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Examining Several Scenarios for the Future of Epidemiology in Iran

*Ganji MF[1], Nematollahi S[2,3], Sehat M[4] and Holakouie-Naieni K[5]**

[1]Department of Epidemiology, School of Public Health, Iran University of Medical Sciences, Iran

[2]School of Physical and Occupational Therapy, McGill University, Canada

[3]Department of Clinical Research, Shriners Hospitals for Children, Canada

[4]Department of Community Medicine, Trauma Research Center, Kashan University of Medical Sciences, Iran

[5]Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Iran

Abstract

The field of epidemiology is constantly evolving, with a wide range of topics that warrant further study. This review article highlights key areas for future research in epidemiology, including disease risk factors and prevalence, factors contributing to disease spread, the role of healthcare systems in disease control, nutrition's impact on health, new diagnostic and therapeutic methods, data collection systems improvement, climate change effects on disease spread, and preparedness for new diseases and epidemics. In the context of Iran, there is a pressing need to develop a comprehensive roadmap for public health improvement, based on future scenarios and forecasting. This roadmap should focus on enhancing preventive and therapeutic systems, increasing knowledge levels, adopting modern technologies, and fostering interdisciplinary collaborations. By implementing these measures, Iran can elevate its epidemiology science to global standards and ensure advancements in public health outcomes.

Introduction

Epidemiology is the study of the distribution and determinants of health and disease in populations. Environmental factors [1], such as air pollution and climate change, can have a significant impact on the health of populations [2]. Scenario analysis is a systematic way of projecting long-term future risks and has been used to explore possible environmental changes and potential response strategies [3]. In this context, we aim to examine several scenarios for the future of epidemiology in Iran, including the potential impact of environmental factors on population health and the effectiveness of policy measures to mitigate these risks [4,5]. We will review the current state of knowledge on scenarios projecting future health risks related to environmental change, the important findings and common methods used in environmental health-related scenario literature, and important gaps in the coverage and use of scenarios for projecting the future state of health in Iran.

Determining the road map in epidemiology by technical people

Additionally, the roadmap can include the integration of technology in epidemiological studies, such as the use of mobile applications for data collection and analysis, the development of predictive models for disease outbreaks, and the use of advanced statistical and computational methods for data interpretation [6,7]. Furthermore, technical people can contribute to the roadmap by identifying potential challenges and limitations in the field of epidemiology, and proposing innovative solutions and technologies to overcome these obstacles. This can lead to the identification of key research areas and priorities for investment and development in the field [6,7].

Overall, the involvement of technical people in determining the roadmap for epidemiology can lead to a more comprehensive and effective approach to addressing public health challenges. By leveraging their expertise in technology and data analysis, technical people can help to drive innovation and progress in the field of epidemiology, ultimately leading to improved public health outcomes [8].

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Correspondence:
Kourosh Holakouie-Naieni, Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran,

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Analysis of the current situation in Iran and the benefits, application and future of the field of epidemiology

Iran is facing many challenges in the field of health. For example, the rate of cardiovascular diseases, diabetes, cancer and diseases related to air pollution is very high in Iran. The analysis of the epidemiological situation shows that the level of public awareness of health issues and prevention of diseases is low. In this situation, the field of epidemiology, as a practical and useful scientific field, can help improve the health status of the Iranian society. Epidemiology, as a science that examines the prevalence, causes and prevention of diseases, can help identify opportunities for prevention and reducing the risk of diseases [9,10].

The advantages of epidemiology include:

1. Identifying causes and risk factors to improve disease prevention and treatment

Epidemiological methods can identify the causes and risk factors for diseases, helping to design and improve disease prevention and control programs.

2. Designing, implementing, and evaluating disease prevention and control programs

Epidemiology can help in designing, implementing, and evaluating disease prevention and control programs.

3. Evaluating the effectiveness of health policies

Epidemiology can evaluate the effectiveness of health policies using epidemiological data.

4. Providing health advice for the community

Epidemiology can provide health advice to society using epidemiological data.

