TOSHKENT TIBBIYOT AKADEMIYASI URGANCH FILIALI
JANUBIY OROLBO‘YI TIBBIYOT JURNALI
2 - TOM, MAXSUS SON. 2026
14.00.00 - TIBBIYOT FANLARI ISSN: 3093-8740

THE PROBLEM OF ANTIBIOTIC RESISTANCE AND ITS PREVENTION

Chariyev Muzaffarbek Yuldashevich
muzaffar86chariyev@gmail.com
https://orcid.org/0009-0006-8995-3431
Termez University of Economics and Service Faculty of Medicine

Odiljonov Ozodbek Odiljon o‘g‘li
odiljonnorkulov0@gmail.com
https://orcid.org/0009-0000-4932-4354
Termez University of Economics and Service Faculty of Medicine

To‘raboyeva Nargiza Asqar qizi
Tisu.tibbiyot@gmail.com
Termez University of Economics and Service Faculty of Medicine

Xolmo‘minova Saida Hamid qizi
Tisu.tibbiyot.fakulteti@gmail.com
Termez University of Economics and Service Faculty of Medicine

TOSHKENT TIBBIYOT AKADEMIYASI URGANCH FILIALI
JANUBIY OROLBO‘YI TIBBIYOT JURNALI
2 - TOM, MAXSUS SON. 2026
14.00.00 - TIBBIYOT FANLARI ISSN: 3093-8740

Annotation: *This article provides a comprehensive analysis of antibiotic resistance, one of the most critical challenges facing modern medicine and global public health. Antibiotic resistance occurs when bacteria develop the ability to survive exposure to antibiotics, leading to reduced effectiveness of standard treatments and increased mortality rates. The study examines the main causes of resistance, including the overuse and misuse of antibiotics, self-medication, and the uncontrolled application of antibiotics in agriculture and veterinary practice. Furthermore, the global spread of resistant microorganisms and their negative impact on healthcare systems, economic stability, and social well-being are discussed. The article emphasizes effective prevention strategies such as rational antibiotic use, strict medical supervision, improved infection prevention measures, public awareness, and international cooperation to combat antibiotic resistance.*

Keywords: *Antibiotics, resistance, microorganisms, infectious diseases, irrational drug use, public health, prevention, medical supervision.*

Аннотация: *В данной статье рассматривается проблема антибиотикорезистентности как одна из наиболее актуальных угроз современному здравоохранению и общественному здоровью в целом. Антибиотикорезистентность возникает в результате способности бактерий адаптироваться к действию антибиотиков, что значительно снижает эффективность лечения инфекционных заболеваний. В исследовании анализируются основные причины развития резистентности, включая чрезмерное и неправильное применение антибиотиков, самолечение, а также их неконтролируемое использование в сельском хозяйстве и ветеринарии. Особое внимание уделяется глобальному распространению устойчивых микроорганизмов и их негативному влиянию на системы здравоохранения, экономику и общество. В статье обосновывается необходимость комплексных профилактических мер, таких как рациональная антибиотикотерапия, медицинский контроль, повышение уровня медицинской грамотности населения и международное сотрудничество.*

Ключевые слова: *Антибиотики, резистентность, микроорганизмы, инфекционные заболевания, самолечение, общественное здоровье, профилактика, медицинский контроль.*

