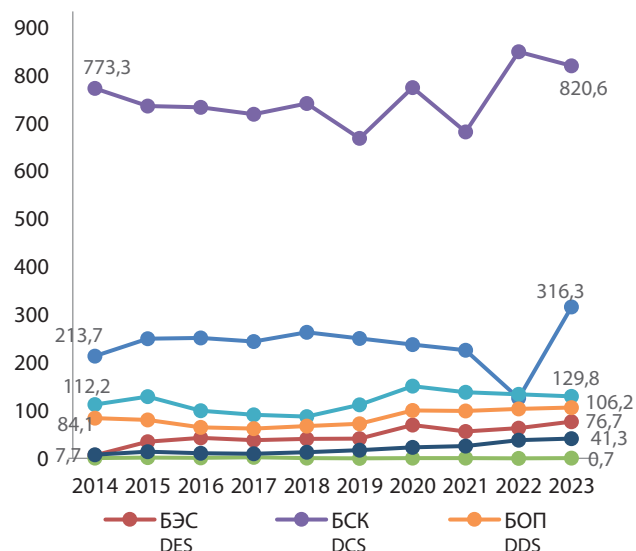
Рис. 2. Общая динамика смертности среди мужчин и женщин в сельской местности Республики Татарстан с 2014 по 2023 гг. на 100 тыс. населения (рисунок подготовлен авторами по результатам собственного исследования)

trend in this indicator in both rural and urban areas, with a high degree of statistical significance among women ($R^2=0.78$ and $R^2=0.98$, respectively) and a decline in the forecast level among men ($R^2=0.45$ and $R^2=0.5$, respectively).

At the same time, the mortality rate of the population of the Republic of Tatarstan showed an upward trend among both rural men and women, exceeding that of the urban population by 21.4–22.8% and 23.2–35%, respectively).



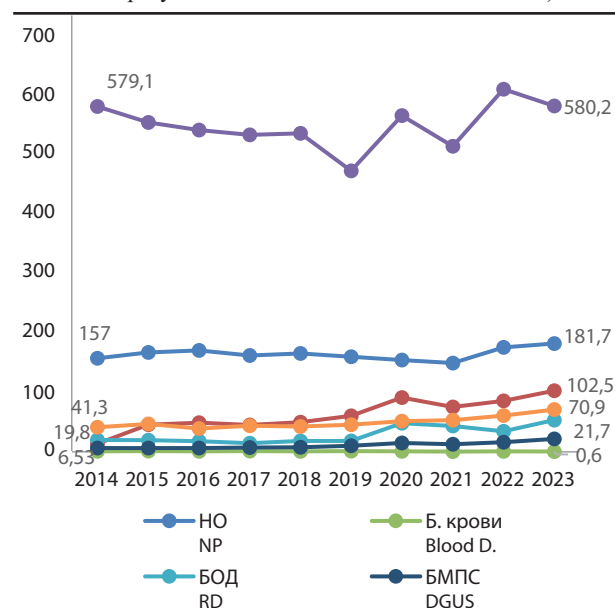
a/a



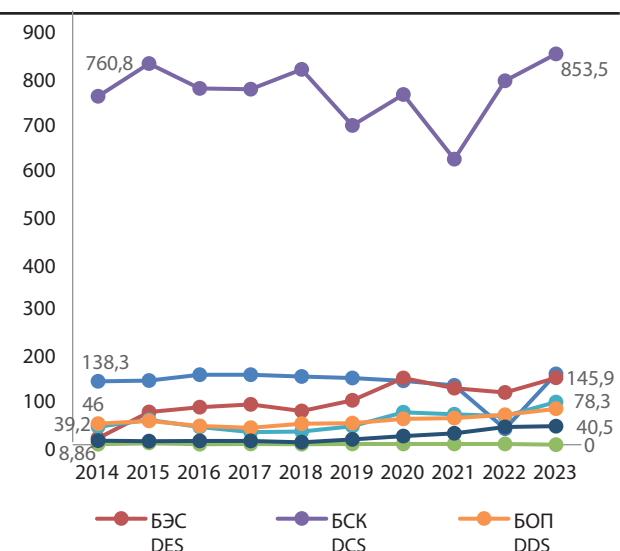
b/b

Fig. 3. Long-term dynamics of mortality among men in urban (a) and rural (b) areas of the Republic of Tatarstan for 2014–2023: DGUS — diseases of the genitourinary system; RD — respiratory diseases; DDS — diseases of the digestive system; DCS — diseases of the circulatory system; DES — diseases of the endocrine system; blood D. — blood diseases; NP — neoplasms (here and further in the pictures) (the figure is prepared by the authors based on data from their own research)

Рис. 3. Многолетняя динамика смертности среди мужчин в городской (a) и сельской (б) местности Республики Татарстан за 2014–2023 гг.: БМПС — болезни мочеполовой системы; БОД — болезни органов дыхания; БОП — болезни органов пищеварения; БСК — болезни системы кровообращения; БЭС — болезни эндокринной системы; Б. крови — болезни крови; НО — новообразования (здесь и далее на рисунках) (рисунок подготовлен авторами по результатам собственного исследования)



a/a



b/b

Fig. 4. Long-term dynamics of mortality among women in urban (a) and rural (b) areas of the Republic of Tatarstan for 2014–2023 (the figure is prepared by the authors based on data from their own research)

Рис. 4. Многолетняя динамика смертности женщин в городской (a) и сельской (б) местности Республики Татарстан за 2014–2023 гг. (рисунок подготовлен авторами по результатам собственного исследования)

ly, with higher rates among men than among women during the study period by 9.2–21.5% (Figs. 1, 2).

The long-term trend in mortality among men in urban areas of the Republic of Tatarstan during the study period is characterized by a significant increase across categories of causes of death: diseases of the genitourinary system (GSD), trend line approximation $R^2=0.94$; respiratory diseases (RD) $R^2=0.67$; and endocrine system diseases (ESD) $R^2=0.86$; and among men in rural areas of the Republic of Tatarstan by category: GSD ($R^2=0.84$), diseases of the digestive system (DDS) ($R^2=0.5$), and ESD ($R^2=0.81$) (Fig. 3).

At the same time, among women living in urban areas of the Republic of Tatarstan, there is an upward trend by cause of death category: ESD ($R^2=0.87$) and GSD ($R^2=0.84$), DDS ($R^2=0.73$), RD ($R^2=0.63$), while in rural areas of the Republic of Tatarstan, the trend is observed across the following categories: ESD ($R^2=0.77$), GSD ($R^2=0.75$), DDS ($R^2=0.62$), and RD ($R^2=0.52$) (Fig. 4).

The steady downward trend in mortality rates up to 2019, against the backdrop of the spread of COVID-19, has been replaced by a significant increase in mortality rates; the growth rate increased 21.4% among men and 28.0% among women [3].

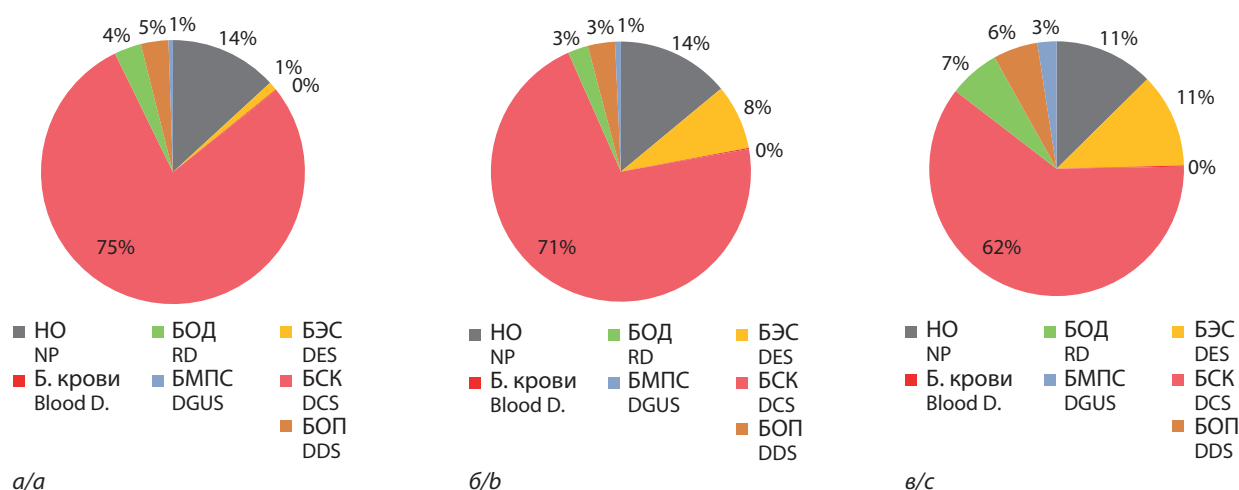


Fig. 5. Mortality structure among women of the rural population of the Republic of Tatarstan for 2014 (a), 2017 (b), 2023 (c) (the figure is prepared by the authors based on data from their own research)

Рис. 5. Структура смертности среди женщин сельского населения Республики Татарстан за 2014 (а), 2017 (б), 2023 гг. (в) (рисунок подготовлен авторами по результатам собственного исследования)

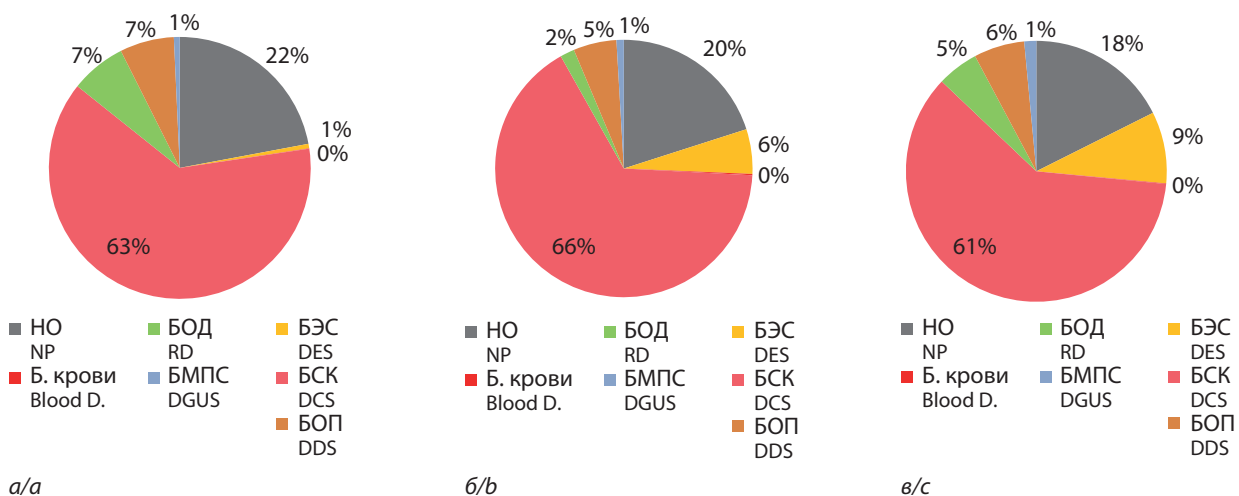


Fig. 6. Mortality structure among women of the urban population of the Republic of Tatarstan for 2014 (a), 2017 (b), 2023 (c) (the figure is prepared by the authors based on data from their own research)

Рис. 6. Структура смертности среди женщин городского населения РТ за 2014 (а), 2017 (б), 2023 гг. (в) (рисунок подготовлен авторами по результатам собственного исследования)

Thus, an analysis of the mortality structure among women of working age in rural areas in 2014, 2017, and 2023 showed that CVD ranked first — 75, 71, and 62%, respectively — while NCD ranked second at 11–14%. In 2014, DDS ranked third at 5%, whereas since 2017, the share of ESD has increased from 8 to 11% in 2023 (Fig. 5).

During this period, mortality among women in the urban population of the Republic of Tatarstan is characterized by a different distribution: CVD ranks first — 63, 66, and 61%, respectively. The share of deaths from NO decreases to 18% by 2023 and ranks second; in 2014, the third place is shared by

mortality from DDS and RD — 7% each; starting in 2017, this position is occupied by the share of ESD, mortality from which increased from 6% in 2017 to 9% in 2023 (Fig. 6).

In the structure of male mortality in rural areas in 2014, 2017, and 2023, CVD ranked first, accounting for 65, 62, and 55%, respectively; second place was held by NO at 18–21%; third place by RD at 8–9%; and fourth place by DDS at 5–7% (Fig. 7).

The mortality structure among urban men in 2014, 2017, and 2023 showed that the leading cause of death was cardiovascular disease — 62,

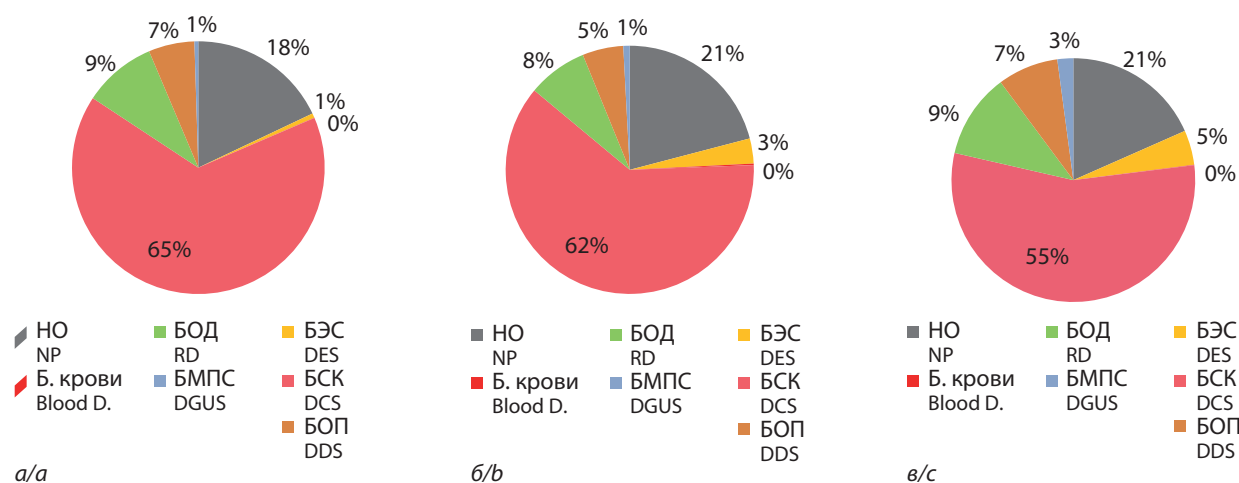


Fig. 7. Mortality structure among men of the rural population of the Republic of Tatarstan for 2014 (a), 2017 (b), 2023 (c) (the figure is prepared by the authors based on data from their own research)

Рис. 7. Структура смертности среди мужчин сельского населения Республики Татарстан за 2014 (а), 2017 (б), 2023 гг. (в) (рисунок подготовлен авторами по результатам собственного исследования)

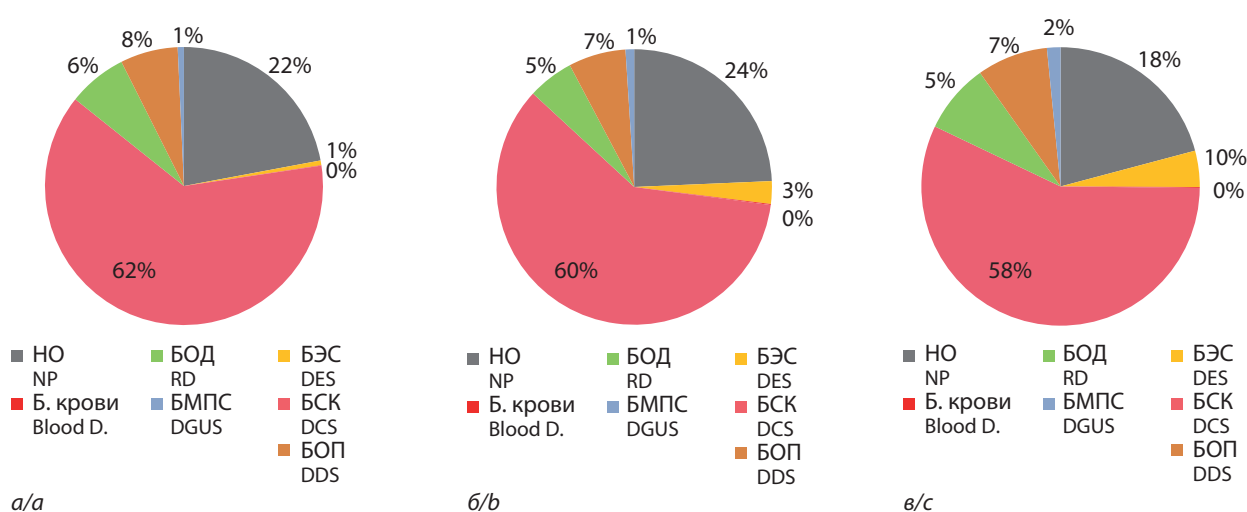


Fig. 8. Mortality structure among men of the urban population of the Republic of Tatarstan for 2014 (a), 2017 (b), 2023 (c) (the figure is prepared by the authors based on data from their own research)

Рис. 8. Структура смертности среди мужчин городского населения Республики Татарстан за 2014 (а), 2017 (б), 2023 гг. (в) (рисунок подготовлен авторами по результатам собственного исследования)

Table 1

Mortality rates of the efficient population of the Republic of Tatarstan in rural areas by classes of causes of death for the period 2014–2023 per 100,000 population

Таблица 1

Показатели смертности трудоспособного населения Республики Татарстан в сельской местности по классам причин смертности за период 2014–2023 гг. на 100 тыс. населения

Классы Classes	2014		2017		2023		Прирост/убыль Gain/decrease, %	
	мужчины men	женщины women	мужчины men	женщины women	мужчины men	женщины women	мужчины men	женщины women
Новообразования Neoplasms	213,7	138,3	244,1	152,6	316,3	154,6	48	11,8
Болезни эндокринной системы Diseases of the endocrine system	6,33	14,1	38,1	88,2	76,7	145,9	1117	934
Болезни крови Blood disorders	0,68	1,05	2,27	1,5	0,7	0	2,9	–100
Болезни системы кровообращения Diseases of the circulatory system	773,3	760,8	719	776,3	820,6	853,5	6,1	12,2
Болезни органов дыхания Respiratory diseases	112,2	39,2	90,8	27,5	129,8	93,2	15,7	137,7
Болезни органов пищеварения Diseases of the digestive system	84,1	46	62,2	36,9	106,2	78,3	26,3	70,2
Болезни мочеполовой системы Diseases of the genitourinary system	7,69	8,86	9,76	7,94	41,3	40,5	436,4	360,2
Всего Total	1198	1008,31	1166,23	1090,94	1491,6	1366	24,5	35,5

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

Table 2

Mortality rates of the efficient population of the Republic of Tatarstan in urban areas by classes of causes of death for the period 2014–2023 per 100,000 population

Таблица 2

Показатели смертности трудоспособного населения Республики Татарстан городской местности по классам причин смертности за период 2014–2023 гг. на 100 тыс. населения

Классы Classes	2014		2017		2023		Прирост/убыль / Gain/decrease, %	
	мужчины men	женщины women	мужчины men	женщины women	мужчины men	женщины women	мужчины men	женщины women
Новообразования Neoplasms	216,8	157	222,1	161,6	272,3	181,7	25,6	15,7
Болезни эндокринной системы Diseases of the endocrine system	6,28	13,7	24,3	45,2	60,3	102,5	857	648
Болезни крови Blood disorders	0,82	0,94	1,03	1,29	0,4	0,6	-50	–33,3
Болезни системы кровообращения Diseases of the circulatory system	602,5	579,1	546	531,7	655,4	580,2	8,8	0,2
Болезни органов дыхания Respiratory diseases	59,8	19,8	49,2	14,5	109,5	53,3	83,1	169,2
Болезни органов пищеварения Diseases of the digestive system	82,9	41,3	61,5	43,7	108,9	70,9	31,4	71,7
Болезни мочеполовой системы Diseases of the genitourinary system	6,36	6,53	9,26	7,4	22,1	21,7	247,5	232,3
Всего Total	975,46	818,37	913,39	805,39	1228,9	1010,9	25,9	23,5

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

60, and 58%, respectively; 2nd place — from NCD, with a decrease in the share from 22% in 2014 to 18% in 2023, 3rd place — from DDS 7–8% (Fig. 8).

Among the rural population, the highest growth rate in 2023 compared to 2014 was observed among working-age men due to deaths from NCD, ESD, and GSD, and among women — from ESD, RD, DDS, and GSD (Table 1).

An analysis of mortality among the working-age urban population shows a higher growth rate for 2014–2023 among men in the ESD, RD, and GSD categories, and among women in the ESD, RD, DDS, and GSD categories (Table 2).

The study results indicate significant changes in the structural and quantitative characteristics of mortality among men and women in both urban and rural populations.

CONCLUSION

Significant interregional differences in mortality rates among the working-age population underscore the importance of studies conducted in the constituent entities of the Russian Federation for identifying priority areas for reducing mortality. In the Republic of Tatarstan, mortality rates among the working-age population have increased over the study period, while the overall mortality rate for the entire population remains at an average level¹ [4, 5].

A comparative analysis of indicators within the Republic of Tatarstan shows that mortality rates among the working-age population in both gender groups are higher in rural areas than in urban areas. It has been established that this indicator is higher among men than among women. In the structure of all-cause mortality, diseases of the circulatory system, neoplasms, and diseases of the endocrine system occupy the top ranks. Analysis of mortality among men and women revealed that the average annual rate for women of working age is higher than that for men: by 17.5% in urban areas and by 12% in rural areas.

An examination of the structure of causes of death showed that the proportion of deaths due to leading disease categories (circulatory system diseases, endocrine system diseases) is, on average, higher among women, while the propor-

tion due to neoplasms is higher among men. The results obtained indicate the need to implement more effective measures aimed at reducing mortality among the working-age population at the regional level, monitoring mortality rates while taking into account the gender composition of the population, and setting priorities for the healthcare system to increase life expectancy and develop specialized programs aimed at improving the quality of life of the population.

ADDITIONAL INFORMATION

Authors' contribution. Gaifullina R.F. — concept definition, data processing, manuscript revision and editing; Mukhutdinova G.M. — visualization, manuscript revision and editing; Fayzullin I.F. — visualization, manuscript draft writing; Valeeva E.R. — concept definition, validation, manuscript revision and editing; Stepanova N.V. — manuscript validation, revision and editing; Imamov A.A. — manuscript revision and editing; Zalyalov R.R. — data processing, manuscript revision and editing; Khamitov D.D. — manuscript draft writing.

All authors read and approved the final version before publication.

Conflict of interest. The authors declare no obvious or potential conflicts of interest related to the publication of this article.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Гайфуллина Р.Ф. — определение концепции, работа с данными, пересмотр и редактирование рукописи; Мухутдинова Г.М. — визуализация, пересмотр и редактирование рукописи; Файзуллин И.Ф. — визуализация, написание черновика рукописи; Валеева Э.Р. — определение концепции, валидация, пересмотр и редактирование рукописи; Степанова Н.В. — валидация, пересмотр и редактирование рукописи; Имамов А.А. — пересмотр и редактирование рукописи; Залялов Р.Р. — работа с данными, пересмотр и редактирование рукописи; Хамитов Д.Д. — написание черновика рукописи.

Все авторы прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

¹ Ministry of Health of the Republic of Tatarstan. Report on the Results of the Healthcare System Performance in the Republic of Tatarstan in 2024. Kazan. Available at: <https://minzdrav.tatarstan.ru> (accessed: September 10, 2025).

REFERENCES

1. Shkolnikov V. M., Andreev E. M., McKee M. Components and possible determinants of the decrease in Russian mortality in 2004–2010. *Demographic Research*. 2013;28:917–950. <https://doi.org/10.4054/DemRes.2013.28.32>.
2. Tafееva E.A., Frolova O.A., Frolov D.N., Yangirova E.H. The trends of the medical demographic indices in the Republic of Tatarstan. *The Bulletin of Contemporary Clinical Medicine*. 2023;16(1):95–100. (In Russian). [https://doi.org/10.20969/VSKM.2023.16\(1\).95-100](https://doi.org/10.20969/VSKM.2023.16(1).95-100).
3. Gorchakova T.Yu., Churanova A.N. Current state of mortality of the working-age population in Russia and Europe. *Russian Journal of Occupational Health and Industrial Ecology*. 2020;60(11):756–759. (In Russian). <https://doi.org/10.31089/1026-9428-2020-60-11-756-759>.
4. Leshchenko Ya.A., Lisovtsov A.A. Trends in life expectancy dynamics in the federal districts of the Russian Federation. *Social Aspects of Population Health*. 2020;66(6):9. (In Russian). <https://doi.org/10.21045/2071-5021-2020-66-6-9>.
5. Stepanova N.V., Valeeva E.R., Fomina S.F., Kamalova F.M., Tunakova Yu.A., Fajzullina R.A. Dynamics of mortality in the Republic of Tatarstan. In: Heavy metals: issues of impact. Vol. 1. Kazan: Astoriya; 2015. P. 56–65.
6. Popova A.Yu., Tutelyan V.A., Nikityuk D.B. On the new (2021) Norms of physiological requirements in energy and nutrients of various groups of the population of the Russian Federation. *Problems of Nutrition*. 2021;90(4):6–19. (In Russian). <https://doi.org/10.33029/0042-8833-2021-90-4-6-19>.
7. Muhutdinova G.M., Imamov A.A., Gomzina E.G. The role of microelements (selenium and iodine) in the prevention of chronic non-infectious alimentary-dependent diseases: possibilities for improving the organization of nutrition of the population. Kazan: MeDDoK; 2024. (In Russian).
8. Mozaffarian D., Forouhi N. G. Dietary guidelines and health — is nutrition science up to the task? *BMJ*. 2018;360:k822. <https://doi.org/10.1136/bmj.k822>.
9. Boytsov S.A., Drapkina O.M., Shlyakhto E.V., et al. Epidemiology of Cardiovascular Diseases and their Risk Factors in Regions of Russian Federation (ESSE-RF) study. Ten years later. *Cardiovascular Therapy and Prevention*. 2021;20(5):3007. (In Russian). <https://doi.org/10.15829/1728-8800-2021-3007>.
10. Valeeva E.R. et al. The regularities of development of cancer morbidity and mortality rate of the population in the Republic of Tatarstan and Finland. *Gig Sanit*. 2015;94(8):8–12. <https://pubmed.ncbi.nlm.nih.gov/26856163>.

ЛИТЕРАТУРА

1. Shkolnikov V.M., Andreev E.M., McKee M. Components and possible determinants of the decrease in Russian mortality in 2004–2010. *Demographic Research*. 2013;28:917–950. <https://doi.org/10.4054/DemRes.2013.28.32>.
2. Тафеева Е.А., Фролова О.А., Фролов Д.Н., Янгирова Э.Х. Тенденции развития медико-демографической ситуации в Республике Татарстан. *Вестник современной клинической медицины*. 2023;16(1):95–100. [https://doi.org/10.20969/VSKM.2023.16\(1\).95-100](https://doi.org/10.20969/VSKM.2023.16(1).95-100).
3. Горчакова Т.Ю., Чуранова А.Н. Современное состояние смертности населения трудоспособного возраста в России и странах Европы. *Медицина труда и промышленная экология*. 2020;60(11):756–759. <https://doi.org/10.31089/1026-9428-2020-60-11-756-759>.
4. Лещенко Я.А., Лисовцов А.А. Тенденции в динамике продолжительности жизни населения в федеральных округах Российской Федерации. *Социальные аспекты здоровья населения*. 2020;66(6):9. <https://doi.org/10.21045/2071-5021-2020-66-6-9>.
5. Степанова Н.В., Валеева Э.Р., Фомина С.Ф., Камалова Ф.М., Тунакова Ю.А., Файзуллина Р.А. Динамика смертности населения Республики Татарстан. В кн.: Тяжелые металлы: вопросы воздействия. Т. 1. Казань: АсториЯ; 2015. С. 56–65.
6. Попова А.Ю., Тутельян В.А., Никитюк Д.Б. О новых (2021) Нормах физиологических потребностей в энергии и пищевых веществах для различных групп населения Российской Федерации. *Вопросы питания*. 2021;90(4):6–19. <https://doi.org/10.33029/0042-8833-2021-90-4-6-19>.
7. Мухутдинова Г.М., Имамов А.А., Гомзина Е.Г. Роль микроэлементов (селена и йода) в профилактике хронических неинфекционных алиментарно-зависимых заболеваний: возможности совершенствования организации питания населения. Казань: МеДДоК; 2024.
8. Mozaffarian D., Forouhi N.G. Dietary guidelines and health — is nutrition science up to the task? *BMJ*. 2018;360:k822. <https://doi.org/10.1136/bmj.k822>.
9. Бойцов С.А., Драпкина О.М., Шляхто Е.В. и др. Исследование ЭССЕ-РФ (Эпидемиология сердечно-сосудистых заболеваний и их факторов риска в регионах Российской Федерации). Десять лет спустя. *Кардиоваскулярная терапия и профилактика*. 2021;20(5):3007. <https://doi.org/10.15829/1728-8800-2021-3007>.
10. Valeeva E.R. et al. The regularities of development of cancer morbidity and mortality rate of the population in the Republic of Tatarstan and Finland. *Gig Sanit*. 2015;94(8):8–12. <https://pubmed.ncbi.nlm.nih.gov/26856163>.

AUTHORS' INFO

Rushanya F. Gaifullina — Cand. Sci. (Med.), Associate Professor, Professor of the Department of Bioecology, Hygiene and Public Health of the Institute of Fundamental Medicine and Biology.

E-mail: rushana78@mail.ru;

<https://orcid.org/0000-0002-0922-5850>; SPIN: 9614-8375

✉ **Guzel M. Muhutdinova** — Cand. Sci. (Med.),

Assistant, Department of Preventive Medicine and Human Ecology. E-mail: guzman76@mail.ru;

<https://orcid.org/0000-0002-6770-7890>; SPIN: 2045-6100

Ilnaz F. Fayzullin — Postgraduate Student of the Institute of Fundamental Medicine and Biology.