Therefore, the field of epidemiology can improve the health status of Iranian society and be recognized as a practical and useful scientific field. In the future, with the development of this scientific field, we can see improvements in the health status of Iranian society in various health and medical fields. Additionally, analyzing the current situation in Iran can provide insights into the effects of the country's economic and political activities on public health. This field is part of understanding the factors, consequences, and results related to Iran's economy. Another advantage of this field is a better understanding of how the country's economy affects the health of Iranian people and creates different outcomes. Furthermore, this field can help identify changes that can be made to improve Iran's economy.

In the future, Iran's epidemiology may be very useful for assessing the country's social and economic challenges. This field can enable a better understanding of progress in various social and economic fields in Iran. Finally, with a better analysis of Iran's economy, it is possible to evaluate factors that improve it and give them special importance.

Development of Scenarios

In order to develop a road map for the future development of the field of epidemiology in the country, a road map that includes specific actions and goals should be developed based on possible scenarios that can happen in the future.

In the following, several scenarios for the future of epidemiology in the country will be discussed:

1. New disease outbreak scenario

In this scenario, we will face the outbreak of new diseases that enter the country from other regions. For this reason, it is necessary to improve crisis management in this area and train people with the necessary abilities to deal with these diseases.

2. The scenario of changing the pattern of diseases

Due to the change of population pattern and environmental factors, it is possible that the pattern of diseases will also change. For example, the increase in diseases caused by air pollution and the increase in chronic diseases such as diabetes and cancer. In this scenario, it is necessary to pay attention to the improvement of the system of prevention and treatment of chronic diseases and the prevention of diseases caused by air pollution and environmental factors.

In this scenario, the focus should be on prevention and control of new diseases. For this purpose, measures should be taken to resist new diseases and diseases that are spreading. Also, one of the goals of this scenario is to promote research in the field of prevention and treatment of new diseases, development of modern technologies and management of effective diseases in the country.

3. Advances in technologies and research in epidemiology

In this scenario, the country's health system changes and is directed in a direction that pays more attention to the general health of the society. In this scenario, epidemiologists should try to improve the prevention and treatment system of various diseases by collaborating with other medical and health disciplines. In this scenario, the focus should be on research related to epidemiology. For this purpose, more investments should be made in the field of epidemiology research. Also, improving the level of knowledge and education in this field, creating cooperation networks between research centers in this field, developing modern technologies and creating tools to collect and analyze epidemiological data can be other important goals.

4. Future scenario according to social changes:

In this scenario, it is assumed that in the future, social changes, such as population growth and increasing urbanization, will be among the most influential factors on the spread of diseases. Based on this, in this scenario, priority will be given to goals that can help improve health conditions and reduce the spread of communicable diseases in urban environments. Measures such as the development of urban health networks, improvement of health conditions in public environments and public transportation, health education and communication between epidemiologists and city officials are very important in this scenario.

5. Future scenario according to climate changes:

In this scenario, it is assumed that climate change, as one of the main factors influencing the spread of diseases, will be highly effective in the future. In this scenario, changes in temperature and weather conditions can increase the risk of diseases, which include food poisoning, respiratory diseases, and infectious diseases. To deal with this scenario, measures should be taken to prevent these diseases and improve their treatment if they occur, according to weather conditions and temperature changes. Also, improving the level of knowledge and education in the field of epidemiology and planning for the prevention and management of these diseases and promoting health and public health with educational and research centers inside and outside the country should be done.

Considering the proposed scenarios and examining their effects on the development of the field of epidemiology, a road map that includes specific actions and goals should be developed. In this road map, general and specific goals for the development of epidemiology in the country, operational steps to achieve these goals, as well as the responsibilities and duties of different individuals and organizations to achieve these goals should be stated.

According to the above scenarios, the road map that should be developed for the future development of the field of epidemiology in the country includes goals such as:

- Development of modern technologies in the field of epidemiologic data collection and analysis
- Improving the level of knowledge and education in the field of epidemiology
- Establish effective disease prevention and management systems in the country
- More research and research in the field of prevention and treatment of new diseases
- Creating cooperation networks between research and treatment centers
- Health and public health promotion programs with educational and research centers inside and outside the country
- Planning for managing health crises and responding to infectious diseases in emergency situations
- Improving the level of awareness and informing the society in the field of disease prevention and management
- Creating mechanisms to prevent the spread of diseases that may spread due to weather conditions.

