

VaccinACTION!

Citizen science project to
promote informed decision
making about vaccination

Secondary education Educational Guidelines

Developed by:

IrsiCaixa

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LWnVIVAT



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About VaccinACTION!

VaccinACTION! is a citizen science program aimed at promoting informed decision making about vaccination through a systemic, personalized, and participatory intervention to be implemented with and for secondary schools and their communities. This program has been developed as part of the EU funded project LWNVIVAT (Limiting West Nile virus impact by novel vaccines and therapeutic approaches) which aims to prevent infection and disease caused by the West-Nile Virus by developing a vaccine.

The COVID-19 pandemic fuelled a rise in vaccine hesitancy—more people began to question the safety, importance, and effectiveness of routine vaccines, influenced by widespread misinformation and doubts about new vaccines¹. Across the EU-27 member states, the perception that vaccines are important decreased from a 91.8% in 2020 to an 81.5% in 2022². Studies show that a significant portion of parents now view childhood vaccines as less safe or less necessary than before the pandemic, and scepticism toward COVID-19 vaccines has sometimes spilled over to other immunizations³.

The researchers involved in LWNVIVAT are concerned that these trends could lead to outbreaks of preventable diseases. While they recognize that vaccines may raise concerns and respect everyone's right to make their own choices, they believe it's important to provide clear information. For example, to make sure that people make decisions being aware that refusing vaccination can impact not only their health, but also the health of those around them.

LWNVIVAT has developed this educational program to support secondary schools' students, teachers, families and their social context in the process of decision making about vaccination after reflecting with different points of view, including, but not only, corroborated scientific information. To achieve this general aim, the program has three specific objectives:

1. Improve vaccine literacy, which refers' to individuals' knowledge, skills and motivation to find, understand, evaluate and apply systemic information to support critical thinking and more informed decision-making⁴.
2. To empower students to become change agents that organize participatory community actions to support informed decision-making among other students and their teachers, families and their social context.
3. To disseminate systemic knowledge and resources to support informed decision-making.

To implement the program, LWNVIVAT has developed the VaccinACTION! educational guidelines with step-by-step instructions for teachers to guide students through the citizen science process. The guidelines follow the Open Schooling approach, promoted by the [Open Schooling Together European network](#). This approach encourages students to collaborate with the local community to solve real-world challenges through citizen science following three phases: (1) Care (engage

¹ Lazarus, J.V., White, T.M., Wyka, K. et al. (2024). Influence of COVID-19 on trust in routine immunization, health information sources and pandemic preparedness in 23 countries in 2023. *Nat Med* 30, 1559–1563. <https://doi.org/10.1038/s41591-024-02939-2>

² European Commission (2022). State of Vaccine Confidence in the European Union. https://health.ec.europa.eu/system/files/2023-02/2022_confidence_rep_en.pdf

³ Lily A. Grills, Abram L. Wagner. (2023). The impact of the COVID-19 pandemic on parental vaccine hesitancy: A cross-sectional survey. *Vaccine*, 41, 6127-6133. <https://doi.org/10.1016/j.vaccine.2023.08.044>

⁴ Pelikan et al. (2021). International Report on the Methodology, Results, and Recommendations of the European Health Literacy Population Survey 2019-2021 (HLS19) of M-POHL. 10.13140/RG.2.2.27894.06721.

students with a real-life issue), (2) Know (students acquire knowledge and skills), (2) Do (students develop attitude for participatory action). Additionally, the guidelines follow the System-Oriented Dialogue Model⁵, which helps to design systemic and personalized strategies collaboratively to address complex health challenges also with citizen science approaches. With these approaches, VaccinACTION! invites participants to conduct a citizen science project to reflect on their problems and needs and to co-design a personalized action plan that responds to their needs and motivations. This results in personalized and participatory interventions that are more effective than pre-designed interventions⁶. Engaging students in citizen science also strengthens scientific and technological skills, such as applying the scientific method to real life problems and develops key competencies that are often challenging to achieve in secondary education, but essential for solving complex problems such as vaccine decision making. For example, these competencies include participation, civic competence, critical and analytical thinking, problem-solving, and inquiry about the world⁷.

The guidelines also include a collection of materials necessary for implementing citizen science sessions (in the annex) and links to a repository of activities that students can select for their action plans.