E-mail: ilnaz.fayzullin@tatar.ru;

<https://orcid.org/0009-0009-8353-8984>; SPIN: 1223-6053

Emiliya R. Valeeva — Dr. Sci. (Med.), Associate Professor, Professor of the Department of Bioecology, Hygiene and Public Health of the Institute of Fundamental Medicine and Biology. E-mail: val_med@mail.ru;

<https://orcid.org/0000-0002-8683-6241>; SPIN: 3040-2258

Natalya V. Stepanova — Dr. Sci. (Med.), Associate Professor, Professor of the Department of Bioecology, Hygiene and Public Health of the Institute of Fundamental Medicine and Biology. E-mail: stepmed@mail.ru;

<https://orcid.org/0000-0002-2889-3109>; SPIN: 3531-0262

Almas A. Imamov — Dr. Sci. (Med.), Professor, Head of Department of Preventive Medicine and Human Ecology. E-mail: profmed_kgmu@mail.ru;

<https://orcid.org/0000-0003-2608-0179>; SPIN: 3580-2463

Ramil R. Zalyalov — Cand. Sci. (Med.), Associate Professor of the Department of Hygiene and Occupational Medicine. E-mail: ramilzal@mail.ru;

<https://orcid.org/0000-0003-2062-0058>; SPIN: 3150-5410

Denis D. Khamitov — Deputy Chief Physician for Organizational and methodological work.

E-mail: xamitovdd@mail.ru;

<https://orcid.org/0009-0000-9278-1227>; SPIN: 2037-3876

ОБ АВТОРАХ

Рушанья Фаритовна Гайфуллина — к.м.н., доцент, профессор кафедры биоэкологии, гигиены и общественного здоровья, заместитель директора Института фундаментальной медицины и биологии.

E-mail: rushana78@mail.ru;

<https://orcid.org/0000-0002-0922-5850>; SPIN: 9614-8375

✉ **Гузель Мансуровна Мухутдинова** — к.м.н.,

ассистент, кафедра профилактической медицины и экологии человека. E-mail: guzman76@mail.ru;

<https://orcid.org/0000-0002-6770-7890>; SPIN: 2045-6100

Ильназ Фанисович Файзуллин — аспирант Института фундаментальной медицины и биологии.

E-mail: ilnaz.fayzullin@tatar.ru;

<https://orcid.org/0009-0009-8353-8984>; SPIN: 1223-6053

Эмилия Рамзиевна Валеева — д.м.н., доцент, профессор кафедры биоэкологии, гигиены и общественного здоровья Института фундаментальной медицины и биологии. E-mail: val_med@mail.ru;

<https://orcid.org/0000-0002-8683-6241>; SPIN: 3040-2258

Наталья Владимировна Степанова — д.м.н., доцент, профессор кафедры биоэкологии, гигиены и общественного здоровья Института фундаментальной медицины и биологии. E-mail: stepmed@mail.ru;

<https://orcid.org/0000-0002-2889-3109>; SPIN: 3531-0262

Алмас Азгарович Имамов — д.м.н., профессор, заведующий кафедрой профилактической медицины и экологии человека. E-mail: profmed_kgmu@mail.ru;

<https://orcid.org/0000-0003-2608-0179>; SPIN: 3580-2463

Рамиль Равилевич Залялов — к.м.н., доцент кафедры гигиены, медицины труда.

E-mail: ramilzal@mail.ru;

<https://orcid.org/0000-0003-2062-0058>; SPIN: 3150-5410

Денис Динарович Хамитов — заместитель главного врача по организационно-методической работе.

E-mail: xamitovdd@mail.ru;

<https://orcid.org/0009-0000-9278-1227>; SPIN: 2037-3876

Original papers

UDC 613.12:159.9

<https://doi.org/10.56871/MHCO.2026.42.78.008>

Methodological approaches to hygienic assessment of public health risk

Alexander V. Levanchuk^{1, 2}, Olga I. Kopytenkova²,
Olga V. Mironenko^{1, 3}, Ekaterina A. Fedorova³

¹ Saint Petersburg State University, 7–9 Universitetskaya emb., Saint Petersburg, 199034, Russian Federation

² Petersburg State Transport University of Emperor Alexander I, 9 Moskovsky ave., Saint Petersburg, 190031, Russian Federation

³ North-Western State Medical University named after I.I. Mechnikov, 41 Kirochnaya str., Saint Petersburg, 191015, Russian Federation

For citation: Levanchuk A.V., Kopytenkova O.I., Mironenko O.V., Fedorova E.A. Methodological approaches to hygienic assessment of public health risk. *Medicine and Health Care Organization*. 2025;10(4):94–101. <https://doi.org/10.56871/MHCO.2026.42.78.008>.

Received: 04.11.2025

Revised: 10.12.2025

Accepted: 28.01.2026

ABSTRACT. Introduction. In order to increase the informativeness of the results of the population health risk calculation and to ensure the possibility of conducting a comparative analysis, it is necessary to use an indicator that allows to characterize the severity of the relationship between factors and indicators of population health. **The purpose of the study** is to substantiate the possibility of using the Global Burden of Diseases indicator for a hygienic assessment of the sanitary and epidemiological well-being of the population based on the use of the health risk assessment methodology. **Materials and methods.** Model territories with atmospheric air pollution by fine dust (above the maximum permissible concentration) and acoustic load (60, 65, 70 dBA) were used. The measured parameter is one year of healthy life DALY (Disability-Adjusted Life Year), lost due to disease, disability, or premature death. Statistical processing was carried out using the standard Excel 16.0 (Office 2016) software package. **Results.** The use of risk factors (chemical or physical pollution of natural environments) allows to assess the proportion of the severity of a particular disease associated with exposure to an unfavorable factor or a combination of environmental factors. The presented calculations are simplifications of complex biological processes. However, as cities develop their transportation infrastructure and noise levels increase, the burden of diseases will also increase. There is a clear non-linear relationship. When the noise level increases from 60 to 70 dBA (by 10 dBA), the total burden of diseases increases by more than two times (from ~1220 to ~2740 DALY/year). **Conclusion.** The proposed methodological approach allows for a higher level of comparative quantitative assessment of the impact of factors on public health and implements a mechanism for calculating the effectiveness of preventive measures.

KEYWORDS: hygienic assessment, health risk, global disease burden

Funding source. This study was not supported by any external sources of funding.

✉ Olga I. Kopytenkova. E-mail: 5726164@mail.ru

© 2025 by the authors

<https://doi.org/10.56871/МНСО.2026.42.78.008>

Методические подходы к гигиенической оценке риска здоровью населения

Александр Владимирович Леванчук^{1, 2}, Ольга Ивановна Копытенкова²,
Ольга Васильевна Мироненко^{1, 3}, Екатерина Андреевна Федорова³

¹ Санкт-Петербургский государственный университет, 199034, г. Санкт-Петербург, Университетская наб., д. 7–9, Российская Федерация

² Петербургский государственный университет путей сообщения Императора Александра I, 190031, г. Санкт-Петербург, Московский пр., д. 9, Российская Федерация

³ Северо-Западный государственный медицинский университет им. И.И. Мечникова, 191015, г. Санкт-Петербург, ул. Кирочная, д. 41, Российская Федерация

Для цитирования: Леванчук А.В., Копытенкова О.И., Мироненко О.В., Федорова Е.А. Методические подходы к гигиенической оценке риска здоровью населения. *Медицина и организация здравоохранения*. 2025;10(4):94–101. <https://doi.org/10.56871/МНСО.2026.42.78.008>.

Поступила: 04.11.2025

Одобрена: 10.12.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. Введение. Для повышения информативности результатов расчета риска здоровью населения и обеспечения возможности проведения сравнительного анализа необходимо использовать показатель, который позволяет характеризовать выраженность взаимосвязи факторов и показателей здоровья населения. **Цель исследования** — обоснование возможности использования показателя «Глобальное бремя болезней» для гигиенической оценки санитарно-эпидемиологического благополучия населения на основе использования методологии оценки риска здоровью. **Материалы и методы.** Использованы модельные территории с загрязнением атмосферного воздуха мелкодисперсной пылью (выше предельно допустимой концентрации) и акустической нагрузкой (60, 65, 70 дБА). Измеряемым параметром был один год здоровой жизни DALY (Disability-Adjusted Life Year), потерянный из-за болезни, инвалидности или преждевременной смерти. Статистическая обработка проведена в пакете стандартных программ Excel 16.0 (Office 2016). **Результаты.** Использование факторов риска (химическое или физическое загрязнение природных сред) позволяет оценить, какая доля бремени конкретного заболевания вызвана воздействием неблагоприятного фактора или комплекса факторов окружающей среды. Представленные расчеты являются упрощениями сложных биологических процессов. Вместе с тем с развитием транспортной инфраструктуры городов и ростом шума будет увеличиваться бремя болезней. Наблюдается выраженная нелинейная зависимость. При повышении уровня шума с 60 до 70 дБА (на 10 дБА) суммарное бремя болезней увеличивается более чем в два раза (с ~1220 до ~2740 DALY/год). **Заключение.** Предложенный методический подход позволяет перевести гигиеническую оценку на более высокий уровень сравнительной количественной оценки влияния факторов на здоровье населения и реализует механизм расчета эффективности профилактических мероприятий.

КЛЮЧЕВЫЕ СЛОВА: гигиеническая оценка, риск здоровью, глобальное бремя болезней

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

✉ Ольга Ивановна Копытенкова. E-mail: 5726164@mail.ru

© Коллектив авторов, 2025

INTRODUCTION

A key approach in modern evidence-based policy in the fields of public health and environmental protection is the methodology for assessing risks to public health. It is necessary to use an indicator that clearly demonstrates the strength of relationships under study to quantitatively assess the negative impact of environmental factors on public health and to determine the proportion of morbidity, mortality, and disability in the population that may be caused by specific risks (air, water, and soil pollution, noise, etc.). This indicator is also important for enabling a comparative analysis of the population's health and epidemiological well-being across different regions.

The Institute for Health Metrics and Evaluation (IHME) has developed a comprehensive methodological approach embodied in the "Global Burden of Disease" (GBD) indicator and its component, the "Environmental Burden of Disease" (EBD) [1–4]. The approach was developed to measure population health losses due to diseases, injuries, and risk factors. Currently, this indicator is not yet widely used for public health risk assessment.

AIM

The aim was to demonstrate whether the Global Burden of Disease (GBD) indicator can be used for the public health assessment of the population's sanitary and epidemiological well-being based on health risk assessment methodology.

MATERIALS AND METHODS

To test the method for calculating the GBD indicator, model areas with atmospheric air pollution from fine particulate matter (exceeding the maximum permissible concentration, MPC) and various levels of noise exposure (60, 65, 70 dBA) were used. The primary parameter measured by the GBD is DALY (Disability-Adjusted Life Year). One DALY represents one year of healthy life lost due to illness, disability, or premature death. This indicator consists of two components: YLL (Years of Life Lost, years of life lost due to premature death) and YLD (Years Lived with Disability, years of life lived with a health impairment (disability), weighted by se-

verity) [1–10]. The use of risk factors (chemical or physical pollution) allows to estimate what proportion of a specific disease is caused by exposure to an adverse environmental factor or a complex of factors. Statistical analysis was performed using the standard Excel 16.0 software package [2].

RESULTS

An analysis of domestic and international scientific literature enabled a comparison between the traditional approach to public health risk assessment and a methodological approach supplemented by the calculation of the GBD index. The results are presented in Table 1.

The comparative analysis showed that supplementing the hygienic assessment of public health risk with the GBD calculation transforms the hygienic assessment from a mere statement of regulatory exceedances into a quantitative assessment of actual harm to public health, making it scientifically sound, integrated, and prioritized.

To confirm the results of the comparative analysis of approaches, we calculated the GBD for model conditions in areas with atmospheric air pollution from fine particulate matter and noise exposure (60, 65, 70 dBA). The calculations were performed using a generally accepted methodology [1]. The following indicators were calculated: YLL, YLD, DALY. It was taken into account that with an increase in DALYs associated with a specific risk factor, its contribution to the overall disease burden in the population rises (Table 2).

An assessment of the disease burden from air pollution caused by motor vehicles and noise pollution in a hypothetical city N with a population of 1,000,000 people showed that the number of deaths associated with PM_{2.5} air pollution from motor vehicles amounts to 720 per year.

The baseline mortality rate (all causes) for a standard population is ~800 deaths per 100,000 people per year. The exposure risk fractions (ERFs) provided by the World Health Organization (WHO) and studies conducted as part of the Global Burden of Disease project were applied.

The main diseases associated with PM_{2.5} are ischemic heart disease (IHD), stroke, lung cancer, chronic obstructive pulmonary disease

Table 1

Results of a comparative analysis of the traditional approach to hygienic assessment and the methodological approach supplemented by the calculation of the “Global burden of disease” indicator

Таблица 1

Результаты сравнительного анализа традиционного подхода к гигиенической оценке и методического подхода, дополненного расчетом показателя «Глобальное бремя болезни»

Традиционный подход Traditional approach	Подход, дополненный расчетом ГББ An approach supplemented by the calculation of the GBD
Отсутствие интегральной оценки. Разрозненные данные по концентрациям разных веществ не дают общей картины ущерба здоровью населения <i>Lack of an integrated assessment. Scattered data on the concentrations of various substances does not provide a comprehensive picture of the damage to public health</i>	Интегральный и количественный показатель. Глобальное бремя болезни (ГББ) дает возможность суммировать ущерб от всех заболеваний, связанных с факторами окружающей среды, в единой метрике (DALY). Это позволяет получить общую «цену» загрязнения для здоровья населения региона или страны <i>An integrated and quantitative indicator. The Global burden of disease (GBD) allows for the summation of the damage caused by all diseases associated with environmental factors in a single metric (DALY). This allows for the overall «cost» of pollution to the health of the population of a region or country</i>
Сложность определения приоритетов. Сравнить предельно допустимые концентрации (ПДК) и предельно допустимые уровни (ПДУ) разных факторов бессмысленно <i>Difficulty in prioritizing. Comparing maximum permissible concentration (MPCs) and maximum permissible levels (MPLs) for different factors is pointless</i>	Сравнимость и расстановка приоритетов. ГББ позволяет сравнивать между собой абсолютно разные факторы риска. Формируется объективная основа для выбора наиболее значимых проблем, на которые в первую очередь должны направляться управленческие решения и ресурсы <i>Comparability and prioritization. The GBD allows for the comparison of completely different risk factors. It provides an objective basis for selecting the most significant issues to prioritize management decisions and resources</i>
Превышение ПДК констатирует проблему, но не показывает ее последствий. Ущерб здоровью может проявляться через годы (хронические болезни) <i>Exceeding the maximum permissible concentration indicates a problem but does not reveal its consequences. Health damage may manifest itself years later (chronic diseases).</i>	Оценка фактических последствий. ГББ измеряет не потенциальную опасность, а реализовавшийся ущерб — конкретные случаи болезней, инвалидности и смерти, которые произошли здесь и сейчас из-за воздействия факторов среды в прошлом <i>Assessing actual consequences. The GBD measures not potential hazards, but actual damage — specific cases of illness, disability, and death that have occurred here and now due to past environmental factors</i>
Учет многофакторности заболеваний. Многие болезни вызываются несколькими факторами (образ жизни, генетика, загрязнение окружающей среды). Традиционный подход не позволяет выделить «экологическую» составляющую <i>Considering the multifactorial nature of diseases. Many diseases are caused by multiple factors (lifestyle, genetics, environmental pollution). The traditional approach fails to isolate the “environmental” component.</i>	Атрибутивная (причинная) оценка. Методология с ГББ с использованием концепции Population Attributable Fraction (PAF) — популяционной атрибутивной доли — позволяет рассчитать, какая доля случаев конкретного заболевания статистически связана с воздействием данного фактора риска <i>Attributable (causal) assessment. The GBD methodology, using the Population Attributable Fraction (PAF) concept, allows to calculate the proportion of cases of a particular disease that is statistically associated with exposure to a given risk factor</i>

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

Table 2

The assessment stages are recommended by World Health Organization (Comparative Risk Assessment, CRA) — comparative risk assessment

Таблица 2

Этапы оценки, рекомендованные Всемирной организацией здравоохранения (Comparative Risk Assessment, CRA) — сравнительная оценка рисков

Этап Stage	Содержание Content
1	Выбор фактора риска и последствия для здоровья. Устанавливаются «последствия для здоровья», для которых есть доказанная причинно-следственная связь с этим фактором <i>Selecting a risk factor and its health consequences. “Health consequences” are identified for a proven causal relationship with the risk factor</i>
2	Анализ воздействия. Оценивается, какая часть населения подвергается воздействию фактора риска и на каком уровне (например, с помощью данных мониторинга качества воздуха, моделей распространения загрязнений, опросов) <i>Exposure analysis. An assessment is made of the proportion of the population exposed to a risk factor and at what level (e.g., using air quality monitoring data, pollution distribution models, and surveys)</i>

Окончание табл. 2 / Ending of the Table 2

Этап Stage	Содержание Content
3	Определение функции «воздействие–ответ». Это математическая зависимость, показывающая, насколько увеличивается риск возникновения заболевания при изменении уровня воздействия. Эти функции получают из крупных эпидемиологических и токсикологических исследований <i>Calculation of the exposure-response function. This is a mathematical relationship that shows how much the risk of developing a disease increases with changing exposure levels. These functions are derived from large-scale epidemiological and toxicological studies</i>
4	Расчет доли attributable fraction (AF). AF (атрибутивная доля) — это доля случаев заболевания, которые можно было бы предотвратить, если бы воздействие фактора риска было устранено. $AF = (P \cdot (RR - 1)) / (P \cdot (RR - 1) + 1),$ где P — доля населения, подверженная воздействию; RR — относительный риск для данной болезни при данном уровне воздействия <i>Calculating the attributable fraction (AF). AF is the proportion of disease cases that could be prevented if exposure to a risk factor were eliminated.</i> $AF = (P \cdot (RR - 1)) / (P \cdot (RR - 1) + 1),$ where P is the proportion of the population exposed; RR is the relative risk for a given disease at a given level of exposure
5	Расчет бремени в DALY. Берется общее количество DALY по конкретному заболеванию в популяции (из статистики здравоохранения). Умножается на атрибутивную долю (AF) для этого заболевания: $\Sigma (DALY) = \text{бремя определенной болезни (DALY)} \cdot AF$ <i>Calculating the burden in DALY. The total number of DALY for a specific disease in the population (from health statistics) is taken and multiplied by the attributable fraction (AF) for that disease.</i> $\Sigma (DALY) = \text{disease-specific burden (DALY)} \cdot AF$
6	Суммирование и анализ. Бремя рассчитывается для всех заболеваний, связанных с выбранным фактором, а затем суммируется. Это и будет общее экологическое бремя болезней от данного фактора <i>Summation and analysis. The burden is calculated for all diseases associated with the selected factor and then summed. This represents the overall environmental burden of disease from this factor</i>

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

Table 3

Summary table of disease burden estimates for city N

Таблица 3

Сводная таблица оценки бремени болезней для города N

Фактор риска Risk factor	Основные последствия Main consequences	Оценочное количество смертей в год Estimated number of deaths per year	Оценочное бремя (DALY в год) Estimated burden (DALYs per year)
Загрязнение воздуха (PM _{2.5} от транспорта) Air pollution (PM _{2.5} from transport)	Ишемическая болезнь сердца, инсульт, рак легких, хроническая обструктивная болезнь легких Ischemic heart disease, stroke, lung cancer, chronic obstructive pulmonary disease	700–800	10 000–15 000
Шум от транспорта Traffic noise	Ишемическая болезнь сердца, нарушения сна, когнитивные нарушения Ischemic heart disease, sleep disorders, cognitive impairments	40–100	500–1500
Итого Total		740–900	10 500–16 500

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

(COPD), and lower respiratory tract infections (in children). The calculation was performed using the method recommended by the WHO, which takes into account the relative risk at the analyzed concentration (RR). DALYs from air pollution amount to ≈7,900–8,500 cases per year.

More precise WHO calculations for similar cities show that the overall burden of air pollution can range from 1,000 to 2,000 DALYs per 100,000 population. Given that transportation in the city under analysis is the primary but not the only source, the estimate for the city is:

~10,000–15,000 DALYs per year from motor vehicle air pollution.

A noise level of $L_{den} > 55$ dBA (the threshold above which the WHO notes serious health consequences) affects 60% of the population (600,000 people). A noise level > 65 dBA affects 20% of the population (200,000 people). The main noise-related health conditions include coronary heart disease, cognitive impairments in children, and sleep disorders. Calculations indicate that ~40 deaths per year result from noise exposure. Cognitive impairments in children affect a cohort of ~150,000 schoolchildren. Studies show a 1–2-month lag in reading and memory skills among children in noisy areas. This can contribute a significant number of YLDs. For a city with a population of 1 million, a rough estimate of the total burden is ~500–1,500 DALYs per year from transportation noise (Table 3).

When assessing the burden of disease from rail transport noise in a hypothetical city N with a population of 1,000,000 people, calculations were performed for equivalent noise levels of 60, 65, 70 dBA. Losses due to ischemic heart disease, irritation, and the total disease burden were calculated (Table 5). Data source: coefficients from WHO reports, specifically Burden of disease from environmental noise (2011). The baseline risk data are presented in Table 4.

Table 4

Input data from World Health Organization models
(Relative risks, RR)

Таблица 4

Исходные данные из моделей Всемирной организации
здравоохранения (относительные риски, RR)

Уровень шума (дБА) Noise level (dBA)	Ишемическая болезнь сердца Ischemic heart disease	Сильное раздражение High Annoyance*
60	1,05	0,20 (20% населения) (20% of the population)
65	1,12	0,29 (29% населения) (29% of the population)
70	1,25	0,44 (44% населения) (44% of the population)

Таблица составлена авторами / The table is prepared by the authors

* The table shows not the RR, but the percentage of the population that is highly irritated at a given noise level (HA%).

* Для раздражения в таблице указано не RR, а непосредственно доля сильно раздраженного населения (HA%) при данном уровне шума.

Table 5

Summary table of results

Таблица 5

Сводная таблица результатов

Показатель Indicator	60 дБА (dBA)	65 дБА (dBA)	70 дБА (dBA)
Потери из-за ишемической болезни сердца (DALY) Losses due to coronary heart disease	24	54	100
Потери из-за раздражения (DALY) Losses due to irritation	1200	1740	2640
Суммарное бремя (DALY/год) Total burden (DALY/year)	~1224	~1794	~2740
На 1 000 000 человек Per 1,000,000 people	~1220	~1790	~2740

Таблица составлена авторами / The table is prepared by the authors

DISCUSSION

Air pollution from motor vehicles is the dominant risk factor for public health in urban areas. Air pollution from motor vehicles in the model city N leads to thousands of years of healthy life lost annually. Vehicle noise makes a smaller, yet still very significant, contribution.

By converting DALYs into economic indicators (e.g., via the statistical life value or the DALY cost), the burden can be estimated to cost the city hundreds of millions of rubles annually in the form of losses and healthcare expenditures.

The presented calculations are simplifications of complex biological processes. At the same time, as urban transport infrastructure develops and noise levels rise, the burden of disease will increase. A pronounced nonlinear relationship is observed. When noise levels increase from 60 to 70 dBA (by 10 dBA), the total burden of disease exceeds twofold (from ~1,220 to ~2,740 DALYs/year). Irritation, rather than direct fatalities, is the main contributor to the disease burden. It accounts for more than 95% of all losses at every noise level. Thus, noise is first and foremost a serious problem for the quality of life and mental well-being of the population.

Even at a seemingly “moderate” noise level of 60 dBA, the burden amounts to more than 1 DALY/year per 1,000 people. On the scale of a large city (e.g., 1 million people), this amounts to thousands of healthy life years lost annually, which

represents a significant public health problem requiring noise abatement measures.

CONCLUSION

The use of the “Global Burden of Disease” methodology is a modern, scientifically sound tool that takes public health assessment to a qualitatively new level, providing a quantitative, integrated, and comparative assessment of the environmental impact on public health. The methodology provides a clear mechanism for economic justification to empirically calculate the effectiveness of environmental protection and health promotion measures, enabling government agencies and businesses to make optimal investment decisions.

ADDITIONAL INFORMATION

Author contribution. Kopitenkova O.I. — formulating the idea and purpose of the study, determining the methods and design of the research, writing the initial text; Levanchuk A.V. — theoretical analysis, statistical analysis, and calculations, writing the original text; Mironenko O.V. — data collection and annotation; Fedorova E.A. — data collection and manuscript preparation for publication.

All authors read and approved the final version before publication.

Competing interests. The authors declare that they have no competing interests.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Копытенкова О.И. — формулирование идеи и цели исследования, определение методов и дизайна исследований, написание первоначального текста; Леванчук А.В. — теоретический анализ, статистический анализ и расчеты, написание первоначального текста; МIRONENKO O.B. — сбор данных, аннотирование; Федорова Е.А. — сбор данных, подготовка рукописи к печати.

Все авторы прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

ЛИТЕРАТУРА / REFERENCES

1. Murray C.J., Lopez A.D. The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. Harvard School of Public Health. Available at: <https://archive.org/details/globalburdenofdi0000unse/page/n9/mode/2up> (accessed: 15.05.2025).
2. Institute for Health Metrics and Evaluation (IHME). Global Burden of Disease Study 2019 (GBD 2019) Methodology Overview. Seattle, United States: IHME; 2020. Available at: <http://www.healthdata.org/gbd> (accessed: 17.06.2025).
3. Zhou M., Liang X. Mortality, morbidity, and risk factors in China during the past three decades: findings from the Global Burden of Disease Study 2021. *China CDC Weekly*. 2023;5(14):1–10. Available at: <https://www.healthdata.org/research-analysis/about-gbd/gbd-data-and-tools-guide> (accessed: 17.06.2025).
4. GBD 2021 US Health Disparities Collaborators. Life expectancy by county, race, and ethnicity in the USA, 2000–2019: a systematic analysis of health disparities. *Lancet*. 2023;400(10345):25–38. [https://doi.org/10.1016/S0140-6736\(22\)00876-5](https://doi.org/10.1016/S0140-6736(22)00876-5).
5. GBD 2021 US Burden of Disease Collaborators. The burden of diseases, injuries, and risk factors by state in the USA, 1990–2021. *Lancet*. 2024;404(10469):2314–2340. [https://doi.org/10.1016/S0140-6736\(24\)01446-6](https://doi.org/10.1016/S0140-6736(24)01446-6).
6. GBD 2019 European Union NCDs Collaborators. Trends in non-communicable diseases in the European Union, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Public Health*. 2023;8(Suppl.):S51. [https://doi.org/10.1016/S2468-2667\(23\)00023-2](https://doi.org/10.1016/S2468-2667(23)00023-2).
7. GBD 2021 Europe Collaborators. The burden of diseases in Europe from 1990 to 2021: A systematic analysis for the Global Burden of Disease Study 2021. *Lancet Public Health*. 2024;9(12):e965–e975. [https://doi.org/10.1016/S2468-2667\(24\)00237-7](https://doi.org/10.1016/S2468-2667(24)00237-7).
8. GBD 2021 Former Soviet Union Collaborators (Lim S.S.). The burden of diseases in the former Soviet Union from 1990 to 2021: a systematic analysis for the Global Burden of Disease Study 2021. *Lancet Regional Health — Europe*. 2024;36(101136). <https://doi.org/10.1016/j.lanepc.2023.101136>.
9. GBD 2021 Causes of Death Collaborators. Global burden of 288 causes of death and life expectancy decomposition in 204 countries and territories and 811 subnational locations, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021. *Lancet*. 2024;403(10440):2100–2132. [https://doi.org/10.1016/S0140-6736\(24\)00367-2](https://doi.org/10.1016/S0140-6736(24)00367-2).

10. GBD 2021 Risk Factors Collaborators. Global burden of 88 risk factors in 204 countries and territories and 811 subnational locations, 1990–2021: a systematic analysis

for the Global Burden of Disease Study 2021. *Lancet*. 2024;403(10440):2162–2200. [https://doi.org/10.1016/S0140-6736\(24\)00933-4](https://doi.org/10.1016/S0140-6736(24)00933-4).

AUTHORS' INFO

Alexander V. Levanchuk — Dr. Sci. (Med.), Professor, Department of Technosphere and Environmental Safety. E-mail: levanchuk1509@gmail.com; <https://orcid.org/0000-0003-2062-7401>; SPIN: 6775-1622

✉ **Olga I. Kopytenkova** — Dr. Sci. (Med.), Professor, Department of Technosphere and Environmental Safety. E-mail: 5726164@mail.ru;

<https://orcid.org/0000-0001-8412-5457>; SPIN: 8008-6365

Olga V. Mironenko — Dr. Sci. (Med.), Professor, Departments of Healthcare Organization and Medical Law. E-mail: o.mironenko@mail.ru;

<https://orcid.org/0000-0002-1484-8251>; SPIN: 9368-7627

Ekaterina A. Fedorova — Assistant of the Department of Communal Hygiene. E-mail: fedorovaea@mail.ru; <https://orcid.org/0000-0002-9233-7203>; SPIN: 3407-7243

ОБ АВТОРАХ

Александр Владимирович Леванчук — д.м.н., профессор, кафедра техносферной и экологической безопасности. E-mail: levanchuk1509@gmail.com; <https://orcid.org/0000-0003-2062-7401>; SPIN: 6775-1662

✉ **Ольга Ивановна Копытенкова** — д.м.н., профессор, кафедра техносферы и экологической безопасности. E-mail: 5726164@mail.ru;

<https://orcid.org/0000-0001-8412-5457>; SPIN: 8008-6365

Ольга Васильевна МIRONENKO — д.м.н., профессор, кафедра организации здравоохранения и медицинского права. E-mail: o.mironenko@mail.ru;

<https://orcid.org/0000-0002-1484-8251>; SPIN: 9368-7627

Екатерина Андреевна Федорова — ассистент отдела коммунальной гигиены. E-mail: fedorovaea@mail.ru; <https://orcid.org/0000-0002-9233-7203>; SPIN: 3407-7243

Original papers

UDC 504.064+614.876+614.253+615.849.5
<https://doi.org/10.56871/MHCO.2026.38.60.009>

Assessment of the contribution of the natural background to the annual effective dose of the staff of the radiology diagnostic rooms at the Saint Petersburg State Pediatric Medical University

Aleksandr V. Vodovatov^{1, 2}, Yuliya N. Kapyrina¹, Aleksandra S. Klimenkova¹,
Olga A. Andzhigaeva¹, Valentina I. Serova¹, Karine K. Panuntseva¹, Viktor G. Puzyrev¹

¹ Saint Petersburg State Pediatric Medical University, 2 Litovskaya str., Saint Petersburg, 194100, Russian Federation

² Saint Petersburg Research Institute of Radiation Hygiene named after Professor P.V. Ramzaev, 8 Mira str., Saint Petersburg, 197101, Russian Federation

For citation: Vodovatov A.V., Kapyrina Yu.N., Klimenkova A.S., Andzhigaeva O.A., Serova V.I., Panuntseva K.K., Puzyrev V.G. Assessment of the contribution of the natural background to the annual effective dose of the staff of the radiology diagnostic rooms at the Saint Petersburg State Pediatric Medical University. *Medicine and Health Care Organization*. 2025;10(4):102–109. <https://doi.org/10.56871/MHCO.2026.38.60.009>.