In developing a road map for the future development of the field of epidemiology in the country, one should not focus on short-term and individual goals, but should move towards comprehensive and national goals that can be used to improve things such as improving public health and health, prevention. He mentioned about diseases, management and control of epidemics, development of epidemiology research, improvement of the level of awareness and capabilities of employees in this field, etc. In addition, considering that the field of epidemiology is widely used in various fields such as health, medicine, pharmaceuticals, etc., coordination and cooperation with related institutions and organizations in the country should also be taken into consideration in compiling the road map for the future development of this field be placed. This coordination and cooperation can lead to improved efforts and increased coordination in order to reduce and control epidemics and various diseases.

To improve the epidemiology situation in the country, it is necessary to look at the countries of the region and the world and use their experiences and knowledge. For this purpose, we can mention the creation of cooperation networks between countries, participation in international research projects and the use of international scientists and researchers in the field of epidemiology. In addition, the development of the field of epidemiology in the country requires international efforts and cooperation and coordination between different domestic and foreign institutions. To facilitate and accelerate the development process of this field in the country, it is possible to use cooperation with universities, research centers and international organizations. In this regard, holding various conventions and conferences, exchanging experiences and knowledge with domestic and foreign universities and research centers, and continuous communication with related organizations abroad can lead to the development of the field of epidemiology in the country.

Also, the development of the field of epidemiology in the country requires adequate funding and financial credits. In this regard, it is possible to use cooperation with related domestic and foreign organizations, and use domestic and foreign resources in attracting funds and credits needed for the development of the field of epidemiology. Also, creating a research fund and granting credits for basic and applied research in the field of epidemiology can lead to the development and promotion of this field in the country.

Finally, evaluating and monitoring the performance and development of the field of epidemiology in the country requires periodic reports and related analyses. For this purpose, comprehensive and reliable information and data about the state of epidemiology in the country and the world can be used. Another important aspect in the development of epidemiology in the country is the need for qualified and skilled workforce.

To meet this need, it is important to provide adequate education and training for those interested in becoming a professional in epidemiology.

This can be done through the creation of specialized academic programs and training courses in collaboration with international universities and research centers to give students the opportunity to gain the necessary expertise through practical experience and exposure to diverse epidemiological scenarios.

In addition, the establishment of a strong research infrastructure in the country is very important for the development of epidemiology. This includes establishing robust surveillance systems, collecting high-quality data, and conducting rigorous epidemiological research studies. In addition, it is important to foster collaboration between epidemiologists, public health practitioners, and other relevant stakeholders to ensure that research findings are translated into effective public health policies and interventions.

In terms of future scenarios, it is important to anticipate and prepare for potential health threats and emerging diseases. This can be achieved through continuous monitoring and surveillance of disease patterns and the development of early warning systems to detect and respond quickly to outbreaks of these diseases. In addition, investing in research on emerging infectious diseases and their potential impact on human health can help inform and prepare various agencies in the future.

Compared to other countries in the region and the world, it is important to measure the development of epidemiology in the country and to identify HOT SPOT areas. This can be achieved through cooperation with international organizations and sharing best practices and experiences with other countries.

Prospects for the Development of the Field of Epidemiology

The development perspective of the field of epidemiology includes the development of advanced technologies in the field of epidemiological data collection and analysis, the development of disease prevention and control programs using epidemiological data,

the development of education and training of specialized human resources in the field of epidemiology, the development of cooperation between countries in the field of epidemiology and development new methods to prevent and control diseases.

To achieve excellence in the field of epidemiology, the following solutions are needed:

1. Development of advanced technologies in the field of epidemiological data collection and analysis

The development of advanced technologies in the field of epidemiological data collection and analysis can help improve the accuracy and speed of epidemiological data collection and analysis. These technologies can include data collection systems, data analysis software and reporting systems.

2. Development of disease prevention and control programs using epidemiological data

Developing disease prevention and control programs using epidemiological data can help improve the effectiveness of disease prevention and control programs. These programs include programs for prevention, diagnosis and treatment of diseases, clinical research and basic research.

3. Development of education and training of specialized human resources in the field of epidemiology

The development of education and training of specialized human resources in the field of epidemiology can help to improve the quality of health and medical services. This education includes the education of students in universities, continuing education for doctors and health professionals, and education for the community.

