SEEDS | science by teenagers for teenagers

How to empower teens to manage their health

a guide for health professionals

SEEDS

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This guide

fostering healthy lifestyles in teens

Teens are going through **many physical changes** that need to be supported by healthy behavior and a balanced diet. According to the World Health Organization (WHO), teenagers establish patterns of behavior — related to diet, physical activity, substance use, and sexual activity — that can protect their **health** and the health of others around them, or put their health at risk now and in the future.

Exploring health issues in teens is the primary scope of the **European project SEEDS** that will be explained in the following pages.
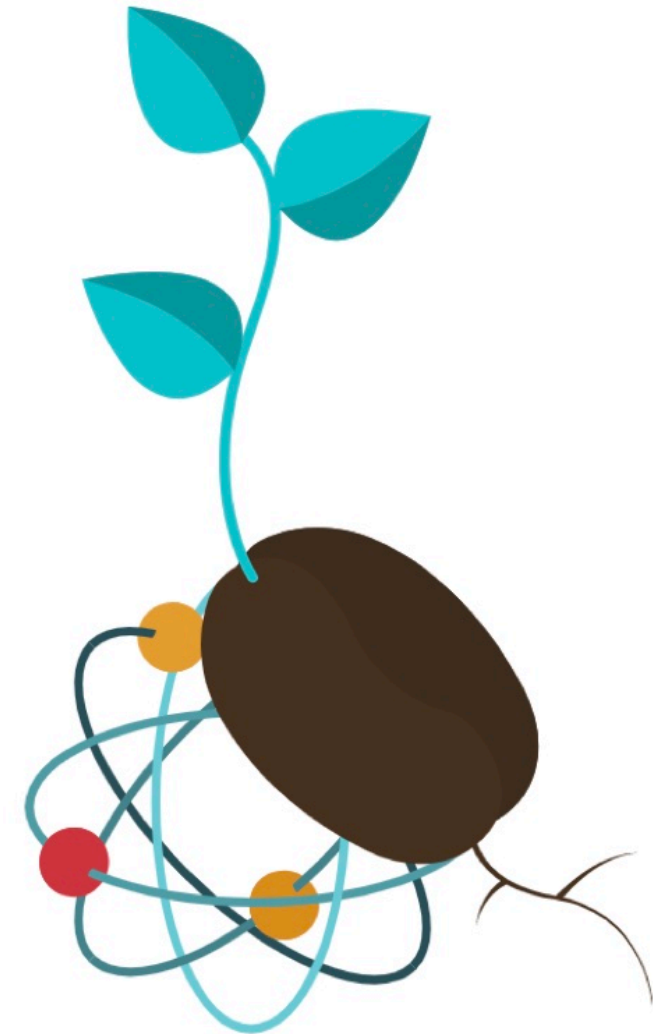
health professionals and teens

One of your primary jobs is to provide medication and prevent diseases from spreading. But you are also required to **educate others about prevention**, cures and other related interventions. Guidance on living a healthy life is central to this goal.

This guide, developed with the project SEEDS, provides information on **four important areas** in teen lives: 1. healthy snacking, 2. physical activity, 3. sedentary behavior, and 4. screen time.

SEEDS has been conducted with the **citizen science approach** involving **teens together with researchers in all stages of the project.**

What is SEEDS

extreme citizen science

SEEDS (Science Engagement to Empower aDolescentS) is a **science project by teenagers for teenagers**. It aims to empower teens to live healthy lifestyles and to help them explore the importance and excitement of science. This is achieved with an approach called **extreme citizen science**, based on the participation of **leader adolescents in all the research processes**: 1. **analysis** of adolescents' barriers and needs for conducting a healthy lifestyles, 2. designing a community-based public **intervention** **for adolescents** of low-socioeconomic areas and with potential stakeholders participation, 3. analysis of **data** 4. and **dissemination** to community. SEEDS is based in **four countries**, Greece, Spain, the Netherlands and the United Kingdom. Each country included schools and a professional partner. To assist with the overall project, the City of Rotterdam and European Citizen Science Association (ECSA) were involved. More here: seedsmakeathons.com/

Research approach

Protagonists in all stages

hard to reach?