Received: 19.11.2025

Revised: 22.12.2025

Accepted: 28.01.2026

ABSTRACT. Introduction. Sources of ionizing radiation play a vital role in modern healthcare, finding widespread use in the diagnosis and treatment of diseases. One of the key requirements for the safe use of ionizing radiation sources in medical practice is a high level of professional training of personnel in radiation safety. **The aim of this study** was to determine the structure and contribution of natural components to the radiation doses of personnel in the X-ray Departments of the Clinic of the Saint Petersburg State Pediatric Medical University (SPbSPMU). **Materials and methods.** The study was conducted in December 2024 at the SPbSPMU Clinic, where the man-made radiation dose of personnel of four departments was determined. Measurements of the ambient dose equivalent rate of gamma radiation were performed with DKS-AT1123 dosimeters in the premises of permanent and temporary stay of Group A personnel. Based on work time recording, the annual radiation doses of personnel from natural sources of ionizing radiation were calculated. The obtained values were compared with individual dosimetric monitoring data to assess the contribution of the natural component to the individual effective dose. Statistical processing was performed using STATISTICA 12 software. **Results.** Based on the dosimetric monitoring conducted in the radiation diagnostics and therapy rooms of the Saint Petersburg State Pediatric Medical University Clinic, it was determined that the annual dose from natural sources does not exceed permissible limits. **Conclusion.** Based on the results of the radiation-hygienic assessment, recommendations for healthcare workers on the implementation of radiation protection measures were developed, and the need to improve professional training in radiation safety through the development of continuing professional education was emphasized.

KEYWORDS: radiation background, annual effective dose, X-ray department staff, dosimeters, X-ray emission, occupational exposure

Funding. This study was not supported by any external sources of funding.

✉ Viktor G. Puzyrev. E-mail: vgpuzyrev@mail.ru

© 2025 by the authors

<https://doi.org/10.56871/МНСО.2026.38.60.009>

Оценка вклада природного фона в годовую эффективную дозу персонала кабинетов лучевой диагностики клиники Санкт-Петербургского государственного педиатрического медицинского университета

Александр Валерьевич Водоватов^{1, 2}, Юлия Николаевна Капырина¹,
Александра Садатовна Клименкова¹, Ольга Алексеевна Анджигасева¹,
Валентина Игоревна Серова¹, Каринэ Константиновна Панунцева¹,
Виктор Геннадьевич Пузырев¹

¹ Санкт-Петербургский государственный педиатрический медицинский университет, 194100, г. Санкт-Петербург, ул. Литовская, д. 2, Российская Федерация

² Санкт-Петербургский научно-исследовательский институт радиационной гигиены имени профессора П.В. Рамзаева, 197101, г. Санкт-Петербург, ул. Мира, д. 8, Российская Федерация

Для цитирования: Водоватов А.В., Капырина Ю.Н., Клименкова А.С., Анджигасева О.А., Серова В.И., Панунцева К.К., Пузырев В.Г. Оценка вклада природного фона в годовую эффективную дозу персонала кабинетов лучевой диагностики клиники Санкт-Петербургского государственного педиатрического медицинского университета. *Медицина и организация здравоохранения*. 2025;10(4):102–109. <https://doi.org/10.56871/МНСО.2026.38.60.009>.

Поступила: 19.11.2025

Одобрена: 22.12.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. Введение. Источники ионизирующего излучения играют важную роль в современном здравоохранении, находя широкое применение в диагностике и лечении заболеваний. Одним из основных условий безопасного применения источников ионизирующего излучения в медицинской практике является высокий уровень профессиональной подготовки персонала в области радиационной безопасности. **Цель работы** — определение структуры и вклада природной компоненты в дозы облучения персонала рентгеновских отделений клиники Санкт-Петербургского государственного педиатрического медицинского университета (СПБГПМУ). **Материалы и методы.** Исследование проведено в декабре 2024 г. на базе клиники СПБГПМУ, где была определена доза техногенного облучения персонала четырех отделений. Измерения мощности амбиентного эквивалента дозы гамма-излучения выполнялись дозиметрами ДКС-АТ1123 в помещениях постоянного и временного пребывания персонала группы А. На основе хронометража рабочего времени были рассчитаны годовые дозы облучения персонала от природных источников ионизирующего излучения. Полученные значения сравнили с данными индивидуального дозиметрического контроля для оценки вклада природной компоненты в индивидуальную эффективную дозу. Статистическая обработка проведена с помощью программного обеспечения STATISTICA 12. **Результаты.** По результатам проведенного дозиметрического контроля в кабинетах лучевой диагностики и терапии клиники СПБГПМУ определили, что годовая доза от природных источников не превышает допустимые значения. **Заключение.** На основании результатов радиационно-гигиенической оценки разработаны рекомендации для медицинских работников по внедрению мер радиационной защиты, а также подчеркнута необходимость повышения уровня профессиональной подготовки в области радиационной безопасности посредством совершенствования системы дополнительного профессионального образования.

КЛЮЧЕВЫЕ СЛОВА: радиационный фон, годовая эффективная доза, персонал рентгеновских отделений, дозиметры, рентгеновское излучение, профессиональное облучение

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

✉ Виктор Геннадьевич Пузырев. E-mail: vgpuzyrev@mail.ru

© Коллектив авторов, 2025

INTRODUCTION

Radiation doses to personnel working with ionizing radiation sources (IRS) consist of two components: external and internal radiation doses from artificial and natural sources. Artificial sources are those with which a person works or an exposure zone where a person is exposed to radiation; natural sources are those that affect a worker while performing their job duties. In accordance with current approaches to ensuring the radiation safety of personnel (workers)¹, dose limits for personnel are established only for artificial radiation. During group and individual dosimetric monitoring (IDM) of personnel, radiation dose values from both artificial and natural radiation are recorded. Thus, current approaches to interpreting radiation monitoring results imply a systematic overestimation of personnel radiation doses. For an objective assessment of artificial radiation doses, it is advisable to account for the contribution of natural background radiation to personnel radiation doses.

Issues related to the proper interpretation of radiation monitoring results for personnel are most relevant for medical staff performing X-ray procedures, particularly regarding the need to subtract the natural background radiation. This category of personnel is among the least exposed of all medical workers classified as Group A^{2 3 4} personnel. If the work process is properly organized, stationary radiation shielding is adequately designed and

implemented, and personal protective equipment is used, the doses of artificial radiation exposure for this category of workers amount to less than 1 mSv/year (natural background dose values are 1.14 mSv/year (based on ambient equivalent dose rate (AEDR) measurements) and 0.89 mSv/year (using the thermoluminescent dosimeter (TLD) method [1–3]).

Since 2012 [4–6], international practice has required to subtract doses from natural ionizing radiation sources (IRS) from the individual effective dose of personnel. All current international documents on the assessment of occupational radiation exposure levels provide information exclusively on doses from man-made radiation sources [7]. An objective analysis of personnel radiation doses from man-made IRS is necessary to evaluate the effectiveness of radiation protection measures and methods applied at the facility, as well as in domestic practice for the special assessment of working conditions.⁵

The Russian Federation does not subtract the natural background radiation when interpreting individual dosimetric monitoring (IDM) results. Sooner or later, a transition to background subtraction will become necessary⁶ due to the need to harmonize domestic regulatory legal acts with the regulatory documents of international organizations in the field of radiation safety [4–6]. The main challenge is to develop a simple and objective method for assessing natural radiation doses that would be specific to each facility where work with ionizing radiation is conducted. It is also necessary to determine in which cases background subtraction should be performed, what value to select for the subtracted background, what method to use for background measurements, and at what

¹ Radiation Safety Standards (NRB-99/2009): Sanitary Rules and Regulations (SanPiN 2.6.1.2523-09). Moscow: Federal Center for Hygiene and Epidemiology of Rospotrebnadzor; 2009. Available at: <https://spb-institute.ru/upload/iblock/270/270770159d23e4b414abc8cf07cbc52f.pdf?ysclid=mgv3v50zme209547980> (accessed: October 17, 2025).

² Ibid.

³ Basic Sanitary Rules for Radiation Safety (OSPORB-99/2010): SP 2.6.1.2612-10. Moscow: Federal Center for Hygiene and Epidemiology of Rospotrebnadzor; 2010. Available at: <https://spb-institute.ru/upload/iblock/daf/daf8fb0f13fb5d4fe5829d5bflab2a85.pdf?ysclid=mgv40tfasr823676087> (accessed: October 17, 2025).

⁴ MR 2.6.1.0257-21.2.6.1. Ionizing radiation, radiation safety. Conducting radiation hygiene certification. Methodological recommendations. Available at: https://mrul.fmba.gov.ru/upload/iblock/c58/dowjqxc8o3nuqrwf0lyxe5p7jsgnq98m/MR-2.6.1.0257_21.pdf?ysclid=mgv4606rrw637674173 (accessed: October 17, 2025).

⁵ Order of the Ministry of Labor of the Russian Federation No. 817N dated November 21, 2023, “On the Approval of the Methodology for Conducting a Special Assessment of Working Conditions, the Classification of Harmful and/or Hazardous Occupational Factors, the Form for the Report on the Special Assessment of Working Conditions, and Instructions for Completing It.” Available at: <https://normativ.kontur.ru/document?moduleId=1&documentId=461108&ysclid=mggatqjvkr441096518> (accessed: October 7, 2025).

⁶ Decree of the President of the Russian Federation No. 585 of October 13, 2018, “On the Approval of the Fundamentals of State Policy in the Field of Ensuring Nuclear and Radiation Safety of the Russian Federation for the Period up to 2025 and Beyond.” Available at: <https://base.garant.ru/72075716/> (accessed: December 17, 2025).

stage of measurement it is necessary to perform background subtraction [8].

The simplest method for assessing levels of external natural radiation exposure is to rely on measurements of the ambient equivalent dose rate (AEDR) of gamma radiation in areas where personnel stay. Such measurements are typically conducted when residential, public, and industrial buildings and facilities are put into operation; however, this method has not been applied to radiation monitoring for Group A personnel.

AIM

The aim was to assess the contribution of natural background radiation to the annual effective dose of personnel in the radiology departments of the SPbSPMU clinical hospital.

MATERIALS AND METHODS

The study was conducted in radiology rooms of the emergency, third, and fourth surgical departments, the oncology department, and the Consultative and Diagnostic Center (CDC) of the SPbSPMU. These rooms are located on the first floor of two-, three-, and four-story brick buildings; the walls are brick, and the floors are reinforced concrete. All rooms are equipped with supply and exhaust ventilation.¹

The study included the following stages:

- identification of rooms for permanent and temporary occupancy by Group A personnel in each of the selected departments;
- conducting a series of gamma-ray radiation measurements using a dosimeter in each room at the end of the workday with radiation sources turned off;
- determining the time spent by individuals classified as Group A personnel in various rooms;
- assessment of external natural gamma-radiation doses for each individual classified as Group A personnel over the course of a year;
- comparison of the IDM results for individuals classified as Group A personnel with the results of external gamma-radiation dose determinations, and determination of the contribution of the natural component.

¹ SanPiN 2.6.1.1192-03 "Hygienic Requirements for the Design and Operation of X-ray Rooms and Equipment and the Conduct of X-ray Examinations." Available at: https://medlicenzor.ru/f/sanpin_2611192-03-rentgen-kabinet.pdf (accessed: October 17, 2025).

AEDR measurements were conducted in accordance with Methodological Guidelines (MG) 2.6.1.2838-11 using DKS-AT1123 dosimeters (Atomtech Production Unit, Republic of Belarus). They were performed by staff members of the P.V. Ramzaev "Research Institute of Radiation Hygiene." All dosimeters had a valid calibration certificate. Measurements were conducted in procedure rooms, control rooms, doctors' offices, and rest rooms. A separate set of measurements was conducted in workwear storage rooms, where work clothing containing personal dosimeters is stored.

The effective doses (ED) for personnel based on the IDM results were taken from the personnel individual radiation dose records for 2024. The IDM was performed by a third-party organization (an accredited radiation monitoring laboratory).

In order to determine working hours and exposure time to natural ionizing radiation at workplaces, a survey of specialists was conducted to establish the specifics of working time tracking.

Personnel radiation doses for 6 hours (a workday) and for 24 hours, taking into account the number of working days in a year, were calculated using the following formulas:

$$X_1 = K_1 \cdot n_1 \cdot h_1 / 1000 = K_1 \cdot 1,49 \text{ and} \\ X_2 = K_2 \cdot n_2 \cdot h_2 / 1000 = K_2 \cdot 8,76,$$

where $X_{1,2}$ — annual dose due to external gamma radiation from natural sources, mSv;

$K_{1,2}$ — AEDR, $\mu\text{Sv/h}$; n_1 — number of working days per year; n_2 — number of days per year; h_1 — number of working hours per day; h_2 — number of hours per day.

Statistical data analysis was performed using STATISTICA 12 software.

RESULTS AND DISCUSSION

The results of AEDR measurements on the premises of SPbSPMU are presented in Figure 1. AEDR values ranged from 107 to 148 nSv/h, and the total measurement uncertainty did not exceed 10%.

The results of AEDR measurements in four departments of the SPbSPMU clinical hospital are presented in Table 1.

The measurement results presented in Figure 1 and Table 1 indicate the absence of radiation anomalies on SPbSPMU premises in the areas where measurements were taken. Natural radiation

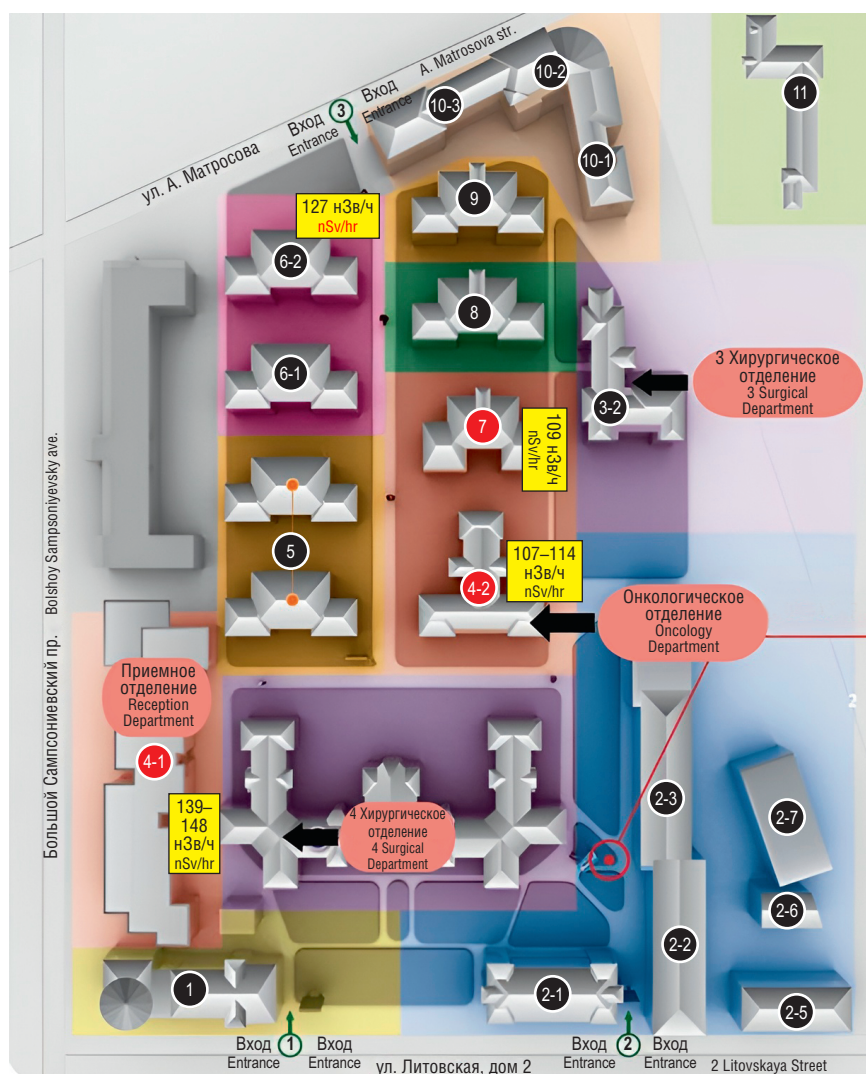


Fig. 1. Dosimetry results on the territory of Saint Petersburg State Pediatric Medical University (the figure is prepared by the authors)

Рис. 1. Результаты дозиметрии на территории Санкт-Петербургского государственного педиатрического медицинского университета (рисунок подготовлен авторами)

levels on the premises and in the departments are uniform, which allows for the subsequent use of weighted average AEDR values to determine the contribution of the natural component to the annual effective dose of personnel.

Annual natural radiation doses were calculated based on a 6-hour workday for staff and 24-hour exposure for dosimeters located in the department offices. The results are presented in Table 2.

Although Group A staff spend only a limited amount of time in the department (no more than 6 hours per day per shift), their personal dosimeters remain in the premises 24 hours a day and are exposed to a uniform dose of ionizing radiation from natural sources.

A comparison was made between the obtained values and data from the personnel's individual ra-

diation dose records. The results of the comparison are presented in Figure 2. The individual annual dose values of 12 employees of the radiology department at SPbSPMU were used: 3 physicians, a nurse, and a laboratory technician from the Diagnostic and Consultation Center; one physician and one nurse each from the emergency, surgical, and oncology departments. The structure of the annual effective dose for staff was calculated assuming round-the-clock exposure of individual dosimeters. One of the orderlies had more than 50% man-made radiation in the annual dose due to long workdays (working two shifts).

As shown in Figure 2, between 0.92 and 1.22 mSv (63% and 77%, respectively) of the annual effective dose for staff is attributable to natural radiation, while the man-made radiation component accounts for 0.31 to 1.48 mSv (37% and 23%, respectively).

Table 1

Value of the natural radiation dose rate distribution by departments

Таблица 1

Значение мощности дозы природного излучения по отделениям

Отделение Department	Рабочее место Workplace	МАЭД±СКО, нЗв/ч ADER±SD, нSv/h
Консультативно-диагностический центр Consultative and diagnostic center	Рабочее место врача 1 Doctor's workplace 1	137±12,5
	Рабочее место врача 2 Doctor's workplace 2	137±12,5
	Рабочее место лаборанта Technician's workplace	137±12,5
	Рабочее место санитары Orderly's workplace	137±12,5
Приемное отделение Admission department	Рабочее место врача Doctor's workplace	143±12,5
	Рабочее место санитары Orderly's workplace	143±12,5
Хирургическое отделение № 3 Surgery 3	Рабочее место врача Doctor's workplace	105±12,5
	Рабочее место санитары Orderly's workplace	105±12,5
Онкологическое отделение Oncology department	Рабочее место врача Doctor's workplace	124±12,5
	Рабочее место санитары Orderly's workplace	124±12,5
Хирургическое отделение № 4 Surgery 4	Рабочее место врача Doctor's workplace	133±12,5
	Рабочее место санитары Orderly's workplace	133±12,5
Среднее для всех отделений Average for all departments		130±12,5

Table 2

Comparison of values for 6- and 24-hour exposure

Таблица 2

Сравнение значений при 6- и 24-часовом облучении

Сотрудник Staff member	6-часовое облучение, мЗв 6-hour exposure, mSv	24-часовое облучение, мЗв 24-hour exposure, mSv
Врач Doctor	0,31	1,22
Врач Doctor	0,31	1,22
Лаборант Technician	0,31	1,22
Санитар Orderly	0,31	1,22
Врач Doctor	0,31	1,21
Санитар Orderly	0,31	1,21
Врач Doctor	0,23	0,94
Санитар Orderly	0,23	0,94
Врач Doctor	0,23	0,92
Санитар Orderly	0,23	0,92
Врач Doctor	0,15	1,01
Санитар Orderly	0,15	1,01

Таблица составлена авторами / The table is prepared by the authors

Note: ADER — ambient gamma dose equivalent rate; SD — Standard Deviation.

Примечание: МАЭД — мощность амбиентного эквивалента дозы гамма-излучения; СКО — среднеквадратичное отклонение.

Таблица составлена авторами / The table is prepared by the authors

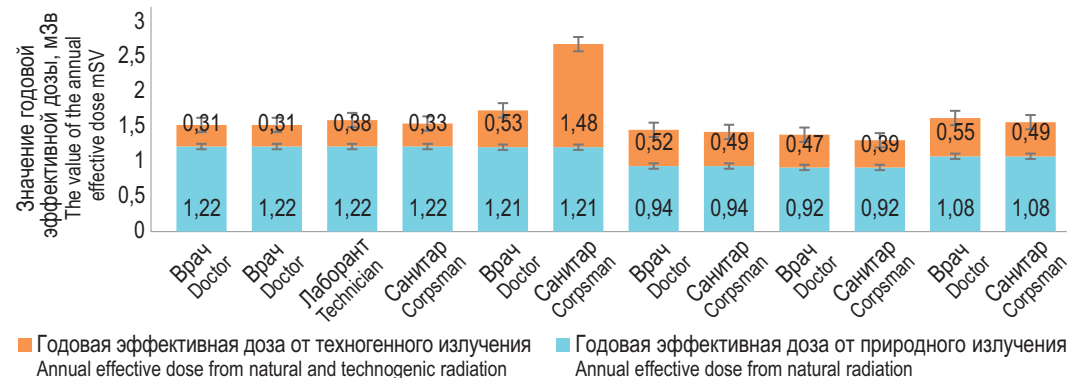


Fig. 2. Contribution of the annual effective dose from natural and technogenic radiation to the annual radiation dose of medical personnel (the figure is prepared by the authors)

Рис. 2. Вклад годовой эффективной дозы от природного и техногенного излучения в годовую дозу облучения медицинского персонала (рисунок подготовлен авторами)

CONCLUSION

The results of the study revealed that:

- the annual dose from natural sources, calculated based on a 6-hour workday and a 5-day workweek, amounted to 0.26 ± 0.06 mSv;
- the annual dose, taking into account 24-hour exposure, was 1.09 ± 0.11 mSv;
- the percentage of background radiation per day for a 6-hour workday and a 5-day workweek was $16 \pm 3.8\%$;
- the percentage of background radiation when accounting for 24-hour exposure was $69 \pm 9.3\%$.

Current levels of man-made radiation exposure for Group A personnel in the examined departments of St. Petersburg State Medical University are extremely low (below the annual dose limit for the general population), indicating that an adequate level of radiation protection for personnel has been achieved.

The proposed methodology is based on dosimetric monitoring and calculation, using a formula to determine how much the natural component contributes to the annual effective dose of personnel at medical organizations working with IRS. It is simple, reproducible, and successfully complements the results of group and individual dosimetric monitoring. The implementation of this methodology will successfully solve the problem of subtracting natural background radiation when interpreting radiation monitoring results.

The study is a pilot project. Further measurements are planned in other medical institutions in St. Petersburg as part of the validation process.

ADDITIONAL INFORMATION

Authors' contribution. A.V. Vodovатов — determination of the main focus of the review, expert evaluation of literature review, research design development; Yu.N. Kapryina — search for relevant publications, literature analysis, research design development; A.S. Klimenkova — research design development, data processing, writing; O.A. Andzhigaeva — research design development, data processing, writing; V.I. Serova — research design development, data processing, writing; K.K. Panuntseva — determination of the main focus of the review, expert evaluation of literature review, research design development, editing of the review; V.G. Puzyrev — determination of the main focus of the review, expert evaluation

of literature review, research design development, editing of the review.

All authors read and approved the final version before publication.

Competing interests. The authors declare that they have no competing interests.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. А.В. Водоватов — определение основной направленности статьи, экспертная оценка списка литературы, разработка дизайна исследования; Ю.Н. Капырина — поиск публикаций по теме, анализ литературы, разработка дизайна исследования; А.С. Клименкова — разработка дизайна исследования, проведение измерений, обработка полученных результатов, написание текста; О.А. Анджигова — разработка дизайна исследования, проведение измерений, обработка полученных результатов, написание текста; В.И. Серова — разработка дизайна исследования, проведение измерений, обработка полученных результатов, написание текста; К.К. Панунцева — определение основной направленности статьи, экспертная оценка списка литературы, разработка дизайна исследования, редактирование статьи; В.Г. Пузырев — определение основной направленности статьи, экспертная оценка списка литературы, разработка дизайна исследования, редактирование статьи.

Все авторы прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

REFERENCES

1. Radiation and Hygienic Passport of the Russian Federation. Moscow: FBUZ FTsGiE Rospotrebnadzora; 2024. (In Russian).
2. Radiation situation in the Russian Federation in 2023. Saint Petersburg; 2024. (In Russian).
3. Romanovich I.K., Stamat I.P., Kormanovskaya T.A. et al. Natural sources of ionizing radiation: radiation doses, radiation risks, preventive measures. G.G. Onishchenko, A.Yu. Popova, eds. Saint Petersburg; 2018. (In Russian).
4. Radiation protection and safety of radiation sources: international basic safety standards. IAEA safety standards series. Vienna: International Atomic Energy Agency; 2014.

5. IAEA (Corporate Author). Radiation Safety of Gamma, Electron and X Ray Irradiation Facilities Specific Safety Guide. International Atomic Energy Agency; 2010.
6. Guide S.S. Radiation protection and safety in medical uses of ionizing radiation. Specific Safety Guide SSG-46. IAEA. Vienna; 2018.
7. Report of the United Nations Scientific Committee on the Effects of Atomic Radiation Sixty-seventh and sixty-eighth sessions (2–6 November 2020 and 21–25 June 2021). United Nations. New York; 2022.
8. Bazhin S.Yu., Kaidanovsky G.N. Consideration of the contribution of the natural background component during individual control of radiation doses to personnel. *Radiation Hygiene*. 2021;14(4):122–128. (In Russian). <https://doi.org/10.21514/1998-426X-2021-14-4-122-128>.
3. Романович И.К., Стамат И.П., Кормановская Т.А., и др. Природные источники ионизирующего излучения: дозы облучения, радиационные риски, профилактические мероприятия. Г.Г. Онищенко, А.Ю. Попова, ред. СПб; 2018.
4. Radiation protection and safety of radiation sources: international basic safety standards. IAEA safety standards series. Vienna: International Atomic Energy Agency; 2014.
5. IAEA (Corporate Author). Radiation Safety of Gamma, Electron and X Ray Irradiation Facilities Specific Safety Guide. International Atomic Energy Agency; 2010.
6. Guide S.S. Radiation protection and safety in medical uses of ionizing radiation. Specific Safety Guide SSG-46. IAEA. Vienna; 2018.
7. Report of the United Nations Scientific Committee on the Effects of Atomic Radiation Sixty-seventh and sixty-eighth sessions (2–6 November 2020 and 21–25 June 2021). United Nations. New York; 2022.
8. Бажин С.Ю., Кайдановский Г.Н. Учет вклада природного фона при контроле индивидуальных доз персонала. *Радиационная гигиена*. 2021;14(4):122–128. <https://doi.org/10.21514/1998-426X-2021-14-4-122-128>.

ЛИТЕРАТУРА

1. Радиационно-гигиенический паспорт Российской Федерации. Москва: ФБУЗ ФЦГиЭ Роспотребнадзора; 2024.
2. Барковский А.Н., Ахматдинов Руслан Р., Ахматдинов Рустам Р. и др. Радиационная обстановка на территории Российской Федерации в 2023 году. СПб.; 2024.

AUTHORS' INFO

Aleksandr V. Vodovатов — Cand. Sci. (Biol.), Senior Researcher, Head of Laboratory of Radiation Hygiene of Medical Facilities, Saint Petersburg Research Institute of Radiation Hygiene named after Professor P.V. Ramzaev; Associate Professor, Department of General Hygiene, Saint Petersburg State Pediatric Medical University. E-mail: vodovatoff@gmail.com; <https://orcid.org/0000-0002-5191-7535>; SPIN: 4560-8978

Yuliya N. Kapryrina — Assistant of the Department of General Hygiene. E-mail: kapirina-yuliya@yandex.ru; <https://orcid.org/0000-0002-1018-5200>; SPIN: 4969-0394

Aleksandra S. Klimenkova — student.

E-mail: alsandra959@gmail.com; <https://orcid.org/0009-0000-1208-7084>

Olga A. Andzhigaeva — student.

E-mail: andzhigaeva.olga@mail.ru; <https://orcid.org/0009-0005-0772-5076>

Valentina I. Serova — student.

E-mail: valyaseroval401@mail.ru; <https://orcid.org/0009-0007-5223-131X>

Karine K. Panuntseva — Cand. Sci. (Med.), Head of the Radiology Department of the clinic. E-mail: kpanuntseva@mail.ru; SPIN: 7484-0713

✉ **Viktor G. Puzyrev** — Cand. Sci. (Med.), Associate Professor, Head of the Department of General Hygiene. E-mail: vgpuzyrev@mail.ru; <https://orcid.org/0000-0002-0185-3545>; SPIN: 2727-0049

ОБ АВТОРАХ

Александр Валерьевич Водоватов — к.б.н., ведущий научный сотрудник, заведующий лабораторией радиационной гигиены медицинских организаций, Санкт-Петербургский научно-исследовательский институт радиационной гигиены им. проф. П.В. Рамзаева; доцент, кафедра общей гигиены, Санкт-Петербургский государственный педиатрический медицинский университет. E-mail: vodovatoff@gmail.com; <https://orcid.org/0000-0002-5191-7535>; SPIN: 4560-8978

Юлия Николаевна Капрырина — ассистент кафедры общей гигиены. E-mail: kapirina-yuliya@yandex.ru; <https://orcid.org/0000-0002-1018-5200>; SPIN: 4969-0394

Александра Садатовна Клименкова — студентка.