INTRODUCTION

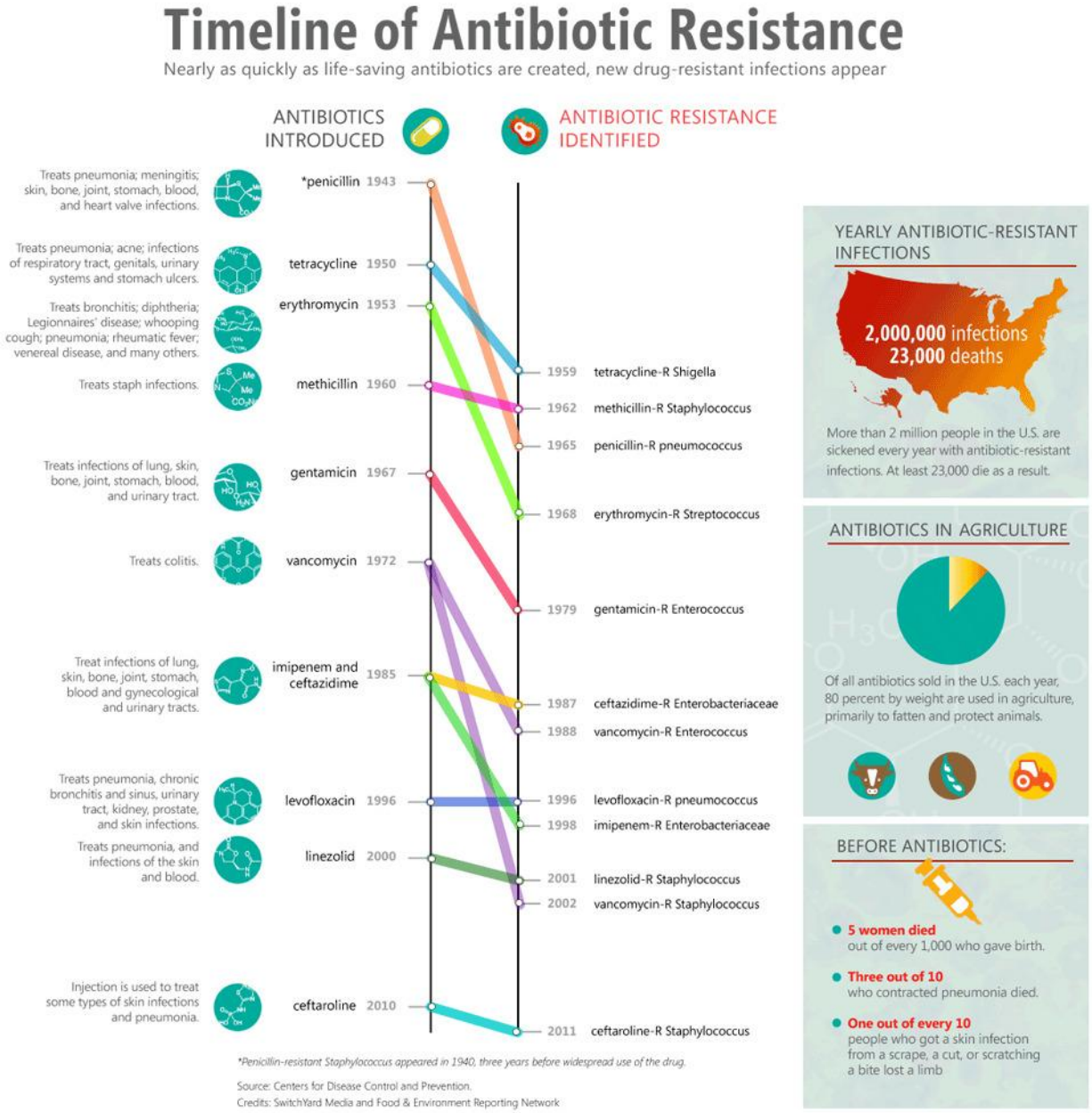
Despite the progress of modern medicine, infectious diseases continue to pose a serious threat to human health. In particular, in recent years, the sharp increase in the problem of antibiotic resistance (antibiotic resistance) has become a global problem for the world's health system. Although antibiotics revolutionized medicine in the 20th century and made it possible to effectively treat many deadly diseases, their improper and uncontrolled use has led to the increasing resistance of microorganisms to these drugs. Antibiotic resistance is explained by the genetic adaptation of bacteria to the ability to resist the effects of antibiotics. This leads to the severity of even simple infections, prolonged treatment, increased medical costs, and an increase in mortality. The World Health Organization considers antibiotic resistance to be one of the most dangerous medical problems of the 21st century. The main factors contributing to this problem are the use of antibiotics without a doctor's prescription, failure to complete the full course of treatment, the unreasonable use of antibiotics for viral diseases, as well as the excessive use of antibiotics in veterinary medicine and agriculture. This leads to the rapid spread of resistant strains and their emergence in new areas. Therefore, it is urgent to study the problem of antibiotic resistance in depth, identify its causes and develop effective preventive measures. This study aims to shed light on the nature of antibiotic resistance, analyze its medical and social consequences, and demonstrate scientifically based preventive approaches to reduce this problem.

