

Communication and Dissemination Report

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| R | Document, report | <input checked="" type="checkbox"/> | PU | Public <input checked="" type="checkbox"/> |
| DEM | Demonstrator, pilot, prototype | <input type="checkbox"/> | CO | Confidential, only for members of the consortium (including the Commission Services) <input type="checkbox"/> |
| DEC | Websites, patent fillings, videos, etc. | <input type="checkbox"/> | | |
| OTHER | | <input type="checkbox"/> | CI | Classified, as referred to Commission Decision 2001/844/EC <input type="checkbox"/> |

Call: H2020-SC1-2020-Single-Stage-RTD

Topic: SC1-HCO-17-2020 • Coordinating and supporting research on the human microbiome in Europe and beyond

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Duration: 36 months

End date of the project: April 30th, 2024

Project ID: 964590



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Executive Summary

The Human Microbiome Action project, funded under the European Union's Horizon 2020 Research and Innovation programme, aims to advance the field of microbiome research through harmonisation and standardisation of the field. Between May 2021 and April 2024, the project implemented several outreach activities to share the project outcomes and enhance Europe's leadership in microbiome research, leveraging these insights for public health advancements. Strategic communication and dissemination plays a vital role in the Human Microbiome Action project. This final report highlights the activities carried out by WP8 with the support of all other project partners during this project. Key activities include the development of a strategic communication and dissemination plan (D8.1), a dynamic project website, active engagement through social media, the production and distribution of various educational materials, and substantial contributions to scientific and public discourse through workshops, conferences, as well as media interactions and a sustainability plan to increase long-term impact (D8.2). The project has fostered a broad spectrum of stakeholder engagements, from academic peers to industry partners and policymakers, ensuring wide dissemination of research findings and fostering a collaborative environment conducive to future innovations in the field.

Introduction

The Human Microbiome Action project was initiated to coordinate and support research on the human microbiome across Europe and beyond. Recognising the potential of microbiome science to revolutionise our understanding of human health, the project aimed to consolidate Europe's leading position in this emerging field. With a clear aim to maximise impact, the project focuses on engaging a diverse range of stakeholders through collaborative communication and dissemination strategies. Led by the European Food Information Council (EUFIC), and supported by all project partners, the project's communication efforts were strategically planned to ensure that findings reached not only the scientific community but also policymakers, industry leaders, and the general public. The communication strategy was centred around the dissemination of research outputs, engagement with stakeholders, and the enhancement of public understanding and support for microbiome research. EUFIC has worked with all project partners to process, tailor, and target the communication materials for efficient dissemination, communication and exploitation of the project outcomes.

Objectives

The communication strategy of the Human Microbiome Action project is designed to engage a broad spectrum of audiences, enhancing support and visibility for the project's goals. By maximizing impact and ensuring the dissemination of findings to relevant stakeholders, the project aims to sustain Europe's leadership in microbiome research and leverage these insights for public health advancements. Led by EUFIC and supported by all partners, WP8 'Exchange and dissemination' has been instrumental in these efforts. The main objectives of WP8 are:

Strategic Dissemination of Outputs: WP8 focuses on using the extensive networks of our partners to effectively spread the project's results. This includes publishing in top scientific journals, presenting at global conferences, and active engagement across various platforms to ensure wide accessibility and distribution of research findings.

Engagement with Stakeholders: The project connects directly with stakeholders through workshops and indirectly via online channels. These interactions help share information about the project across diverse audiences, from academia and industry to policymakers and the general public. Through workshops, webinars, and a dynamic online presence, we foster discussions that refine research directions and extend the project's reach beyond the project's lifetime.

This structured approach not only broadens the impact of our research but also ensures that the benefits of microbiome science are widely understood and future applications will be integrated into public health strategies. The objectives underscore the comprehensive approach taken by the project to enhance the visibility and impact of its research, ensuring that insights from the Human Microbiome Action project not only contribute to the scientific community but also influence public health policies and practices. Through the concerted efforts of WP8, the project maintains Europe's leadership in microbiome research and harnesses the potential of microbiome science for future health innovations.

Results

Communication and Dissemination Plan Update

During the first six months of the project, EUFIC developed a communication and dissemination plan (D8.1) to ensure effective communication towards the above-mentioned objectives. The plan defines key target audiences and sets out a strategy to reach and engage with stakeholders via appropriate tools and channels, providing

information about the project and its outcomes. Since completing the initial communication and dissemination plan, EUFIC has reviewed and updated the plan to ensure all roles and responsibilities are clearly defined and that all outputs are reaching the target audiences most effectively and engagingly. The plan further includes a set of key performance indicators (KPIs) that will be evaluated later in this report.

Communication and Dissemination Materials

This section details the various materials produced during the project, designed to support ongoing and future dissemination efforts. These materials include educational videos, informative leaflets and detailed infographics. Upon creation, these resources serve as lasting tools that can be utilised continuously to communicate about the project's aims and outcomes, ensuring sustainability in the project's communication strategy.