E-mail: alsandra959@gmail.com; <https://orcid.org/0009-0000-1208-7084>

Ольга Алексеевна Анджи́гаева — студентка.

E-mail: andzhigaeva.olga@mail.ru; <https://orcid.org/0009-0005-0772-5076>

Валентина Игоревна Серова — студентка.

E-mail: valyaseroval401@mail.ru; <https://orcid.org/0009-0007-5223-131X>

Каринэ Константиновна Панунцева — к.м.н., заведующая рентгенологическим отделением клиники. E-mail: kpanuntseva@mail.ru; SPIN: 7484-0713

✉ **Виктор Геннадьевич Пузырев** — к.м.н., доцент, заведующий кафедрой общей гигиены. E-mail: vgpuzyrev@mail.ru; <https://orcid.org/0000-0002-0185-3545>; SPIN: 2727-0049

Original papers

UDC 616-006-052+618.19-006.6+159.923+159.942

<https://doi.org/10.56871/MHCO.2026.74.35.010>

Uncertainty in the framework of cancer case

Elena V. Pestereva^{1, 2}, Tatiana V. Kaurova¹

¹ Saint Petersburg State Pediatric Medical University, 2 Litovskaya str., Saint Petersburg, 194100, Russian Federation

² Saint Petersburg State University, 6 Makarova emb., Saint Petersburg, 199034, Russian Federation

For citation: Pestereva E.V., Kaurova T.V. Uncertainty in the framework of cancer case. *Medicine and Health Care Organization*. 2025;10(4):110–118. <https://doi.org/10.56871/MHCO.2026.74.35.010>.

Received: 16.11.2025

Revised: 25.12.2025

Accepted: 28.01.2026

ABSTRACT. Introduction. The problem discussed in the paper is the problem of uncertainty, which may happen in any person's life. Being able to cope with uncertainty is expressed in the concept "tolerance to uncertainty," manifested in a person's willingness to act in conditions of insufficient information, lack of safeguards and reliable guidance. When one is diagnosed with cancer, he fears facing a life threatening situation, lack of guarantees of recovery, the ideas and beliefs about himself and the world around him common for everyone seeking for a safe world are being destroyed. In this regard, uncertainty in the situation of cancer disease is more exciting compared to other life circumstances. **The purpose of the article** is to study tolerance to uncertainty in breast cancer patients, the most common cancer pathology among the female population. **Materials and methods.** 34 patients aged 34 to 59 years were examined (the study was conducted in March–May 2024): 17 patients underwent primary treatment, 17 patients were in remission state for 1 to 5 years. Methods: clinical conversation, scale tolerance to D. McLane uncertainty (MSTAT-II), anxiety scale Spielberger–Hanina, Attitude to Life, Death and Crisis Questionnaire (Leontiev D.A., Osin E.N., Lukovitskaya E.G.). **Results.** A moderate level of tolerance was revealed to uncertainty in 76.4% of patients at the treatment stage and in 82.4% of patients at the stage of remission. These patients were able to accept the situation of the disease and their feelings associated with the disease, being and living in uncertainty helped them determine the zone of their own control over the present situation, the desire, despite all the difficulties, to live just now and direct attention to positive life events. The illness and the uncertainty associated with it are causing anxiety, but can at the same time stimulate personal growth, make the patient to reassess life values and meanings. Link found between level of tolerance to uncertainty and "crisis concept" scales ($r=0.423$ $p<0.05$), "personality anxiety" ($r=-0.392$ $p<0.05$): Considering the situation of the disease as a crisis by a BC patient makes oneself more resistant to uncertainty and more able to cope with anxiety associated with a disease as the resolution of the crisis helps a person advance to a higher level of understanding of self and life in general. **Conclusion.** After a life-threatening diagnosis, this uncertainty becomes apparent, giving rise to various fears and anxieties. For women with breast cancer, experiencing uncertainty can prompt them to re-evaluate their value system. In this case, the role of specialists supporting cancer patients is crucial; they must be able to navigate this uncertainty alongside the patient.

KEYWORDS: oncological disease, oncological patient, breast cancer, uncertainty, tolerance to uncertainty, personal anxiety, attitude to crisis situations

Funding. This study was not supported by any external sources of funding.

✉ Elena V. Pestereva. E-mail: vi-lenal@mail.ru

© Pestereva E.V., Kaurova T.V., 2025

<https://doi.org/10.56871/МНСО.2026.74.35.010>

Неопределенность в ситуации онкологического заболевания

Елена Викторовна Пестерева^{1, 2}, Татьяна Владимировна Каурова¹

¹ Санкт-Петербургский государственный педиатрический медицинский университет, 194100, г. Санкт-Петербург, ул. Литовская, д. 2, Российская Федерация

² Санкт-Петербургский государственный университет, 199034, г. Санкт-Петербург, наб. Макарова, д. 6, Российская Федерация

Для цитирования: Пестерева Е.В., Каурова Т.В. Неопределенность в ситуации онкологического заболевания. *Медицина и организация здравоохранения*. 2025;10(4):110–118. <https://doi.org/10.56871/МНСО.2026.74.35.010>.

Поступила: 16.11.2025

Одобрена: 25.12.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. Введение. В статье рассматривается проблема неопределенности, которая включена в жизнь любого человека. Возможность справляться с неопределенностью бытия выражена в конструкте «толерантность к неопределенности», проявляемом в готовности человека действовать в условиях нехватки информации, отсутствия гарантий и устойчивых ориентиров. Когда человеку диагностируют онкологическое заболевание, он оказывается в ситуации угрозы жизни, отсутствия гарантий выздоровления, у него разрушаются представления и убеждения, которые имеются у каждого человека относительно себя и окружающего мира и отвечают его потребности жить в безопасном мире. В этой связи неопределенность в ситуации онкологического заболевания переживается острее, чем при других жизненных обстоятельствах. **Цель исследования** — изучить толерантность к неопределенности у больных раком молочной железы — самой распространенной онкопатологии среди женского населения. **Материалы и методы.** Исследованы 34 пациентки в возрасте от 34 до 59 лет (исследование проводилось в марте–мае 2024 года): 17 больных проходили первичное лечение, 17 пациенток находились в состоянии ремиссии от 1 года до 5 лет. Методы: клиническая беседа, шкала толерантности к неопределенности Д. Маклейна (MSTAT-II), шкала тревоги Спилбергера–Ханина, опросник «Отношение к жизни, смерти и кризисной ситуации» (Леонтьев Д.А., Осин Е.Н., Луковицкая Е.Г.). **Результаты.** Выявлен умеренный уровень толерантности к неопределенности у 76,4% больных на этапе лечения и у 82,4% пациенток на этапе ремиссии. Эти больные были способны принять ситуацию болезни и свои чувства в связи с болезнью, находиться и жить в неопределенности им помогало определение зоны собственного контроля в ситуации болезни, стремление, вопреки всем сложностям, жить в настоящем и направлять свое внимание на те события жизни, которые приносят что-то хорошее. Болезнь и неопределенность, связанная с ней, вызывает тревогу, но одновременно может стимулировать личностный рост, подтолкнуть больную к переоценке жизненных ценностей и смыслов. Обнаружена связь между уровнем толерантности к неопределенности и шкалами «концепция кризисной ситуации» ($r=0,423$ $p<0,05$), «личностная тревожность» ($r=-0,392$ $p<0,05$): переживание больной раком молочной железы ситуации болезни как кризиса делает ее более устойчивой к неопределенности и способной управлять своей тревогой в связи с заболеванием, так как разрешение кризиса помогает человеку продвинуться на более высокий уровень понимания себя и жизни в целом. **Заключение.** После постановки диагноза, связанного с витальной угрозой, неопределенность становится очевидной, порождая разного рода страхи и опасения. Для женщин, больных раком молочной железы, переживание неопределенности может подтолкнуть их к переоценке собственной системы ценностей. Важное значение в этом случае приобретает роль специалистов, сопровождающих онкологического больного, которые должны уметь находиться в ситуации неопределенности вместе с пациентом.

КЛЮЧЕВЫЕ СЛОВА: онкологическое заболевание, онкологический больной, рак молочной железы (РМЖ), неопределенность, толерантность к неопределенности, личностная тревога, отношение к кризисным ситуациям

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

✉ Елена Викторовна Пестерева. E-mail: vi-lenal@mail.ru

© Пестерева Е.В., Каурова Т.В., 2025

INTRODUCTION

Every human life is marked by uncertainty in terms of future, circumstances, and personal preferences. At the same time, the modern world is characterized by growing uncertainty: over the past few decades, traditional society has become increasingly fluid [1] due to rapidly changing norms caused by a multitude of factors (an unstable international situation, a flood of negative information in the media, man-made disasters, an accelerated pace of life, the expansion of the virtual world, etc.).

The concept of “uncertainty” is generally understood as a state of unfamiliarity, ambiguity, and low predictability or foresight, as well as an event that depends on future occurrences beyond the direct control of an individual [2].

On the one hand, people possess various means of coping with uncertainty, both spontaneous (unconscious) and purposeful ones. For example, some people, when faced with uncertainty, strive to find the necessary information and calculate the probability of anticipated events; others (especially when life's problems cannot be modeled using logic and calculations) turn to inspiring stories about people who have successfully navigated trials and multifaceted uncertainty. Some people rely on the principle of “do what you must, and let the chips fall where they may” (the Roman emperor from 161 to 180 AD, the philosopher Marcus Aurelius), which implies that a person should be guided not by the experiences of others, but by their own personal values.

On the other hand, uncertainty harbors danger, and the state of uncertainty is accompanied by a wide range of negative emotions (anxiety, fear, irritation, helplessness, disappointment, etc.). In this regard, one may seek to avoid this experience. Escaping from uncertainty and unpredictability in the modern world can take many different forms, starting from religious fanaticism and anti-globalism to anxiety disorders and addictions [3].

The quality of life of modern people, their health, and well-being largely depend on their ability to cope with the uncertainty of existence. Psychological science has captured this human capacity in a construct known as “tolerance for uncertainty” [4]. Tolerance for uncertainty, as a stable personality trait, manifests in

a person's readiness to act under conditions of information scarcity and the absence of stable decision-making cues. Such a person accepts and analyzes their actual life situation, focusing on solving the problem rather than avoiding it. Tolerance for uncertainty is viewed as an attribute of a mature personality who possesses their own conscious values and is capable of building their life in accordance with them, while simultaneously respecting the values of others.

In every person's life, there may be unique, crisis situations associated with uncertainty and danger. These include oncological diseases, the primary characteristic of which is uncertainty [5]: no one can ever guarantee a cancer patient a complete recovery, and their entire future life is spent in uncertainty. The uncertainty of cancer manifests itself in patients' heightened anxiety, anticipation and fear of negative outcomes. Prolonged exposure to a state of uncertainty can lead to heightened vulnerability (both physical and psychological), depression, asthenia, insomnia, and other manifestations of a neurotic nature [6]. Experiencing uncertainty can intensify feelings of loneliness, especially if a patient believes that people around do not understand one's condition.

Unfortunately, cancer rates are rising worldwide. The most common type of cancer worldwide is lung cancer, which accounts for 12.4% of all new cancer cases each year (2.5 million); breast cancer (2.3 million cases, 11.6%), followed by colorectal cancer (1.9 million cases, 9.6%), prostate cancer (1.5 million cases, 7.3%), and stomach cancer (970,000 cases, 4.9%). The most common type of cancer among women is breast cancer: 1,250,000 new cases of breast cancer are diagnosed worldwide each year. More than 100 cases per 100,000 are registered in Belgium, Germany, and Denmark (standardized rates). In Russia, breast cancer ranks first in the incidence of malignant neoplasms (MN) among females (21.2%). Likewise, it ranks first in mortality (15.91%). At the same time, breast cancer belongs to the group of MN with the lowest mortality rate [7].

AIM

The aim is to investigate tolerance to uncertainty in patients with breast cancer.

MATERIALS AND METHODS

The study included 34 female breast cancer patients aged 34 to 59 years. Among them:

- 17 patients with breast cancer undergo initial treatment at the I.N. Napalkov St. Petersburg Clinical Scientific and Practical Center for Specialized Care (Oncology) (mean age — 48 years);
- 17 patients had successfully completed treatment for breast cancer (mean age — 45 years).

The duration of remission ranged from 1 to 5 years (mean duration — 32 months). In oncology, survival is statistically defined for up to 5 years, since after 5 years, for many tumor localizations, the patient is considered to be in stable remission. From the patient's perspective, 5 years of remission marks a milestone: "If you've lived for 5 years and everything is fine, there's a feeling that you've overcome the disease" (patient's words). Thus, the patient's life prior to 5 years is filled with fears of disease recurrence.

The selected patient groups were identical in terms of social and demographic characteristics.

The following methods were used: a clinical interview aimed at studying the specific experiences of patients during treatment and in remission, and an experimental-psychological method using the Spielberger–Hanin Anxiety Scale [8], D. McLean's General Tolerance of Uncertainty Scale (MSTAT-II) [4], and the "Attitudes Toward Life, Death, and Crisis" questionnaire [9].

RESULTS AND DISCUSSION

A study of situational and personal anxiety [4] showed that during the treatment phase, 58.8% (10 patients) of patients with breast cancer were diagnosed with a high level of situational anxiety, which is associated with immediate events during treatment. Thus, clinical interviews revealed that patients undergoing treatment typically exhibit strong emotional reactions to information about the disease and the necessity of treatment: 58.8% (10 patients) felt a sense of hopelessness and a loss of security, while 23.3% (4 patients) experienced anxiety and fear; 29.4% (5 patients) experienced various fears regarding treatment (fear of side effects, fear of being helpless). Increased anxie-

ty manifested itself in anticipation of possible treatment failure and fear of negative outcomes. Given that cancer treatment does not yield immediate results, patients felt frustration, irritation, and disappointment.

During remission, 88.2% (15 patients) were diagnosed with high levels of personal anxiety, which may be associated with uncertainty and fear of recurrence. After completing treatment, a patient worries about recurrence of the disease and the need to undergo treatment again which involves various restrictions and suffering, so that a patient tends to interpret any symptoms as a relapse. After completing treatment, a woman faces many issues related to returning to her normal life; she has questions about the future: on the one hand, she wants to return to work, but on the other, she doubts her ability to work with the same emotional and physical strain.

Some patients in remission noted that they were unable to make plans even for the immediate future — *"what's the point, if I'm going to die soon anyway?"* By doing so, they limited their lives: they were afraid to live, change jobs, take planned trips, or start new relationships. No one told them they were dying; in reality, they could live for a very long time, but the quality of their daily lives was declining. In this case, the awareness that a person is mortal leads to a fear of living. From an oncologist's perspective, a patient may be healthy, but from a psychological standpoint, she is unhealthy if she is in this state, because she is not living but awaiting the end of her life.

Breast cancer patients indicated that the degree of access to medical care, as well as family support, which is important both during treatment and after its completion, reduce anxiety and fear of recurrence. Thus, 94.1% (16 patients) of patients in remission emphasized that the support of their loved ones helped them endure the hardships of treatment.

A study on tolerance for uncertainty [4] revealed that a proportion of breast cancer patients (17.6% of patients, both during treatment and in remission) had a low level of tolerance for uncertainty (Fig. 1). Clinical interviews revealed that patients with low tolerance for uncertainty tend to deny and oversimplify their illness (*"I have the disease, but it's not that serious compared to patients in another ward,"* patient's words), as well as a tendency to use medications to reduce emotional stress (*"Afobazol is a lifesaver,"*

patient's words). Patients with low tolerance cannot cope with uncertainty and strive to avoid it by any means: for example, taking pills but not thinking about it (*"don't tell me about the bad stuff,"* patient's words).

It should be noted that patients in remission have a higher level of tolerance for uncertainty than those undergoing treatment ($p < 0.05$): patients in remission have a potential fear of recurrence, but at the time of the study, there is no real threat, and this allows them to be tolerant of uncertainty.

Breast cancer patients with a moderate level of tolerance for uncertainty (76.4% of patients during treatment, 82.4% of patients in remission) were able to accept the reality of their illness and their feelings. They were willing to analyze contradictory information about the disease, and could even prefer situations where multiple solutions were available. What allowed them to remain in a state of uncertainty and continue living? These patients noted that defining their own zone of control and responsibility in the face of illness helps them cope with the feeling of uncertainty (*"I don't need to control the disease; there are things I can control: my mood — my sensations — my pain,"* said one patient). It should be noted that cancer patients are often forced to hand over control

of their illness to doctors; some manage this better than others, which depends, among other things, on the quality of their relationship with the doctor [10]. In addition, patients pointed out the importance of learning to focus their attention on those life events, words, and moments of closeness with others that bring something good (*"Illness isn't all of life; in any situation, you need to try to look for what brings joy and peace,"* said a patient). Since it is practically impossible to wait until one can finally relax and find joy, one must do it now. One should not put life on hold, but live each moment as actively as possible, despite all difficulties. Thus, the patient gradually comes to understand that life is not the past or the future, but the present, and that it is very important to remain in the present, as well as to learn how to live in this moment.

If uncertainty as an external characteristic of reality (a cancer diagnosis, the need for prolonged and arduous treatment) is unavoidable, then subjectivity is based on a patient's perception. Challenges associated with the uncertainty of a cancer diagnosis require patients to structure their own system of life meanings and values and to accept uncertainty as an integral part of life [11].

The questionnaire "Attitudes Toward Life, Death, and Crisis Situations" [8] was used to study existential experiences of breast cancer patients. Figure 2 presents the scale scores for these patients.

The scale "acceptance of feelings regarding death" is least pronounced in patients both during treatment and in remission which destroys the illusion of immortality forever. What does the illusion of immortality consist of? Of course, everyone knows about the finitude of existence, but this applies to death in general: each of us knows that we are mortal, but we also know that this will happen sometime in the future. The illusion lies in the fact that, at the present moment, a person is immortal. For a cancer patient, this illusion is shattered: the realization that they are mortal becomes a reality right now [12]. The fear of death, being at the core of a cancer patient's psychological experiences, intensifies due to uncertain disease progression: patients do not know in advance how they will be treated, how they will tolerate therapy, or what the outcomes will be. Cancer

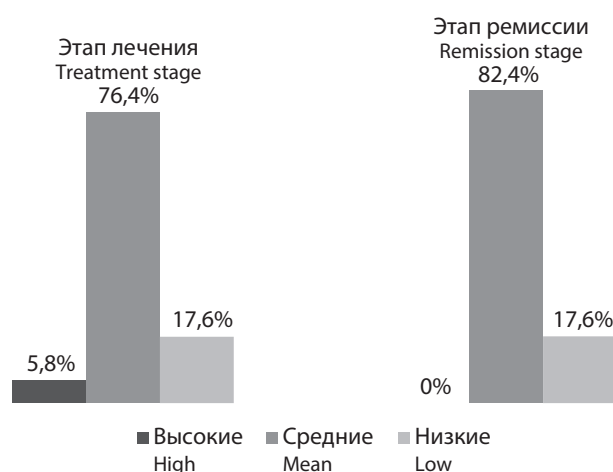


Fig. 1. Number (%) of breast cancer patients with different levels of tolerance to uncertainty at the treatment stage ($n=17$) and in disease remission ($n=17$) (the figure is developed by the authors)

Рис. 1. Количество (%) пациенток с раком молочной железы с различными уровнями толерантности к неопределенности на этапе лечения ($n=17$) и в ремиссии заболевания ($n=17$) (рисунок разработан авторами)

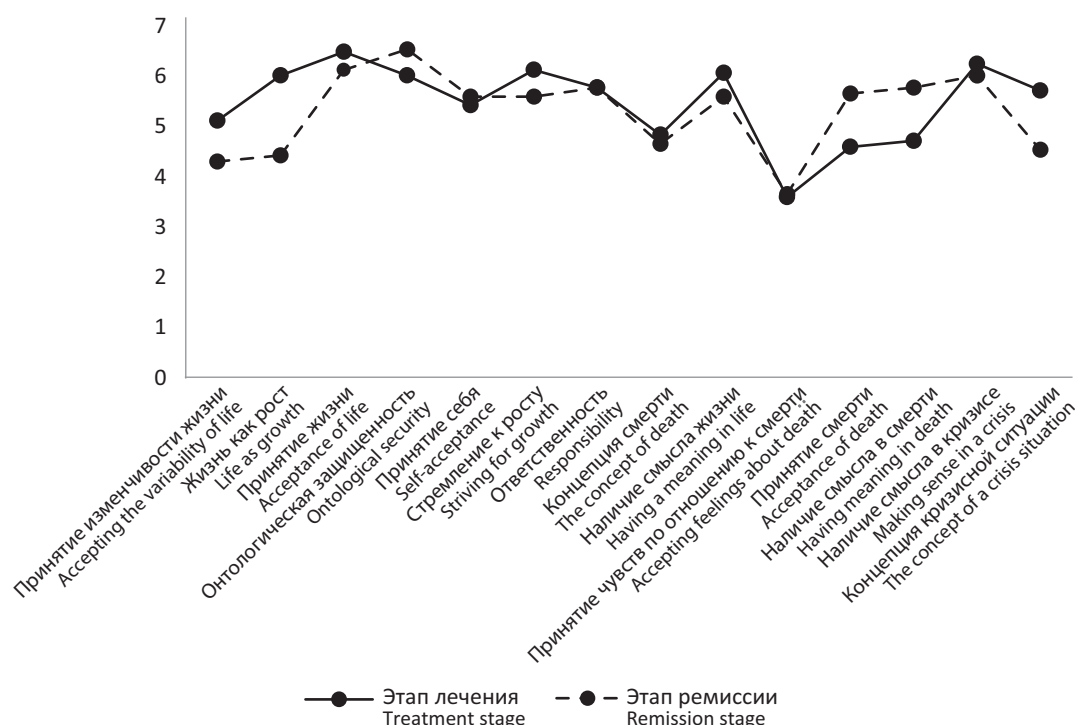


Fig. 2. The severity of the scales of the questionnaire "Attitude to life, death and crisis situations" in patients with breast cancer at the stage of treatment and in remission of the disease (the figure is developed by the authors)

Рис. 2. Выраженность шкал опросника «Отношение к жизни, смерти и кризисным ситуациям» у больных раком молочной железы на этапе лечения и в ремиссии заболевания (рисунок разработан авторами)

patients are concerned about the length of their lives, the course of the disease, and ways to care for themselves, and all these concerns are veiled by the uncertainty of tomorrow [5].

Among breast cancer patients, the "acceptance of life" scale score is predominant: 6.47 points during treatment and 6.11 points during remission. Correlation analysis revealed a direct relationship between the "acceptance of life" scale and the scales for "meaning of life" ($r=0.714$, $p<0.01$), "striving for growth" ($r=0.513$, $p<0.05$), and "acceptance of death" ($r=0.574$, $p<0.05$): acceptance of life is associated with the desire to find meaning in it, and this is linked to the acceptance of its finitude. Altogether, this indicates that patients have a need to make sense of what is happening. All patients asked themselves: "Why did I get sick? For what? For what sins?" These questions are very important for a person, as they may later transform into a search for an answer to the question: "What is the meaning of my illness?" (*Is my illness a punishment or a test?* — the patient's reflections). In everyday life, people rarely ponder the meaning of life, but when faced with the real possibility

of death, many patients began asking questions about life: "Who am I in my life? What do I want? What am I living for, or what have I lived for?" It is impossible to answer these questions without accepting your own life in its temporal aspect — acknowledging its finitude — and viewing life as a value. Clinical interviews reveal that for 76.5% (13 patients) undergoing treatment and for 47% (8 patients) in remission, the primary motivation for treatment and the desire for recovery was the motive "my life and its value."

During clinical interviews, it became clear that 23.5% (8 out of 34) of the surveyed perceived their illness as something external, as something that reduces their quality of life, and as something they must fight against; another 23.5% (8 out of 34) perceived their illness as a "punishment". 35.3% (12 out of 34) of patients asked to reflect on the question "What is the meaning of my illness?" described their illness as a "trial." For 17.6% (6 out of 34) of breast cancer patients, the disease served as a "catalyst" for reevaluating their lives (*the normal course of life has been disrupted and I can no longer live as before*, *"I don't know how to go on, but*

I can no longer be in the role I was in before,” in the patients’ own words). The disease and the uncertainty push these patients toward authenticity. They realize that every person has their own unique life, and that their own life is on the first place. It becomes crucial for a woman to live her own life, rather than one imposed by others who expect her to fulfill familiar roles.

Patients with breast cancer perceive their disease as a crisis, and this perception contributes to their resilience, regardless of the stage of the disease. Correlation analysis showed that the “Concept of a Crisis Situation” scale has a positive correlation with tolerance for uncertainty ($r=0.423$, $p<0.05$) and a negative correlation with anxiety ($r=-0.392$, $p<0.05$). A woman with breast cancer who experiences her illness as a crisis situation becomes more resilient to uncertainty, as resolving the crisis helps her advance to a higher level of understanding of herself and life in general, and she becomes more capable of managing her anxiety.

Patients in remission show a high level of “ontological security” (6.52 points). According to I. Yalom, ontological security is a primary existential feeling that provides a person with confidence and a sense of safety [13]. No one can guarantee a patient in remission a complete cure, but a person has a need for psychological comfort, as well as trust in oneself, in others, in the world, and in life as a whole. It should be noted that trust is an essential condition for existence. Without trust, no progress or development is possible.

Patients in remission show a high level of “ontological security” (6.52 points). According to I. Yalom, ontological security is a primary existential feeling that provides a person with confidence and a sense of safety [13]. No one can guarantee a patient in remission a complete cure, but a person has a need for psychological comfort, as well as trust in oneself, in others, in the world, and in life as a whole. It should be noted that trust is an essential condition for existence. Without trust, no progress or development is possible. People could not live if they did not trust life, since, in one way or another, every action, every step a person takes, every choice one makes, and every decision is determined by trust in the surrounding world. The ability to trust forms an integral part of life and is reflected in a person’s worldview. By choosing life, a person thereby acknowledges that

this life is trustworthy. It is impossible to trust life without accepting it, which includes accepting a history of cancer. Contact with the doctor and family support contribute to fulfilling the patient’s need for security.

CONCLUSION

Uncertainty is an inherent part of human existence; it is present in everyone’s life. When patients with breast cancer face a fatal diagnosis, the uncertainty of their lives becomes apparent and contributes to various fears, including the fear of recurrence, which arises despite a favorable outcome.

Breast cancer patients with moderate tolerance for uncertainty are able to accept their illness and their feelings related to it; they value life as it is and strive to live each day to the fullest. Experiencing uncertainty can prompt patients to reevaluate their own value system and motivate them to lead a more meaningful life. All of this makes a breast cancer patient more resilient to uncertainty, capable of managing anxiety and taking responsibility for her behavior within the context of the disease, but not for the course of the disease itself.

Patients with low tolerance for uncertainty tend to deny and oversimplify their life situation, including a tendency to use medication to reduce psychological and emotional stress.

Specialists caring for cancer patients must be able to navigate situations of uncertainty alongside the patient: oncologists and oncology psychologists must accept uncertainty as a part of their own lives.

ADDITIONAL INFORMATION

Authors’ contribution. E.V. Pestereva — formulation of the study hypothesis, selection of research methods, data collection and processing, and image preparation; T.V. Kaurova — literature review, writing, and editing of the manuscript.

All authors read and approved the final version before publication.

Competing interests. The authors declare that they have no competing interests.

Consent for publication. Written consent was obtained from the patient for publication of relevant medical information within the manuscript.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Пестерева Е.В. — формулировка гипотезы исследования, подбор методов исследования, сбор и обработка данных, подготовка изображений; Каурова Т.В. — проведение анализа литературных источников по теме исследования, написание текста и редактирование рукописи.

Все авторы прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

Информированное согласие на публикацию. Авторы получили письменное согласие пациентов на публикацию медицинских данных.

REFERENCES

1. Bauman Z. Fluid Modernity. Saint Petersburg: Piter; 2008. (In Russian).
2. Asmolov A.G. Psychology of Modernity: Challenges of Uncertainty, Complexity, and Diversity. *Psychological Research*. 2015;8(40):1. (In Russian). <https://doi.org/10.54359/ps.v8i40.550>.
3. Leontiev D.A. The challenge of uncertainty as a central problem in personality psychology. *Psychological Research*. 2015;8(40):2. (In Russian). <https://doi.org/10.54359/ps.v8i40.555>.
4. Leontiev D.A., Osin E.N., Lukovitskaya E.G. Tolerance to Uncertainty. D. McLane's Scales. Moscow: Smysl; 2016. (In Russian).
5. Mikhailova E.I. Radchenko S.A. Actual problems of modern psychology: oncology in orphaned children and psychosomatic disorders in early childhood. Shakhty: Avtor; 2023. (In Russian).
6. Chulkova V.A., Pestereva E.V. Clinical and psychological aspects in oncology. *Vestnik Saint Petersburg State University*. 2010;12(1):91–100. (In Russian).
7. Merabishvili V.M. The state of cancer care In Russia: breast cancer among the female population. Morbidity, mortality, index of accuracy, detailed localization and histological structure. (Population study at the federal district level. *Oncology Issues*. 2022;68(3):286–293. (In Russian). <https://doi.org/10.37469/0507-3758-2022-68-3-286-293>.
8. Karelin A. The great encyclopedia of psychological tests. Moscow: Ehksmo; 2007. (In Russian).
9. Bakanova A.A. Attitude to life, death and disease of HIV-infected 20-30 years. *Medical Psychology in*

Russia: electronic scientific journal. 2015;2(31):4. Available at: <https://cyberleninka.ru/article/n/otnoshenie-k-zhizni-smerti-i-bolezni-vich-infitsirovannyh-20-30-let/viewer> (accessed on 01.11.2025). (In Russian).

10. Pendleton D., Scofield T., Tate P., Havelock P. The doctor and the patient: The art of communication. Moscow: Praktika; 2021. (In Russian).
11. Lyubachevskaya E.A. Tolerance to uncertainty as a personal phenomenon. *Akmeologiya*. 2013;3(47):78–80. (In Russian).
12. Psychology of Crisis and Extreme Situations. Khrustaleva N.S., ed. Saint Petersburg: SPbSU; 2018. (In Russian).
13. Yalom I. Existential psychotherapy. Moscow: Klass; 1999. (In Russian).