4. Development of cooperation between countries in the field of epidemiology

The development of cooperation between countries in the field of epidemiology can help to improve the knowledge and control of infectious diseases at the global level. This cooperation includes the exchange of epidemiological data, joint research and cooperation programs in the field of disease prevention and control.

5. Development of new methods to prevent and control diseases

Developing new methods for disease prevention and control can help improve the effectiveness of disease prevention and control programs. These methods include rapid diagnosis methods, advanced data analysis methods and new treatment methods.

Integration of the field of epidemiology in the health system and disease monitoring and care: The integration of the field of epidemiology in the health system and monitoring and monitoring of diseases in order to improve and prevent diseases, can help in the early identification of diseases and the design of prevention and treatment programs. Epidemiology, as a scientific discipline, investigates the prevalence and risk factors of diseases, and by integrating it into the health system, it can help to analyze and review the data collected in the field of disease outbreaks. Using the collected data, it is possible to identify the risk factors for the occurrence of diseases and design prevention and treatment programs to reduce the spread of diseases.

Also, the integration of the field of epidemiology in monitoring and monitoring of diseases can help to improve the system of monitoring and monitoring of diseases. By using the data collected in the field of disease outbreaks, it is possible to design a disease monitoring and surveillance system in order to be informed about the occurrence of diseases more accurately and earlier.

From a health point of view, the integration of epidemiology in health can help to improve and prevent diseases. By using the data collected in the field of disease outbreaks, it is possible to design prevention and treatment programs to reduce disease outbreaks and thus help improve community health.

In general, the integration of the field of epidemiology in the health system and monitoring and monitoring of diseases and health care can help to improve and prevent diseases and improve the health of the society.

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Excellence in Epidemiology

Excellence in the field of epidemiology means having the necessary knowledge and abilities to identify, prevent and control diseases and improve community health. In order to develop solutions to achieve excellence in this field, you can pay attention to the following:

1. Increasing knowledge:

To achieve excellence in the field of epidemiology, increasing knowledge and expertise in this field is very important. For this purpose, different sources such as books, articles, conferences and training courses should be used.

2. Development of skills:

In addition to knowledge, developing the necessary skills to identify, prevent and control diseases is also very important. For this purpose, attention should be paid to practice and experience in this field.

3. Use of new technologies:

The use of new technologies such as disease surveillance and monitoring systems, statistical and data mining software, and other technologies related to epidemiology can help improve performance in this field.

4. Cooperation and interaction with others:

Cooperation and interaction with others in this field, such as doctors, researchers and health officials, can help improve performance and development in this field.

5. Planning and resource management:

Proper and optimal resource planning and management, such as time, budget, and human resources, can help improve performance in this area.

Considering the above, to achieve excellence in the field of epidemiology, the following methods should be used:

- Accurate and specific planning to achieve desired goals
- Determining the appropriate timing for each activity and program
- Using appropriate educational and specialized resources
- Developing the necessary skills in this field
- Cooperation and interaction with others in this field
- Use of new technologies
- Optimal resource management

According to the above, a proper schedule can be developed to achieve the desired goals, for example:

- Year 1: Studying and familiarizing with educational and specialized resources, participating in conferences and training courses, developing the necessary skills in this field.
- Year 2: Starting to work in a research center or hospital, participating in research and research projects, collaborating with others in this field.
- Year 3: Use of new technologies, development of disease monitoring and surveillance systems, optimal resource management.

By implementing such a schedule, one can gradually achieve excellence in the field of epidemiology.

Formulating Strategies to Achieve Excellence in the Field of Epidemiology

Formulating solutions to achieve excellence in the field of epidemiology means identifying and providing solutions that are needed for the improvement and development of this field. These solutions should be designed based on the current and future needs of this field, taking into account new developments and technological advances in the field of collecting, analyzing and using epidemiological data.

The following methods can be used to formulate strategies for achieving excellence in the field of epidemiology:

1. Identification of needs:

In order to formulate effective solutions in the field of epidemiology, it is necessary to identify the current and future needs of this field. For this purpose, various methods can be used, such as holding conferences, interviewing experts, and making suggestions by the community of epidemiologists.