TOSHKENT TIBBIYOT AKADEMIYASI URGANCH FILIALI
JANUBIY OROLBO‘YI TIBBIYOT JURNALI
2 - TOM, MAXSUS SON. 2026
14.00.00 - TIBBIYOT FANLARI ISSN: 3093-8740

LITERATURE REVIEW AND METHODOLOGY

The problem of antibiotic resistance has been in the spotlight of world science and the health system in recent decades. Scientific studies on this issue show that antibiotic resistance is spreading rapidly globally and creating serious obstacles to the treatment of infectious diseases. Reports published by the World Health Organization assess antibiotic-resistant bacteria as one of the main threats to human health and emphasize that this situation leads to a decrease in the effectiveness of treatment, an increase in morbidity and mortality. The mechanisms and factors of the emergence of antibiotic resistance are widely covered in foreign scientific literature. In particular, Davies and Davies interpret antibiotic resistance as a process of evolutionary adaptation of bacteria and note that the overuse of antibiotics is the main factor accelerating this process. Levy and Marshall in their studies scientifically demonstrate that the misuse of antibiotics increases genetic mutations in microorganisms and leads to the formation of resistant strains. Laxminarayan and co-authors, along with the medical consequences of antibiotic resistance, analyze its economic and social harm, emphasizing that it creates a huge financial burden for healthcare systems. The problem of antibiotic resistance has also been considered as an urgent issue in studies conducted by CIS countries and local scientists. These studies indicate that taking antibiotics without a doctor's recommendation, not

completing the full course of treatment, unreasonable use of antibiotics for viral diseases, and low medical literacy of the population are among the main reasons for the development of resistance. Also, the possibility of the transfer of resistant microorganisms to the human body through the environment as a result of uncontrolled use of antibiotics in veterinary medicine and agriculture is also highlighted in the scientific literature. The literature review shows that antibiotic resistance is a multifactorial and complex biological process that cannot be limited to a pharmacological approach alone. To effectively control this problem, it is necessary to develop comprehensive strategies that include medical, social, organizational and preventive measures. At the same time, although existing scientific research provides sufficient theoretical recommendations for the prevention of antibiotic resistance, it is necessary to study in more depth the mechanisms for their implementation in practice.



TOSHKENT TIBBIYOT AKADEMIYASI URGANCH FILIALI
JANUBIY OROLBO‘YI TIBBIYOT JURNALI
2 - TOM, MAXSUS SON. 2026
14.00.00 - TIBBIYOT FANLARI ISSN: 3093-8740