VaccinACTION! is structured on six phases: (1) online training for teachers, (2) implementation of the educational guidelines to design the action plan, (3) follow-up meeting between teachers and LWNVIVAT researchers, (4) design and implementation of activities with and for the community, (5) final congress with all participants and (6) evaluation. In the following infographic you can find more detailed information about the aims, length and format of each of the phases of the program:

⁵ Malagrida et al. (2023). A System-Oriented Dialogue Model to Design Community Partnerships for More Effective Sars-Cov-2 Prevention in Schools: The Case of Spain. *International Journal of Public Health*, 68. <https://doi.org/10.3389/ijph.2023.1605624>

⁶ Sawyer et al. (2021). Developing the logic framework underpinning a whole-systems approach to childhood overweight and obesity prevention: Amsterdam Healthy Weight Approach. *Obesity Science & Practice*, 7(5). <https://doi.org/10.1002/osp4.505>

⁷ Malagrida et al. (2022). Towards competencies and methods to support Responsible Research and Innovation within STEAM secondary education – the case of Spain. *Research in Science & Technological Education*, 1–21. <https://doi.org/10.1080/02635143.2022.2123790>

- 1 **Teacher training** (online 2h)
Practical workshop to learn about the programs and understand how to apply the teaching guide.
- 2 **Classroom implementation** (5 sessions of 50 min + personalized activities)
 - » Presentation of a challenge by project scientists through a video.
 - » Exploration of the topic and implementation of citizen science to analyze the key factors that determine the decision to vaccinate and/or implement infectious disease prevention and/or mental health promotion measures.
 - » Design, implementation, and evaluation of educational and/or informational activities with and for the educational community and its social environment.
- 3 **Teacher follow-up meeting** (optional 30-minute online session)
Support and question resolution space with the LWNVIVAT educational and scientific team.
- 4 **Final Congress** (online)
Meeting of participating educational centers where students offer presentations and interact with the scientific community.
- 5 **Evaluation** (online questionnaire(s))
On the acquisition of knowledge, scientific and citizenship competencies and the implementation process.

The program can be implemented through various subjects, but we understand that the most common approach will be to do so through science or tutoring subjects.

The Living Lab for Health at IrsiCaixa will support the implementation of VaccinACTION! in your school. To ask for more details and/or register for the program, please contact us at: livinglab@irsicaixa.es.

VaccinACTION!



EDUCATIONAL GUIDELINES

Session overview

Session (50 min each)	Description	Classroom management	Material
1	Introduction to the LWNVIVAT project and the vaccination challenge. • Activity 1.1: presentation of the project's goals, emphasizing students' role in promoting informed decision-making on vaccination. • Activity 1.2: completion of an initial self-assessment for students to track their learning progress. • Activity 1.3: students create individual and collective mind maps to explore their perceptions of vaccination, helping them understand the key concepts related to the challenge.	Plenary and individual work	• Projector or large screen • 1 device with internet access for each student • Self-assessment questionnaire • Questionnaire for families • Templates in Annex 2 • Large-format medium (e.g., wrapping paper, blackboard, website for mind maps).
2	Exploring key factors influencing vaccine hesitancy with citizen science • Activity 2.1: students enhance their mind map with new information by watching a video and answering questions. • Activity 2.2: students explore the factors influencing vaccine hesitancy by categorizing factors in groups.	Plenary and small groups work (4-5 students per group)	• Projector or large screen • Templates in Annex 3 • Templates in Annex 4
At home	Exploring key factors influencing vaccine literacy with citizen science Students share their findings about factors influencing vaccine hesitancy with families to identify the most influential factors for them.	With the family	• Template 2.2.2 completed by students
3	Citizen science: prioritization of key factors influencing vaccine hesitancy • Activity 3.1: students prioritize the factors influencing vaccine decisions by first selecting the most relevant factors	Plenary and small groups work (4-5 students per group)	• Cards for Discussion Continuum (thick paper) • Table from Annex 5

	and then ranking them using a “Discussion Continuum” activity. • Activity 3.2: students plan activities to explore these factors in greater detail.		• Repository of activities for the prioritized factors
Variable	Implementation of activities for the prioritized factors Students implement the activities planned in the previous session based on the prioritized factors. The number of sessions will depend on how many factors and activities were selected for exploration.	The management will depend on the activities planned	
Final	Evaluation and design of community actions and communication campaigns • Activity 4.1: students will reflect on their learning through a self-assessment and compare their initial and final responses. • Activity 4.2: students design two key components: (1) Participatory Community Actions and (2) Communication Campaign. An evaluation of their activities through surveys to assess participation and satisfaction is suggested.	Individual and small groups work (4-5 students per group)	• Self-assessment questionnaire • Questionnaire for families • Table in Annex 6 • Table in Annex 7

Session 1. Introduction

Objectives of the session

- To introduce the LWNVIVAT project and the objectives of these educational guidelines.
- To explore initial knowledge and prior perceptions about vaccination and citizen science.