Project Brand Identity

The project adopted the name 'Human Microbiome Action' for all public-facing activities to convey more accessible and relevant information to external stakeholders, compared to the project's official abbreviation, IHMCSA (International Human Microbiome Coordination and Support Action). The abbreviation IHMCSA was thus reserved solely for internal and legal communications with the European Commission.

To support this branding, comprehensive Brand Guidelines were developed and shared amongst the consortium to ensure consistent branding and recognition of the project. The brand guidelines (Figure 2) include the project logo (Figure 1) and a cohesive visual identity that was consistently applied across Microsoft Office Word and PowerPoint templates, as well as social media templates. Moreover, the project produced a toolkit containing branded and standardised graphic materials. This toolkit was designed to assist partners in organising workshops across various Work Packages. It featured adaptable visual assets such as roll-ups, event posters, 'save the date' notices, and agenda templates, customisable upon request.



Figure 1: Human Microbiome Action logo

Construction and Roles of Use

COLOUR PALETTE

The corporate brand colour of Human Microbiome Action is blue and orange. The colour blue was chosen for its meaning in conveying credibility, truth and communication. Orange was chosen as a secondary colour in order to promote the brand's prominence.



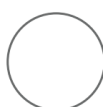
Blue

CMYK: 90 70 0 0
RGB: 48 83 181
HEX: #3053A1



Orange

CMYK: 6 59 77 0
RGB: 230 127 69
HEX: #E67F45



White

CMYK: 0 0 0 0
RGB: 255 255 255
HEX: #FFF



Black

CMYK: 100 100 100 100
RGB: 0 0 0
HEX: #000

Figure 2: Sample from the Brand Guidelines

Website

The Human Microbiome Action website was designed and created by EUFIC within the first six months of the project and became publicly available as of October 2021 under <https://www.humanmicrobiomeaction.eu/>. The website plays a crucial role in the communication and dissemination efforts of the project as it acts as the main hub of information towards the public. The website provides concise information about the project and the field of microbiome research and is continuously updated by EUFIC with recent information about the project such as workshops performed by other WPs, articles or events. The structure of the is as follows:

- Home – General Information about the project and the topic
- About – Detailed information about the project and the consortium
- Human Microbiome – Detailed information about the field of human microbiome research
- News & Events
 - News – Project news and blog articles
 - Events – Events in the field of microbiome research
 - Press – Press releases & media mentions of the Human Microbiome Action project

- Resources – Publicly available research outcomes and other materials of the project
- Contacts

For the promotion and retention of the project’s final conference, a dedicated subpage has been created and linked on the homepage (<https://humanmicrobiomeaction.eu/final-conference/>). Another subpage has been created to highlight the creation of the European Microbiomes Centres Consortium – a legacy network of the Human Microbiome Action project to foster innovative translational developments in Europe, advocating for the acknowledgement of scientific consensus and requirements in the field of microbiome research (<https://humanmicrobiomeaction.eu/european-microbiome-centres-consortium/>).

During the project duration, the website has reached 8,200 users (Figure 3) with 23,000 views (Figure 4). Most users came from the United States, France, Netherlands, Germany and the United Kingdom (Figure 5).