RESULTS

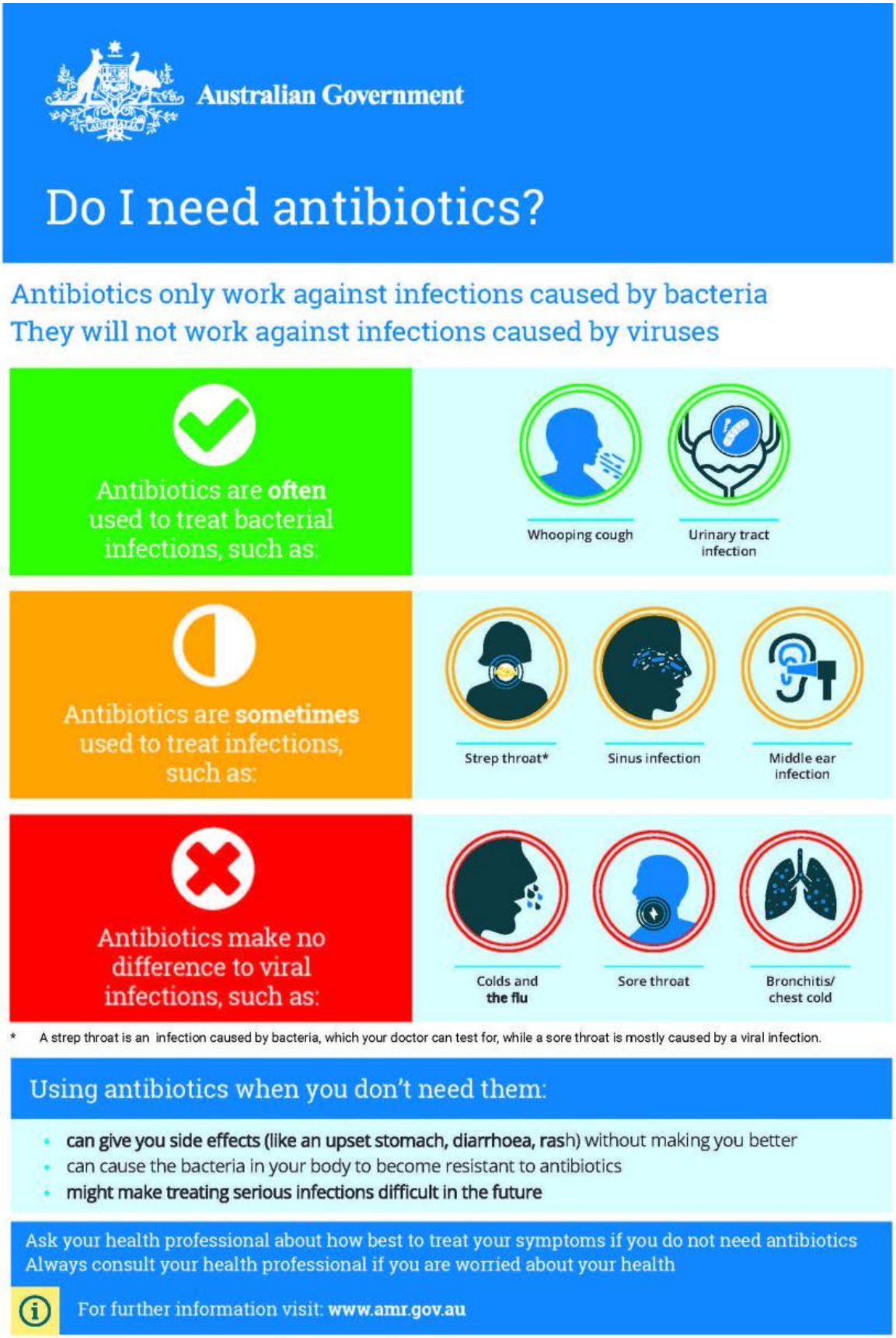
As a result of the analysis of the literature and methodological research, it was found that the problem of antibiotic resistance is becoming increasingly acute in the modern healthcare system. The results of the study show that the incorrect and uncontrolled use of antibiotics increases the adaptability of microorganisms and leads to the rapid formation of resistant strains. In particular, the unreasonable use of antibiotics with a wide spectrum of action is a leading factor in the development of resistance. Based on the analyzed scientific sources, it was determined that antibiotic resistance not only complicates the treatment of bacterial infections, but also prolongs the duration of the disease and causes an increase in the number of complications. This, in turn, increases the burden on healthcare institutions and leads to a significant increase in treatment costs. The results show that patients with resistant infections have a longer hospital stay and lower treatment effectiveness. During the study, one of the main reasons for antibiotic resistance was identified as insufficient medical literacy of the population. Many sources report that patients are taking antibiotics without a doctor's prescription, not completing the full course of treatment, and using antibiotics for viral diseases are common. These factors have been identified as important factors accelerating the adaptation of bacteria to antibiotics. The results also show that the uncontrolled use of antibiotics in veterinary medicine and agriculture is causing the spread of resistant microorganisms through the environment. This poses an indirect threat to human health, confirming that the problem of antibiotic resistance is not only a medical problem, but also an ecological and social one.