Activity 1.1 The assignment

(15 min) Present the LWNVIVAT project and an assignment letter to the students.

In the class, read together the assignment **letter** (Annex 1) addressed to the students and signed by the LWNVIVAT project team. You can complement the letter with this [video](#) where the LWNVIVAT researchers explain in more detail the project and its goal to develop a vaccine against the West Nile Virus (WNV). They also introduce the characteristics of this virus and the disease it causes, the situation around vaccine hesitancy and the challenge assigned to the students requesting their participation.

Open a **dialogue** to emphasize the key reasons why they should participate as responsible citizens. Students should be informed that they:

- have the opportunity to help the scientific community to address the current problems of social acceptance of vaccination.
- are being invited to lead a community-based reflection on vaccination to support other students, their families and other stakeholders from their social context in the formulation of opinions with corroborated scientific information and other sources of information coming from different stakeholders with respect for all points of view.
- will have the opportunity to learn how to become change agents by promoting the participation of the community following the scientific method through a process of citizen science to address a real-world challenge.
- will have the opportunity to meet the researchers of LWNVIVAT and other stakeholders and students from other schools in a final congress.

Activity 1.2 Initial self-assessment

(15 min) Complete the initial self-assessment

The VaccinACTION! program includes an evaluation to check whether the program can be successfully carried out and whether it meets its specific goals. This is done by giving a final questionnaire to teachers and both an initial and final questionnaire to students and families. Students individually complete the initial online self-assessment questionnaire. They will be able to download the answers and save them to compare with those from the questionnaire that will be conducted in the final session. This way, they will be able to reflect on their learning. If, as teachers, you also wish to use this questionnaire to assess the students, remember to inform them.

To assess whether the programme has an impact on families, we ask you to provide them the **questionnaire for families**. In the same way as the students, they will have to fill it in at the beginning and at the end of the implementation.

Activity 1.3 Introduction to the challenge

(20 min) Explore prior perceptions about vaccination

Invite your students to explore their previous perceptions in relation to vaccination. They will do so individually by drawing up a mind map in [Template 1.3.1](#) (Annex 2). After that, the class works together to create a collective mind map that summarizes key concepts on a large-format medium (e.g., wrapping paper, blackboard, website for mind maps). They also complete the [Template 1.3.2](#) (Annex 2) by identifying recurring key concepts and unique perceptions. We suggest distributing a picture of the collective mind map to all the students so they can have the final result of the activity.

Session 2. Exploring the key factors influencing vaccine hesitancy with citizen science

Objectives of the session

- To learn about vaccines: their composition, function, mechanism of action, purpose, and the concept of herd immunity.
- To review prior knowledge about vaccination.
- To explore the key factors influencing vaccine hesitancy.

Activity 2.1 Improving our mind map

(25 min) Let's get informed

To continue improving the mind map, explain students that they will watch a video where they will find information related to the questions in [Template 2.1](#) (Annex 3). Distribute the rows of the template among the student groups, ensuring each group is responsible for answering some of the questions.

Watch the video "[Vaccines, a game-changer for prevention](#)" twice as a class. Each small group collaborates to answer the questions from their assigned rows based on the video content. Template 2.1 also contains a row for students to record any doubts that may arise. When sharing the responses, students should also write their doubts in this row and attempt to clarify them together. Groups note down any concepts that remain unclear even after discussion.

Then, each group shares the answers with the rest of the class ensuring that all the questions in every row are answered. The students also share their doubts, and they are addressed collectively, ensuring all doubts are resolved.

(10 min) Integrating the results in the mind map

Students individually return to the collective mind map and, using a different colour, add newly learned concepts and, if needed, correct any misconceptions.