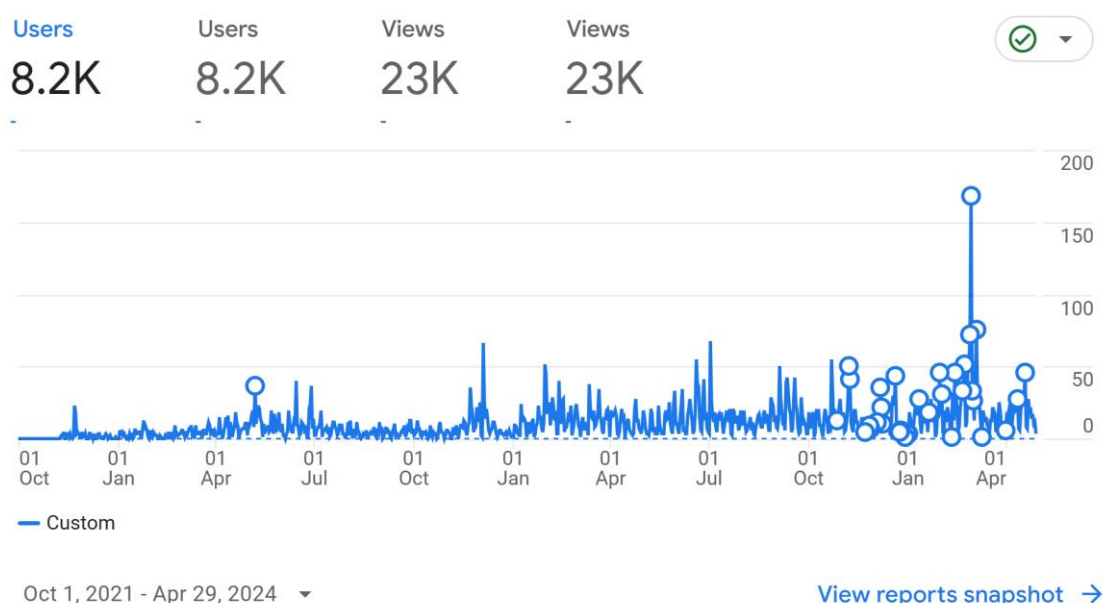


Figure 3: Website Users

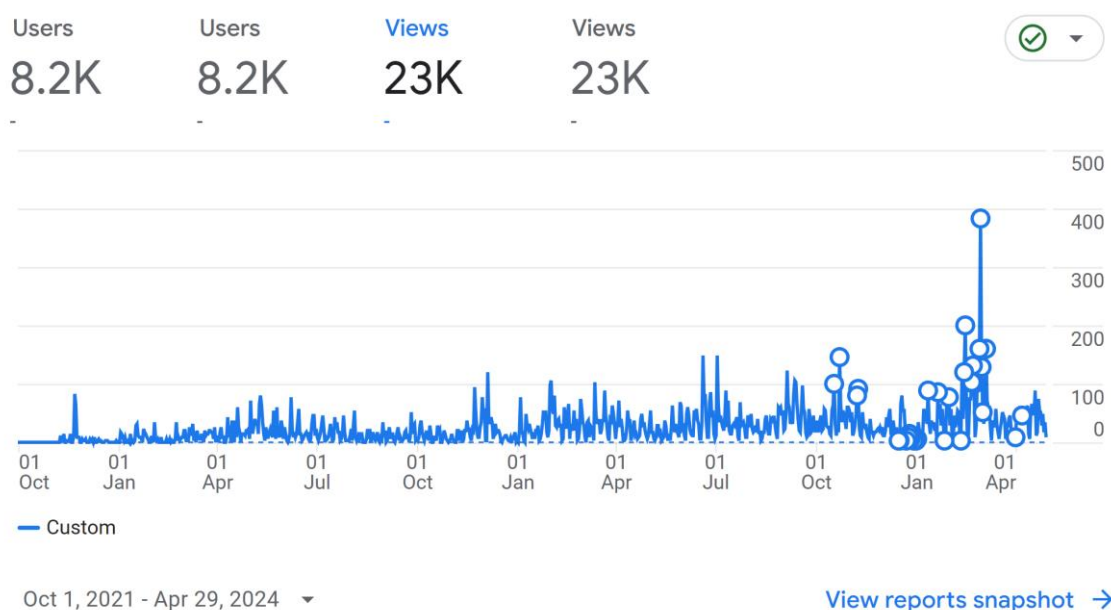


Figure 4: Website Views

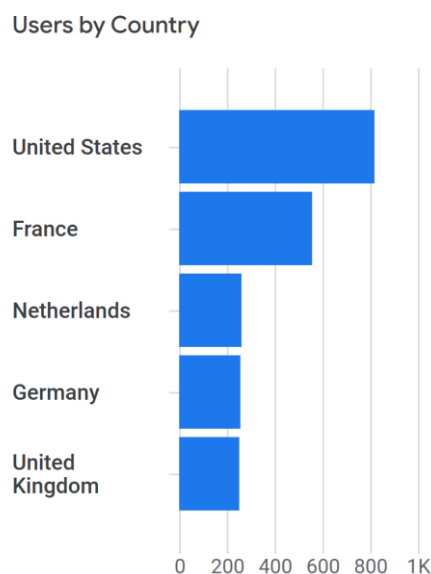


Figure 5: Most users by country

Social Media Templates

Throughout the project, several social media templates have been created and shared with partner organisations via the internal sharing platform and email. In the first six months of the project, a set of 21 ready-to-use images has been created to promote general key messages around the project. Additionally, a set of adjustable templates has been shared with partners to promote key aspects of the projects or highlight specific partners through the #MicrobiomeAmbassador campaign. During the promotional phase of the project's final conference,

a save-the-date template was shared with the partner organisations to engage with their organisational networks (see Figure 6).



Figure 6: Social Media Templates (left key message; right #MicrobiomeAmbassador campaign; bottom Final Conference)

Leaflet

Since the uptake of in-person events after the COVID pandemic, a dedicated project leaflet has been developed to showcase the project's key concepts, goals and activities and to promote the open Stakeholder Advisory Board. This leaflet's web version (see Figure 7) has been [published via Zenodo](#). A print version has been shared with project partners via the internal sharing platform for events and meetings.