Adolescence is a **great period to promote healthy lifestyles** since young adults are sufficiently mature to understand the reasons behind behavioral choices and the long-term impact of the individual health and wellbeing.
As teens are often considered a hard-to-reach group, there can be a **gap between programs offered and what is truly an inclusive approach to empower and engage youth** in healthy lifestyles.
Through citizen science, **SEEDS aims to engage adolescents in generating new knowledge** whilst producing scientifically reliable results.

Collaborative and creative

makeathons to create together

The project **kicked off with four makeathons**, brief and intensive experience where people from different background gather together to hack, build, tinker and create something new.

A group of ambassadors representing their peers were selected in the four countries participating in the project. During the makeathons the **selected teen ambassadors** met in the Greece, Spain, The Netherlands, and UK, with researchers and other stakeholders to define the main topics and shape the work.

what is a makeathon

Makeathons are **creative, collaborative challenges** in a short, predetermined amount of time that bring together people (aka **makers**) from different backgrounds to reflect on and tackle a single challenge together. The makers work in teams to **freely create** whatever they want from a preset theme or subject, which is revealed to participants at the last moment so that they have free rein to improvise. Everyone can interpret the theme in their own way, regarding any discipline or field of study. What's important is that participants come together to **create a project that is sustainable, unique, and innovative.**

Four countries four interventions

the SEEDS marathons

Although the general theme of the project was established, the results of the 4 makeathons were not defined in advance. The **topics of the interventions** to be carried out during the duration of the SEEDS project emerged from the creative process carried out by makeathons with the crucial contribution of the **teens protagonists**. Teens decided to focus on:

- healthy **snacks**

- physical **activity**

- **sedentary** behaviour.

when and how

The SEEDS makeathons were implemented in November – December 2021, in the four pilot countries (Greece, Spain, the Netherlands and the United Kingdom).

After collecting all ideas, **one or more interventions per pilot country** were created. All interventions were carried out with the active **contribution of the teens**, both ambassadors and their peers. They are described on the following pages and can be an inspiration for other projects.

The four countries

Pilot country 1: Greece

food and physical activity

The plan for Greek schools started with the observation of the **scarcity of sports** equipment and the **lack of variety of food** offered and consumed by students. In the six months of the intervention, a **double track** effort was therefore organized. One dedicated to increasing **available sports equipment,** and one dedicated to **healthier nutrition**, especially for snacks consumed during breaks.

Pilot country 1: Greece

healthy food choices

To increase the **availability of healthier food** choices in the school canteen, fruits and juices, whole-grain cereal bars, whole grain bagels and custom-made toasts were added to the menu. These choices were **proposed and voted on by the ambassadors**, who promoted the projects with leaflets and posters displayed all over school. The aim was to encourage students to increase consumption of healthier snacks during school hours. The impact was assessed by feedback from the canteen personnel.

This intervention was carried out from January to May 2022.

physical activity

New equipment was made available and a variety of alternative non-competitive **activities** were proposed. The aim was to increase student engagement in activities that were less competitive, and instead focused on participation and fun rather than competing and winning. **Teachers were suggested to promote exercises** other than the typical ones covering sports rules, such as body training exercises, team activities and more free games with balls.

The impact was viewed through feedback by the ambassadors about their enjoyment in participating in physical activity classes.

Pilot country 2: Spain

first training, then acting

The makeathons sparked a lot of innovative ideas, which were restructured into **actions plans** regarding **physical activity** and **healthy snacks** as primary outcomes, and decreasing **screen time** as a secondary outcome. Different types of activities were designed for each behavioral outcome. Interventions started with **training sessions** on the selected topics, one for parents and one for students. The training for students ended with a **workshop** focused on how to optimize their time by doing different free out-of-school activities. The impact was assessed by the participants themselves.