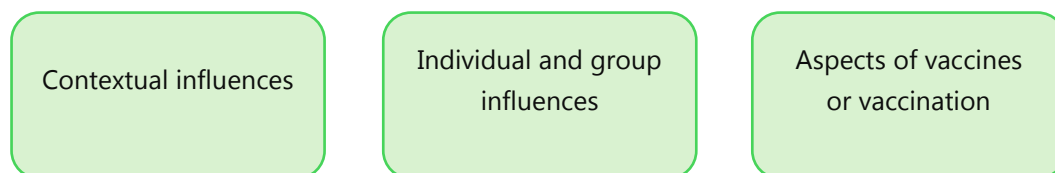
The teacher closes the activity by discussing the concepts added to the mind map and highlighting any challenges identified or misconceptions that were clarified. She introduces the next activity where students will reflect on the determinants of vaccine hesitation.

Activity 2.2. Citizen science: exploring the key factors influencing vaccine hesitance

Students will engage in a citizen science process to identify their own perspectives and those of their families on the most relevant factors influencing vaccine hesitancy. This activity, along with the next one—where students will explore these factors in depth—will provide them with the necessary knowledge and skills to design and implement community actions and to promote informed decision-making about vaccination.

(15 min) Presentation of the key factors influencing vaccine hesitancy

Explain that vaccine hesitancy is influenced by multiple factors, which can be categorized into **three main groups**:



Divide the students into small groups of 4-5 and provide each group with an envelope containing 10-15 factors (cut them from [Template 2.2.1](#) of Annex 4). Include a few blank cards so that students can add any additional factors they believe are important. When distributing the factors among the different envelopes, include some from each category to each group, making sure that all factors are covered among all the groups. Each group classifies their factors into the three categories using the table in [Template 2.2.2](#) of the same Annex 4. Store the categorized factors to be used in the next session.

As in the next session we will do a priority setting of the factors, we suggest engaging the families in this process. To do so students should **share the results** of the factor classification **with their families** and ask them to identify the three most influential factors in their decision to vaccinate themselves or their children. In the next session, students will incorporate their families' perspectives into the prioritization process. Remind families that before this activity, they should fill out the questionnaire.

Session 3. Citizen science: prioritisation of key factors influencing vaccine hesitancy

Objectives of the session

- To prioritise the key factors influencing vaccine hesitancy.
- To plan activities that increase the understanding of the selected factors.

The goal of prioritization is to identify the factors that have the greatest influence on the students' and families' decisions to get vaccinated and to determine which optional activities

you can carry out in relation to them. The number of prioritized factors will depend on the number of activities you wish to conduct, which can vary depending on whether you choose to work as a whole class or in small groups, as well as the time available.

For example, if you decide to work in small groups with each group carrying out one activity, you can either prioritize as many factors as there are groups or select one or two key factors and design different activities around them to be split among the groups. Alternatively, if, for example you prefer to conduct two activities as a whole class, you can either prioritize two factors and assign one activity to each of them or focus on a single factor and implement two different activities related to it. As you can see, multiple activities can be designed around a single factor. As a teacher, you will need to determine the most effective approach for organizing and implementing the activities.

Activity 3.1 Citizen science: Prioritizing the key factors influencing vaccine hesitancy

(10 min) First prioritisation of factors in small groups

Each group revisits the categorized table of factors from the previous session. Each student selects two factors they consider most relevant by marking them with a cross or placing a sticker on them. Additionally, students mark with a cross the priority factors according to their family's perspectives using a different colour.

Before moving on to the final prioritization, please take a photo of each table of factors and send them to livinglab@irsicaixa.es. In LWNVIVAT, we're very interested in analysing the results you've obtained and also in whether you've added any new key factors that weren't included in the guidelines. By sending us this information together with the results of the evaluation surveys, you and your students will be contributing to a scientific paper that the Living Lab will publish in the nearing future!

(35 min) Final prioritization

In this step, students will finalize the prioritization of factors through an activity called "Discussion Continuum" (DC). The teacher decides whether to carry out the prioritization in small groups or as a whole class.

To run the activity with the Discussion continuum, you need to:

- Select the 7 factors that received the most votes (crosses). If done at the class group level, collect the highest number of votes from each small group and add them together to identify the most voted factors. If there are duplicates, consider selecting 8 factors.
- Prepare two cards: HIGH INFLUENCE and LOW INFLUENCE.

Development of the DC:

1. Lay the HIGH INFLUENCE card and the LOW INFLUENCE card on the backboard, floor or table, one meter apart, representing the two ends of a continuum. Explain the students that the key factor cards will be placed between these two cards to classify them in order of influence on vaccine hesitance.
2. The teacher asks one student to read the first factor to the group and ensures everyone understands it.