Figure 7: Human Microbiome Action Leaflet

Factsheets

The project produced a total of ten factsheets. A first set of three factsheets was published in October 2023. It targets key stakeholders from public health, industry and policy, focusing on raising awareness and explaining the importance of the human microbiome for their respective fields, emphasising new frontiers to develop microbiome research further. A second set of seven factsheets was published in April 2024. These factsheets highlight the main project outcomes of work packages 1-7. The factsheets also highlight engagement opportunities for stakeholders via the Stakeholder Advisory Board or the European Microbiomes Centres Consortium. Figure 8 shows an example of each of the factsheet sets.

All factsheets are being distributed via the project newsletter and social media accounts, are part of the sustainability kit shared with project partners via the internal sharing platform and are freely accessible via the project website as well as the [Human Microbiome Action Zenodo community](#).



Figure 8: Examples of the Human Microbiome Action Factsheets (left: Stakeholder Factsheets; right: Factsheet WP1)

Infographic

A project infographic (MS29), designed by EUFIC in collaboration with project partners, has been published in April 2024. It draws together information from the various project activities including scientific publications, partner workshops with international experts, Delphi surveys and other activities. The infographic focuses on the role of microbiome research in the context of public health, explaining the current understanding of a healthy microbiome, current shortcomings and pitfalls in translating microbiome research into clinical practice and outlining research focuses on making microbiome research more inclusive and accessible in the future. The infographic is linked to the factsheets derived from WP 1-7, which provide more detailed information on each aspect, creating a valuable cross-communication link. Further details on the Infographic can be seen in Milestone Report 29.

Videos

Throughout the project, a variety of videos have been released to clarify the project's objectives and share progress in microbiome research. On June 17th, 2021, KPL released a video interview with project coordinator Joël Doré, which has accumulated 183 views (available at <https://www.youtube.com/watch?v=NkMBONFZTXk>). Additionally, a series of six short videos was recorded during the second Annual Meeting in Paris from May 30th to June 1st, 2023. These short videos were published by EUFIC on the [SciFoodHealth YouTube channel](#) on October 31, 2023, collectively attracting 188 views. These videos provide general updates and delve into specific aspects of the project's work, as summarised in Table 1. As part of the Sustainability Kit (D8.2) these videos are available for project partners on the internal sharing platform for individual dissemination.

EUFIC also developed an animated video that outlines the current stage of microbiome research and its limitations (accessible at https://www.youtube.com/watch?v=6pLD_R6nLlw). This video, which highlights the need for increased harmonisation and standardisation to further public health advancements, mentions the [European Microbiomes Centres Consortium \(EMCC\)](#) as a key legacy initiative of the Human Microbiome Action project. Since its release on February 29, 2024, the video has reached 95 views.

Moreover, the live recording of the final conference (MS29), held on February 29th, 2024, is available for public viewing on the SciFoodHealth YouTube channel (https://www.youtube.com/watch?v=5agsPWw7_DY). The recordings have so far accumulated 1,078 views.

Table 1: Short videos of Human Microbiome Action partners

| Title | Speaker | Views (30 th April 2024) |
|--|------------------------------|-------------------------------------|
| How does #HumanMicrobiomeAction relate to the future of microbiome research and public health? | Joël Doré (INRAE) | 25 |
| How can we link the gut microbiota with specific diseases? | Hervé Blottière (INRAE) | 15 |
| Which are the biggest contributions of #HumanMicrobiomeAction to the field of microbiome research? | Manimozhiyan Arumugam (UCPH) | 19 |
| How can we reach consensus in the field of microbiome research? | Zahra Hassani (KPL) | 29 |
| What is the future role of the human microbiome for healthcare professionals and in public health? | Alessio Fasano (EBRIS) | 55 |
| How does the HumanMicrobiomeAction intends to enhance the impact of microbiome research? | Céline Druart (PRI) | 45 |

Communication and Dissemination Activities

This section outlines specific activities that have been conducted to directly engage with the target audiences as outlined in D8.1. These actions include articles, newsletters, events, and other activities that occurred at specific points throughout the project's timeline. Each action is tailored to foster interaction, stimulate discussion, and provide real-time updates on the project's progress, contributing dynamically to the field's development.

Website Articles

The project website was used as the main information channel for the project. News about the activities carried out were constantly published with the main goal of disseminating the project activities and outcomes as well as to engage key stakeholders. Since the launch of the website, EUFIC has published 19 news items that can be grouped into four categories (Table 2):

1. Updates on project activities.
2. Events attended by Human Microbiome Action partners.
3. Collaborations with other projects or events such as other EU-funded projects or World Microbiome Day (more details in the section “Collaboration with other EU-funded projects”).