Pilot country 2: Spain

healthy snacking competition

A **healthy snacks competition** was organized in March 2022 and consisted in eating a healthy snack once or twice per week. In the same period, dietitians provided a **booklet of healthy snacks recipes** to high schools. The snacks were scored according to their healthiness. Those students bringing their snacks based on the recipe booklet got an extra score. Tutors and ambassadors shared one recipe once a month.

All points scored were added to those scored in the screen time competition.

screen time competition

Each class competed in achieving the **least number of hours per week** in front of a screen. As part of the program, new types of activities were promoted, such as sports or hobbies.

Once a week, teachers, helped by ambassadors, **monitored the screen time of each student** in the class. The total score was calculated including the class as a whole. Teachers used a checklist where the score to be given to each student was indicated according to the hours spent in front of the screen. From there, an overall sum score was calculated for each class.

Pilot country 2: Spain

active classes and break time

Teachers were encouraged to perform **classes in more active ways**. Once a month, from February to May 2022, a different proposal was offered: short trips, classes in the playground instead of inside, visits to a museum or science centre, etc. **Active breaks** consisting in 2-3 minutes were also proposed during longer classes or between classes. Active breaks consisted of simple choreographies, relaxation exercises or mobility exercises, instructed by a short video provided by the SEEDS researcher team.

sportsday and final score

Competitions, active class and breaks continued throughout April 2022. In addition, a **sports day** was organized including sport tournaments, traditional games, dance, etc. The **sports were chosen** by the students to maximize participation.

All competition scores were calculated class by class (not individually) at the end of May resulting final scores of the SEEDS competition. As a reward, the winner received a bunch of local products such as vegetable drinks, vegetable broths, etc.

Pilot country 3: The Netherlands

students, teachers, researchers together

From the makeathon, **various activities** were designed for **nutrition** and **physical activity**. Students from two intervention schools along with **diversified stakeholders** were involved.

The project groups consisted of ambassadors supported by a teacher from their school and were guided by the SEEDS team. All students were free to join both the physical activity and nutrition interventions. For all activities, the **gender dimension** was monitored.

This intervention was jointly developed and managed by the Erasmus University Medical Center Rotterdam and the City of Rotterdam.

DE SCHIJF VAN VIJF IS DE BASIS
Het Voedingscentrum heeft een richtlijn opgesteld om kantines te helpen met een gezonder aanbod en uitstraling. Dit is de Richtlijn Eetomgevingen voor Scholen. De Schijf van Vijf is hiervoor de basis en houdt in:

- Veel groente en fruit
- Vooral volkoren, zoals volkorenbrood, volkorenpasta en -couscous en zilvervliesrijst
- Minder vlees en meer plantaardig. Varieer met vis, peulvruchten, eieren en vegetarische producten
- Magere en halfvolle zuivel, zoals melk, yoghurt en kaas
- Kleine porties ongezouten noten
- Zachte of vloeibare smeer- en bereidingsvetten
- Voldoende vocht, zoals water, thee en koffie

Pilot country 3: The Netherlands

workshops on sports

A project group of 3-6 students supported by a teacher created a survey for an **inventory of sports interests** within their school. **Local sport clubs** were contacted to deliver workshops. The workshops (15-90 minutes long) were organized from April to June 2022 during the physical education classes, lunch breaks or after school. The number of responses to the survey, the number of workshops per school, and the number of attendees during workshops were monitored.

workshops on cooking

The cooking workshops (45–90 minutes) were given by professionals from April to June 2022 at school. Students participated on voluntary basis after regular classes.

The cooking workshops focused on how to **make tasty and healthy food.** Detailed content of the workshops were determined by the professionals together with the requests of the students.

The number of registrations and the list of attendees to each cooking workshop was used to evaluate the impact of the intervention.

