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Ocena ekonomiczna i epidemiologiczna programu szczepień ochronnych w Polsce

Economic and epidemiological evaluation of vaccination program in
Poland

Rozprawa doktorska na stopień doktora
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STRESZCZENIE W JĘZYKU ANGIELSKIM

The aim of this study is to conduct an economic and epidemiological evaluation of vaccination against the diseases included in the vaccination program.

In the context of rising healthcare costs and the need for optimal resource allocation, evaluating the immunization program becomes crucial for making decisions regarding the allocation of public funds.

The study is based on the analysis of epidemiological, financial, and economic data related to the vaccination program in Poland, taking into account various vaccinations against infectious diseases: polio, diphtheria, tetanus, pertussis, hepatitis B, measles, mumps and rubella in epidemiological and economic terms. The analysed period covered the years 2010-2020.

The estimation was based on available epidemiological data linked to an obligatory vaccination program and morbidity in the Polish population. The economic evaluation included data on funds spent from the state budget on the purchase of vaccines, as well as the costs of outpatient and hospital treatment of patients.

The following assumptions have been implemented:

- analysis of the epidemiological situation with the assumption that the universal obligation of preventive vaccinations is discontinued,
- comparison of the theoretical model of vaccination discontinuation with the current situation, in which over 98% of Polish society is covered by the vaccination program,
- comparison of the costs of prevention with the costs of treating diseases, taking into account the current level of the Polish population in which over 98% of the Polish society is vaccinated against infectious diseases included in the current vaccination calendar.

In order to analyse the epidemiological situation, a theoretical model was developed based on historical data on the incidence of individual infectious diseases. Based on these data, a curve was determined using the linear regression method, which was used to estimate the theoretical number of cases in the current population of Poland, in case of lack of vaccination.

The economic analysis was based on detailed data on the cost of purchasing vaccines financed from the state budget and privately by patients. This analysis was a part of an infectious disease prevention study. The second part of the analysis was the estimation of treatment costs based on data obtained from the National Health Fund for the current population and the real number of cases in a given year. The last element of the study was to determine the total cost of treatment of individual infectious diseases for the years 2010-2020 for the theoretical number of cases determined on the basis of a mathematical model.

The analysis of epidemiological data confirmed that the decrease in the level of vaccination in the population resulted in an increase in the incidence of the diseases. Economic analysis showed that the costs associated with the implementation of a vaccination program are lower than the direct costs of treatment of the diseases per patient.

Vaccinations should be a fundamental tool in the fight against infectious diseases despite emerging reports of adverse events or vaccine evasion. There are clinical, economic and epidemiological arguments for broadening the scope of vaccination against some diseases like pertussis as well as extending the vaccination calendar by inclusion of currently recommended vaccines but not financed yet.

The results of the analyses conducted enable the assessment of the cost-effectiveness of the vaccination program in Poland from both economic and epidemiological perspectives.

The study provides information and tools to aid decision-making regarding the further development of the vaccination program and resource allocation for vaccination policy.

The conducted analysis represents a significant contribution to the development of health strategies and the making of rational decisions related to the vaccination program in Poland.