3. The student who reads the factor decides where to place the factor card on the continuum (closer to HIGH INFLUENCE or LOW INFLUENCE) based on her personal view, without debate. The teacher invites the student to justify the position of the card by asking her why she placed the card there.
4. Other students, in turns, read the other factors, ensuring everyone understands them, and individually place them on the continuum and explain the reasons why they placed them in the selected position.
5. After all factors are placed on the continuum, the group discusses where each factor should be positioned. Students may suggest moving factors while justifying their reasoning. The final goal is to **reach a consensus** on the final order of factors placed between the cards **HIGH INFLUENCE and LOW INFLUENCE**. After a fruitful discussion, the group finalizes the placement of factors on the continuum, with an agreement by the majority. The factor placed closest to **HIGH INFLUENCE** will be the most prioritized. If more factors need to be prioritized, the order in which they are placed in the continuum determines their ranking.
6. If multiple groups are working simultaneously, the **teacher** may want to facilitate sharing results across groups. Discuss if the rankings are similar and invite a representative from each group to **justify their decisions** for certain factors.

Since the prioritized factors will guide the next activities, the final selection of priority factors will depend on the **number of activities and factors** you choose **to address** as a teacher at the beginning of this session. Based on this, you will conclude the activity by determining which factors will be prioritized.

Activity 3.2: Planning activities

(15 min) Planning of activities for the prioritized factors

In this step, students will select and plan activities that can help them to explore the factors they prioritized in the previous session. The process can be conducted in small groups or as a whole class. Ideally, students will make the selection of activities using the Table 1, but the teacher can also get involved by providing a pre-selected list of activities or directly selecting them.

If working in small groups, each group will work on one of the priority factors and will select one activity. After the selection, each group will present their proposed activities to the class to inform them and seek approval. Finally, each group or the class as a whole will complete the table provided in the [Annex 5](#) to plan the execution of the activities, including details such as the schedule, the subject in which it will be implemented and the individuals responsible for facilitating each activity.

Table 1. Correlation between factors and activities for their exploration

Factor	Activity/s
Contextual influences	
Information, communication and campaigns to promote vaccination and anti-vaccine fake news	1, 2, 3, 4
Existence of vaccination advocates, opinion leaders and anti-vaccine groups	3
Success of vaccination programs throughout history	2, 3, 4
Availability and accessibility to vaccines (free vs paid, living away from health services...)	2, 3, 4
Aspects of personal identity such as the life stage or genre	6,7

Public health policies of the different countries	2.4, 3, 4
Individual and group influences	
Previous experience with vaccination: one's own, family, friends or other stories that have come to us (e.g. pain and other side effects)	3.2
Believing that vaccination is safe and an effective prevention tool	1, 2, 3, 4
Level of knowledge/studies	7
Trust and previous experiences with the health system and health professionals and with pharmaceutical industry supplying vaccines	2, 3, 4, 5
Perception of risk/benefit	1, 2.3, 3, 4
Believing in herd immunity as a social norm or, on the contrary, that vaccination is harmful and unnecessary	2.4, 3, 4
Being part of a social group, such as a religious group, that refuses vaccines	3.1
Confidence in the motivations that lead policy makers to include a vaccine in the vaccination schedule of the public health system	2.4, 3, 4
Perceived low severity of the disease	3, 4
Aspects of vaccines or vaccination	
Evidence of risk/benefits	2.3, 3, 4
Modes of administration (e.g. by puncture)	5
Attitude and knowledge of health professionals when recommending a vaccine	3, 4
Knowledge of how a vaccine is developed and approved (rapid development, it has only been on the market for a short time...)	1, 2, 3, 4, 7.2
Vaccine included in the vaccination schedule of the public health system	1, 2.4, 3
Design of the vaccination campaign (e.g. vaccination in schools or health centres)	2.4, 3, 4
Cost of vaccines	3,4

Implementation of activities for the prioritized factors

The activities selected during the previous session are now implemented according to the plan. The number of sessions will vary depending on the number of key factors prioritized and the activities planned.

Final Session. Evaluation and design of community actions and communication campaigns

Objectives of the session

- Conduct the final evaluation
- Reflect on the knowledge and skills developed
- Plan and design participatory community actions and communication campaigns

Activity 4.1. Final self-assessment

(10 min) Completing the self-assessment

Students individually fill in the final self-assessment questionnaire, reflecting on their learning and skills development throughout the project.