Table 2: Overview of articles on the Human Microbiome Action Website

| Title | Date | Link |
|---|----------------------------------|---|
| Minimal requirement for clinical metadata and sample processing in microbiome clinical studies | April 30 th , 2024 | https://humanmicrobiomeaction.eu/minimal-requirement-for-clinical-metadata-and-sample-processing-in-microbiome-clinical-studies/ |
| Gut Health & Fermented Foods – An Emerging Factor for Health and Disease Prevention? | December 20 th , 2023 | https://humanmicrobiomeaction.eu/news-gut-fermented-foods/ |
| Advancing Microbiome Research: Highlights from the Workshop on Establishing Consensus for Microbiome Analysis Standards | October 31 st , 2023 | https://humanmicrobiomeaction.eu/advancing-microbiome-research-highlights-from-the-workshop-on-establishing-consensus-for-microbiome-analysis-standards/ |
| How to bridge the Gap between Science and Industry | October 23 rd , 2023 | https://humanmicrobiomeaction.eu/how-to-bridge-the-gap-between-science-and-industry/ |
| Are you a microbiome expert? Help tackle the lack of consensus in the field! | October 18 th , 2023 | https://humanmicrobiomeaction.eu/are-you-a-microbiome-expert-help-tackle-the-lack-of-consensus-in-the-field/ |
| Microbiome Self-Care: A Philosophical Perspective | October 16 th , 2023 | https://humanmicrobiomeaction.eu/microbiome-self-care-a-philosophical-perspective/ |
| Human Microbiome Action – Delphi Surveys | August 17 th , 2023 | https://humanmicrobiomeaction.eu/human-microbiome-action-delphi-surveys/ |
| Why Isn't Your Doctor Focusing on Your Microbiome? | June 28 th , 2023 | https://humanmicrobiomeaction.eu/world-microbiome-day-2023/ |
| TEDx talk “Advocating for the Microbial Human: A Zone to Defend” | June 28 th , 2023 | https://humanmicrobiomeaction.eu/tedx-talk-dore/ |
| Microbiome outcomes in clinical trials: a workshop | June 20 th , 2023 | https://humanmicrobiomeaction.eu/workshop-microbiome-outcomes-in-clinical-trials/ |
| 2nd Annual Meeting – Paris, France | June 12 th , 2023 | https://humanmicrobiomeaction.eu/2nd-annual-meeting-paris-france/ |

| | | |
|---|----------------------------------|---|
| Self-management tools for faecal microbiome analysis | April 4 th , 2023 | https://humanmicrobiomeaction.eu/regulation-control-ethical-issues-surrounding-self-management-tools-for-faecal-microbiome-workshop/ |
| Call for Experts – Delphi Survey on Microbiome-based Biomarkers | November 23 rd , 2022 | https://humanmicrobiomeaction.eu/call-for-experts-delphi-survey-on-microbiome-based-biomarkers/ |
| Defining a healthy microbiome and virome – a workshop on microbial functions | October 21 st , 2022 | https://humanmicrobiomeaction.eu/defining-a-healthy-microbiome-and-virome-a-workshop-on-microbial-functions/ |
| Our Microbial Selves – What does it mean to be human? | October 20 th , 2022 | https://humanmicrobiomeaction.eu/our-microbial-selves-what-does-it-mean-to-be-human/ |
| Updated rules for greater safety and quality of blood, tissues, and cells & microbiome? | September 2, 2022 | https://humanmicrobiomeaction.eu/updated-rules-for-greater-safety-and-quality-of-blood-tissues-and-cells-microbiome/ |
| Human Microbiome Action at MicrobiomeSupport Final Conference | July 1 st , 2022 | https://humanmicrobiomeaction.eu/human-microbiome-action-at-microbiomesupport-final-conference |
| 1st Annual Meeting – Salerno, Italy | May 20 th , 2022 | https://humanmicrobiomeaction.eu/1st-annual-meeting-salerno-italy/ |
| The Human Microbiome Action Project | May 15 th , 2021 | https://humanmicrobiomeaction.eu/the-human-microbiome-action-project/ |

Beyond the articles on the project website, several other articles have been published to communicate about related aspects of microbiome research. In collaboration with UCC/APC, INRAE and EUR, Eufic prepared two articles for the website of the World Microbiome Day. In “[Why Isn't Your Doctor Focusing on Your Microbiome?](#)” (see Annex I) project coordinator Joël Doré (INRAE) highlights microbiome research's current role and future outlook for clinical practice. Hub Zwart (EUR), leader of WP7, discusses the role of philosophical implications of microbiome research in “[Microbiome Self-Care: A Philosophical Perspective](#)” (see Annex II). Both articles have also been co-published on the Human Microbiome Action project website (see Table 2) and are directed to a lay audience, giving them easy-to-understand knowledge about recent research activities. Another article titled

[“What are prebiotics and probiotics and are they important for health?”](#) has been published in collaboration with INRAE and PRI on the EUFIC website. EUFIC’s website gets millions of visits every year, making it a great platform to spread the word about microbiome research and the Human Microbiome Action project. The article (see Annex III) explains the concept of prebiotics and probiotics, how they can contribute to gut health and well-being, as well as their limitations and challenges. The article was designed with lay audiences in mind, avoiding complex jargon and providing relatable examples where appropriate.