ЛИТЕРАТУРА

1. Бауман З. Текущая современность. СПб.: Питер; 2008.
2. Асмолов А.Г. Психология современности: вызовы неопределенности, сложности и разнообразия. *Психологические исследования*. 2015;8(40):1. <https://doi.org/10.54359/ps.v8i40.550>.
3. Леонтьев Д.А. Вызов неопределенности как центральная проблема психологии личности. *Психологические исследования*. 2015;8(40):2. <https://doi.org/10.54359/ps.v8i40.555>.
4. Леонтьев Д.А., Осин Е.Н., Луковицкая Е.Г. Толерантность к неопределенности. Шкалы Д. Маклейна. М.: Смысл; 2016.
5. Михалькова Е.И. Радченко С.А. Актуальные проблемы современной психологии: онкология у детей-сирот и психосоматические расстройства в раннем возрасте. Шахты: Автор; 2023.
6. Чулкова В.А., Пестерева Е.В. Клинико-психологические аспекты в онкологии. *Вестник СПбГУ*. 2010;12(1):91–100.
7. Мерабишвили В.М. Состояние онкологической помощи в России: рак молочной железы среди женского населения. Заболеваемость, смертность, достоверность учета, детальная локализационная и гистологическая структура (популяционное исследование на уровне федерального округа). *Вопросы онкологии*. 2022;68(3):286–293. <https://doi.org/10.37469/0507-3758-2022-68-3-286-293>.
8. Карелин А. Большая энциклопедия психологических тестов. М.: Эксмо; 2007.
9. Баканова А.А. Отношение к жизни, смерти и болезни ВИЧ-инфицированных 20–30 лет. *Медицинская психология в России: электрон. научн. журн*. 2015;2(31):4. Доступен по: <https://cyberleninka.ru/article/n/otnoshenie-k-zhizni-smerti-i-bolezni-vich-infitsirovannyh-20-30-let/viewer> (дата обращения 01.11.2025).

10. Пендлтон Д., Скофилд Т., Тейт П., Хавлок П. Врач и больной: искусство общения. М.: Практика; 2021.
11. Любачевская Е.А. Толерантность к неопределенности как личностный феномен. *Акмеология*. 2013;3(47): 78–80.
12. Психология кризисных и экстремальных ситуаций. Хрусталева Н.С., ред. СПб.: СПбГУ; 2018.
13. Ялом И. Экзистенциальная психотерапия. М.: Класс; 1999.

AUTHORS' INFO

✉ **Elena V. Pestereva** — Cand. Sci. (Psychological Science), Associate Professor, Department of Psychology of Crisis and Extreme Situations, Senior Lecturer, Department of Humanities and Bioethics.

E-mail: vi-lena1@mail.ru;

<https://orcid.org/0009-0000-5790-3698>; SPIN: 5345-6932

Tatiana V. Kaurova — Cand. Sci. (Med.), Associate Professor, Department of Humanities and Bioethics.

E-mail: meditanika@gmail.com

<https://orcid.org/0009-0006-1191-2533>; SPIN: 9162-3627

ОБ АВТОРАХ

✉ **Елена Викторовна Пестерева** — к.п.н., доцент, кафедра психологии кризисных и экстремальных ситуаций, старший преподаватель, кафедра гуманитарных дисциплин и биоэтики.

E-mail: vi-lena1@mail.ru;

<https://orcid.org/0009-0000-5790-3698>; SPIN: 5345-6932

Татьяна Владимировна Каурова — к.м.н., доцент, кафедра гуманитарных дисциплин и биоэтики.

E-mail: meditanika@gmail.com

<https://orcid.org/0009-0006-1191-2533>; SPIN: 9162-3627

HISTORY OF MEDICINE

ИЗ ИСТОРИИ МЕДИЦИНЫ

Original papers

UDC 929:61(091)+614.25+355.415.6+617-089+355.72

<https://doi.org/10.56871/MHCO.2026.53.63.011>

V.F. Voyno-Yasenetsky (Saint Luke) as an organizer of healthcare during the Great Patriotic War of 1941–1945

Ekaterina I. Kalikinskaya

Museum of St. Luke (V.F. Voyno-Yasenetsky) in Pereslavl-Zalessky, 85 Moskovskaya str., Pereslavl-Zalessky, 152021, Russian Federation

For citation: Kalikinskaya E.I. V.F. Voyno-Yasenetsky (Saint Luke) as an organizer of healthcare during the Great Patriotic War of 1941–1945. *Medicine and Health Care Organization*. 2025;10(4):119–128. <https://doi.org/10.56871/MHCO.2026.53.63.011>.

Received: 20.10.2025

Revised: 03.12.2025

Accepted: 28.01.2026

ABSTRACT. Valentin Feliksovich Voyno-Yasenetsky, glorified in 2000 at the Council of New Martyrs and Confessors of the Russian Church as Saint Luke of Crimea, is world known as a outstanding surgeon and a prominent scientist, and was also a talented organizer of healthcare system. In 1923, after being ordained a bishop of the Russian Orthodox Church, he was declared an “enemy of the people” and had for many years suffered persecution, been imprisoned, sent to camps, and three exiles. After the end of his last exile in 1943, he nevertheless remained under suspicion and was actually under the control of the People’s Commissariat of Internal Affairs (PCIA) until the last days of his life. So, the conditions in which he had to demonstrate his qualities as a talented leader were not in the least favorable. Despite this, he managed to do a lot to organize healthcare processes during the years of Soviet power — first in the Krasnoyarsk Territory, then in Tambov. The article examines the facts of the biography of V.F. Voyno-Yasenetsky, related to the sphere of health care organization in 1941–1946. In the last decades of his life at the Crimean cathedra, despite the awarded title of Stalin laureate, V.F. Voyno-Yasenetsky (Saint Luke) was deprived of the opportunity to influence the medical community due to ideological divergence of views with the Soviet government and concentrated entirely on church service.

KEYWORDS: Healthcare organization, Great Patriotic War medicine, evacuation hospitals, surgeon Voyno-Yasenetsky, Saint Luke

Funding. This study was not supported by any external sources of funding.

✉ Ekaterina I. Kalikinskaya. E-mail: ek.selena@yandex.ru

© Kalikinskaya E.I., 2025

<https://doi.org/10.56871/МНСО.2026.53.63.011>

В.Ф. Войно-Ясенецкий (святитель Лука) как организатор здравоохранения в годы Великой Отечественной войны 1941–1945 гг.

Екатерина Игоревна Каликинская

Музей святителя Луки (В.Ф. Войно-Ясенецкого) в Переславле-Залесском, 152021, г. Переславль-Залесский, ул. Московская, д. 85, Российская Федерация

Для цитирования: Каликинская Е.И. В.Ф. Войно-Ясенецкий (святитель Лука) как организатор здравоохранения в годы Великой Отечественной войны 1941–1945 гг. *Медицина и организация здравоохранения*. 2025;10(4):119–128. <https://doi.org/10.56871/МНСО.2026.53.63.011>.

Поступила: 20.10.2025

Одобрена: 03.12.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. Валентин Феликсович Войно-Ясенецкий, прославленный в 2000 году в Соборе новомучеников и исповедников церкви русской как святитель Лука Крымский, известный во всем мире как гениальный хирург и крупный ученый, был также талантливым организатором здравоохранения. В 1923 году, после принятия сана епископа Русской православной церкви, он был объявлен «врагом народа» и долгие годы подвергался гонениям: побывал в тюрьмах, лагерях и трех ссылках. После окончания последней ссылки в 1943 году он оставался под подозрением и до последних дней жизни находился под контролем органов Народного комиссариата внутренних дел. Так что условия, в которых ему пришлось проявлять свои качества руководителя большого масштаба, были не самыми благоприятными. Несмотря на это, ему удалось немало сделать для организации процессов здравоохранения в годы Великой Отечественной войны — сначала в Красноярском крае, потом в Тамбове. В статье впервые рассматриваются факты биографии В.Ф. Войно-Ясенецкого, относящиеся к сфере организации здравоохранения в 1941–1946 гг. В последние десятилетия своей жизни на Крымской кафедре, несмотря на звание Сталинского лауреата, В.Ф. Войно-Ясенецкий (святитель Лука) был лишен возможности влиять на медицинское сообщество из-за мировоззренческих расхождений с советской властью и сосредоточился только на церковном служении.

КЛЮЧЕВЫЕ СЛОВА: организация здравоохранения, медицина Великой Отечественной войны, эвакуационные госпитали, хирург Войно-Ясенецкий, святитель Лука

Источник финансирования. Автор заявляет об отсутствии внешнего финансирования при проведении исследования.

✉ Екатерина Игоревна Каликинская. E-mail: ek.selena@yandex.ru

© Каликинская Е.И., 2025

CHIEF CONSULTANT OF HOSPITALS IN THE KRASNOYARSK REGION

After Valentin Feliksovich Voino-Yasenetsky was ordained in 1921 and became a bishop two years later, his life turned into a continuous series of arrests, prison terms, labor camps, and exile. The department in Tashkent, which he founded in 1920, was taken over after Bishop Luke's arrest by G.I. Ilyin, and later by Professor F.I. Val'ker, a graduate of the Military Medical Academy in St. Petersburg [1].

Only in 1941 Valentin Feliksovich got the opportunity both to practice his beloved surgery under appropriate conditions and to make a significant contribution to the organization of healthcare. He did so in the Krasnoyarsk Region, while serving his third exile. In June 1941, shortly after the start of the Great Patriotic War, the surgeon-episcopal priest went to see P. Musalnikov, the first secretary of the Bolshemurtinsky District Party Committee, demanding to be sent to a hospital to treat the wounded. When his efforts came to nothing, Valentin Feliksovich began sending telegrams to state leaders and prominent figures in the country's healthcare system, offering to put his experience and knowledge to use in treating soldiers [2]. Such a telegram, in which the exile addressed high-ranking government officials (M.I. Kalinin, for example), stating that his expertise in treating purulent wounds should serve the country and wounded soldiers, and at the end of which he promised to return to exile after the war ended, likely caused quite a stir. But such was the character of Valentin Feliksovich, Bishop Luka. He spoke the most important things directly, to the point, without regard for any obstacles.

Why did they say yes? It's hard to say for sure now. We think it's quite possible that N.N. Burdenko, who had worked with infected wounds and was familiar with V.F. Voino-Yasenetsky's 1934 monograph "Essays on Surgical Treatment of Infected Wounds", played a role. Nikolai Nilovich may have consulted with Kalinin, with whom he often communicated, and confirmed the value of such work for doctors and patients, highly praising his colleague's professionalism.

In any case, permission was granted, and on September 30, 1941, Valentin Feliksovich was flown from Bolshaya Murta to Krasnoyarsk. In those years, the evacuation hospitals (EH) of the People's Commissariat of Health were grouped

into local evacuation centers (LEC), typically located within a single region or several regions. Valentin Feliksovich was assigned to LEC-49.

Evacuation hospitals located behind the front lines bore the main burden of treating the wounded. Over the years, the proportion of evacuation hospital beds located in the rear ranged from 34.8 to 68.1% of the total number of hospital beds, which were available at the hospital bases of the armies, fronts, and the People's Commissariat of Health's evacuation hospitals. There were enough buildings in the rear that could be easily converted into hospitals. Up to 60% of evacuation hospitals were housed in schools [3]. Valentin Feliksovich's main workplace became Hospital No. 1515, which was housed in four buildings. Building No. 2, where surgeon V.F. Voino-Yasenetsky lived and worked, was located in School No. 10 on Lenin Street. On October 20, 1941, the hospital housed 800 beds; on December 15, 1941, the hospital's capacity was increased to 1,000 beds, after which the number slowly grew¹.

It must be said that this was an extraordinary figure. In 1941, the average capacity of a military hospital was 350 beds; by 1944, as a result of organizational measures, it had reached 500 beds [3].

Most of Chief Surgeon Voino-Yasenetsky's workday was spent in a four-story building with a spacious courtyard, central heating, running water, and a local sewer system (Fig. 1). The pharmacy and X-ray room were located in another building.

When the bishop-surgeon began his work, the total number of medical and service personnel at Hospital No. 1515 was 350 people, including 28 doctors. There were only five surgeons among them, and not all of them were capable of performing serious operations².

In December 1941, the hospital director, Third-Rank Military Doctor Tyschenko, reported: "The most difficult circumstance is that the most critically ill and sometimes hopeless patients from all the evacuation hospitals in the city are being sent to our hospital, which, given our small staff of nursing personnel, makes it very difficult to care for other patients. We have no stretchers to transport patients from wards to the operating room... no boxes for storing blood.

¹ Central Archives of the Ministry of Defense (TsMAO), f. 974, op. 49575, e.h. 1.

² Ibid.



Fig. 1. Corridor of the second building of Hospital No. 1515 (School No. 10) in Krasnoyarsk, the surgeon V.F. Voyno-Yasenetsky, Bishop Luka's main place of work (1941) (photo from the museum of School No. 10 in Krasnoyarsk)

Рис. 1. Коридор второго корпуса госпиталя № 1515 (школы № 10) в Красноярске, где было основное место работы хирурга В.Ф. Войно-Ясенецкого, епископа Луки (1941 год) (фото из музея школы № 10 г. Красноярска)



Fig. 2. Unloading the wounded patients at the train station in Krasnoyarsk (1942) (photo from the museum of School No. 10 in Krasnoyarsk)

Рис. 2. Выгрузка раненых на вокзале в Красноярске (1942 год) (фото из музея школы № 10 г. Красноярска)

There are no instruments for cranial surgery. Three buildings lack quartz burners”.¹

Work began under such conditions...

Bringing in an outstanding surgeon who also had experience as a healthcare administrator gave the hospital a great opportunity to raise the standard of medical care for the wounded. Valentin Feliksovich managed to expand operations significantly. He worked with complete dedication and demanded the same from his staff. All the hospital's resources were devoted to providing the most effective care to as many patients as possible. The most critically wounded

and ill patients from other field hospitals in the city, those whom other doctors considered hopeless, were sent to Field Hospital No. 1515, where V.F. Voyno-Yasenetsky was in charge. He also received the most severely wounded and sick who arrived in Krasnoyarsk on medical trains from the front. They were triaged directly on the railway platform (Fig. 2).

Memoirs by T.P. Sizykh, “A Contemporary of a Turbulent Era”, dedicated to the life of N.A. Branchevskaya, the chief medical officer of Hospital No. 1515, describe this process: “The chief physician had to organize the reception of the wounded, their unloading from the train cars, sorting, and delivery to all four wards of the hos-

¹ TsAMO, f. 974, op. 69646, e.h. 2.

pital... by truck or horse-drawn cart... Unloading the medical train required people, and plenty of them. We received a telegram informing that the medical train was on its way even before it arrived at Krasnoyarsk Station. After that, we contacted paramedic and midwifery school at night, and the heads... and wards of the evacuation hospital during the day, so they would send people to the station. All the mobilized personnel went to the station to unload the wounded and transport them to the hospital. A medical screening officer (paramedic) was dispatched from the hospital, along with doctors... who were not busy with surgeries... on a personal assignment from Professor V.F. Voyno-Yasenetsky, to identify all severely wounded patients with injuries to major joints and pelvic bones, as well as the chest, since only the professor could operate them. Therefore, from all the medical trains arriving from the front, these wounded were taken out of the heated railcars and... concentrated at School No. 10. The fulfillment of this task was mandatory and strictly enforced. Only a small number of such wounded happened to end up in other hospitals in Krasnoyarsk. Then the doctors at these hospitals would summon Professor V.F. Voyno-Yasenetsky, the chief consultant for all evacuation hospitals in Krasnoyarsk, who would examine the wounded soldier and, as a rule, transfer him to... School No. 10" [4].

Evacuation Hospital No. 1515 surpassed all other medical facilities not only in terms of the number of wounded. Its structure changed completely after V.F. Voyno-Yasenetsky took office as chief surgeon. The hospital, which was originally a general surgery facility, began admitting wounded soldiers with severe injuries to the joints, skull, and chest, as well as those with purulent complications [1]. By May 1942, the hospital was already performing surgeries on patients with trauma, neurosurgical, and urological conditions, as well as on soldiers with chest injuries (Fig. 3).

According to S.V. Kozhevnikov, the hospital also housed a medical-aviation commission within a medical aviation unit, which made decisions regarding transporting the most severely wounded from hospitals in the Krasnoyarsk Region to the chief surgeon. In addition, V.F. Voyno-Yasenetsky referred patients from Hospital No. 1515 to specialized hospitals: for example, patient G.I. Ilyin, who had shrapnel wounds to his chin and lower jaw, was transferred

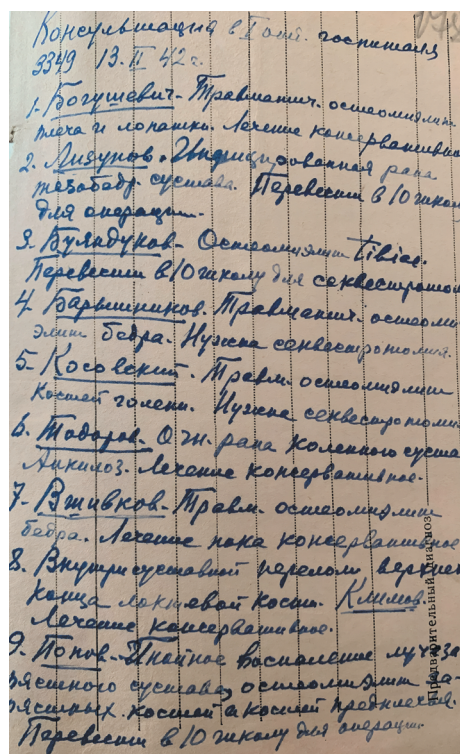


Fig. 3. Fragment consultations held by Professor Voyno-Yasenetsky at the State Archives of Krasnoyarsk Krai. Photo by the author, 2025

Рис. 3. Фрагмент консультации профессора Войно-Ясенецкого в Государственном архиве Красноярского края. Фото автора, 2025 год

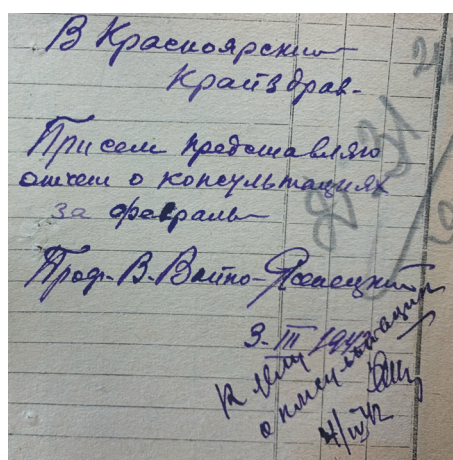


Fig. 4. Title page of the report to the Regional Health Department by Professor V.F. Voyno-Yasenetsky for February 1942 at the State Archives of Krasnoyarsk Krai. Photo by the author, 2025

Рис. 4. Титульный лист отчета в Крайздрав профессора В.Ф. Войно-Ясенецкого за февраль 1942 года в Государственном архиве Красноярского края. Фото автора, 2025 год

by his order to the maxillofacial hospital, while patient S.E. Alekseev was sent for treatment to Field Hospital No. 3343 to see the surgical oncologist Rakhtangov [5].

To develop a new surgical approach, Valentin Feliksovich had to conduct not only clinical studies but also experimental research on cadavers. At Hospital No. 1515, 20 autopsies were performed over a nine-month period in 1942. For this purpose, Professor Voyno-Yasenetsky insisted on hiring a part-time pathologist whose duties included “performing autopsies on all cadavers from the city’s hospitals” [6]. Subsequently, these observations supplemented the second edition of “Essays on Purulent Surgery” and formed the basis for a new, extremely effective method of surgical treatment for gunshot wounds of large joints, described by Valentin Feliksovich in his work “Late Resections in Infected Gunshot Wounds of the Joints”. This monograph was published in 1944. The surgeon’s medical achievements were applied in practice from the early years of the war, long before official publication, as evidenced by reports on the activities of hospitals in the Krasnoyarsk Territory (Fig. 4), where these methods are listed in the “Scientific Work” section [5].

Some time later, a commission led by N.N. Pri-
orov, Chief Surgeon of the People’s Commissariat of Health of the RSFSR, visited the hospital and rated the surgical work very highly, despite the noted shortcomings: a shortage of ether and other anesthetics, insufficient qualifications of mid-level and lower-level staff, and a lack of

bone graft material. “In conclusion regarding the organization of surgical work at the hospital, and especially in Ward No. 2, it should be noted that it is organized to a high standard, as was noted by the Chief Surgeon of the People’s Commissariat of Health hospitals” [7].

Professor Voyno-Yasenetsky was committed to improving the knowledge and skills of young specialists. He delivered a series of lectures at the hospital on the treatment of infected wounds, joint injuries, new methods of anesthesia, and implementing a unified treatment protocol. Surgeons from other hospitals also came to him for training and to share their experience. The headquarters of the Siberian Military District issued an order to the heads of hospitals throughout the Krasnoyarsk Territory: to send their surgeons to Hospital No. 1515 for advanced training. According to S.V. Kozhevnikov, approximately 50 doctors attended Professor Voyno-Yasenetsky’s course over six months. Lectures were held on Mondays; hospital directors were specifically prohibited from granting doctors time off on Mondays. In addition, Valentin Feliksovich participated in the training of rural doctors. In some cases, he traveled to remote corners of the Krasnoyarsk Region to give lectures or consult on complex cases, and, when necessary, to perform surgeries [5]. A copy of the order dated April 26, 1943, signed by T.M. Astafieva, head of the Krasnoyarsk Regional Health Department, has been preserved. The order states that Professor Voyno-Yasenetsky was assigned to the surgical department of the consulting bureau to “improve



Fig. 5. Bishop-surgeon with the hospital medical staff No. 1515

Рис. 5. Епископ-хирург с медицинским персоналом госпиталя № 1515

the quality of medical and sanitary services for the rural population and provide practical assistance to rural doctors”.

In 1943, at Valentin Feliksovich's initiative, three doctors were sent to the Novosibirsk Institute for the Advanced Training of Physicians for a course in surgery, while two doctors underwent training in traumatology in Krasnoyarsk (Fig. 5).

The district surgical conference of the Siberian Military District in Novosibirsk on March 24–29, 1943, marked an important milestone for the surgeon and his students. V.F. Voyno-Yasenetsky participated in the conference, having arrived with his students and R.A. Branitskaya, head of the Krasnoyarsk District Health Department. He delivered a presentation on the treatment of gunshot osteomyelitis. In a letter to his son, Valentin Feliksovich wrote: “They listened with delight, with deep attention, and demanded a continuation. They called the report not only profound but also wise... people came up from all sides to introduce themselves” [8].

Professor Voyno-Yasenetsky generously shared his findings with his students, encouraging their scientific work in every way. It was important to him to train not only practically experienced but also thoughtful surgeons. When, in February 1944, the surgeon-bishop left Krasnoyarsk due to his transfer to the Tambov department, he left behind a perfectly organized and efficiently functioning hospital with a team of female surgeons he had trained.

This is evidenced by a report dated August 11, 1944, found in the archives, compiled by Hospital Director Vernikovskiy covering the first three years of Hospital No. 1515's operation. It reports that during the past period, a total of 8,012 wounded were treated at the hospital, and 2,384 people (29.75%) were returned to their units. There were 94 deaths (1.17%) during the entire period [7].

After the departure of the outstanding surgeon, surgical performance indicators declined slightly but generally remained at a high level.

CHIEF SURGEON OF THE HOSPITALS IN THE TAMBOV REGION

In February 1944, surgeon Voyno-Yasenetsky, who had already become Archbishop Luke, was transferred to Tambov. The medical community of Tambov welcomed him very warmly. A directive issued by A.S. Gasparyan, head of the Regional Health Department, to A.A. Avetisov,

head of Hospital No. 5953, instructed that he must create the most favorable conditions for the newly arrived senior surgeon. The surgeon quickly launched a massive effort in the hospitals. Bishop Luke immediately began working actively with several surgical teams where there was a shortage of experienced surgeons. In the first half of 1944, in less than five months of work, the chief surgeon performed 507 surgical procedures, which was six times more than before his arrival [9]. Patient mortality also dropped sharply. Alongside his work in the hospitals, the professor began consulting at hospitals and seeing patients at the regional hospital's outpatient clinic. Archbishop Luke wrote at that time: “Work in the hospitals is going excellently; a monograph on the treatment of chronic gunshot-induced pleural empyema is taking shape. I am giving lectures to doctors on suppurative arthritis. There are almost no days off” [8].

Professor V.F. Voyno-Yasenetsky participated in the 5th Congress of Physicians in Tambov. He opened the morning session on September 27, 1945, with a report titled “Sepsis, Its Forms, Pathogenesis, Clinical Picture, and Therapy”, and was later invited to the Final Republican Conference of the Ministry of Health's Evacuation Hospitals on January 26–30, 1946 [9].

However, the bishop-surgeon no longer took an active part in organizational or educational activities. With his enormous workload, it was already difficult for him to divert his attention from surgical work. Moreover, he was not always able to secure even adequate conditions for his work. A document has been preserved, written by V.F. Voyno-Yasenetsky to the head of the regional health department, A.S. Gasparyan, on March 19, 1944, in which the consulting professor intercedes on behalf of doctors Popkova and Mazurkevich, asking that they not be dismissed and that they be allowed to remain at the hospital. “I ask you not to deprive me of doctors Popkova and Mazurkevich, who are already working under very difficult conditions and are extremely useful and necessary to me for assisting with surgeries and managing critically ill postoperative patients. During their time at the hospital, both have shown an interest in surgery and have significantly improved their skills in it. Without them, the work at the hospital, which the doctors are already barely managing, will suffer greatly. Professor V. Voyno-Yasenetsky” [10]. However, his request was not granted.

P.V. Bystrova, head of the autopsy department at the Tambov Regional Hospital, recalled that the archbishop-surgeon's contributions were not officially recognized, and the reason was his active involvement in the revival of the church. She personally knew His Eminence during years of work in Tambov and believed that he had been denied the title of "Honored Physician of the RSFSR", which was awarded by the Tambov Regional Committee of the All-Union Communist Party (Bolsheviks) and the Regional Executive Committee — in a completely unjust, yet quite demonstrative manner. On April 11, 1945, some Tambov doctors, who were far inferior to him in terms of medical expertise, were awarded this title, but Archbishop Luke was excluded for ideological reasons. Moreover, the awarding of the medal "For Valiant Labor in the Great Patriotic War of 1941–1945" which was approved by the Tambov Regional Council of Workers on December 20, 1946, was an act of disrespect rather than an honor. There is evidence from eyewitnesses that the bishop himself was offended by such an award and remarked that it was worthy of lower-ranking medical personnel, while his students had been awarded Orders for their work [9].



Fig. 6. Bust of Stalin Prize laureate Professor V.F. Voyno-Yasenetsky, Archbishop Luke, in front of the house-museum of St. Luke in Tambov. Photo by the author, 2024

Рис. 6. Бюст Сталинского лауреата профессора В.Ф. Войно-Ясенецкого, архиепископа Луки, перед домом-музеем святителя Луки в г. Тамбове. Фото автора, 2024 год

However, the saint had another sphere where he felt he had reached a new pinnacle in life: by his own admission, it was in Tambov that he fully felt himself to be a bishop (Fig. 6). Church affairs came to the forefront for him. Leading the diocese and maintaining relations with a newly established institute of commissioners for religious affairs took up much of his energy and time [11].

His award of the Stalin Prize in Medicine, First Class, in 1946, and the immense fame he gained both in the country and abroad, one might think, should have changed this situation. But his hopes were not fulfilled. The relationship between the authorities and the Stalin Prize laureate was finally settled in Crimea, when the archbishop was invited to take up the Cathedra of Simferopol.

AT THE CRIMEAN CATHEDRA: BISHOP OR SURGEON?

During his first months in Crimea, the bishop often mentioned that he was a recipient of the Stalin Prize and that the government held him in high regard. He also expressed a firm intention to continue his medical practice. But in early October 1946, the Stalin Prize laureate was prevented from attending the 25th All-Union Congress of Surgeons. The Archbishop had received an invitation to this congress even while he was on his way to Crimea. He had been personally invited by the Deputy Minister of Health of the USSR, Professor N.N. Priorov, who held his scientific and surgical work in high esteem. Two weeks before the congress, Priorov sent a letter to Archbishop Luke informing him that the official invitation had been sent. The archbishop-surgeon was eagerly preparing for the trip and had even purchased plane tickets. However, the Regional Health Department, having received a telegram on September 27 regarding the archbishop-surgeon's assignment to the congress, did not deliver it to His Eminence until October 2. The Stalin Prize laureate was no longer able to attend the congress [12].

The award ceremony in an official setting did little to change the situation. On December 2, 1947, at 2:00 p.m., D.A. Krivoshein, accompanied by his deputies and other members of the Executive Committee, as well as a representative of the newspaper "Krasny Krym," awarded Professor V.F. Voyno-Yasenetsky a diploma, a gold badge, and a certificate of the Stalin Prize laureate. Archbishop Luke arrived at the ceremony in his episcopal vestments, graciously thanked the Soviet

government, and proposed giving a series of lectures for local surgeons. Permission was granted, and sometime later, at the Congress of Crimean Physicians, Saint Luke delivered a lecture on surgery. The congress participants were very pleased and expressed their gratitude to him. On March 17, 1947, at the request of the City Health Department, a public lecture by the archbishop-surgeon was organized for doctors in Feodosia. At this lecture, dedicated to the treatment of carbuncles, he was not understood by his colleagues; the method he had developed together with the Arkhangelsk healer Valneva was declared by the doctors to be “quackery,” even though the surgeon had previously tested it at the Tashkent clinic. Authorities took advantage of this misunderstanding to gradually discredit the archbishop in academic circles. At first, invitations to participate in the medical community poured in from all sides. On April 24, 1947, for example, he delivered a major one-and-a-half-hour lecture at the Officers’ Club for military doctors, attended by 150 people. Prior to that, there had been five other major lectures. The archbishop hoped to begin a full series of lectures on purulent surgery for doctors in Simferopol.