Remind families that once their participation is over, they should fill out the questionnaire again.

(10 min) Comparing initial and final evaluations

Once the questionnaires are completed, students compare their initial and final responses, identifying changes and discussing their evolution.

To guide the reflection, the teacher can pose the following questions:

- Do you notice any differences between your initial and final responses? How would you describe these changes?
- Has your perception of vaccines and vaccination changed? If so, in what way?
- Do you feel that you have developed the competences needed to make informed decisions about vaccination in the future? And the competencies needed to address problems of your community through citizen science?
- After completing VaccinACTION! program, do you feel capable of organizing activities that support other students and families in making informed decisions about vaccination?

If needed, the teacher can facilitate a deeper discussion on other specific questions from the questionnaire to further explore students' insights.

Activity 4.2. Design participatory community actions and a communication campaign

As final steps of the program students will develop two key initiatives:

1. Participatory and educational community actions to promote decision-making on vaccination.
2. A communication campaign to raise awareness about the need for informed decision-making on vaccination and about the implementation of the VaccinACTION! program.

Given that both activities require considerable time and effort, we recommend implementing them simultaneously. You may want to suggest that all groups of students focus on the community educational actions except one that can work on the communication campaign.

4.2.1 Design of participatory community actions (30 min)

To facilitate decision-making on vaccination, students will design and carry out a participatory community action aimed at promoting informed decision making about vaccination tailored at other students, teachers, other members of the local community and/or their families.

Students can first design an **informative video or flyer** to encourage families to reflect on the factor(s) they have prioritized. These materials should incorporate knowledge they have learned and reflected upon during the complementary activities and may also include reflective questions. Optionally, an online forum can be created where families can share their responses. This is just one possibility, but feel free to be creative and explore other innovative approaches.

In addition to this community action, you can carry out other actions aimed at families or other stakeholders such as students, teachers, or other members of the local community. Below are some examples, but as always, you are welcome to explore other options:

- **Information and Debate Session:** Organize an event to present key findings and engage the audience in a dialogue. Replicate the *Discussion continuum* with families dividing the

participants in small groups and inviting them to prioritize relevant factors influencing vaccine hesitancy and adapt the selected activities in the session 3.2 to lead a debate on the most voted ones.

- **Round Table with Experts:** Invite healthcare professionals and/or researchers. Present them the results of your project and invite them to answer questions that students can previously formulate. Invite an audience who can also attend the debate and ask questions.
- **Role-Playing Game:** Assign students different roles that represent various perspectives on vaccination (e.g., doctors, scientists, parents, government officials, anti-vaccine advocates etc.). Each student will research and present arguments from their assigned perspective. Then, organize a debate where they discuss their viewpoints in front of an audience.
- **Oral Presentation:** Present the research process and results to peers, teachers, and families using a poster with the different phases of the scientific method.

[Annex 6](#) provides a planning tool to help structure and organize the participatory community actions.

4.2.2 Design of a communication campaign (30 min)

The communication campaign involves creating social media content, flyers, posters, exhibitions, or videos to raise awareness about informed decision-making on vaccination and the implementation of the VaccinACTION! program. While this campaign is suggested as a final activity, communication efforts can be integrated throughout the process to maximize engagement and impact.

If it's difficult to design and implement the communication campaign because you need all students to focus on the community actions, alternatively, motivated students willing to dedicate time outside the classroom can take on this responsibility. As a last resort, teachers can take charge of the communication efforts. For support in developing the campaign, refer to the table in [Annex 7](#).

Evaluation of the actions by the teachers

To assess the impact of this educational project, we kindly request your collaboration in tracking key indicators related to participatory community actions. You will report this data in the final questionnaire for teachers. Please keep this in mind and collect the data described in Table 2 for each action you implement using a short survey that you can send to the participants to be filled in after the actions, included in Table 3. You can add extra questions according to your needs and interests. You can design the survey using tools like LimeSurvey, Google Forms, or any other survey application you are familiar with.

Table 2. Indicators to track the community actions

INDICATORS TO REPORT ON THE FINAL QUESTIONNAIRE FOR EACH ACTION	DESCRIPTION OF THE DATA TO BE COLLECTED
Number of participating students	Number of students organizing and executing the activity
Type of participants in the participatory community actions (e.g., 2nd ESO students of the center, families, professionals, etc.).	Report the type of participants

Number of each type of participants in the community actions	Count the number of each type of participants that come to the action organized.
Satisfaction and assessment of the participants	Report the frequency of each of the responses to describe the level of satisfaction.

