

Study of the Mortality of Vaccine-Preventable Infections in Ukraine (1965– 2015)

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Objective

The aim of this work was to determine the impact of vaccination on the dynamics of mortality and the contribution of vaccine preventable infections to the structure of total infectious mortality of the population of Ukraine over the past 50 years to develop a more effective system of surveillance for this group of infections.

Introduction

Infectious diseases are still the cause of a large number of deaths in Ukraine. Analysis of infectious mortality allows the study of the dynamics of diseases that pose the greatest danger. In particular, those that are vaccine-preventable and suggest more effective methods for organizing an epidemic surveillance system.

Methods

This work describes a retrospective population epidemiological study. The material for the statistical analysis was taken from the statistical form C-8 “Distribution of deceased by sex, age groups and causes of death” of the Ukrainian Center for Disease Control and Monitoring of the MoH of Ukraine for the period 1965-2015. This work analyzed the mortality dynamics of 1965, 1991 and 2015, which correspond to the firstly achieved 90-95% vaccination coverage against diphtheria, whooping cough, tetanus and poliomyelitis (1965), the first year of Ukraine’s independence (1991), after its separation from the Soviet Union and the end of the study period (2015).

Results

Our data shows the difference in the number of deaths from all vaccine-preventable and non-vaccine-preventable infections in 1965, 1991 and 2015 among the total population, children aged 0-14 years and in the age group 15 years and older. We also have data on the proportion of some infections in the nosological structure and total infectious mortality. The proportion of all infectious diseases decreased in the total number of deaths from 7.47% in 1965 to 1.53% in 1991 and 2.51% in 2015.

The proportion of deaths from all infections was significantly higher in the overall structure of child mortality. It was 39.4% in 1965 and 7.25% in 2015. Almost the same decrease of proportion is demonstrated by all non-vaccine-preventable infections. The proportion of all vaccine-preventable infections (diphtheria, tetanus, whooping cough, poliomyelitis, hepatitis B, tuberculosis) in the total number of deaths decreased from 3.77% in 1965 to 0.85% in 2015. The decrease in the proportion of children deaths from vaccine-preventable infections was from 2.12% in 1965 to 0.35% in 2015.

There is a 2.6-fold decrease in the total number of deaths from all vaccine-preventable infections among the general population, but for the children’s population the reduction rate in 2015 compared to 1965 was 31.2 times. In the context of infant infectious mortality, vaccine-preventable infections (inclusive of tuberculosis) were 5.39% in 1965 and 4.8% in 2015. Potentially vaccine-preventable infections (pneumonia, meningococcal infection, influenza and other acute upper respiratory infections) demonstrated a child mortality rate of 80.52% in 1965 and 60.17% in 2015, and the number of deaths from these infections among children in 2015 was 37.3 times less than in 1965.

Conclusions

Collection of data on infectious diseases mortality should be included into the epidemiological surveillance system. Decrease in mortality from non-vaccine-preventable infections may indicate a significant impact of natural, demographic and economic factors that can influence the decrease in mortality from vaccine-preventable diseases too.

In Ukraine, vaccination of certain infections certainly had and in the future will also have an important value for controlling infectious incidence and mortality. Moreover, vaccination continues to be the most accessible and effective intervention for achieving global or regional eradication of infections.

Keywords

vaccine-preventable infections; mortality; vaccination

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