2. Analysis and review of developments:

In order to develop effective strategies in the field of epidemiology, new developments and technological advances in the field of collecting, analyzing and using epidemiological data should be reviewed. For this purpose, various sources such as scientific articles, books and reports related to this field can be used.

3. Compilation of solutions:

After identifying the needs and examining the developments, effective solutions for the improvement and development of this field can be formulated. These solutions should be designed based on the current and future needs of this field, taking into account new developments and technological advances in the field of collecting, analyzing and using epidemiological data.

4. Implementation of solutions:

After formulating the solutions, it is necessary to implement these solutions in practice. For this purpose, various methods can be used such as holding workshops, online training and providing financial support.

5. Evaluation and improvement:

After the implementation of the solutions, it is necessary to evaluate these solutions. This assessment should be used to improve and optimize future solutions in the field of epidemiology.

Compilation of New Statutes for Iranian Epidemiologists

Drafting a new statute for epidemiologists in Iran can be considered as an important measure for the development and progress of this field in the country. A new statute can include the following:

1. **Definition and goals of the association:** In this section, the goals and mission of the Iranian Epidemiologists Association should be defined precisely. This section should include goals such as promoting the science of epidemiology, facilitating research related to epidemiology.

2. **Membership in various committees:** This section includes such things as the terms of membership in this statute, the process of selecting members of various committees, the rights and benefits of membership, and determining the duties of members.

3. **The mission of epidemiologists:** This section can include the missions and tasks that epidemiologists must perform in the implementation of their duties. These missions can include:

- Identifying and controlling diseases related to various factors such as infectious, environmental and genetic
- Providing suggestions for preventing and controlling diseases and increasing the level of community health

Collecting and analyzing disease data to detect new disease patterns and identify risk factors associated with them.

- Designing and implementing training programs

Also, the new statute should determine provisions on the dissemination and transfer of knowledge and technology in the field of epidemiology. In this regard, regulations on intellectual property rights, how to transfer knowledge and technology, and how to communicate with industry and other private companies should be developed, and the rules and conditions of membership in this association should be clearly defined. It should be determined what conditions are needed to be a member of the association and what benefits and rights are available to its members.

For the correct implementation of this statute, an independent organization with professional management should be formed to be responsible for implementing the statute and providing financial resources for this organization. In general, drafting a new statute for Iranian epidemiologists is very important because of its direct relationship with the improvement of the health status of the society. To be successful in this field, it is necessary to pay attention to all aspects related to epidemiology as well as the current needs of the society and to determine the regulations that follow scientific and ethical principles in order to improve the health status of the people.

In order to develop a new statute for epidemiologists in Iran, a circular and collaborative approach can be used. For example, first, a small committee of epidemiologists can be formed to develop a preliminary version of the constitution. This initial version should then be distributed to different epidemiologists around the country and their opinions collected.

Then, by examining the opinions and criticisms provided by epidemiologists, the second version of the statute is compiled. At this stage, other methods can be used, such as holding online meetings or holding face-to-face meetings with epidemiologists to discuss and exchange opinions.

A second version of the statute should be submitted to epidemiologists and their comments again collected. This process is repeated until the final version of the statute is compiled according to the opinions and suggestions of epidemiologists. After drafting the final version, the statute must be approved and approved by a legal expert in the legal field.

The new statute must be up-to-date and comprehensive and cover all the needs of epidemiologists. This statute should include things such as the rights and duties of epidemiologists, membership conditions in the association, how to elect and dismiss managers, and determine the rules and regulations of the association.

Therefore, drafting a new statute for Iranian epidemiologists can be an important step for the development of this field. This statute can include things such as the goals and duties of the Union of Epidemiologists of Iran, the authorized members and the specifications of each member, the methods of selecting the president and members of the board of directors, the methods of selecting the secretary, the methods of determining the rights and benefits of members, financial and budget regulations, the responsibilities of members and the board of directors, decision-making methods in summits and meetings, methods of publishing announcements and news, and other things. By drafting such a statute, Iranian epidemiologists can become a stronger and better organized body and make the best decisions for the development of this field in the country.

