

Module 2. Cultural knowledge - Topic 2. Advantages and disadvantages of immunization

*Athina Kalokairinou, Paraskevi Apostolara, Venetia-Sofia Velonaki, Anna Kardari
National and Kapodistrian University of Athens*

1. INTRODUCTION

All medications and vaccines have potential risks that must be carefully weighed against the benefits that medications and vaccines offer to prevent illness. Vaccination is one of the most effective public health interventions in reducing disease spread, preventing complications and even deaths from vaccine preventable diseases (*Benefits and Risks of Vaccines* | SCDHEC, n.d).

2. AIMS

The aim of this learning unit is the recognition of the vaccines' advantages and disadvantages.

3. LEARNING OUTCOMES

At the end of this training, the participants will be able to:

- Be acquainted with the most common side effects of the vaccines.
- Be aware of the benefits of immunization, both physical and socio economical.

4. THEORETICAL FRAMEWORK

4.1. Concepts and definitions

Side effect: Any health problem that happens after vaccination is considered an adverse event following immunization. An adverse event can be a true adverse reaction, also known as a side effect, that is related to the vaccine, or a coincidental event that happened following vaccination (Centre for Disease Control and Prevention, 2020).

Herd immunity: Herd immunity occurs when a high percentage of the community is immune to a disease (through vaccination and/or prior illness), making the spread of this disease from person to person unlikely. Even individuals not vaccinated (such as new-borns and the immunocompromised) are offered some protection because the disease has little opportunity to spread within the community. Herd immunity depends on the contagiousness of the disease. Diseases that spread easily, such as measles, require a higher number of immune individuals in a community to reach herd immunity. Herd immunity protects the most vulnerable members of our population. If enough people are vaccinated against dangerous diseases, those who are susceptible and cannot get vaccinated are protected because the germ will not be able to “find” those susceptible individuals (Association for Professionals in Infection Control and Epidemiology, 2021).

4.2. What the research says

- **Michel, J.P. (2020). The well-known and less well-known benefits of vaccines. *Ageing Clinical and Experimental Research*, 32(8), 1401–1404. <https://doi.org/10.1007/s40520-020-01638-5>**
Due to vaccines, there has been 68% to 100% reduction in preventable infectious diseases (congenital rubella, diphtheria, influenza A, measles, mumps, rubella, tetanus and smallpox). The communicable diseases worldwide decreased from 33% of total deaths in 1990 to 25% in 2010, thus preventing more than 2.5 million deaths annually. Also, it has been scientifically

proven that vaccines have a significant efficacy on the prevention of cardio- and neuro-vascular events.

- **Nandi, A., & Shet, A. (n.d.). Why vaccines matter: Understanding the broader health, economic, and child development benefits of routine vaccination. *Human Vaccines & Immunotherapeutics*, 16(8), 1900–1904. <https://doi.org/10.1080/21645515.2019.1708669>**
 The direct benefits of childhood vaccination in reducing the burden of disease morbidity and mortality in a cost-effective manner are well-established. By preventing a great deal of serious diseases, vaccination helps in the avoidance of medical expenses and healthcare provider costs. Research has related vaccines positively with cognition and school attainment, suggesting benefits of long-term improved economic productivity.
- **Doherty, M., Buchy, P., Standaert, B., Giaquinto, C., & Prado-Cohrs, D. (2016). Vaccine impact: Benefits for human health. *Vaccine*, 34(52), 6707–6714. <https://doi.org/10.1016/j.vaccine.2016.10.025>**
 This article reviews the positive impact of vaccines on human health and productivity. The continued success of the vaccines requires the delivery of sufficient vaccine coverage to interrupt transmission.
- ***Vaccine platforms | National Centre for Immunisation Research and Surveillance (NCIRS)*. (n.d.). Retrieved 11 February 2023, from <https://ncirs.org.au/vaccine-platforms>**
 This article describes the advantages and disadvantages of each one of the four platforms used to develop viral vaccines (whole virus, protein, viral vector, nucleic acid).
- ***Possible Side effects from Vaccines | Centre for Disease Control and Prevention (CDC)*. (2022, April 6). <https://www.cdc.gov/vaccines/vac-gen/side-effects.htm>**
 This article mentions the most common vaccines' side effects. **All vaccines have side effects**, but for the most part these are minor and go away within a few days.