Newsletter

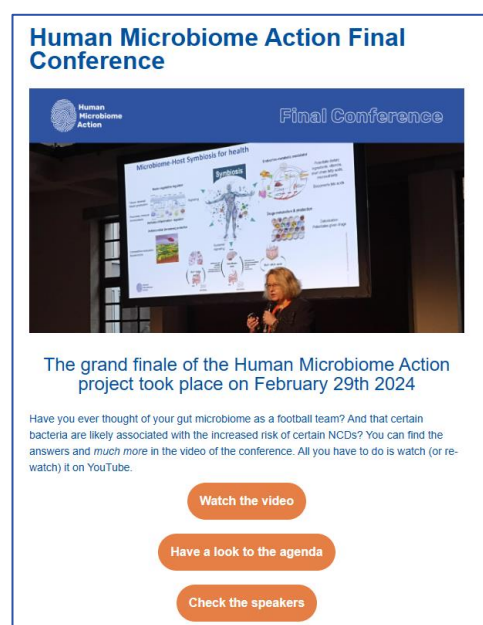


Figure 9: Example of project newsletter

To increase the dissemination of the Human Microbiome Action activities, a dedicated E-newsletter (Figure 9) created with Mailchimp was established by EUFIC in January 2023. The newsletters highlighted updates and events related to the project and mentioned key information from the field of microbiome research, specifically from other EU-funded projects working on the microbiome field. To maximise the outreach, the newsletter was also disseminated through social media. In total, six project newsletters have been sent during the project duration (Table 3).

Table 3: Project Newsletter

| Date | Link | Subscribers | Open rate |
|------------|---|-------------|-----------|
| 30/04/2024 | https://mailchi.mp/humanmicrobiomeaction/news-from-the-human-microbiome-action-project-17379535 | 385 | 231 |
| 05/04/2024 | https://us4.admin.mailchimp.com/campaigns/show?id=17375608 | 372 | 229 |
| 31/01/2024 | https://us4.admin.mailchimp.com/campaigns/show?id=17367408 | 325 | 171 |
| 08/11/2023 | https://us4.admin.mailchimp.com/campaigns/show?id=17348104 | 295 | 166 |
| 03/07/2023 | https://us4.admin.mailchimp.com/campaigns/show?id=16884252 | 221 | 128 |
| 31/01/2023 | https://us4.admin.mailchimp.com/campaigns/show?id=15919423 | 120 | 63 |

Social Media

Social media is a useful tool for increasing public awareness. It has been used to share the project's outcomes, events and help redirect users towards the website. To maximise the outreach and communication about the Human Microbiome Action project, social media activities were carried out through multiple channels. These include the EUFIC-managed Twitter (@SciFoodHealth), YouTube (@SciFoodHealth) and, since February 2023, SciFoodHealth LinkedIn account as well as partner's social media channels. The hashtag for all social media posts is #HumanMicrobiomeAction and all partners were encouraged to use the hashtag when posting about the project. Moreover, relevant partners were tagged in each post, and they have been actively engaging and re-sharing the messages, further emphasising the common voice on multiple platforms.



Figure 10: Example Twitter post from @SciFoodHealth

The EUFIC-managed **Twitter** account EU Food Health (@SciFoodHealth) was used to tweet about the project and related topics (Figure 10). The account currently has over 26K followers that are interested in EU-funded research outcomes. Between May 2021 and 29th April 2024, 103 posts related to Human Microbiome Action have been published on @SciFoodHealth. These posts have obtained a total of 122,011 impressions and 3,986 engagements (e.g., likes, retweets, clicks).

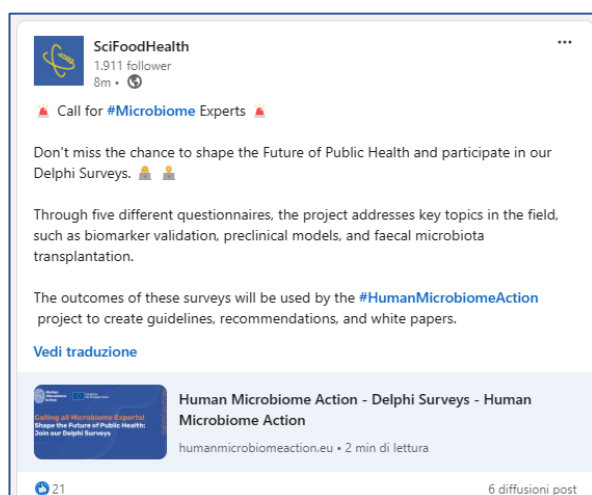


Figure 11: Example post SciFoodHealth LinkedIn

The EUFIC-managed **LinkedIn** account, established in February 2023, has over 2k followers, mainly researchers, policymakers and stakeholders interested in EU-funded projects (Figure 11). Between March 2023 and April 2024, 48 LinkedIn posts received 103,977 impressions and gained 4,963 engagements.