The following were also suggested:

1. Forming committees or joint meetings with relevant executive agents of the Ministry of Health

2. Forming a committee or joint meetings with the Secretariat of Basic Sciences and monitoring how epidemiology courses are taught throughout the country.

3. Forming a committee or joint meetings with the Vice President of Research and Technology of the Ministry of Health in order to carry out and promote research in the field of health

4. Compilation and implementation of Niaz Setji project regarding the provision of educational, scientific, technical and research services

5. Establishing scientific awards to encourage scientists and young researchers and students to promote scientific, research, educational and health activities.

6. Creation of the publications committee with the participation of the relevant executive authorities of the Ministry of Health.

7. Improving the scientific body of the association through the restoration of the editorial board of the Iran Epidemiology Journal and strengthening its office.

8. Encouraging the participation of the representatives of the association in the election of the board of directors of the scientific associations of the medical department

9. Encouraging the implementation of community health assessment projects and participating in the standard of community health assessment courses

10. Setting up the student committee of the association in order to spread the science of epidemiology to other disciplines.

11. Follow up on the launch of field epidemiology professional skills course

12. Promotion of public education through appropriate productions using virtual spaces and media interviews

13. Participation in the management of widespread epidemics including COVID-19 at the country level by using the advisory, scientific and expert power of the members of the association.

14. Systematic and active communication with the International Association of Epidemiology and its Eastern Mediterranean and North African regional branch.

15. Follow-up on the launch of the professional skill course Epidemiology field logic and make it interactive for useful and faster communication of members.

16. Strengthening groups and virtual communication channels such as Telegram, Instagram, WhatsApp groups

17. Encouraging and following up on the financial support of respected members of the association

18. Emphasizing and creating conditions for freedom of expression in announcing scientific ideas

Advantages and Limitations

As one of the advantages of this study, we can mention the importance and necessity of developing the field of epidemiology in the country. By analyzing the current situation and future needs in

the field of epidemiology, this study helps to develop a road map for the development and improvement of this field in the country. Also, by examining the situation of other countries and comparing it with the target country, this study helps to better understand the current situation and future needs of this field in the country.

However, one of the disadvantages of this study is the limitations that may arise in analyzing the current situation and predicting the future. Various factors such as political, economic and social developments in the future can have a great impact on the epidemiology situation in the country, which are not considered in the analysis of this study. Also, for the successful implementation of this roadmap, attention should be paid to the country's financial and organizational capabilities.

In general, despite the disadvantages that may exist in this study, these types of analyzes and strategic maps are important and necessary for the development of scientific disciplines. Due to the importance of epidemiology in the health of society and its impact on the sustainable development of the country, it is very important to pay attention to the development of this field.

Suggestions for Future Studies

Considering the wide and dynamic topic of the world of epidemiology, there are many suggestions for future studies. Some suggestions are:

1. Further study in the field of risk factors for diseases and their prevalence, especially in developing countries.

2. Examining the factors that contribute to the spread and spread of diseases in society, such as the prevalence of common diseases and their spread in society and the social and economic situations of people.

3. Investigating the impact of health systems in reducing the spread of diseases and improving the health of society.

4. Investigating the impact of nutrition on the health of society and ways to improve nutrition.

5. Investigating new methods of diagnosing diseases and developing new drugs to treat them.

6. Investigating the methods of improving and promoting demography and epidemiological data collection systems.

7. Investigating the impact of climate change on the spread of diseases and their control and prevention methods.

8. Investigating the impact of new diseases and future epidemics on the health of society and preparing to face it.

Conclusion

In line with the development of the field of epidemiology in the country, there is a need to develop a comprehensive and documented road map with the aim of improving the public health of the society. This road map should be developed based on possible scenarios for the future and forecasting the favorable situation in comparison with the countries of the region and the world. For this purpose, measures such as improving the system of prevention and treatment of diseases, improving the level of knowledge and education in this field, developing modern technologies and connecting with other medical and health fields, improving health conditions and reducing the spread of diseases in urban and rural environments and other areas. Be considered. Also, the experiences of the leading countries in this field should be analyzed and used. According to these measures, it is possible to try to bring the field of epidemiology in the country to a level that competes with other countries in the region and the world and can guarantee the improvement of the general health of the society.

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