Pilot country 3: The Netherlands

healthy school canteen

For each school, a project group of 3-6 students and a teacher or a canteen representative **focused on creating a healthy canteen** with a nutrition expert from Onwijs Gezond! specializing in solutions to make schools healthier. It is the **first time students were included in the planning of a healthy canteen themselves**. After completing a canteen scan to gain insight into the initial healthiness of the canteen, the teams **designed a roadmap** for their school canteen. This included adjusting products in the canteen, adjusting school policies and paying attention to healthy nutrition in classes.

lesson package on nutrition

Weet wat je eet is an existing **lesson package** developed by the Dutch nutrition institute, consisting of 10 online lessons about healthy eating for students ages 12 to 15 years. Each lesson consists of information, videos, interactive assignments and tests. This lesson package was **offered to all students** in grades 1, 2 and 3 and could be discussed during a regular class time. Teachers could follow the progress of students using an online teacher environment. This lesson package was delivered from March to June 2022 and the content was adapted to the available time and the interest of the students.

Pilot country 3: The Netherlands

more activity during breaks

The student-project group on physical activity created a survey to produce an **inventory** of student interests and needs. They also did a brainstorm session with local policymakers of the City of Rotterdam focused on active school days and smart breaks. **New physical activities during breaks**, using new materials, games, or competition, were organized from April to June 2022. **Students were trained to lead activities themselves** and create more opportunities for their peers, when possible. The number of responses to the survey, the amount of new activities, and the total participants during each event were monitored.

final event

A final event for and together with students was planned in June-July 2022 by both project groups together with external professionals. The aim was to **celebrate their healthy school canteen and engage participants in competitions in both topics**, physical activity and nutrition.

Pilot country 4: United Kingdom

a progressive plan to get healthier

The UK team designed multi-purpose program to **challenge** three behaviors; **screen time**, eat **healthy snacks and drinks**, and **physical activities**. The frequency of these tasks was between one and five days per week throughout the six months of the intervention and were presented as progressive challenges for the participants.

Pilot country 4: United Kingdom

get more active!

This activity was launched as a challenge to **progressively increase physical activity**, from January to June 2022. This goal was chosen by the participants themselves. The challenge was to **gradually increase physical activity from 10 – 20 minutes per day over the 4 weeks of the month**. The first week the teens did a minimum of 10 minutes of physical activity per day. The second week, they did physical activity at least two days a week for 10 minutes. In the third, they did physical activity three days for 10 minutes. Finally, in the fourth week they did it for four days.

drink water

The water consumption activity aimed to **increase the consumption of water** instead of other beverages so that teens were properly hydrated and did not abuse sugary drinks. It was a face-to-face and individual activity that encouraged participants to drink more water from 1 to 4 times a week. The activity launched a series of challenges each week based on consuming water as a beverage exclusively during school hours for several days a week. This activity **increased progressively**, starting with drinking water exclusively for one day in the first week of the month to the last week of the month for four days.

Pilot country 4: United Kingdom

healthy eating

While the program of increased physical activity and water consumption activity continued a **new activity on healthy snacks began**. It was a behavioral change program carried out face-to-face on an individual basis, with a frequency from one to four times a week. Teens were challenged to consume one healthy snack per week and progressively **increase their consumption each week** up to four healthy snacks per week by the end of the month.

learn to skip

Each SEEDS participant in the UK was **provided with a skipping rope and tasked to learn this new exercise**. Building up over the course of four weeks, the goal was to skip consecutively for two minutes. Adolescents were **encouraged to experiment**, trying it with no instructions, while also being given tutorial-based web-links to help them progress if needed. There were no set rules for when this should happen. Participants were free to engage in the activity at a time that was convenient for them and their day.

Citizen science

Citizen science

a participative approach in doing research

Citizen science is the **involvement**, at different levels, of the **public in scientific investigation** and data collection. A citizen science project can involve up to millions of people collaborating towards a common goal. Projects of citizen science can be devised in different fields, typically ecology, astronomy, medicine, computer science, statistics, psychology, genetics, and in social science, humanities and the arts. The massive collaborations that can occur through **citizen science allow investigations at wider scales** — leading to discovery that a single scientist or group could never achieve on their own, or even help to **design the scope of new research**.

the potential of citizen science

Citizen science is a new form of science, in which members of the public actively participate in the research work. Through it, citizens are no longer the target of science communication, but actively engaged in the scientific process. (SCIVIL, 2019)

Citizen science is the involvement in research activities of individual citizens, teams and networks of volunteers of any age or background who are not professional researchers.