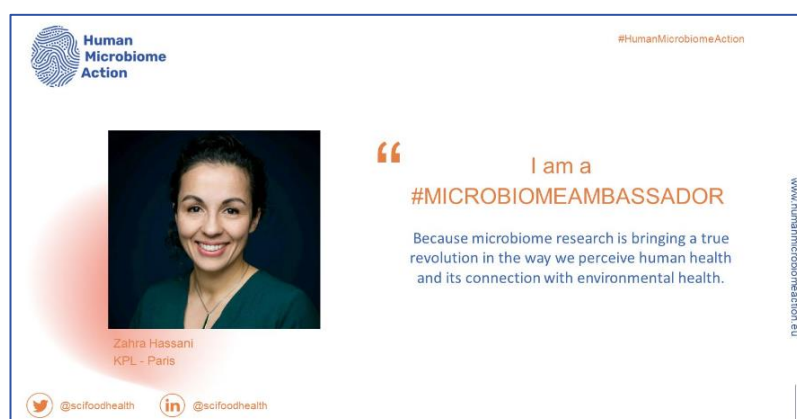


Figure 12: Example post #MicrobiomeAmbassador campaign

Additionally, Human Microbiome Action took part to the social media campaign **#MicrobiomeAmbassador** with 19 more ambassadors, both partners of the project and members of the Stakeholder Advisory Board (Figure 12).

The @SciFoodHealth YouTube channel has been used as the main channel to communicate informational videos about the project. These include a series of short videos, an animated video as well as the live streaming and recording of the project's final conference (all as reported previously in this document).

Sustainable Food System Network (SFSN)

The project was featured in the Sustainable Food Systems Network (>2,000 members) Newsletter as well as its Microbiome Subgroup (>300 members) Newsletter (see Table 4).

Table 4: SFSN Newsletter featuring Human Microbiome Action

| Date | Recipients | Openers |
|----------------------------|------------|---------|
| SFSN Main Group | | |
| 15/12/2023 | 2215 | 463 |
| 25/04/2024 | 2300 | 821 |
| Microbiome Subgroup | | |
| 15/12/2022 | 167 | 61 |
| 27/01/2023 | 171 | 70 |
| 24/02/2023 | 181 | 66 |
| 31/07/2023 | 236 | 80 |
| 31/08/2023 | 238 | 72 |

The project was also featured in the SFSN flyer, together with other EU funded projects (DOMINO, CLEVERFOOD, FoodPaths, holifood & BETTER4U) to be distributed during relevant events (see Figure 13).



Figure 13: Sustainable Food Systems Network Flyer

Media Coverage

The project was mentioned in 13 news publications with a reach of a respectable 1,217,333. In particular, Human Microbiome Action received 2 mentions in 2021, 2 in 2022, 5 in 2023 and 3 in 2024. English was the predominant language (9 mentions). Table 5 shows the details of the mentions.

Table 5: Media Mentions

| Date | Headline | URL | Country | Language | Reach |
|------------|--|---|---------------|----------|--------|
| 04/03/2024 | New EU consortium aims to advance microbiome research | https://itpointplus.com/new-eu-consortium-aims-to-advance-microbiome-research/ | United States | English | 743 |
| 29/02/2024 | New EU consortium aims to advance microbiome research | https://www.siliconrepublic.com/innovation/human-microbiome-research-eu-consortium | Ireland | English | 214171 |
| 22/02/2024 | Human Microbiome Action - Final Conference | https://stayhappening.com/e/human-microbiome-action-final-conference-E3LV2JP7HG8M | United States | English | 119453 |
| 25/08/2024 | Digs into the role of gut microbes in mucosal barrier degradation | https://www.umu.se/en/news/digs-into-the-role-of-gut-microbes-in-mucosal-barrier-degradation_11815887 | Finland | English | 271527 |
| 02/03/2023 | Czy w macicy rzeczywiście znajdują się bakterie? | https://nauka.studentnews.pl/s/5104/81252-zdrowie/5602607-Czy-w-macicy-rzeczywiscie-znajduja-sie-bakterie.htm | Poland | Polish | 2143 |
| 16/02/2023 | Join the consensus-building process and contribute to advancing microbiome-based biomarkers in the HMA Delphi Survey | https://www.gutmicrobiotaforhealth.com/join-the-consensus-building-process-and-contribute-to-advancing-microbiome-based-biomarkers-in-the-hma-delphi-survey/ | Austria | English | 33350 |
| 09/02/2023 | Are there really bacteria in the womb? | https://cordis.europa.eu/article/id/442887-are-there-really-bacteria-in-the-womb | Luxemburg | English | 536288 |