The chairman of the regional executive committee, D.A. Krivoshein, granted permission for this.

Professor Potapov, Professor in a medical institute, a communist and secretary of the local party organization, was assigned to organize the event. Naturally, Potapov was not pleased with this. Together with his wife, who was a surgeon as well, he began to turn other professors against the archbishop, pointing out that it was unacceptable to give lectures while wearing a cassock.

When Archbishop Luke was giving a lecture at the Third Clinical Hospital, all the professors demonstratively left the hall during a break.

Although some doctors still asked Potapov whether the award-winning surgeon would continue to give lectures, he replied: “No, he will not, and if he does, only when he takes off his cassock and stops wearing a cross”. The archbishop responded to these demands: “Why do they care about my cassock? Does it really matter what I’m wearing? I’m not lecturing doctors on theology, but only on matters of surgery” [13]. Soon he ceased to have official contact with the medical community...

On January 17, 1949, Archbishop Luke wrote a letter to an old acquaintance from Pereslavl, Dr. Mikhail Grigorievich Molyakov, in which he unequivocally expressed his attitude toward the situation. “You, Mikhail Grigoryevich, have

forgotten that Dr. Valentin Feliksovich died in 1923, and in his place, by God’s grace, Archbishop Luke lives. No matter how important Valentin Feliksovich’s surgical and scientific work was, the work of His Eminence Luke is more important and fruitful. Before I arrived, there were no more than 10 worshippers at the Simferopol Cathedral on weekdays, but now there are 250. On Sundays the cathedral is full, and on major holidays, when it is extremely crowded, many are forced to stand in the courtyard. Glory to God!” [12]. Thus, at the end of his life, the 71-year-old archbishop-surgeon unequivocally chose church activities and never returned to matters of healthcare organization.

ADDITIONAL INFORMATION

The author read and approved the final version before publication.

Competing interests. The author declares the absence of obvious and potential conflicts of interest related to the publication of this article.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Автор прочитал и одобрил финальную версию перед публикацией.

Конфликт интересов. Автор декларирует отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

REFERENCES

1. Archpriest George. Greetings from Saint Luke, the beloved physician. Saint Petersburg: Nauka; 2009. (In Russian).
2. Kozhevnikov S.V. Krasnoyarsk period (1941–1945) of the life and work of St. Luke (surgeon V.F. Voyno-Yasenetsky). Krasnoyarsk: Polikor; 2020. (In Russian).
3. Bobiy B.V., Goncharov S.F. On Issue of Creation and Activity of Evacuation Hospitals of People’s Commissariat of Health of USSR during Great Patriotic War of 1941–1945. *Disaster Medicine*. 2020;(2):5–16. (In Russian). <https://doi.org/10.33266/2070-1004-2020-2-5-16>.
4. Sizykh T.P. The Same Age as the Dashing Century (a Personal Biographical Narrative). Krasnoyarsk: PIK Offset; 2015. (In Russian).
5. Kozhevnikov S.V. Siberian Periods of the Life and Work of St. Luke (Surgeon V.F. Voyno-Yasenetsky). 1924–1926; 1940–1944. Krasnoyarsk: Polikor; 2024. (In Russian).
6. Kozhevnikov S.V. Krasnoyarsk Evacuation Hospital No. 1515 — the Center of Military Field Surgery of the

- Country in 1941–1943. *Bulletin of SUSU. Series “Social and Humanitarian Sciences”*. 2018;18(2):14–18. (In Russian). <https://doi.org/10.14529/ssh180202>.
7. Kalikinskaya E.I. V.F. Voyno-Yasenetsky — leading surgeon of Krasnoyarsk evacuation hospital No. 1515 during the Great Patriotic War. *Military Medical Journal*. 2019;(6):83–89. (In Russian). EDN: BOZPGG.
 8. Popovsky M.A. Life and Habits of St. Luke Voyno-Yasenetsky, Archbishop and Surgeon. Saint Petersburg: Satis; 2013. (In Russian).
 9. Lisyunin V.F., Archpriest. Revival of the Tambov diocese during the years of the service of St. Luke (Voyno-Yasenetsky): Based on state, departmental, and private archives. MD dissertation. Theological Sciences. Tambov; 2019. (In Russian).
 10. Abramova G.A., Archpriest V. Lisyunin. Accept My Love. The Tambov Period of St. Luke’s Service: Research, Documents, and Memories. Tambov: Studiya pechati Galiny Zolotovoy; 2022. (In Russian).
 11. Chebotarev S.A. Restless People. Tambov: Derzhavinskiy; 2025. (In Russian).
 12. Archpriest Nikolai Donenko, Filimonov S.B. “We continue to develop Luka...” Saint Luka (Voyno-Yasenetsky) and the Crimean diocese. 1946–1961. Collection of documents. Moscow: Sretensky Monastery Publishing House; 2011. (In Russian).
 13. Archpriest Nikolai Donenko, Zamtaradze R.A., Filimonov S.B. Crimean diocese in the documents of Saint Luka (Voyno-Yasenetsky) and supervisory bodies 1946–1961. Simferopol: N. Orianda; 2015. (In Russian).
 4. Сизых Т.П. Ровесница лихого века (личностно-биографическое повествование). Красноярск: ПИК Офсет; 2015.
 5. Кожевников С.В. Сибирские периоды жизни и деятельности святителя Луки (хирурга В.Ф. Войно-Ясенецкого). 1924–1926; 1940–1944. Красноярск: Поликор; 2024.
 6. Кожевников С.В. Красноярский эвакогоспиталь № 1515 — центр военно-полевой хирургии страны в 1941–1943 гг. *Вестник ЮУрГУ. Серия «Социально-гуманитарные науки»*. 2018;18(2):14–18. <https://doi.org/10.14529/ssh180202>.
 7. Каликинская Е.И. В.Ф. Войно-Ясенецкий — ведущий хирург Красноярского эвакогоспиталя № 1515 в годы Великой Отечественной войны. *Военно-медицинский журнал*. 2019;(6):83–89. EDN: BOZPGG.
 8. Поповский М.А. Жизнь и житие святителя Луки Войно-Ясенецкого, архиепископа и хирурга. Санкт-Петербург: Сатис; 2013.
 9. Лисюнин В.Ф., протоиерей. Возрождение Тамбовской епархии в годы служения святителя Луки (Войно-Ясенецкого): на материале государственных, ведомственных и частных архивов. Дисс. ... канд. богословских наук. Тамбов; 2019.
 10. Абрамова Г.А., протоиерей Лисюнин В. Примите мою любовь. Тамбовский период служения святителя Луки: исследования, документы воспоминания. Тамбов: Студия печати Галины Золотовой; 2022.
 11. Чеботарев С.А. Беспокойные люди. Тамбов: Державинский; 2025.
 12. Протоиерей Николай Доненко, Филимонов С.Б. «Разработку Луки продолжаем...» Святитель Лука (Войно-Ясенецкий) и Крымская епархия. 1946–1961 гг. Сборник документов. М.: Изд-во Сретенского монастыря; 2011.
 13. Протоиерей Николай Доненко, Замтарадзе Р.А., Филимонов С.Б. Крымская епархия в документах святителя Луки (Войно-Ясенецкого) и надзирающих органов 1946–1961 гг. Симферополь: Н. Орианда; 2015.

ЛИТЕРАТУРА

1. Протоиерей Георгий. Приветствует вас Святитель Лука, врач возлюбленный. СПб.: Наука; 2009.
2. Кожевников С.В. Красноярский период (1941–1945) жизни и деятельности святителя Луки (хирурга В.Ф. Войно-Ясенецкого). Красноярск: Поликор; 2020.
3. Бобий Б.В., Гончаров С.Ф. К вопросу о создании и деятельности Наркомздава СССР в годы Великой Отечественной войны 1941–1945 гг. *Медицина ката-*

AUTHORS’ INFO

✉ **Ekaterina I. Kalikinskaya** — Cand. Sci. (Biol.), Director of the Museum of St. Luke in Pereslavl-Zalessky
E-mail: ek.selena@yandex.ru;
<https://orcid.org/0009-0000-1665-6029>; SPIN: 1248-4356

ОБ АВТОРАХ

✉ **Екатерина Игоревна Каликинская** — к.б.н., директор музея святителя Луки Крымского в Переяславле-Залесском. E-mail: ek.selena@yandex.ru;
<https://orcid.org/0009-0000-1665-6029>; SPIN: 1248-4356

Original papers

UDC 341.485+172.4+341.322.5+159.947.5+378.6
<https://doi.org/10.56871/MHCO.2026.98.90.012>

No statute of limitations: postmemory of Nazi crimes. For the 80th anniversary of the Nuremberg trial

*Galina L. Mikirtichan, Lyubov N. Lisenkova, Daniil A. Fedorov, Sergey S. Komarov,
Vladislava I. Makeeva, Kirill A. Pavlenko*

Saint Petersburg State Pediatric Medical University, 2 Litovskaya str., Saint Petersburg, 194100, Russian Federation

For citation: Mikirtichan G.L., Lisenkova L.N., Fedorov D.A., Komarov S.S., Makeeva V.I., Pavlenko K.A. No statute of limitations: postmemory of Nazi crimes. For the 80th anniversary of the Nuremberg trial. *Medicine and Health Care Organization*. 2025;10(4):129–142. <https://doi.org/10.56871/MHCO.2026.98.90.012>.

Received: 14.10.2025

Revised: 10.12.2025

Accepted: 28.01.2026

ABSTRACT. The problem of preserving historical memory and protecting the historical past from falsifications and oblivion is becoming increasingly relevant in modern conditions. The historical education of young generations is particularly important in this regard. Within the limits of Russian nationwide education project of Ministry of Education of the Russian Federation “Without a statute of limitations” the team of authors organized the testing of Saint Petersburg State Pediatric Medical University students. The point of the testing was to identify the level of students’ theoretical awareness about the Nuremberg trial. 830 students of the first and the second year of education in various degree programs took part in the test. Overall test results can be considered successful. Nevertheless the study manifested that the second year students showed worse test results than the freshmen. The team of authors suggests that this result is due to the high workload of second-year students and their interest in learning their specialty subjects and the relevant disciplines, as well as declining interest in history and other socio-humanitarian disciplines. Accordingly, one of the main tasks of historical education in secondary and higher education should be not only to assimilate contextual historical knowledge, but also to form a deep internal motivation to study the history of the Homeland. Otherwise, acquired knowledge will not become part of historical memory and will eventually be forgotten.

KEYWORDS: The Nuremberg trial, Nazi Crimes, Nazi concentration camps, Second World War, Postmemory, University medical students

Funding. This study was not supported by any external sources of funding.

✉ Daniil A. Fedorov. E-mail: fedoroff.daniil2014@yandex.ru

© 2025 by the authors

<https://doi.org/10.56871/МНСО.2026.98.90.012>

Без срока давности: постпамять о нацистских преступлениях. К 80-летию Нюрнбергского процесса

Галина Львовна Микиртичан, Любовь Николаевна Лисенкова, Даниил Алексеевич Федоров, Сергей Сергеевич Комаров, Владислава Игоревна Макеева, Кирилл Алексеевич Павленко

Санкт-Петербургский государственный педиатрический медицинский университет, 194100, г. Санкт-Петербург, ул. Литовская, д. 2, Российская Федерация

Для цитирования: Микиртичан Г.Л., Лисенкова Л.Н., Федоров Д.А., Комаров С.С., Макеева В.И., Павленко К.А. Без срока давности: постпамять о нацистских преступлениях. К 80-летию Нюрнбергского процесса. Медицина и организация здравоохранения. 2025;10(4):129–142. <https://doi.org/10.56871/МНСО.2026.98.90.012>.

Поступила: 14.10.2025

Одобрена: 10.12.2025

Принята к печати: 28.01.2026

РЕЗЮМЕ. В условиях современности все более актуальной становится проблема сохранения исторической памяти, защиты исторического прошлого от фальсификаций и забвения. Особо значимым в этой связи видится историческое просвещение молодежи. В рамках проведения мероприятий по реализации Всероссийского просветительского проекта Министерства просвещения Российской Федерации «Без срока давности» авторами настоящего исследования было организовано тестирование студентов Санкт-Петербургского государственного педиатрического медицинского университета с целью выявления уровня теоретической осведомленности студентов о Нюрнбергском процессе. В тестировании приняли участие 830 студентов первого и второго курсов различных направлений подготовки. Общие результаты прохождения тестирования студентами Санкт-Петербургского государственного педиатрического медицинского университета можно считать успешными. Тем не менее в ходе исследования было установлено, что студенты второго курса хуже справились с вопросами тестирования, нежели студенты-первокурсники. Авторы настоящей статьи предполагают, что такой результат объясняется высокой учебной профессиональной нагрузкой студентов второго курса, их заинтересованностью в постижении своей специальности и профильных дисциплин, и, в результате, снижением интереса к истории и другим социогуманитарным дисциплинам. Соответственно, одной из главных задач исторического образования и просвещения в системе среднего и высшего образования должно являться не только усвоение контекстных исторических знаний, но и выработка глубокой внутренней мотивации к изучению и пониманию истории своего Отечества, развитию и сохранению, а также трансляции исторической памяти. В противном случае усвоенные в процессе образования знания не станут частью исторической памяти и исторического сознания, и в конечном счете окажутся преданы забвению.

КЛЮЧЕВЫЕ СЛОВА: Нюрнбергский процесс, преступления нацистов, концентрационные лагеря, Вторая мировая война, постпамять, студенты медицинского университета

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

✉ Даниил Алексеевич Федоров. E-mail: fedoroff.daniil2014@yandex.ru

© Коллектив авторов, 2025

In the context of our modern multicultural information society, where the crisis of national, ethnic, and historical identity is becoming an increasingly pressing issue, the importance of historical education in the Russian Federation is not only undiminished but, on the contrary, has become a top priority. Moreover, the international community is increasingly attempting to revise and falsify historical events (particularly those of World War II, as well as the role and decisive contribution of the Soviet Union to victory in that war). Thus, President of the Russian Federation V.V. Putin, who has repeatedly emphasized the crucial importance of Russians knowing the history of their homeland, speaking of the Soviet soldiers who defeated the Nazis, noted: "Preserving the memory of their steadfastness and achievements has enduring moral, social, and state significance for us and for the future of Russia. It gives our people new strength, tempers their spirit and character. It inspires today's generation of soldiers who safeguard the security of our citizens, fight against neo-Nazis, and liberate historic Russian territories"¹. In this regard, historical education of young, emerging generations is particularly important, as their worldview and civic consciousness are still in the formative stage, exposed to numerous dangers, the influence of destructive forces, and unreliable information drawn almost uncontrollably from diverse, often dubious sources.

On May 8, 2024, a decree of the President of the Russian Federation approved the foundations of state policy in the field of historical education, the stated goal of which is to form a pan-Russian civic identity and strengthen the unity of the Russian World based on traditional Russian spiritual, moral, cultural, and historical values. The decree outlines a number of ways to achieve this goal, including patriotic education, preserving the memory of those who defended the Fatherland, and preserving the memory of significant events in Russian history.²

¹ Telegram from the President of the Russian Federation "To the Participants and Guests of the XXVII World Russian People's Council." Official Internet Portal of the Presidential Administration of Russia. Available at: <http://www.kremlin.ru/events/president/letters/78491> (accessed: November 22, 2025).

² Decree of the President of the Russian Federation No. 314 of May 8, 2024, "On the Approval of the Fundamentals of the State Policy of the Russian Federation in the Field of Historical Education." Official website of the Presidential Administration of Russia. Available at: <http://www.kremlin.ru/acts/bank/50534> (accessed: November 22, 2025).

2025 marks the 80th anniversary of Victory in the Great Patriotic War, the events of which have long been, and for many generations of Russians remain (as confirmed by a number of studies [1–3]) a cornerstone and key element of historical memory. However, this same year also marked the 80th anniversary of another memorable date: on November 20, 1945, the Nuremberg Trials began. These were international trials of Nazi criminals who unleashed World War II, a conflict that involved approximately 80% of the world's population (1.7 billion people) [4]. Every year, approximately 8.5 million people perished in the war [5]. Festive events dedicated to the 80th anniversary of Victory Day allow us to pay tribute to the veterans of the Great Patriotic War and honor the memory of those who defended their homeland and the world, sacrificing their own strength, health, and lives, cleansed and liberated the world from the Nazis. This memorable date, marking the start of the Nuremberg trials, is an important symbol that Nazi atrocities and crimes are not subject to revision or oblivion and have no statute of limitations.

The scale of the crimes committed by the Nazis and their accomplices during World War II, which were inhuman in their cruelty, is difficult to quantify for objective reasons. But even the approximate figures reflecting the number of human casualties are horrifying. Nazi criminal ideology, based on pseudoscientific, populist racial theories and fierce anti-Bolshevism, was put into practice through methods amounting to open genocide. Thus, during the years of the Holocaust, the Nazis exterminated about 6 million Jews (2 million were killed during mass executions, and about 1 million perished in ghettos, labor camps, and concentration camps). About 2.7 million more people were exterminated in death camps. About 250,000 Jews were killed during riots, executions of civilians, and partisan attacks)³. The Third Reich regime was equally ruthless toward Soviet citizens, united by the communist ideology so fiercely hated in the Third Reich. Soviet citizens represented a multitude of different nationalities, including Jews and Slavs, who were so hated by the

³ How many people did the Nazis kill? Encyclopedia of the Holocaust. Available at: <https://encyclopedia.ushmm.org/content/ru/article/documenting-numbers-of-victims-of-the-holocaust-and-nazi-persecution> (accessed: November 23, 2025).

Nazis. The number of Soviet citizens who perished during the German occupation is estimated at more than 13.6 million people (7.4 million were deliberately exterminated, more than 2.1 million died in forced labor in Germany, 4.1 million died from the unbearable conditions of the occupation regime, starvation, infectious diseases, and lack of medical care) [6].

Widespread tools of the Nazi regimes included not only labor but also sexual enslavement of the population in the occupied territories of the Soviet Union. Soviet women were forced into prostitution under the threat of brutal reprisals, which were often carried out, and brothels were blasphemously set up in buildings such as theaters, libraries, and schools [7].

The elderly were among the first victims of the Nazi regime among the civilian population of the occupied territories. The Nazis viewed them as “mouths to feed” who deprived Germany of bread and offered no benefit in return; consequently, the elderly were targeted for extermination. As a result of the “starvation policy” carried out by the occupiers, the population was left without access to food and medicine, condemning hundreds of thousands of people to certain death. Due to their physical limitations, the elderly were often unable to resist Wehrmacht soldiers and posed no threat to them; nevertheless, there are numerous documented instances of mass killings, burnings, and burials alive of innocent Soviet elderly people carried out by the Nazis [8].

Soviet children and adolescents also fell victim to Nazi sadism; many of them were taken to Germany as young “Ostarbeiters” (during the Great Patriotic War, more than 385,000 Soviet children under the age of 16 were taken from the territories of the USSR for forced labor) [9]. However, as researchers note, the fate of children left behind in the occupied territories often turned out to be even more horrific than the forced labor performed in German factories and enterprises: “The absence of mercy and the trampling of universally accepted civilized norms are among the indisputable characteristics of the Nazi regime. There is countless evidence of cruelty to children, including deliberate murder or actions leading to death. Children were forced to wear “OST” tags; their parents were tortured in front of them; blood was drawn from them; and they were often put to work on tasks that were psychologically taxing even for healthy adult

men. For example, A.V. Danilycheva (born in 1930), aged 11–12, along with her sister Masha, aged 13–14, was in a group that dug trenches and disposed of corpses there [9–11]. Children were subjected to brutal corporal punishment for the slightest infractions (such as playing or picking berries in a wrong place)¹. They were often tortured and executed alongside their parents, even though they were innocent [12].

The establishment of concentration camps, including death camps, will forever remain a distinct chapter in the history of Nazi crimes. The network of concentration camps, located both across Western and Eastern Europe and in Soviet territories occupied by the Germans, served, on the one hand, as a source of virtually free labor for the Third Reich, as well as a venue for brutal and sophisticated executions and medical (and pseudo-medical) experiments. On the other hand, concentration camps became an eternal symbol of inhumanity, vividly reflecting the rotten essence of Nazi ideology.

A small detail that reveals malicious, sarcastic mockery towards the victims who fell into their hands are Nazi slogans placed above the gates of concentration camps: “Arbeit macht frei”², “Jedem das Seine”³, “Lasst alle Hoffnung fahren, die ihr hier eintretet”⁴. Although most Nazi con-

¹ Deprived of Childhood. No Statute of Limitations. Available at: <https://безсрокадавности.рф/lishennye-detstva/> (accessed: November 23, 2025).

² Translated from German as “Work sets you free.” The slogan, displayed on the gates of the infamous concentration camps Auschwitz (Oświęcim), Sachsenhausen, Dachau, Terezín, Groß-Rosen, and others, refers to the title of a popular German novel of the same name by the nationalist German writer L. Difenbach. According to a common account, Difenbach used this expression as a parody of the popular medieval saying “City air sets you free,” which in turn was a paraphrase of the words taken from the Gospel: “The truth shall set you free.”

³ Translated from German as, “To Each His Own.” The slogan was displayed on the gates of the Buchenwald concentration camp. It is the German version of the Latin phrase “suum cuique,” which was used by the first Prussian king, Frederick I, as his personal motto.

⁴ Translated from German: “Abandon all hope, ye who enter here.” According to the recollections of prisoners at the Mauthausen concentration camp, the inscription was placed above the camp gates as well as in the torture chamber. It is a quote from Dante Alighieri’s “Divine Comedy”. These words conclude the text inscribed above the gates of Hell in the novel.

centration camps did not have the status of “death camps,” the statistics clearly and unequivocally reveal the conditions under which prisoners were held and forced to work. Approximately 11 million of an estimated 18 million prisoners in Nazi concentration camps (including about 7 million Soviet citizens) perished. Approximately 4 million people were exterminated at the Auschwitz-Birkenau concentration camp (Oświęcim); more than 250,000 prisoners died at the Dachau camp; 56,000 people fell victim to torture and executions at the Buchenwald camp [13]; 122,000 were killed within the walls of Mauthausen; another approximately 100,000 prisoners (including at least 7,000 children) died at the Salaspils concentration camp [14].

Thus, it is quite evident that the Nazis were devoid of principles. On the one hand, they were brainwashed and conditioned by the skillful propaganda of the Third Reich’s leaders, led by A. Hitler. On the other hand, they were driven by an animalistic, savage instinct that deprived them of any sense of empathy or compassion toward their victims, who primarily included the most defenseless groups of prisoners. Those prisoners often posed no threat, including women, children, and the elderly, regardless of their nationality or political affiliation [15].

Although retribution and punishment for Nazi criminals was discussed in negotiations among the countries of the anti-Hitler coalition (the USSR, the United States, and the United Kingdom) as early as 1942, reaching a consensus was far from immediate. Thus, according to British officials (in particular, Prime Minister W. Churchill and Foreign Secretary A. Eden), it was not considered expedient to pursue legal proceedings against the leaders of the Third Reich, foremost among whom were Adolf Hitler and Rudolf Hess. British and American officials agreed that executing Nazi leaders should be a political and administrative decision, not a legal one. As for lower-ranking Nazis who were not among Germany’s top leaders, it was assumed that they would be tried at the locations where they committed their crimes, in accordance with the local laws of affected countries [16].

The Soviet side, however, firmly adhered to its position, which had already taken shape by October 1942: trials of major Nazi war criminals should constitute international legal proceedings, widely covered by the media [16]. Researchers explain differences in positions between the

USSR and its allied nations by their varying roles in the war. The Soviet Union considered the war against the Third Reich a struggle for its existence, a fight to eradicate Nazism and liberate Europe and the world from it. In contrast, as noted by legal scholar V.M. Derevskova, for Great Britain and the United States, World War II was, rather, “a struggle to preserve statehood and eliminate Germany and Japan as competitors, and to restore the old order there” [17]. Consensus was not reached until May 1945: the idea of establishing an international tribunal and conducting a trial was ultimately accepted first by the U.S. leadership and then by the Great Britain.

On August 8, an agreement was signed between the governments of the USSR, the United States, the United Kingdom, and France, joined by representatives of the governments of 19 other countries that were members of the United Nations [16]. On August 8, 1945 the International Military Tribunal was established. It was a collegial international body based in Berlin charged with bringing the principal Nazi war criminals to justice. Among them were 24 representatives of Nazi Germany: H. Göring, R. Hess, I. Ribbentrop, R. Ley¹, W. Keitel, E. Kaltenbrunner, A. Rosenberg, G. Frank, W. Frick, J. Streicher, W. Funk, G. Schacht, G. Krupp², K. Dönitz, E. Redel, B. Schirach, F. Zauckel, A. Jodl, M. Bormann³, F. Papen, A. Seyss-Inquart, A. Speer, K. Neurath, G. Fritzsche [18]. Court hearings took place in the Bavarian city of Nuremberg and began on November 20, 1945.

Prosecutor R.A. Rudenko served as the chief prosecutor for the Soviet Union. During the trial, which lasted more than 10 months, the Soviet side presented 500 pieces of evidence confirming the guilt of defendants who were charged with several counts (crimes against peace, crimes against humanity, war crimes) [16]. The historic verdict against the Nazi leaders was handed

¹ R. Ley committed suicide by hanging himself from a sewer pipe in his cell on October 25, 1945, even before the Nuremberg trials began [18].

² G. Krupp was deemed terminally ill, and the case against him was dismissed before the trial began (though it was to be resumed if his physical condition improved) [18].

³ The case against the Führer’s personal secretary, M. Bormann, was tried in absentia, as he could not be found [18].

down on October 1, 1946. Göring¹, Ribbentrop, Keitel, Kaltenbrunner, Rosenberg, Frank, Frick, Streicher, Sauckel, Jodl, Seyss-Inquart, and Bormann (in absentia) were sentenced to death by hanging. Hess, Reder, and Funk were sentenced to life imprisonment. Schirach and Speer received sentences of 20 years' imprisonment, Neurath — 15 years, and Dönitz — 10 years. Acquittal was handed down for Schacht, Papen, and Fritzsche [19].

It should be noted that retribution against the Nazis was not limited solely to 24 cases. Subsequently, trials involving war criminals, accomplices of the Nazi regime, collaborators, and concentration camp staff took place in Germany, Poland, and the USSR, with the total number reaching 900². The trials (Tokyo, Khabarovsk) of Japanese war criminals became a separate chapter in international law. Thus, despite serious disagreements among countries represented at the International Military Tribunal, which led to the start of the Cold War, a colossal amount of work was accomplished through consolidated efforts. These efforts undoubtedly included not only retribution against the Nazis but also eradication of Nazi ideology and measures to prevent its revival. And yet, as the common saying goes, Nazism is an incurable cancer, and its metastases continue to grow to this day.

Today, we can observe a peculiar global trend of social amnesia. Memories of World War II, Nazi atrocities, and acts of genocide are fading. Sacred memorials, which are so crucial for shaping historical and cultural memory, are increasingly being treated as profane³. For instance, the Holocaust memorial in Berlin has become a popular spot for lighthearted tourist photo sessions⁴, while monuments, sculptural groups, and obelisks dedicated to the heroes of World War II

are being desecrated and subjected to mass attacks by vandals.⁵

The merits and role of the Soviet Union in defeating Hitler's Germany are being downplayed in every possible way. A telling example is the fact that on the 75th anniversary of Auschwitz's (Oświęcim) liberation, several authoritative Western media outlets reported that the camp was liberated by U.S. soldiers [21]. Although the editors hastily issued corrections, this kind of mistake shows, on the one hand, a lack of basic historical knowledge among media representatives and, on the other hand, a deliberate, systematic effort to downplay Soviet soldiers' role in defeating the Nazis. Attempts to portray the Soviet Union as a totalitarian aggressor state that almost single-handedly unleashed the war against Germany are also not uncommon [22].

For natural reasons, an ever-decreasing number of participants in the events of World War II and the Great Patriotic War remain alive. Over time, this profound traumatic experience acquired by representatives of several generations during the war years is passed on to new generations. This experience is firmly embedded in historical memory which forms the foundation of historical consciousness and worldview, and is transmitted in the form of a perception that, while still painful, is now mediated. This concept is referred by modern science as "post-memory"⁶. The worldview of new generations of schoolchildren and students is shaped by a powerful and diverse information landscape. It is rich in content that is, among other things, destructive and undermines the foundations of Russian culture and identity. If students take a perfunctory stance

¹ H. Göring committed suicide in his cell on the eve of his execution by ingesting potassium cyanide [18].

² Postwar Trials. Encyclopedia of the Holocaust. Available at: <https://encyclopedia.ushmm.org/content/ru/article/war-crimes-trials> (accessed: November 25, 2025).

³ The concept of profanity (in this example, profane sites of memory) in contemporary memory studies is used to denote the world of routine, everyday life, the struggle for existence, and the pursuit of utilitarian goals [20].

⁴ Dancing on Bones: Outrageous Selfies Against the Backdrop of a Holocaust Memorial. Available at: <https://kulturologia.ru/blogs/220117/33141/> (accessed: November 26, 2025).

⁵ War on Monuments. A Chronicle of Vandalism. Available at: <https://pravfond.ru/press-tsentr/stati/voyna-s-pamyatnikami-khronika-vandalizma/> (accessed: November 26, 2025).

⁶ The concept of "post-memory" was introduced into academic discourse by modern American researcher Marianne Hirsch, author of a number of works devoted to issues of historical and cultural memory regarding the events of the Holocaust. Hirsch understands post-memory as "lived worlds of the past that accompany us in the present and shape our future". She defines it as the memory of the most profound collective upheavals such as war, genocide, and ruthless violence, passed down to new generations and, despite its indirect nature, deeply imprinted in their own memory and consciousness [23].

toward learning the history of their homeland, they unquestionably risk being deprived of historical knowledge and worldview attitudes that could serve as a basis for post-memory regarding tragic events of World War II.