It includes a **wide set of activities that can be carried out in a collaborative workflow** to investigate, explore, collect data, observe, create, and experiment. Its research fields span from ecology to astronomy, medicine, computer science, cartography, statistics, psychology, genetics, engineering, neuroscience, biochemistry, air or sea pollution monitoring, and more than 2,500 peer-reviewed research studies benefitting from citizen science have been published in the past ten years.

Citizens' participation can be small or large, from crowdsourced citizen science, in which participants contribute data or volunteer computing power, to co-created research, in which individuals or communities actively engage in most aspects of the research and even the research scope is chosen in a participatory way.

SEEDS adopted the so-called **extreme citizen science approach.** This is a situated, bottom-up practice that takes into account local needs, practices and culture and works with broad networks of **people to design and build** new devices, knowledge, processes that can transform the world.

the ten principles of citizen science

These principles were developed by the 'Sharing best practices and building capacity' working group of the European Citizen Science Association, led by the Natural History Museum London with input from many members of the Association.

1. Citizen science projects actively involve citizens in scientific endeavour that generates new knowledge or understanding. Citizens may act as contributors, collaborators, or as project leader and have a meaningful role in the project.

2. Citizen science projects have a genuine science outcome. For example, answering a research question or informing conservation action, management decisions or environmental policy.

3. Both the professional scientists and the citizen scientists benefit from taking part. Benefits may include the publication of research outputs, learning opportunities, personal enjoyment, social benefits, satisfaction through contributing to scientific evidence e.g. to address local, national and international issues, and through that, the potential to influence policy.

4. Citizen scientists may, if they wish, participate in multiple stages of the scientific process. This may include developing the research question, designing the method, gathering and analysing data, and communicating the results.

5. Citizen scientists receive feedback from the project. For example, how their data are being used and what the research, policy or societal outcomes are.

6. Citizen science is considered a research approach like any other, with limitations and biases that should be considered and controlled for. However unlike traditional research approaches, citizen science provides opportunity for greater public engagement and democratisation of science.

the ten principles of citizen science

7. Citizen science project data and meta-data are made publicly available and where possible, results are published in an open access format. Data sharing may occur during or after the project, unless there are security or privacy concerns that prevent this.

8. Citizen scientists are acknowledged in project results and publications.

9. Citizen science programmes are evaluated for their scientific output, data quality, participant experience and wider societal or policy impact.

10. The leaders of citizen science projects take into consideration legal and ethical issues surrounding copyright, intellectual property, data sharing agreements, confidentiality, attribution, and the environmental impact of any activities.

The Ten Principles of citizen science are available in 32 languages here: ecsa.citizen-science.net/ecsa-guidelines-and-policies/