Table 3. Questionnaire to design the survey to evaluate the community actions

Question	Responses
Items for participants' identification (age, class, sex)	
To what extent are you satisfied with your participation in one or more community educational actions?	1. Very satisfied 2. Satisfied 3. Neutral 4. Dissatisfied 5. Very dissatisfied
Other questions?	

ANNEXES



Annex 1. Assignment Letter for activity 1.1

LETTER OF COMMISSION FOR STUDENTS

[City], at [date]

To the attention of the students at [Name of the school]

We are a group of researchers participating in a project called LWNVIVAT, (*Limiting West Nile virus impact by novel vaccines and therapeutic approaches*) which is funded by the European Union and aims to prevent infection and disease caused by the West-Nile Virus by developing therapeutic and prevention tools such as a vaccine. This virus is transmitted by mosquito bites and has been detected in several European countries such as France, Spain and Portugal in the past decade. While most WNV infections are mild, some cases in individuals over 50 years of age can lead to serious conditions, such as meningitis, encephalitis (brain inflammation), Guillain-Barré syndrome (nerve inflammation) or flaccid paralysis, which can sometimes result in death.

However, the researchers participating in LWNVIVAT are concerned about the fact that some citizens are hesitant to get vaccinated. Although they respect the perceptions and decisions of all citizens, they would like to facilitate tools to support citizens in decision making with information from different communities as the information that comes from the scientific community shows that rejecting vaccination can have important consequences on our own health and also on the health of our community. For this reason, LWNVIVAT has developed this educational program to support secondary schools' students, teachers, families and their social context in the process of decision making about vaccination after reflecting with different points of view, including, but not only, corroborated scientific information.

To foster informed decision-making about vaccination, we encourage you implement the following participatory community actions:

- Create a video or a flyer for families, including questions to encourage reflection.
- If time allows, consider enhancing this initiative with additional community actions, such as an information and debate day at your school or a roundtable with experts, among other possibilities.
- Launch a communication campaign to share knowledge and resources with a wider community.

To support the preparation of this participatory community action/s and dissemination campaign, we invite you to conduct a citizen science project to learn about the pros and cons of vaccination and explore the factors influencing your and your families' decisions to get vaccinated

In this way we invite you to contribute to address the vaccination challenge in your community and we request you to share your results with us in a final congress, where we will meet also with other schools and stakeholders, and via email at livinglab@irsicaixa.es.

We hope you find this proposal engaging and choose to become co-researchers in this project.

Thank you in advance for your time and consideration.

Warm regards,

The LWNVIVAT Team

Annex 2. Materials for activity 1.3

Template 1.3.1: Vaccination mind map

Individually create a **mind map** about vaccination. What concepts and perceptions come to your mind when you think of vaccines and vaccination?

*A mind map is a diagram that begins with a central concept and branches out with key perceptions or related terms. In this case, the central word is "**Vaccination**". Try to use specific words or short expressions, group related perceptions together, avoiding repetition and be creative to capture them graphically.*



Template 1.3.2: Sharing mind maps

Share the individual mind maps. Are there any concepts repeated? Which ones are not? Combine all the concepts from the mind maps into one large list, grouping related perceptions together, and share it with the class.

Repeated key concepts	Concepts that are not repeated

Annex 3. Materials for activity 2.1

Template 2.1: Vaccines, a game-changer for prevention

Watch the video "[Vaccines, a game-changer for prevention](#)" and answer the following questions:

	Questions	Video-related responses
What diseases does the vaccine protect us from?	1. How many diseases has Biel been vaccinated against so far?	
	2. List the names of the different infectious diseases that have a vaccine and that appear throughout the video.	
	3. What disease has been eradicated thanks to vaccination?	
Risks of not getting vaccinated and the risks of doing so.	4. What very serious symptoms can polio cause and in how many cases does it occur? What consequences has the infection had on Núria and Zulay?	
	5. How has the number of polio cases changed since the WHO launched the vaccination campaign?	
	6. What are the symptoms of measles?	
	7. Why do you think there is so much talk about risks in video? What other risks is it compared to?	