The authors of this study organized a test for students at St. Petersburg State Pediatric Medical University as part of the nationwide educational project “No Statute of Limitations”. This test was aimed to assess students’ theoretical knowledge of the Nuremberg Trials. The study was conducted in October and November 2025 through an online survey using the “Yandex.Forms” platform. A random sample consisted of 830 respondents, namely students majoring in both medical fields (pediatrics (29.96%), dentistry (28.04%), general medicine (15.52%), preventive medicine (0.96%), nursing (0.96%)), as well as psychology and education (clinical psychology (13.37%), special education (11.19%)). It should be noted that this sample, consisting of medical university students, is especially relevant. Issues related to fascist, including illegal and barbaric medical experiments conducted by the Nazis, directly touch upon the field of bioethics. Furthermore, the Nuremberg Code, adopted in 1947, is the first international document to establish ethical and legal principles of medical research.

79.66% of respondents were female and 20.34% were male. The vast majority of respondents (84.24%) belonged to an age group between 18 and 19 years old; 13.72% of respondents indicated their age as between 20 and 23 years old, and only 2.04% were older than 23. 38.5% of respondents named St. Petersburg (and its immediate surroundings in the Leningrad Region) as their hometown (place of residence). More than 200 different geographical names were mentioned in other respondents’ answers regarding their hometown, both within Russia (the most frequent were Voronezh, Yekaterinburg, Kaliningrad, Krasnodar, Makhachkala, Moscow, Omsk, Pskov, Rostov-on-Don, Ufa, and Chelyabinsk), as well as in Azerbaijan, Belarus, Iran, Kazakhstan, Mongolia, Tajikistan, and Turkmenistan. Thus, the survey achieved a homogeneous sample (consisting of first- and second-year medical university students), which, based on its quantitative and demographic characteristics, can be considered representative.

It is worth noting separately that 52.35% of respondents were first-year students, while 47.65% were second-year students. When taking the test (which was not announced in advance), first-year students could rely only on residual knowledge of history acquired during their previous stage of education (in school or college) and rely on their own level of historical knowledge. In contrast, second-year students had studied a course on Russian history at the university during the 2024–2025 academic year.

However, at the higher education level, neither group of respondents attended special thematic seminars dedicated to the Nuremberg Trials, and issues of retribution against Nazi criminals were discussed in lecture and seminar formats only in the context of examining the history of the Great Patriotic War¹.

It should be noted that a study we conducted earlier with a similar sample composition, aimed at measuring the level of active historical memory among students at the Pediatric University, revealed fairly high indicators (it is also worth noting that the Great Patriotic War was named by the absolute majority of students as the most significant event for the historical memory of Russians) [24]. The questions posed to students in this test, however, were knowledge-based rather than reflective in nature and assumed the existence of a correct answer. In total, the questionnaire included six substantive closed-ended questions, both with a single answer option and requiring the selection of multiple options.

The first question (“Select the correct definition of the term ‘Nuremberg Trials’”) was designed to assess the students’ awareness of Nuremberg Trials’ core essence. The correct answer (“An international trial in which the leaders of Nazi Germany were held accountable for crimes against peace, humanity, and war crimes”) was selected by 86.04% of respondents. However, 14% answered the question incorrectly

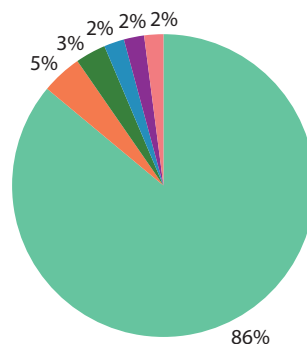
¹ In 2025, staff members of the Department of Humanities and Bioethics at St. Petersburg State Pediatric Medical University developed a special thematic seminar titled “Nazi Crimes Against Humanity During World War II and Retribution for Them (Nuremberg, Tokyo, Khabarovsk Trials)”. The seminar was held during Russian history classes as part of the “No Statute of Limitations” project. However, to ensure the experimental integrity of the study, the testing was conducted prior to the seminar and corresponding discussion.

(among the incorrect answer options were “A series of peace negotiations that concluded with signing a peace treaty between Germany and the countries of the anti-Hitler coalition in November 1945”, “The treaty concluded between the Western powers and the USSR regarding the division of spheres of influence in Europe after the end of World War II”, “The internal German investigation into the crimes of the Third Reich leadership, conducted after the fall of Nazism”, “The conference of Allied heads of government on the future structure of Europe and the formation of the UN in February 1945”, “The procedure for deporting the German population from the former occupied territories of Europe following Germany’s defeat in World War II” (Fig. 1). It should be noted that although most of these incorrect answers were chronologically linked to the period of World War II and the postwar world order, they nevertheless differed significantly from the correct answer in terms of meaning and content. Thus, to respond correctly, students were required to have only general contextual knowledge of history, rather than in-depth historical knowledge. Nevertheless, 114 respondents answered the question incorrectly.

The second (“Indicate the start date of the Nuremberg Trials (beginning of the hearings)”) and third (“Indicate the end date of the Nuremberg Trials (conclusion of the hearings)”) questions were focused on knowing chronological details of the Nuremberg Trials. It should be noted that these two questions were aimed not only at testing students’ historical knowledge directly, but also, indirectly, at assessing the development of their historical memory and their engagement with the contemporary Russian social and cultural context. Due to the 80th anniversary of The Nuremberg Trials 18¹, events commemorating these significant dates were actively promoted in Russian media at both federal and regional levels. 85.56% of respondents were able to correctly identify the start date of the Nuremberg Trials (Fig. 2), and 81.47% correctly identified the end date (Fig. 3).

The fourth question posed to students required them to select multiple answers (“Which countries were represented on the International Military Tribunal?”). Alongside the Soviet Union, the United States of America, the United Kingdom, and France, several obviously incorrect

options were presented as potential choices for countries that were members of the International Military Tribunal (IMT): Germany, Japan, Italy, China, Sweden, and Denmark. A completely correct answer, in which all countries that were part of the IMT were selected and at the same time



- Международный судебный процесс, в рамках которого руководители нацистской Германии были привлечены к ответственности за совершение преступлений против мира, человечества и военные преступления
The International trial in which the leaders of Nazi Germany were brought to justice for crimes against peace, humanity and war crimes
- Серия мирных переговоров, завершившихся подписанием мирного договора между Германией и странами антигитлеровской коалиции в ноябре 1945 года
The series of peace talks culminating in the signing of a peace treaty between Germany and the countries of the anti-Hitler coalition in November 1945
- Договор, заключенный между западными державами и СССР относительно раздела зон влияния в Европе после окончания Второй мировой войны
Treaty between the Western states and the USSR concerning the division of zones of influence in Europe after the end of the World War II
- Внутреннее немецкое расследование преступлений руководства Третьего рейха, проведенное после падения нацизма
The Internal German investigation of the crimes of the leadership of the Third Reich, conducted after the fall of Nazi regime
- Конференция глав правительств союзников по вопросам будущего устройства Европы и формирования ООН в феврале 1945 года
The Allied Heads of Government Conference on the future of Europe and the formation of the UN in February 1945
- Процедура депортации немецкого населения из бывших оккупированных территорий Европы после поражения Германии во Второй мировой войне
Procedure for the deportation of the German population from the former occupied territories of Europe after the defeat of Germany in World War II

Fig. 1. Distribution of respondents to question 1 (“Select the correct definition of «Nuremberg process»”) (the figure is prepared by the authors)

Рис. 1 Распределение ответов респондентов на вопрос № 1 («Выберите верное определение понятия “Нюрнбергский процесс”») (рисунок подготовлен авторами)

¹ At the time of testing, this significant commemorative date had not yet arrived.

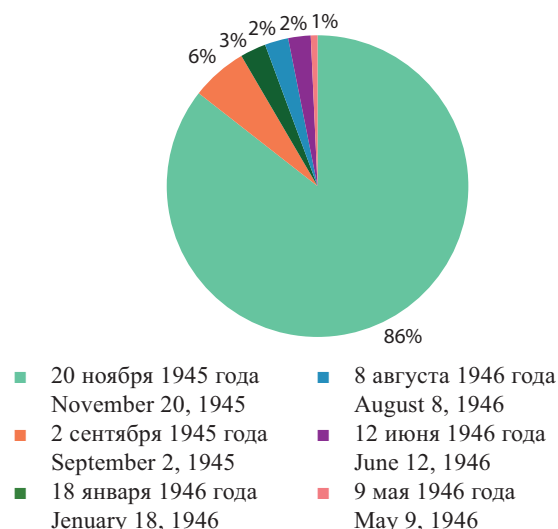


Fig. 2. Distribution of respondents to question 2 ("Select the correct date of the beginning of the Nuremberg process (the begin of court hearings)") (the figure is prepared by the authors)

Рис. 2. Распределение ответов респондентов на вопрос № 2 («Укажите дату начала Нюрнбергского процесса (начало судебных слушаний)») (рисунок подготовлен авторами)

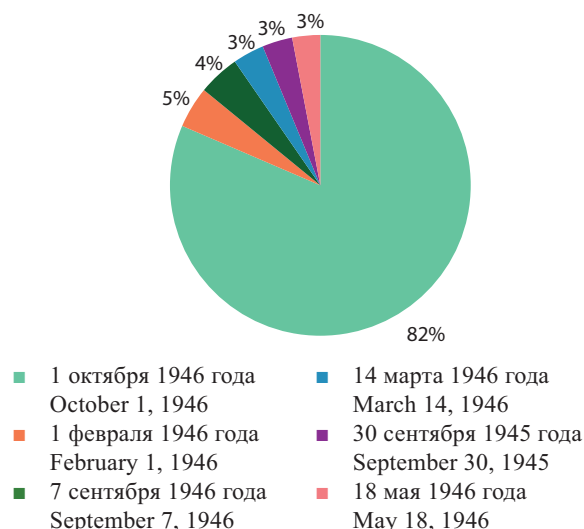


Fig. 3. Distribution of respondents to question 3 ("Select the correct date of the end of the Nuremberg process (the end of court hearings)") (the figure is prepared by the authors)

Рис. 3. Распределение ответов респондентов на вопрос № 3 («Укажите дату окончания Нюрнбергского процесса (завершение судебных слушаний)») (рисунок подготовлен авторами)

no extra incorrect options were chosen, was given by 71% of respondents (590 people, of whom 380 are first-year students and 210 are second-year students). It should also be noted that 15.73% of respondents "included" Germany in the Allied Powers, while 9.58% of respondents did not name the Soviet Union among the member countries of the Allied Powers. Figure 4 presents the distribution of respondents' answers to this question in absolute numbers.

The fifth substantive question of the test ("Identify who served as the chief prosecutor for the USSR at the Nuremberg Trials?") posed a difficulty for 21.29% of respondents: thus, 6.74% of the total number of respondents selected V.M. Molotov, 5.78% chose G.K. Zhukov, 3.49% chose K.K. Rokossovsky, 2.77% chose L.P. Beria, and 2.51% chose M.I. Kalinin. 78.71% of respondents selected the correct answer to this question, naming R.A. Rudenko (Fig. 5).

The final, sixth question ("Which of the defendants listed below at the Nuremberg Trials were found guilty of crimes against peace and humanity and sentenced to death?"), which required selecting multiple correct answers, was answered completely correctly (by selecting the names of Göring, Ribbentrop, Keitel, and Kaltenbrunner from the list provided), by only 37.18% of respondents (28.28% were first-year

students and 8.90% were second-year students). Although this question required respondents to possess not merely superficial but somewhat deeper knowledge of the Nuremberg Trials, the answer options were also aimed at identifying the respondents' general cultural level and the development of their historical memory. Thus, 16.27% of test-takers mistakenly named Paulus (the fact of his participation in the Nuremberg Trials as a witness for the prosecution from the Soviet Union is widely covered not only in educational materials but also in works of contemporary popular culture: for example, the plot of the Russian feature film "Nuremberg" (dir. N. Lebedev, 2023)); 21.80% of respondents named Himmler (the fact of his suicide long before the events of the Nuremberg trials is also widely known); 8.92% chose Schacht (one of the few Nazis acquitted during the Nuremberg Trials), and another 8.92% chose Dönitz (who served his full sentence and was released). Figure 6 shows distribution of respondents' answers in absolute numbers.

Thus, summarizing test results, we can conclude that Pediatric University students performed successfully. The total percentage of correct answers exceeded 80% on three of the six questions. In addition, the percentage exceeded 75% on two more questions, and only the sixth

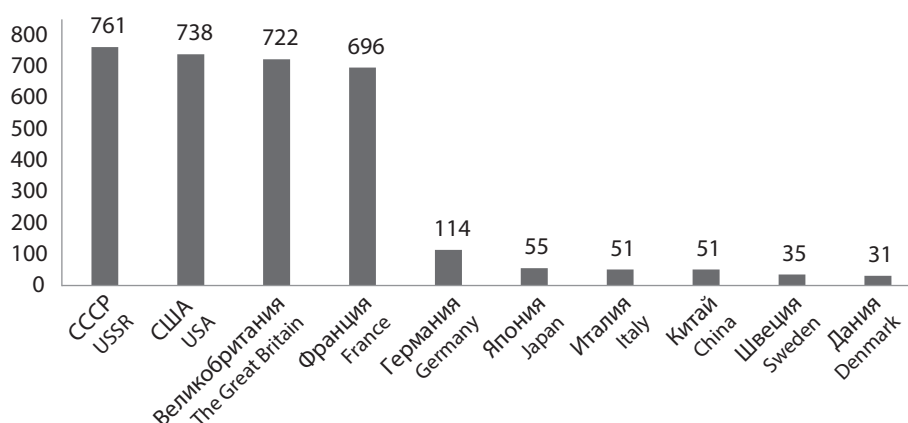


Fig. 4. Distribution of respondents to question 4 ("Which countries' representatives joined the International tribunal?") (the figure is prepared by the authors)

Рис. 4. Распределение выбора респондентами вариантов ответа в вопросе № 4 («Представители каких стран вошли в состав Международного военного трибунала?») (рисунок подготовлен авторами)

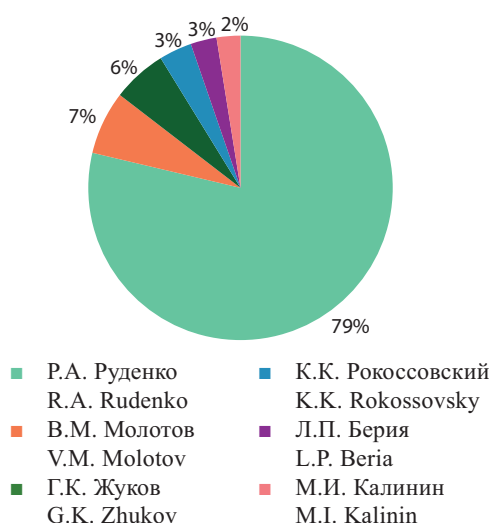


Fig. 5. Distribution of respondents to question 5 ("Who was the main prosecutor on the Nuremberg process from USSR?") (the figure is prepared by the authors)

Рис. 5. Распределение ответов респондентов на вопрос № 5 («Укажите, кто выступил главным обвинителем на Нюрнбергском процессе от СССР») (рисунок подготовлен авторами)

and final question which proved to be the most difficult for the respondents failed to reach even a 40% correct answer rate. It is also worth noting that first-year students performed significantly better than second-year students. The percentage of correct answers (where 100% was taken as the number of first-year students in the first case and second-year students in the second) exceeded the percentage of correct answers given by second-year students by 15–35% (Table 1).

We interpret this pattern as one of several possible indicators of a decline in students' his-

torical memory and a loss of historical knowledge, which may be explained by their heavy academic workload, their focus on mastering their major and core disciplines, and, against this backdrop, a waning interest in the social sciences. They tend to neglect knowledge acquired in these disciplines, as if it were not urgently needed to solve current academic tasks. First-year students, who were still adapting to higher education at the time of testing, were more motivated to study history. Although this motivation may not have stemmed from deep convictions, it was at least driven by practical considerations¹. Second-year students, who are deeply immersed in academic and social activities at the university, tend to view issues related to historical knowledge as matters of personal responsibility and interest.

Hence, it should be noted that educational activities aimed at providing students with a historical education, including higher education, must be directed toward fostering profound personal motivation to study and understand the history of their homeland, as well as toward developing, preserving, and transmitting historical memory. Otherwise, historical knowledge will lack personal meaning and will not become part of historical memory, and

¹ On September 1, 2023, the Concept for Teaching Russian History for Non-History Majors and Programs of Study Offered by Higher Education Institutions came into force. According to the Concept, the history course in bachelor's and specialist degree programs must account for at least 4 credit units, that is, 144 academic hours, and the final assessment must be conducted as an exam.

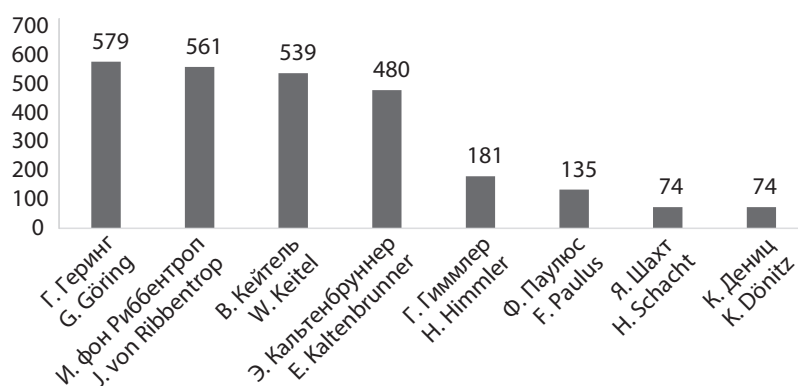


Fig. 6. Distribution of respondents to question 6 ("Which of the following defendants in the Nuremberg trials were found guilty of crimes against peace and humanity and sentenced to death?") (the figure is prepared by the authors)

Рис. 6. Распределение выбора респондентами вариантов ответа в вопросе № 6 («Кто из представленных ниже обвиняемых на Нюрнбергском процессе был признан виновным в преступлениях против мира и человечества и приговорен к смертной казни?») (рисунок подготовлен авторами)

Table 1

Correct answers provided by test participants to the suggested questions (in % of respondents to first and second year)

Таблица 1

Верные ответы, данные участниками тестирования на предложенные вопросы
(в % от числа респондентов первого и второго курсов обучения)

Курс обучения Year of study	Номер вопроса Number of question					
	1	2	3	4	5	6
Первый курс First year	93,79%	98,16%	94,02%	87,36%	92,87%	54,02%
Второй курс Second year	77,53%	72,47%	67,42%	53,03%	62,88%	18,68%

Таблица составлена по данным собственного исследования авторов / The table is based on data from the authors' own research

consequently, part of the historical consciousness, worldview, and civic stance of a future specialist. Such knowledge includes events that are fundamentally important for understanding Russian history. Such events include the Great Patriotic War, the Soviet Union's decisive contribution to the victory over Nazism and investigation of crimes committed by the Nazis during World War II, as well as the organization of trials aimed at bringing the Nazis to justice, which had a legal, judicial, and public character.

Furthermore, if students acquire not only a knowledge but also a deeply meaningful understanding of their homeland's history during their secondary and higher education, empathy for its tragic episodes, and pride in its triumphs, then the historical memory and post-memory will be able to withstand contemporary challenges without succumbing to distortion or misrepresentation. In this case, there will be a chance that the most horrific pages of history associated with World War II will not be consigned to oblivion, and Nazi crimes will continue to have no statute of limitations.

ADDITIONAL INFORMATION

Authors' contribution. The authors jointly developed the research concept, defined its objective, and selected the methodological foundations. All authors participated in the collection of statistical data for the study. Scientific supervision of the study: G.L. Mikirtichan. Formatting and editing of the article's text and metadata: L.N. Lisenkova. Summarization of statistical data and writing of the article's text: D.A. Fedorov. Summarization of research results in graphic form, writing of the abstract, and translation of necessary sections of the article into English: S.S. Komarov. All authors read and approved the final version before publication.

Competing interests. The authors declare that they have no competing interests.

Consent for publication. The authors received written consent from the respondents to publish the data.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Авторами совместно была разработана концепция исследования, определена его цель, выбраны методологические основы. Все авторы приняли участие в сборе статистических данных исследования. Научное руководство исследованием: Г.Л. Микир-тичан. Оформление и редактирование текста и метаданных статьи: Л.Н. Лисенкова. Обобщение статистических данных и написание текста статьи: Д.А. Федоров. Обобщение результатов исследования в графической форме, написание резюме, перевод необходимых разделов статьи на английский язык: С.С. Комаров. Все авторы прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

Информированное согласие на публикацию. Авторы получили письменное согласие анкетированных на публикацию данных.

REFERENCES

1. Toshchenko J.T. Historical consciousness and historical memory. Analysis of the current state. *Modern and Contemporary History*. 2000;(4):3–14. (In Russian). EDN: RGEDNB.
2. Fadeev P.V. The historical memory of Russians in sociological surveys: foundations, reality, problems. *Vestnik Instituta Sotziologii*. 2021;12(2):36–54. (In Russian). <https://doi.org/10.19181/vis.2021.12.2.710>.
3. Gorshkov M.K., Barash R.E. Historical Memories of Russians Today (history of the XX century Russia in the optics of families' stories). *Sociological Studies*. 2024;(9):125–137. (In Russian). <https://doi.org/10.31857/S0132162524090119>.
4. Shol V.V. The cost of World War II. *Observer*. 2014;6(293):6–27. (In Russian). EDN: SFNZEJ.
5. Rybakovski L.L. Human losses of the USSR and Russia in 1941–1945. *Population*. 2011;1(51):8–24. (In Russian). EDN: PKXGOB.
6. Rubtsov D.I. Genocide of the Peoples of the USSR — the Crime that Has No Statute of Limitations. *Ius Publicum et Privatum*. 2022;3(18):94–105. (In Russian). <https://doi.org/10.46741/2713-2811.2022.18.3.010>. EDN: AQFWZZ.
7. Nizhnik N.S. Forced prostitution as a Nazi crime against the civilian population of the occupied territories during the Great Patriotic War. *Bulletin of the Ural Law Institute of the Ministry of the Interior of Russia*. 2025;(2):32–41. (In Russian). EDN: DZAJHB.
8. Bakhtin V.V., Pripadchev A.A. Old People as a Special Category of Victims Nazi Crimes. *Izvestiya Yugo-Zapadnogo gosudarstvennogo universiteta. Seriya: Istoriya i pravo*. 2023;13(4):217–234. (In Russian). <https://doi.org/10.21869/2223-1501-2023-13-4-217-234>.
9. Garazha N.A. Nature and conditions of using Soviet children's and adolescents' labor in Germany during the Great Patriotic war. *University proceedings. Volga region. Humanities*. 2015;2(34):44–53. (In Russian). EDN: ULUCNX.
10. Sapozhnikova N.V. Reflection adults on the experiences childhood of that took place in the most severe conditions of Nazi Concentration camp. *Development of Personality*. 2011;(2):186–195. (In Russian).
11. Harsh childhood. M.K. Volkov, A.Ya. Zakharov, compiler. Voronezh: Center for the Spiritual Revival of the Black Earth Region; 2013. (In Russian).
12. Kulakov I.A. Crimes against children and adolescents in the occupied territories of the RSFSR during the Great Patriotic War (1941–1944). A review of Russian historiography. *RSUH/RGGU Bulletin. Political science. History. International relationships Series*. 2022;(2):48–55. (In Russian). <https://doi.org/10.28995/2073-6339-2022-2-48-55>. EDN: CKXMBK.
13. Ishkov Yu.V., Abbyasova Yu.A., Golovina E.O. Using forbidden research methods and taking biological material from prisoners of Concentration camps by Nazi medical workers during World War II. *Bulletin of the Astrakhan State Technical University*. 2017;64(2):115–122. (In Russian). EDN: ZTXBJ.
14. Aristov S.V. Problems of the Concentration Camp Salaspils history (1941–1944). *Tomsk State Pedagogical University Bulletin*. 2017;186(9):24–30. (In Russian). <https://doi.org/10.23951/1609-624X-2017-9-24-30>.
15. Lider N.V. Nazi crimes in the occupied Eastern territories. In: Materials of Regional scientific and practical conference on the 72nd anniversary of the atomic bombing of Hiroshima. Omsk, September 15, 2017. Omsk: Omsk State Technical University; 2017. P. 47–52. (In Russian). EDN: YLDAIO.
16. Lebedeva N.S. Nuremberg trial and its sentence. *MGIMO Review of International Relations*. 2010;15(6):75–92. (In Russian). EDN: OOUJXT.
17. Derevskaia V.M. Nuremberg International Tribunal: History and Significance for International Community (Materials Round Table Devoted to the 70th Anniversary of the end The International Military Tribunal. *ExLegis: Legak research*. 2016;(2):83–87. (In Russian). EDN: LHGGCB.
18. The Nuremberg process. Compendium of materials. T. 1. Moscow: Gosudarstvennoe izdatel'stvo yuridicheskoi literatury; 1952. (In Russian).
19. The Nuremberg process. Compendium of materials. At 8 vol. Vol. 8. Moscow: Yuridicheskaya literatura; 1999.
20. Sulzhytski I.S. Desacralization of collective memory of the holocaust: case of the Auschwitz-Birkenau memorial

- and museum. *Journal of the Belarusian State University. Sociology*. 2018;(2):48–66. (In Russian). EDN: YSICRN.
21. Marmazova T.I., Fomenko M.V. Attempts to falsify history in the fight against Russia: reassessment of the results of the World War II. *Modern scientific through*. 2021;(2):95–99. (In Russian). <https://doi.org/10.24412/2308-264X-2021-2-95-99>.
22. Shchedrin V.A. Manipulation of Historical Memory of the Second World War in the Countries of the European Union. *Klio*. 2025;220(4):235–239. (In Russian). <https://doi.org/10.24412/2070-9773-2025-4220-235-239>.
23. Hirsh M. Memory Generation: Writing and visual culture after the Holocaust. Moscow: Novoe izdatel'stvo; 2021. (In Russian).
24. Fedorov D.A. Historical memory as a value: results of the study of its formation in students of higher educational institutions of non-history specialties. *Problemy sovremennoogo obrazovaniya*. 2025;(4):117–126. (In Russian). <https://doi.org/10.31862/2218-8711-2025-4-117-126>.
9. Гаража Н.А. Характер и условия принудительного трудоустройства советских детей и подростков в Германии в период Великой Отечественной войны. *Известия высших учебных заведений. Поволжский регион. Гуманитарные науки*. 2015;2(34):44–53. EDN: ULUCNX.
10. Сапожникова Н.В. Рефлексия на переживания детства в условиях концлагерей фашистской Германии: к 70-летию со дня начала Великой Отечественной войны. *Развитие личности*. 2011;(2):186–195.
11. Суровое детство. М.К. Волков, А.Я. Захаров, сост. Воронеж: Центр духовного возрождения Черноземного края; 2013.
12. Кулаков И.А. Преступления против детей и подростков на оккупированных территориях РСФСР в годы Великой Отечественной войны (1941–1944 гг.): обзор отечественной историографии. *Вестник РГГУ. Серия: Политология. История. Международные отношения*. 2022;(2):48–55. <https://doi.org/10.28995/2073-6339-2022-2-48-55>. EDN: CKXMBK.
13. Ишков Ю.В., Аббясова Ю.А., Головина Е.О. Использование запрещенных методов исследования и взятие биологического материала медицинскими работниками нацистской Германии у узников концентрационных лагерей в период Второй мировой войны. *Вестник Астраханского государственного технического университета*. 2017;2(64):115–122. EDN: ZTXBNJ.
14. Аристов С.В. Проблемы истории концентрационного лагеря Саласпилс (1941–1944 годы). *Вестник Томского государственного педагогического университета*. 2017;9(186):24–30. <https://doi.org/10.23951/1609-624X-2017-9-24-30>.
15. Лидер Н.В. Преступления нацистов на оккупированных восточных территориях В кн.: Война: продолжение политики или преступление: материалы региональной научно-практической конференции, посвященной 72-й годовщине атомной бомбардировки Хиросимы. Омск, 15 сентября 2017 года. Омск: Омский государственный технический университет; 2017. С. 47–52. EDN: YLDAIO.
16. Лебедева Н.С. Нюрнбергский процесс и его приговор. *Вестник МГИМО Университета*. 2010;6(15):75–92. EDN: OOUJXT.
17. Деревскова В.М. Нюрнбергский международный трибунал: история создания и значение для мирового сообщества (по материалам круглого стола, посвященного 70-летию окончания Международного военного трибунала). *ExLegis: правовые исследования*. 2016;(2):83–87. EDN: LHGGCB.
18. Нюрнбергский процесс. Сборник материалов. Т. 1. М.: Государственное издательство юридической литературы; 1952.
19. Нюрнбергский процесс. Сборник материалов. В 8 т. Т. 8. М.: Юридическая литература; 1999.

ЛИТЕРАТУРА

1. Тощенко Ж.Т. Историческое сознание и историческая память. Анализ современного состояния. *Новая и новейшая история*. 2000;(4):3–14. EDN: RGEDNB.
2. Фадеев П.В. Историческая память россиян в социологических опросах: основания, реальность, проблемы. *Вестник Института социологии*. 2021;12(2):36–54. <https://doi.org/10.19181/vis.2021.12.2.710>.
3. Горшков М.К., Бараш Р.Э. Историческая память современных россиян (история России XX века сквозь призму семейных историй). *Социологические исследования*. 2024;(9):125–137. <https://doi.org/10.31857/S0132162524090119>.
4. Штоль В.В. Цена Второй мировой войны. *Обозреватель*. 2014;6(293):6–27. EDN: SFNZEJ.
5. Рыбаковский Л.Л. Людские потери СССР и России в 1941–1945 гг. *Народонаселение*. 2011;1(51):8–24. EDN: PKXGOB.
6. Рубцов Д.И. Геноцид народов СССР — преступление, не имеющее срока давности. *Ius Publicum et Privatum*. 2022;3(18):94–105. <https://doi.org/10.46741/2713-2811.2022.18.3.010>. EDN: AQFWZZ.
7. Нижник Н.С. Принуждение к проституции — преступление нацистов против мирного населения оккупированных территорий в годы Великой Отечественной войны. *Вестник Уральского юридического института МВД России*. 2025;(2):32–41. EDN: DZAJNB.
8. Бахтин В.В., Припадчев А.А. Пожилое население и старики как особая категория жертв нацистских военных преступлений. *Известия Юго-Западного государственного университета. Серия: История и право*. 2023;13(4):217–234. <https://doi.org/10.21869/2223-1501-2023-13-4-217-234>.