Image credit: NASA

How to start
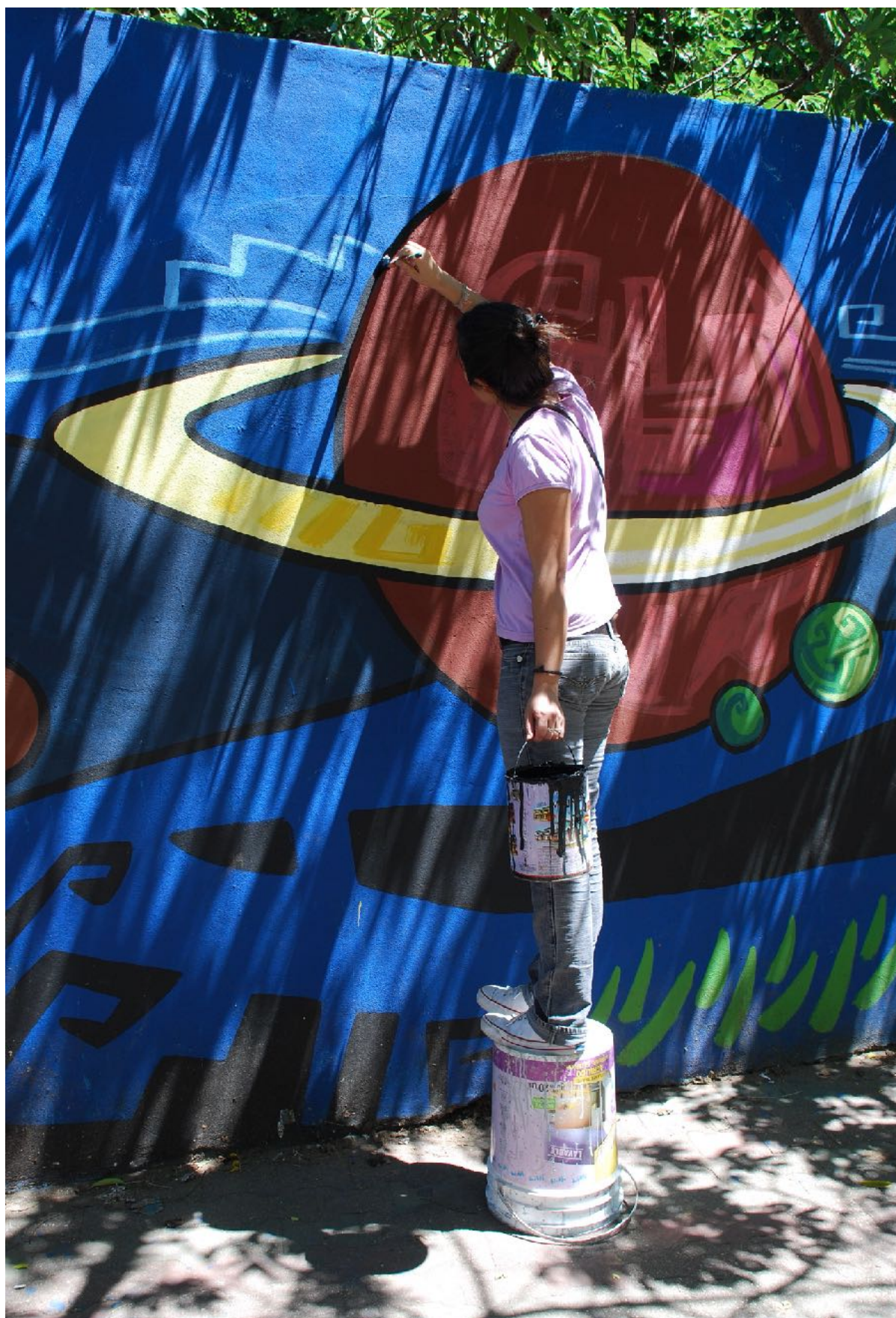
Citizen science tool kit

your role as a health professional

Many studies have shown that health professionals **do not always communicate well with adolescents**, leaving them under-involved and unsure who to ask when concerned (Davidson et al, 2020). Poor interactions can lead to fear, missed appointments and potentially a worse clinical outcome (Milne and Chesson, 2000).

Yet health professionals can have a positive influence on adolescents' experiences, incorporating **their views**, giving them a **voice**, and establishing a **partnership**. A good strategy for achieving this is **citizen science**.

citizen science tool kit

The European funded project CitieSHealth offers a tool kit to help you to set up and run a citizen science project.

The CitieS-Health Toolkit provides a **customised and interactive collection of adaptable instruments**. You can it to engage the community, solve common concerns and to share together in making the world a better place.

The **toolkit is free of charge.** It will guide you in everything from crowdsourcing, exploring and defining environmental and health issues that affect your communities, as well as implementing bottom-up actions to enable change. The **CitieS-Health tool kit provides specific and adaptable solutions** for identifying common problems, designing citizens-driven research studies, and proactively collecting data to provide evidence for future actions.

To learn more: https://citizensciencetoolkit.eu/

step 1: identification

Identify the issue that interests you and your community, transform it into one or more research questions.

The first and most important thing is to start from what **interests you and the youth in your community**: these must be at the heart of what you do.