DISCUSSION

The results of this study once again confirm the relevance of the problem of antibiotic resistance for modern medicine and public health. The results obtained are consistent with the conclusions of previous scientific studies and international organizations and indicate that the inappropriate use of antibiotics is a major factor in the development of resistance. In particular, the views that the unreasonable use of broad-spectrum antibiotics leads to the rapid adaptation of microorganisms were confirmed by the results of this study. Analysis of the results shows that antibiotic resistance is not only a medical problem, but also a complex social and economic issue. The increase in the duration of treatment and the increase in treatment costs due to resistant infections impose a significant financial burden on the healthcare system. This situation is consistent with the conclusions of the studies conducted by Laxminarayan et al., namely, that antibiotic resistance also has a negative impact on economic stability. During the discussion, it was found that the level of

medical literacy of the population plays an important role in the formation of antibiotic resistance. Patients taking antibiotics without a doctor's prescription, not completing the full course of treatment, and using antibiotics for viral infections accelerate the emergence of resistant strains. This is consistent with the conclusions of many foreign and domestic studies and once again justifies the need to strengthen preventive measures. Also, the misuse of antibiotics in veterinary medicine and agriculture was highlighted as an aspect that received special attention during the discussion. The results of the study show that the spread of resistant microorganisms through the environment poses an indirect threat to human health. This indicates that antibiotic resistance cannot be limited only to the medical field, but also needs to be addressed taking into account environmental and social factors.

TOSHKENT TIBBIYOT AKADEMIYASI URGANCH FILIALI
JANUBIY OROLBO‘YI TIBBIYOT JURNALI
2 - TOM, MAXSUS SON. 2026
14.00.00 - TIBBIYOT FANLARI ISSN: 3093-8740



CONCLUSION

This study scientifically substantiates the fact that the problem of antibiotic resistance is an urgent and serious threat to modern medicine and public health. The analysis of the literature, methodological approach and results obtained show that the main causes of antibiotic resistance are closely related to the incorrect and uncontrolled use of antibiotics, non-compliance with doctor's instructions, and insufficiently developed medical literacy of the population. The study revealed that the spread of antibiotic-resistant microorganisms reduces the effectiveness of treating infectious diseases, leads to an increase in the duration of treatment, complications and mortality. This situation creates a significant economic burden for the healthcare system and reduces the efficiency of using medical resources. At the same time, the uncontrolled use of antibiotics in veterinary medicine and agriculture leads to the spread of resistant microorganisms through the environment, which indicates that the problem is global and multidisciplinary.

In conclusion, effective control of the problem of antibiotic resistance requires cooperation between the health system, public policy and all segments of society. The results of this study provide scientific evidence that it is possible to maintain the effectiveness of antibiotics for future generations through scientifically based preventive measures and informed approaches.

REFERENCES

1. World Health Organization. Antimicrobial resistance: global report on surveillance. Geneva: WHO, 2014.

2. World Health Organization. Global action plan on antimicrobial resistance. Geneva: WHO, 2015.

3. Davies J., Davies D. Origins and evolution of antibiotic resistance. Microbiology and Molecular Biology Reviews, 2010, Vol. 74(3), pp. 417–433.

4. Levy S. B., Marshall B. Antibacterial resistance worldwide: causes, challenges and responses. Nature Medicine, 2004, Vol. 10(12), pp. 122–129.

5. Laxminarayan R., Duse A., Wattal C. et al. Antibiotic resistance — the need for global solutions. The Lancet Infectious Diseases, 2013, Vol. 13(12), pp. 1057–1098.

6. Ventola C. L. The antibiotic resistance crisis: causes and threats. Pharmacy and Therapeutics, 2015, Vol. 40(4), pp. 277–283.

7. Spellberg B., Bartlett J. G., Gilbert D. N. The future of antibiotics and resistance. The New England Journal of Medicine, 2013, Vol. 368, pp. 299–302.

8. U'rinov A. A., Karimov B. S. Rational use of antibiotics and resistance problems. Journal of Medicine of Uzbekistan, 2020, No. 3, pp. 45–50.

9. Madjidov J. R. Modern problems of antibiotic therapy in infectious diseases. Tashkent: Tibbiyot, 2019.