20. Сульжицкий И.С. Десакрализация коллективной памяти о Холокосте: кейс Государственного музея Аушвиц-Биркенау. *Журнал Белорусского государственного университета. Социология*. 2018;(2):48–66. EDN: YSICRN.
21. Фоменко М.В., Мармазова Т.И. Попытки фальсификации истории в борьбе против России: переоценка итогов Второй мировой войны. *Современная научная мысль*. 2021;(2):95–99. <https://doi.org/10.24412/2308-264X-2021-2-95-99>.
22. Щедрин В.А. Манипуляции исторической памятью о Второй Мировой войне в странах Европейского Союза. *Клио*. 2025;4(220):235–239. <https://doi.org/10.24412/2070-9773-2025-4220-235-239>.
23. Хирш М. Поколение постпамяти: Письмо и визуальная культура после Холокоста. М.: Новое издательство; 2021.
24. Федоров Д.А. Историческая память как ценность: результаты исследования сформированности у студентов высших учебных заведений неисторических специальностей. *Проблемы современного образования*. 2025;(4):117–126. <https://doi.org/10.31862/2218-8711-2025-4-117-126>.

AUTHORS' INFO

Galina L. Mikirtichan — Dr. Sci. (Med.), Professor, Head of the Department of Humanities and Bioethics. E-mail: glm306@yandex.ru;

<https://orcid.org/0009-0007-7913-4325>; SPIN: 3208-9066

Lyubov N. Lisenkova — Cand. Sci. (Hist.), Associate Professor, Department of Humanities and Bioethics.

E-mail: lunili@yandex.ru;

<https://orcid.org/0000-0001-7211-1090>; SPIN: 5058-6883

✉ **Daniil A. Fedorov** — Lecturer, Department of Humanities and Bioethics.

E-mail: fiodoroff.daniil2014@yandex.ru;

<https://orcid.org/0009-0000-4037-2106>; SPIN: 1667-7795

Sergey S. Komarov — Lecturer, Department

of Humanities and Bioethics. E-mail: ssk129@mail.ru;

<https://orcid.org/0009-0007-5985-6451>; SPIN: 2484-7350

Vladislava I. Makeeva — Senior lecturer, Department of Humanities and Bioethics.

E-mail: makeeva.vladislava@yandex.ru;

<https://orcid.org/0009-0002-8839-6080>; SPIN: 5088-9444

Kirill A. Pavlenko — Lecturer, Department of Humanities and Bioethics.

E-mail: kirianzaden@mail.ru;

<https://orcid.org/0009-0004-9950-9006>; SPIN: 9261-9637

ОБ АВТОРАХ

Галина Львовна Микиртичан — д.м.н., профессор, заведующий кафедрой гуманитарных дисциплин и биоэтики. E-mail: glm306@yandex.ru;

<https://orcid.org/0009-0007-7913-4325>; SPIN: 3208-9066

Любовь Николаевна Лисенкова — к.и.н., доцент, кафедра гуманитарных дисциплин и биоэтики.

E-mail: lunili@yandex.ru;

<https://orcid.org/0000-0001-7211-1090>; SPIN: 5058-6883

✉ **Даниил Алексеевич Федоров** — преподаватель, кафедра гуманитарных дисциплин и биоэтики.

E-mail: fiodoroff.daniil2014@yandex.ru;

<https://orcid.org/0009-0000-4037-2106>; SPIN: 1667-7795

Сергей Сергеевич Комаров — преподаватель,

кафедра гуманитарных дисциплин и биоэтики.

E-mail: ssk129@mail.ru;

<https://orcid.org/0009-0007-5985-6451>; SPIN: 2484-7350

Владислава Игоревна Макеева — старший пре-

подаватель, кафедра гуманитарных дисциплин и биоэтики.

E-mail: makeeva.vladislava@yandex.ru;

<https://orcid.org/0009-0002-8839-6080>; SPIN: 5088-9444

Кирилл Алексеевич Павленко — преподаватель,

кафедра гуманитарных дисциплин и биоэтики.

E-mail: kirianzaden@mail.ru;

<https://orcid.org/0009-0004-9950-9006>; SPIN: 9261-9637

ПРАВИЛА ДЛЯ АВТОРОВ

Утв. приказом ректора
ФГБОУ ВО СПбГПМУ Минздрава России от 19.02.2026

ОБЩИЕ ПОЛОЖЕНИЯ

Журнал «Medicine and Health Care Organization / Медицина и организация здравоохранения» (далее по тексту «Журнал») видит свою миссию в том, чтобы обеспечивать наивысшее качество публикуемых научных материалов. В Журнале печатаются ранее не опубликованные работы по профилю Журнала. Журнал не рассматривает работы, результаты которых по большей части уже были опубликованы или описаны в статьях, представленных или принятых для публикации в другие печатные или электронные средства массовой информации. Представляя статью, автор всегда должен ставить редакцию в известность обо всех направлениях этой статьи в печать и о предыдущих публикациях, которые могут рассматриваться как множественные или дублирующие публикации той же самой или очень близкой работы. Автор должен уведомить редакцию о том, содержит ли статья уже опубликованные материалы, и предоставить ссылки на предыдущую, чтобы дать редакции возможность принять решение, как поступить в данной ситуации.

В своей работе мы придерживаемся неукоснительного соблюдения принципов редакционной этики, изложенных в рекомендациях Международного комитета редакторов медицинских журналов (International Committee of Medical Journal Editors, ICMJE). и международного Комитета по этике научных публикаций (Committee on Publication Ethics, COPE). Не принимаются к печати статьи, представляющие собой отдельные этапы незавершенных исследований, а также статьи с нарушением «Правил и норм гуманного обращения с биообъектами исследований».

Авторы обязаны помнить о требованиях Хельсинкской декларации Всемирной медицинской ассоциации (World Medical Association, WMA): добросовестные ученые несут ответственность за публикацию и распространение итогов своей исследовательской деятельности, соблюдают общепринятые нормы этики в научных сообщениях и обязательно указывают организацию, финансировавшую исследование, место его проведения и возможные конфликты интересов.

Все статьи, в том числе статьи аспирантов и докторантов, публикуются бесплатно.

Рукописи, оформленные не в соответствии с настоящими правилами, могут не рассматриваться редакцией, не рецензироваться и возвращаются авторам с пометой «рукопись оформлена не в соответствии с правилами журнала».

Файл статьи отправляется электронной почтой по адресу medorgspb@yandex.ru, lt2007@inbox.ru, а также через сайт <https://ojs3.gpmu.org/index.php/medorg>.

К каждой статье прилагается файл Экспертного заключения (ЭЗ). Для авторов СПбГПМУ ЭЗ может подписываться только авторами статьи, печать обязательна. Для авторов других учреждений ЭЗ оформляется обязательно полностью, с печатями (круглая печать учреждения) и подписями руководителей и комиссий данного учреждения. Заполненный, подписанный и «опечатанный» бланк ЭЗ для отправки онлайн предварительно сканируется или фотографируется. Образец ЭЗ можно скачать (https://gpmu.org/userfiles/file/journals/Medorganization/Blank-Экспертное-Закл_Medicina%20i%20org%20zdravoohr.doc, Бланк экспертного заключения).

ПЛАГИАТ И ВТОРИЧНЫЕ ПУБЛИКАЦИИ

Недопустимо использование недобросовестного заимствования и присвоение результатов исследований, не принадлежащих авторам подаваемой рукописи. Проверить статью на оригинальность можно при помощи сервисов <https://www.antiplagiat.ru/> (для русскоязычных текстов) и <http://www.plagiarism.org/> (для англоязычных текстов). Редколлегия оставляет за собой право проверки поступивших рукописей на плагиат. В соответствии с требованиями, предъявляемыми к научным работам и публикациям в журналах перечня SCOPUS, степень оригинальности должна превышать 85%, а суммарная доля заимствования не превышать 10%. Нельзя направлять в Журнал работы, опубликованные в иных изданиях или отправленные в иные издания.

В случае, если статья написана с применением искусственного интеллекта, необходимо сообщить

об этом (в конце статьи в разделе «Дополнительная информация»).

РЕЦЕНЗИРОВАНИЕ

Все статьи, поступающие в редакцию, проходят рецензирование двумя независимыми экспертами, которые не знают ни имени автора, ни его места работы (система двойного слепого рецензирования). В случае возникновения вопросов у рецензентов статья возвращается автору с их комментариями. При этом информация о самих рецензентах не раскрывается. Если отзывы рецензентов расходятся, окончательное решение о публикации принимает главный редактор. Датой поступления материала считается день, когда редакция получает финальный вариант статьи. Срок рецензирования составляет 3–5 недель, возможно увеличение срока рецензирования в зависимости от объема статьи. Размещение публикаций допустимо только после получения положительных рецензий.

ОФОРМЛЕНИЕ РУКОПИСИ

Файл статьи должен содержать НА РУССКОМ И АНГЛИЙСКОМ ЯЗЫКАХ:

- **Заглавие (Title)** должно быть кратким (не более 120 знаков), точно отражающим содержание статьи.
- **Сведения об авторах (публикуются).** Для каждого автора указываются: фамилия, имя и отчество, ученая степень, звание, должность, место работы, почтовый адрес места работы, e-mail, ORCID, SPIN-код. Фамилии авторов рекомендуется транслитерировать так же, как в предыдущих публикациях, или по системе BSI (British Standards Institution), см. сайт <http://www.translit.ru>. Автор для корреспонденции выделяется (например, *).
- **Учреждения.** Необходимо привести официальное полное название учреждения (без сокращений). После названия учреждения через запятую нужно написать почтовый индекс, название города, улицу, дом, страну. Если в написании рукописи принимали участие авторы из разных учреждений, необходимо соотнести названия учреждений и ФИО авторов путем добавления цифровых индексов в верхнем регистре перед названиями учреждений и фамилиями соответствующих авторов. Указывается полное **официальное англоязычное название учреждения**. Наиболее полный список названий учреждений и их официальной англоязычной версии можно найти на сайте РУНЭБ (<https://elibrary.ru/orgs.asp>).
- **Резюме (Abstract)** (1500–2000 знаков, или 200–250 слов для оригинальных статей, 100–250 слов для обзоров и клинических случаев)

помещают перед текстом статьи. Резюме не требуется при публикации рецензий, отчетов о конференциях, информационных писем. Авторское резюме к статье является основным источником информации в отечественных и зарубежных информационных системах и базах данных, индексирующих журнал. Резюме доступно на сайте журнала «Medicine and Health Care Organization / Медицина и организация здравоохранения» (<https://ojs3.gpmu.org/index.php/medorg>) и индексируется сетевыми поисковыми системами. Из аннотации должна быть понятна суть исследования, нужно ли обращаться к полному тексту статьи для получения более подробной, интересующей читателя информации. Резюме должно излагать только существенные факты работы. **Сокращения в тексте резюме недопустимы.**

- Рекомендуемая структура как аннотации, так и самой статьи — IMRAD (для оригинальных исследований структура обязательна): введение (Introduction), материалы и методы (Materials and methods), результаты (Results), обсуждение (Discussion), выводы (Conclusion). Предмет, тему, цель работы нужно указывать, если они не ясны из заглавия статьи; метод или методологию проведения работы целесообразно описывать, если они отличаются новизной или представляют интерес с точки зрения данной работы.
- **Ключевые слова (Keywords)** от 3 до 10 ключевых слов или словосочетаний из 2–4 слов, которые будут способствовать правильному перекрестному индексированию статьи, помещаются под резюме с подзаголовком «Ключевые слова». Используйте термины из списка медицинских предметных заголовков (Medical Subject Headings), приведенного в Index Medicus (если в этом списке еще отсутствуют подходящие обозначения для недавно введенных терминов, выберите наиболее близкие из имеющихся). Ключевые слова разделяются запятой.
- Заголовки таблиц, подписи к рисункам, а также все тексты на рисунках и в таблицах должны быть **на русском и английском языках.**

СТРУКТУРА ОСНОВНОГО ТЕКСТА СТАТЬИ

- Текст статьи должен быть подготовлен в строгом соответствии с настоящими правилами и тщательно выверен автором. Текст статьи может быть написан либо на русском, либо на английском языке, также возможна публикация статьи с полным переводом. В случае обнаружения значительного количества опечаток, небрежностей,

- пунктуационных и орфографических ошибок, нерасшифрованных сокращений, отсутствия основных компонентов, переводов заголовков таблиц, подрисуночных подписей, надписей на рисунках, текста таблиц и других технических дефектов оформления статей редакция возвращает статью автору для доработки. Небольшие погрешности редакция может исправить сама без согласования с автором. Редакция оставляет за собой право осуществления литературного и технического редактирования статей.
- Текст статьи должен иметь структуру: введение, изложение основного материала, заключение, литература; для оригинальных исследований — введение, методика (материалы и методы), цели исследования, результаты исследования, обсуждение результатов, выводы, литература.
 - **Объем рукописей.** Объем рукописи обзора не должен превышать 25 страниц машинописного текста (формата А4), полуторный интервал, 12 кеглем (включая таблицы, список литературы, подписи к рисункам и резюме на английском языке), поля не менее 20 мм. Нумеруйте страницы последовательно, начиная с титульной. Объем рукописи статьи экспериментального характера не должен превышать 15 страниц машинописного текста; клинических случаев — 6 страниц, кратких сообщений (писем в редакцию) — 7 страниц; отчетов о конференциях — 3 страницы. **По согласованию с редакцией** обозначенные пределы могут быть увеличены. Файл со статьей должен быть представлен в формате Microsoft Word (иметь расширение *.doc, *.docx, *.rtf).
 - В разделе «Материалы и методы» обязательно указываются сведения о статистической обработке экспериментального или клинического материала (оформление статистических методов и интерпретацию полученных статистических данных необходимо представлять в соответствии с рекомендациями SAMPL (Statistical Analyses and Methods in the Published Literature). Единицы измерения даются в соответствии с Международной системой единиц — СИ.
 - Если в качестве субъектов исследования были использованы животные, в тексте рукописи должно быть отмечено, что авторы обеспечили гуманное отношение к ним. В разделе «Материалы и методы» необходимо указать, что исследователи действовали в соответствии с «Правилами по уходу и использованию лабораторных животных» или в соответствии с местными или национальными руководствами по использованию лабораторных животных и уходу за ними.
 - Все пациенты, принимающие участие в исследовании, должны подписывать добровольное информированное согласие на публикацию медицинских данных.
 - Таблицы и рисунки приводятся непосредственно в теле статьи, каждый из которых имеет номер и название с обязательными ссылками на них в тексте статьи — в контексте предложения (например: «... как показано на рисунке 1...») или в конце предложения в круглых скобках (например: «...выявлена положительная корреляционная связь умеренной степени ($r=0,41$) между уровнем ТТГ матери и новорожденного (рис. 2)»); просьба учитывать, что в печатной версии журнала рисунки могут воспроизводиться в черно-белом варианте. Число рисунков рекомендуется не более 8. Большее количество рисунков и иллюстраций должно быть оправданным. В подписях под рисунками должны быть приведены объяснения значений всех кривых, букв, цифр и прочих условных обозначений. Все графы в таблицах должны иметь заголовки. Повторять одни и те же данные в тексте, на рисунках и в таблицах не следует. В подрисуночных подписях всех рисунков (таблиц, фотографий) следует указать источник (рисунок авторов, составлено авторами, результаты собственных гистологических исследований), указать ссылку на оригинальный источник, за исключением документов, находящихся в общественном доступе.
 - Сокращений, кроме общеупотребительных, следует избегать. **Сокращения в названии статьи, названиях таблиц и рисунков, в выводах недопустимы.** Если аббревиатуры используются, то все они должны быть непременно расшифрованы полностью при первом их упоминании в тексте (например: «Наряду с данными о резидуально-органической недостаточности (РОН), обуславливающей развитие гиперкинетического синдрома (ГКС), расширен диапазон исследований по эндогенной природе данного синдрома»).
 - Все цитирования производятся следующим образом: ФИО автора, год издания и прочая информация не упоминаются в тексте. Вместо этого указывается ссылка на источник литературы в виде номера в квадратных скобках (пример: «Ряд исследователей отмечает различные нарушения речевых функций при эпилепсии в детском возрасте [17, 21, 22].»), который включен в расставленный в порядке упоминания (1, 2, 3 и т.д.) список источников в конце статьи.
 - Все ссылки должны иметь соответствующий источник в списке, а каждый источник в списке — ссылку в тексте.

- В виде исключения в тексте могут приводиться ФИО конкретных авторов в формате И.О. Фамилия, год и даже название источника, но при этом все равно обязательна ссылка (в квадратных скобках в конце предложения) на источник, включенный в список литературы (например: «В исследовании Н. Thomassin и соавт. было выяснено, что ГКС регулируют деметилирование ДНК [42]»). Фамилии иностранных авторов, цитируемые в тексте рукописи, приводятся в оригинальной транскрипции.
- **Приказы, нормативные акты, методические письма и прочие законные акты, патенты, полезные модели, архивные документы, ссылки на интернет-ресурсы** (за исключением электронных научных журналов, которые входят в список литературы) **не вносятся в список литературы, оформляются в виде сносок.** Сноска — примечание, помещаемое внизу страницы (постраничная сноска). Знак сноски ставят цифрой после фрагмента основного текста, где есть упоминание об этих источниках. Рекомендуется сквозная нумерация сносок по тексту.
- В конце каждой статьи обязательно указываются вклад авторов в написание статьи (при этом следует подробно написать об участии каждого автора), источники финансирования (или их отсутствие), отсутствие конфликта интересов, наличие согласия на публикацию со стороны пациентов. Данная информация должна быть переведена на английский язык. При представлении рукописи в Журнал Авторы несут ответственность за раскрытие своих финансовых и других конфликтных интересов, способных оказать влияние на их работу. В рукописи должны быть упомянуты все лица и организации, оказавшие финансовую поддержку (в виде грантов, оборудования, лекарств или всего этого вместе), а также личное участие.

Пример:

Вклад авторов. Архивов П.Д. — концептуализация исследования; Петров И.С. — разработка дизайна исследования; Смирнов К.В. — составление списка литературы; Столов А.М. — редактирование текста.

- В конце статьи приводятся **данные всех авторов** с обязательным указанием ученой степени (при наличии), занимаемой должности, места работы, E-mail, ORCID, eLIBRARY SPIN-кода.

ЛИТЕРАТУРА (REFERENCES)

Учитывая требования международных систем цитирования, список литературы приводится не только в обычном виде, но также и дополнительно в переведенном на английский язык (References). Необходимо

проверять все источники литературы (верифицировать). Преимущественно источники литературы приводятся за последние 5 лет (не относится к единственной публикации, уникальным или архивным статьям).

В оригинальной статье рекомендуется использовать не менее 10 и не более 30 достоверных источников. В обзорной статье не должно быть более 60 источников (половина из которых являются зарубежными), в лекциях и других материалах — до 15. В списке литературы должно быть не менее 5 источников, опубликованных за последние 2 года в периодических изданиях с высоким индексом международного цитирования.

В описании публикации достаточно привести фамилии первых шести авторов, после чего для отечественных источников необходимо указать «и др.», а для иностранных — «et al.».

Ссылки на неопубликованные работы не допускаются. Литература в Журнале оформляется в формате Vancouver.

Примеры оформления литературы

Книга

Юрьев В.К., Моисеева К.Е., Глущенко В.А. Основы общественного здоровья и здравоохранения. СПб.: СпецЛит; 2019.

Никифоров О.Н., ред. Санкт-Петербург в 2021 году. СПб.: Петростат; 2022.

Brandenburg J.H., Ponti G.S., Worring A.F. eds. Vocal cord injection with autogenous fat. 3rd ed. NY: Mosby; 1998.

Domeika M. Diagnosis of genital chlamydial infection in humans as well as in cattle. Uppsala; 1994.

Глава из книги

Тутельян В.А., Никитюк Д.Б., Шарафетдинов Х.Х. Здоровое питание — основа здорового образа жизни и профилактики хронических неинфекционных заболеваний. В кн.: Здоровье молодежи: новые вызовы и перспективы. Т. 3. М.: Научная книга; 2019. С. 203–227.

Статья из журнала

Карсанов А.М., Полунина Н.В., Гогичаев Т.К. Безопасность пациентов в хирургии. Часть 2: Программа менеджмента качества хирургического лечения. *Медицинские технологии. Оценка и выбор*. 2019;1(35):56–65. <https://doi.org/10.31556/2219-0678.2019.35.1.056-065>.

Brandenburg J.H., Ponti G.S., Worring A.F. Vocal cord injection with autogenous fat: a long-term magnetic resonance. *Laryngoscope*. 1996;106(2,pt 1):174–180.

Deb S., Campbell B.K., Pincott-Allen C. et al. Quantifying effect of combined oral contraceptive pill on functional ovarian reserve as measured by serum anti-Müllerian hormone and small antral follicle count using three-dimensional ultrasound. *Ultrasound Obstet Gynecol*. 2012;39(5):574–580.

Каршибоев Ш.Б., Мирзавалиев Д.Б. Методы очистки и промышленное применение селена. *Universum: технические науки: электрон. научн. журн.* 2023;4(109). URL: <https://7universum.com/ru/tech/archive/item/15338> (дата обращения: 03.02.2026).

Тезисы докладов, материалы научных конференций

Марковская И.Н., Завьялова А.Н., Кузнецова Ю.В. Микробный пейзаж пациента первого года жизни с дисфагией, длительно находящегося в ОРИТ. XXX Конгресс детских гастроэнтерологов России и стран СНГ: тез. докл. М.; 2023. С. 29–31.

Салов И.А., Маринушкин Д.Н. Акушерская тактика при внутриутробной гибели плода. В кн.: Материалы IV Российского форума «Мать и дитя». Ч. 1. М.; 2000. С. 516–519.

Авторефераты

Авилов А.Ю. Девиации полоролевой идентичности мужчин с умственной отсталостью в условиях психоневрологического интерната. Автореф. дис. ... канд. психол. наук. СПб.; 2021.

Описание интернет-ресурса

Естественное движение населения. Москва: Росстат. URL: <https://rosstat.gov.ru/folder/12781> (дата обращения: 23.10.2023).

World Health Organization. Prevalence and incidence of selected sexually transmitted infections — 2008. Geneva: World Health Organization; 2012. URL: https://aefsg.ch/wp-content/uploads/who-9789241503839_eng.pdf (accessed: 11.04.2024).

Перевод и транслитерация

В зависимости от ситуации следует либо приводить транслитерацию (писать исходные неанглоязычные слова буквами романского алфавита), либо указывать перевод неанглоязычной информации о первоисточниках в References.

Если цитируемая статья написана на латинице (на английском, немецком, испанском, итальянском, финском, датском и других языках, использующих романский алфавит), ссылку на нее следует привести на оригинальном языке опубликования. Пример (статья в норвежском журнале на норвежском языке):

Ellingsen A.E., Wilhelmsen I. Sykdomsangst blant medisinske studenter. *Tidsskr Nor Laegeforen.* 2002;122(8):785–787. (In Norwegian).

Если статья написана не на латинице (на кириллице, в том числе на русском), нужно привести официальный перевод или выполнить транслитерацию в романский алфавит. Для книг необходимо в этом случае привести транслитерацию на латиницу. В конце описания в скобках указать язык издания.

Ссылка на источник литературы в References может состоять одновременно и из транслитерированных элементов (например, ФИО авторов, назва-

ния журналов при отсутствии зарегистрированного названия на английском языке), и из переводных (название публикации).

Стандарт транслитерации. Для транслитерации рекомендуется использовать стандарт BSI (British Standard Institute, UK); можно воспользоваться ссылкой <https://transliteration.pro/bsi>.

ФИО авторов, редакторов. Фамилии и инициалы всех авторов на латинице следует приводить в ссылке так, как они даны в оригинальной публикации (независимо от использованной системы транслитерации в первоисточнике). Если в официальных источниках (на сайте журнала, в базах данных, в том числе в eLIBRARY) ФИО авторов на латинице не приведены, следует транслитерировать их самостоятельно по стандарту BSI.

Название публикации. Если у цитируемой Вами работы существует официальный перевод на английский язык или англоязычный вариант названия (его следует искать на сайте журнала, в базах данных, в том числе в eLIBRARY, PubMed), следует указать именно его. Если в официальных источниках название публикации на латинице не приведено, следует выполнить транслитерацию в романский алфавит по стандарту BSI.

Название издания (журнала). Некоторые неанглоязычные научные издания (журналы) имеют кроме названия на родном языке официальное «параллельное» название на английском (например, у журнала «Сахарный диабет» есть официальное англоязычное название «Diabetes Mellitus»). Таким образом, для списка References в ссылке на статью из русскоязычного журнала следует указать либо транслитерированное название журнала, либо переводное. Переводное название журнала можно взять либо с официального сайта журнала (или использовать данные о правильном написании англоязычного названия из цитируемой статьи), либо проверить его наличие в базе данных, например в CAS Source Index, библиотеке WorldCat или каталоге Web of Science (ISI), каталоге названий базы данных MedLine (NLM Catalog), PubMed. В случае, когда у журнала нет официального названия на английском языке, в References нужно приводить транслитерацию по системе BSI. **Не следует самостоятельно переводить названия журналов.**

Место издания. Место издания в ссылках всегда следует указывать на английском языке и полностью — не в транслитерации и без сокращений. То есть «Moscow», а не «Moskva» и не «М.», «Saint Petersburg», а не «Sankt Peterburg» и не «SPb».

Название издательства/издателя. В отличие от места издания, название издательства для ссылок

в References следует только транслитерировать (за исключением крайне редких случаев наличия у издателя параллельного официального англоязычного названия).

Примеры перевода русскоязычных источников литературы для англоязычного блока статьи

Книга

Yuriev V.K., Moiseeva K.E., Glushchenko V.A. Fundamentals of public health and healthcare. Saint Petersburg: SpetsLit; 2019. (In Russ.).

Nikiforov O.N., ed. Saint Petersburg in 2021. Saint Petersburg: Petrostat; 2022. (In Russ.).

Глава из книги

Tutelyan V.A., Nikityuk D.B., Sharafetdinov Kh.Kh. Healthy nutrition is the basis of a healthy lifestyle and the prevention of chronic non-communicable diseases. In: Youth health: new challenges and prospects. Vol. 3. Moscow: Naychnaya kniga; 2019. P. 203–227. (In Russ.).

Статья из журнала

Karsanov A.M., Polunina N.V., Gogichaev T.K. Patient safety in surgery. Part 2: Quality management program for surgical treatment. *Medical technologies. Evaluation and selection*. 2019;1(35):56–65. (In Russ.). <https://doi.org/10.31556/2219-0678.2019.35.1.056-065>.

Тезисы докладов, материалы научных конференций

Markovskaya I.N., Zavyalova A.N., Kuznetsova Yu.V. Microbial landscape of a patient in the first year of life with dysphagia who has been in the ICU for a long time. XXX Congress of pediatric gastroenterologists of Russia and the CIS countries: abstract. report. Moscow; 2023. P. 29–31. (In Russ.).

Salov I.A., Marinushkin D.N. Obstetric tactics in intrauterine fetal death. In: Materials from the Russian forum "Mother and Child". Part 1: Moscow; 2000. P. 516–519. (In Russ.).

Авторефераты, диссертации

Avilov A.Yu. Deviations of gender role identity of men with mental retardation in a psychoneurological boarding school. PhD thesis. Saint Petersburg; 2021. (In Russ.).

Zotov A.S. Modern approaches to surgical treatment of patients with atrial fibrillation. MD dissertation. Saint Petersburg; 2024. (In Russ.).

Описание интернет-ресурса

Natural population movement. Moscow: Rosstat. URL: <https://rosstat.gov.ru/folder/12781> (accessed: 23.10.2023). (In Russ.).

Kealy M.A., Small R.E., Liamputtong P. Recovery after caesarean birth: a qualitative study of women's accounts in Victoria, Australia. *BMC Pregnancy and Childbirth*. 2010. URL: <http://www.biomedcentral.com/1471-2393/10/47/> (accessed: 11.09.2013).

Пример списка литературы (References)

ЛИТЕРАТУРА

1. Криворученко В.К. Жестокое обращение с ребенком. Проявление и меры предотвращения. Информационный гуманитарный портал Знание. Понимание. Умение. 2012; 3. URL: http://www.zpu-journal.ru/e-zpu/2012/3/Krivoruchenko_Child-Abuse (дата обращения: 27.12.2023).

2. Jacobi G., Dettmeyer R., Banaschak S., Brosig B., Herrmann B. Child abuse and neglect: diagnosis and management. *Dtsch Arztebl Int*. 2010;107(13):231–239. <https://doi.org/10.3238/arztebl.2010.0231>.

REFERENCES

1. Krivoruchenko V.K. Child abuse. Manifestation and prevention measures. "Knowledge. Understanding. Skill" Journal. 2012; 3. URL: http://www.zpu-journal.ru/e-zpu/2012/3/Krivoruchenko_Child-Abuse (accessed: 27.12.2023). (In Russ.).

2. Jacobi G., Dettmeyer R., Banaschak S., Brosig B., Herrmann B. Child abuse and neglect: diagnosis and management. *Dtsch Arztebl Int*. 2010;107(13):231–239. <https://doi.org/10.3238/arztebl.2010.0231>.

Для всех статей необходимо указывать индекс DOI в конце библиографического описания, а также EDN при его наличии.

Примеры:

Саттаров А.Э., Карелина Н.Р. Особенности родовых процессов у мальчиков и юношей различных пропорций и телосложения, проживающих в южной части Кыргызстана. *Педиатрия*. 2018;9(5):47–52. <https://doi.org/10.17816/PED9547-52>. EDN: YRAEPZ.

Voropaeva E.E., Khaidukova Yu.V., Kazachkova E.A. et al. Perinatal outcomes and morphological examination of placentas in pregnant women with critical lung lesions in new COVID-19 coronavirus infection. *Ural Medical Journal*. 2023;22(2):109–121. (In Russ.). <https://doi.org/10.52420/2071-5943-2023-22-2-109-121>. EDN: CXRCMN.

АДРЕС РЕДАКЦИИ

194100, Санкт-Петербург, Литовская ул., 2

E-mail: medorgspb@yandex.ru.

Сайты журнала: http://www.gpmu.org/science/pediatrics-magazine/Medicine_organization
<https://ojs3.gpmu.org/index.php/medorg>