Your role is very important in transforming the chosen issue in one or more **research questions** and defining the method of research.

Citizen science in based on active participation. A **community** that is affected by the problem can be ideal for recruiting participants who will maintain an active interest for the duration of the project.

Your main goal is to **sustain the community** and ensure their **involvement**.

step 2: co-design

Provide knowledge, define the study protocol, identify the tools to collect and analyze data, and choose the model of governance and decision making.

The **essential information** to deal with the research questions defined in the Step 1 must be given, so that they can help to provide reliable data.

The **study protocol must include all information** on the experimental variables, the type of data to be collected and the methods and tools to collect them.

Deciding **what tools to use** to collect data is crucial, as a **lack of usability** in the tools for citizens could potentially lead to unsuccessful project outcomes.

Citizen science aims to democratize science. The rules that **govern the development** of the project must reflect this principle and **be discussed and shared** by the community involved.

step 3: deployment

Collect the data, analyze and interpret them, assess the impact on the community.

Data collection is an essential part of any citizen science project. It must be perceived as **meaningful and entertaining.** Plan a good communication campaign to keep this peace meaningful and entertaining.

Data analysis and interpretation are not restricted to experts. **Citizen scientists can be actively involved:** they have valuable situated knowledge that can contribute to interpreting data and results.

The same principle applies to **assessing impact**: the project starts from a need of the community and the community is entitled to set **targets and indicators** that enable them to critically assess the success of the intervention.

step 4: action

Disseminate the results with any possible means, plan and implement further actions, do your best to ensure the results last over time.

When the project ends, your work is not finished. You have to **disseminate the results** towards various **publics** (scientific community, public authorities, civic society, schools, and industries) with the most appropriate tools.

Work with the participants to **implement actions** to support the goals of the project.

Find inventive ways to **encourage the duration** of the results so that your work will receive the most appreciation.

you are not alone

There is a large and vibrant community working in citizen science willing to help you in your new journey.

Starting alone is not a good idea. You can turn to experts, research groups and associations that have experience and expertise to accompany you in your citizen science journey.

Many resources, inspiring projects and people are available on the **European Citizen Science Platform**.

The **European Citizen Science Association (ECSA),** born in 2014, supports the exploration of how citizen science should be understood and practiced, and help to shape different aspects of the citizen science movement, in Europe and around the world.

Many countries have national citizen science association, and you may contact them.

Info

Further reading

On SEEDS

Practical tools, SEEDS project, https://seedsmakeathons.com/category/practical-tools/

On citizen science

ECSA characteristics of citizen science, https://zenodo.org/record/3758555#.Ypn5_BNBzJ9

The ten principles of citizen science (available in 35 languages), https://ecsa.citizen-science.net/documents/

Veeckman, C., Talboom, S., Gijsel, L., Devoghel, H., Duerinckx, A. (2019). *Communication in Citizen Science. A practical guide to communication and engagement in citizen science*. SCIVIL, Leuven, Belgium. ISBN: 9789463965613

Extreme citizen science, https://www.geog.ucl.ac.uk/research/research-centres/excites

CitieSHealth, *Citizen science toolkit*, https://citizensciencetoolkit.eu/

On adolescents and health

Healthy eating for teens, National Health System UK, https://www.nhs.uk/live-well/eat-well/healthy-eating-for-teens/

Healthy diet, World Health Organization, https://www.who.int/news-room/fact-sheets/detail/healthy-diet

Adolescents Health, World Health Organization, https://www.who.int/health-topics/adolescent-health#tab=tab_1

Global Recommendations on Physical Activity for Health, World Health Organization, https://www.who.int/dietphysicalactivity/physical-activity-recommendations-5-17years.pdf

Health workforce, World Health Organization, https://www.who.int/teams/health-workforce/health-professions-networks