How do vaccines work?	8. How do vaccines act on the immune system?	
	9. What is the community benefit of vaccination?	
	10. Why have there been cases of measles again in recent years?	
What are vaccines made of?	11. What components can vaccines contain?	
	12. What is thiomersal? Can it be considered harmful?	
Who gets vaccinated and when?	13. At what age do you receive most routine vaccinations? Why?	
	14. Which people does the video mention who cannot be vaccinated? How can they be protected?	
I don't quite understand... I write down my doubts individually and solve them by asking my classmates and the teacher as the class progresses		

Annex 4. Materials for activity 2.2

Template 2.2.1: Table of Factors to Cut

Contextual influences	Individual and group influences	Aspects of vaccines or vaccination
Information, communication and campaigns to promote vaccination and anti-vaccine fake news	Previous experience with vaccination: one's own, family, friends or other stories that have come to us (e.g. pain and other side effects)	Evidence of risk/benefits
Existence of vaccination advocates, opinion leaders and anti-vaccine groups	Believing that vaccination is safe and an effective prevention tool	Modes of administration (e.g. by puncture)
Success of vaccination programs throughout history	Level of knowledge/studies	Attitude and knowledge of health professionals when recommending a vaccine
Availability and accessibility to vaccines (free vs paid, living away from health services...)	Trust and previous experiences with the health system and health professionals and with pharmaceutical industry supplying vaccines	Knowledge of how a vaccine is developed and approved (rapid development, it has only been on the market for a short time...)
Aspects of personal identity such as the life stage or genre	Perception of risk/benefit	Vaccine included in the vaccination schedule of the public health system
Public health policies of the different countries	Believing in herd immunity as a social norm or, on the contrary, that vaccination is harmful and unnecessary	Design of the vaccination campaign (e.g. vaccination in schools or health centres)
	Being part of a social group, such as a religious group, that refuses vaccines	Cost of vaccines
	Confidence in the motivations that lead policy makers to include a vaccine in the vaccination schedule of the public health system	
	Perceived low severity of the disease	

Template 2.2.2: Table for the classification of factors

Contextual influences	Individual and group influences	Aspects of vaccines and vaccination

Annex 5. Plan of activities on the prioritized factors

Prioritized factor (indicate the factor you will explore in depth)	Activity (indicate the activity you will implement to explore the selected factor)	Schedule (indicate the date and time for implement the activity)	Subject (indicate the subject in which the activity will be implemented)	Responsible (individuals in charge of the activity)

Annex 6. Participatory Community Action sheet

PARTICIPATORY COMMUNITY ACTION	
Title:	
Objective/s Define what you aim to achieve with this action	
Target audience Who will benefit from or participate in the action (students, families, teachers, etc.)	
Description of the action Provide a detailed overview of what will be done, how participants will engage and the interactions that will take place.	
Collaborators List any individuals or groups involved organizing or executing the action (e.g. teachers, health professionals, families).	
Schedule Specify the date, time and duration of the action.	
Location Indicate where the action will take place.	
Resources List the materials and tools needed (e.g., paper, pens, markers, projector, tables, chairs, sticky notes)	
Responsibilities and tasks Identify the people responsible for designing, organizing, and implementing the action. Clearly outline specific roles and tasks for each individual.	
Evaluation Define indicators to assess the success of the action. Examples include number of participants, types of participants (e.g., 2nd ESO students, families, professionals), level of engagement, participant satisfaction).	

Annex 7. Communication Campaign sheet

COMMUNICATION CAMPAIGN	
Campaign objective What do we aim to achieve? What key message(s) do we want to communicate?	<i>Example: Raise awareness about the importance of vaccination.</i>
Target audience Who are we addressing? (e.g., students, teachers, school staff, families, local businesses, neighbourhood organizations, town hall representatives)	
Actions What communication actions will we use to reach our audience? Possible actions will include posting information on the school's website or social media, distributing newsletters, creating infographics.	
Resources to be developed For each resource, define the following: • Content: what will be included? (e.g. key messages for and infographic) • Responsibility: who will be charge of developing the resource? • Material needed (e.g. cameras, graphic design software) • Parental involvement: could a parent volunteer to help create content or participate as a speaker in a conference? • Production timeline: estimated time needed for the execution.	
General schedule • Date of the action: When will the campaign take place? • Target audience outreach: How and when will we engage participants? • Task distribution: Assign roles such as content creation, technical support, and communication coordination.	