5. LEARNING ACTIVITIES

Activity 1: Advantages of vaccination (duration: 20 minutes):

No.	Title and description of the resource	Type	Language of resource	Learning, training, assessment and evaluation activities	Access URL/ download
1.	Societal benefits of immunization	Article	English	Individual learning	https://www.euro.who.int/_data/assets/pdf_file/0009/339624/Sociatal-benefits.pdf
2.	Vaccines 101: Importance of Vaccinations	Video 2'47''	English*	Individual learning	https://www.youtube.com/watch?v=OG8bU1OJlm8&ab_channel=YourekaScience

*Subtitles auto-generated in all languages

Read the article “Societal benefits of immunization” and watch the video “Vaccines 101: Importance of Vaccinations” with duration 2'47''.

- Discuss the information presented about the vaccines' benefits. After the discussion, the students should be able to answer the following questions:

1. How do vaccines affect poverty, productivity, education, life expectancy, maternal health and child mortality?
2. How do vaccines affect the health system?
3. Do vaccines prevent the outbreaks of the diseases? If so, how?

Activity 2: Disadvantages of vaccination (duration: 10 minutes):

No.	Title and description of the resource	Type	Language of resource	Learning, training, assessment and evaluation activities	Access URL/download
1.	Possible Side effects from Vaccines	Article	English	Individual learning	https://www.cdc.gov/vaccines/gen/side-effects.htm

Read the article “Possible Side effects from Vaccines”.

- Discuss the information presented about the vaccines’ side effects and check if some vaccines have similar side effects. After the discussion, the students should be able to answer the following questions:
 1. What are the possible side effects of vaccines for: influenza, meningitis, hepatitis A and B, HPV and pneumococcal disease?

Activity 3: Crossword Puzzle (duration: 10 minutes) (Optional, only in English language):

- Fill out the crossword puzzle with the suitable term or sentence concerning the understanding of vaccine and vaccination. Available [here](#). Please upload a screenshot or pdf file of the solved puzzle on the platform for collaborative learning.
- Resource: Crossword Labs a tool for creating online crosswords; social platform for collaborative learning.

6. ASSESSMENT ACTIVITIES

Quiz: True or False (duration: 5 minutes):

1. An immunized population lives longer and increases the average life expectancy.
2. When a vaccine is introduced and immunization coverage rates increase, the infant and child mortality rates decline dramatically.
3. Many vaccines cause severe allergic reactions or death.

7. REFERENCES

- Benefits and Risks of Vaccines* | SCDHEC. (n.d.). Retrieved 11 February 2023, from <https://scdhec.gov/benefits-risks-vaccines>
- Doherty, M., Buchy, P., Standaert, B., Giaquinto, C., & Prado- Cohrs, D. (2016). Vaccine impact: Benefits for human health. *Vaccine*, 34(52), 6707–6714. <https://doi.org/10.1016/j.vaccine.2016.10.025>
- Herd immunity. (n.d.). APIC. Retrieved 11 February 2023, from https://apic.org/monthly_alerts/herd-immunity/

Michel, J.-P. (2020). The well-known and less well-known benefits of vaccines. *Aging Clinical and Experimental Research*, 32(8), 1401–1404. <https://doi.org/10.1007/s40520-020-01638-5>

Nandi, A., & Shet, A. (n.d.). Why vaccines matter: Understanding the broader health, economic, and child development benefits of routine vaccination. *Human Vaccines & Immunotherapeutics*, 16(8), 1900–1904. <https://doi.org/10.1080/21645515.2019.1708669>

Possible Side effects from Vaccines | Centre for Disease Control and Prevention (CDC). (2022, April 6). <https://www.cdc.gov/vaccines/vac-gen/side-effects.htm>

Understanding adverse events and side effects | Vaccines safety | Centre for Disease Control and Prevention (CDC). (2021, March 30). <https://www.cdc.gov/vaccinesafety/ensuringsafety/sideeffects/index.html>

Vaccine platforms | National Centre for Immunisation Research and Surveillance (NCIRS). (n.d.). Retrieved 11 February 2023, from <https://ncirs.org.au/vaccine-platforms>