Millen A.C., Chesson R. (200), *Health services can be cool: partnership with adolescents in primary care*, https://doi.org/10.1093/fampra/17.4.305
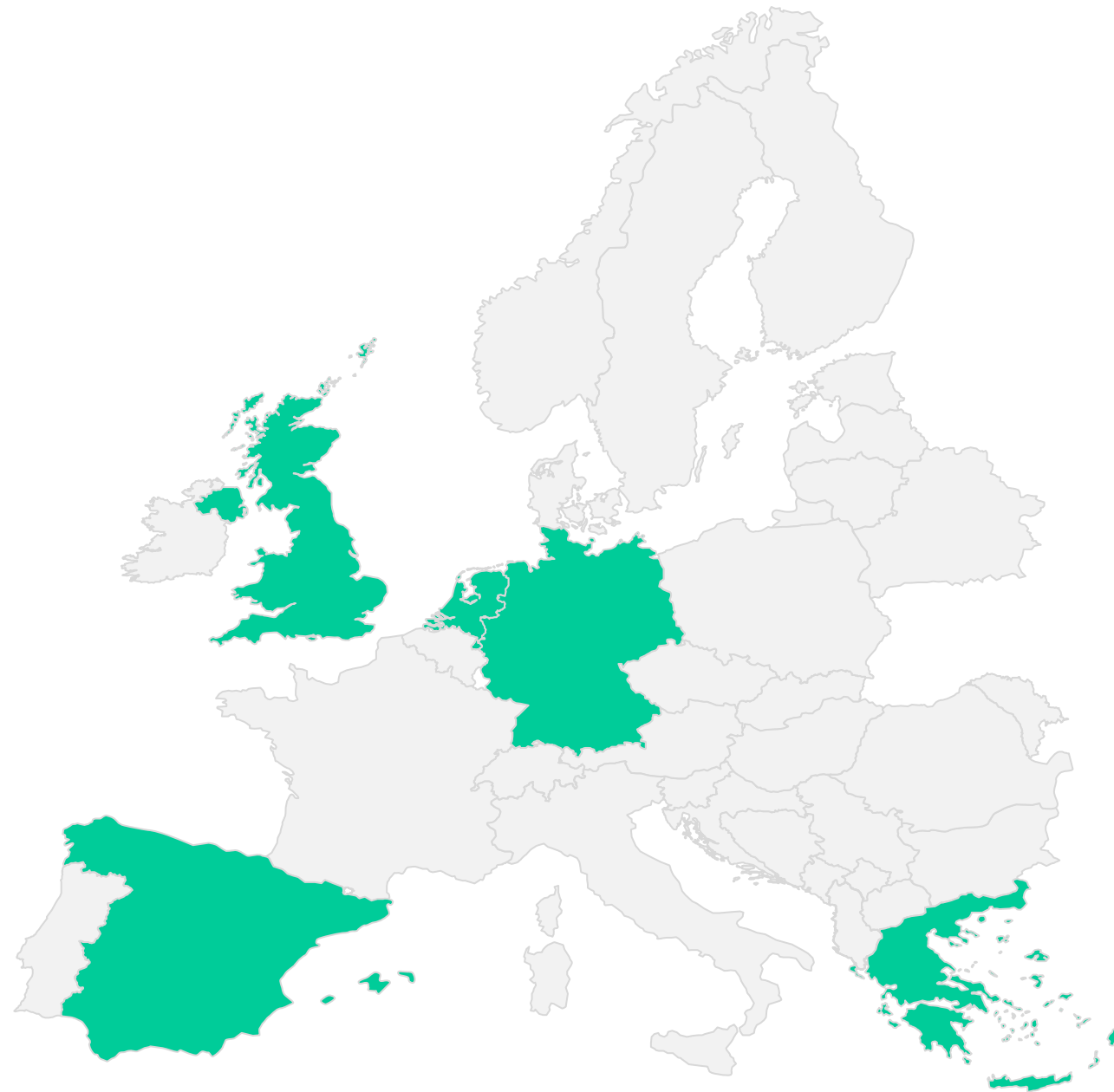
The SEEDS team

who we are

A group of nutrition, public health, physical activity and citizen science experts, working across Europe to explore how the SEEDS approach can help improve healthy lifestyles and STEM interest in teenagers.

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