| | | | | | |
|------------|---|---|----------------|---------|--------|
| 07/02/2023 | Call for Experts – A Survey on Microbiome-Based Biomarker Development - Microbiome Times Magazine | https://www.microbiometimes.com/call-for-experts-a-survey-on-microbiome-based-biomarker-development/ | Belgium | English | 15972 |
| 10/11/2022 | Leading scientists gather at UCC to plan future of microbiome research | https://www.echolive.ie/corknews/arid-40980290.html | Ireland | English | 10,099 |
| 29/03/2022 | 2022 디지털 나노의학 상반기 공동세미나 | https://www.nutraingredients.com/Article/2022/03/02/Probiota-2022-Microbiome-musings-with-Magali-Cordaillat-Simmons | South Korea | Korean | 3,844 |
| 03/03/2022 | Probiota 2022: Microbiome musings with Magali Cordaillat-Simmons | https://www.nutraingredients.com/Article/2022/03/02/Probiota-2022-Microbiome-musings-with-Magali-Cordaillat-Simmons | United Kingdom | English | 3,744 |
| 10/06/2021 | CBMR joins €2M Horizon2020 project to help steer the future of human microbiome research | https://cbmr.ku.dk/news/2020/cbmr-joins-2m-horizon2020-project-to-help-steer-the-future-of-human-microbiome-research/ | Denmark | Danish | 125 |
| 08/06/2021 | Un nouveau projet européen pour coordonner les recherches sur le microbiome humain | https://www.inrae.fr/actualites/nouveau-projet-europeen-coordonner-recherches-microbiome-humain | France | French | 5,874 |

Events

In the last years, Human Microbiome Action's partner attended several events, with an estimated audience of more than 35,000 people, mainly within the scientific community. The graph shows the geographic distribution of the events (Figure 14). Table 6 summarises the events with representations of the Human Microbiome Action project.

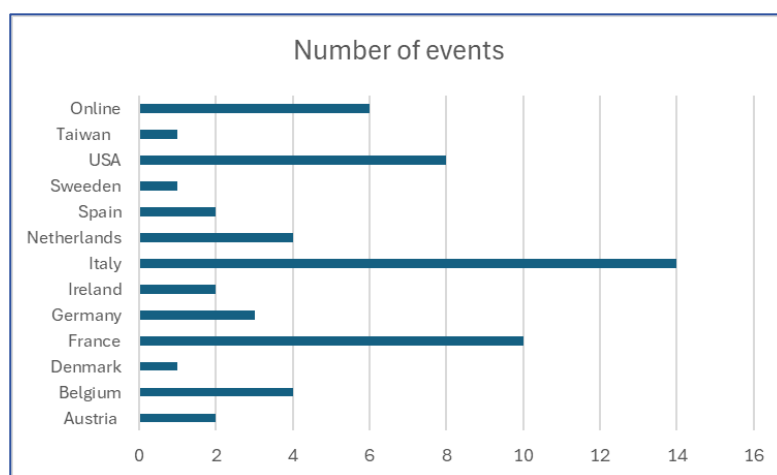


Figure 14: Geographical distribution of participated events

Table 6: List of Events

| Nr. | Event (Date) | Attendees | Target Groups |
|-----|--|-----------|---|
| 1 | IX International Human Microbiome Consortium meeting (June 2021) | 500 | Scientific Community |
| 2 | Asian Digestive Disease Week (August 2021) | 1200 | Scientific Community |
| 3 | Closure Meeting of University Hospital Network RHU LUMIERE (10/09/2021) | 48 | Scientific Community, Industry, Policy Makers, Investors |
| 4 | Presentation at Pre-Pro-New Foods ROME meeting (12/09/2021) | 275 | Scientific Community, Industry, Policy Makers, Media, Investors |
| 5 | 9th Microbiome R&D and Business Collaboration Forum: Europe (26/10/2021) | 15 | Scientific Community, Industry |
| 6 | AGGEI meeting young scientist Interactions Between Diet (November 2021) | 290 | Scientific Community |
| 7 | Translational Research Group Yale University | 110 | Scientific Community |

| | | | |
|----|---|------|---|
| 8 | Conference Pole Pharma Rouen (04/11/2021) | 61 | Scientific Community, Industry, Policy Makers, Media, Investors |
| 9 | ANPA Presidential Presentation (March 2022) | 200 | Scientific Community |
| 10 | Autism Research Institute (April 2022) | 350 | Scientific Community |
| 11 | Autism Research Coalition (April 2022) | 450 | Scientific Community |
| 12 | The American Academy of Anti-Aging Medicine (April 2022) | 180 | Scientific Community |
| 13 | Invited Seminar at the University of Pennsylvania (06/04/2022) | 200 | Scientific Community |
| 14 | Pharmabiotics 2022 Conference (20/04/2022) | 135 | Scientific Community, Industry, Media, Investors |
| 15 | Presentation at World of Microbiome (28/04/2022) | 2020 | Scientific Community, Industry, Policy Makers |
| 16 | Bromatech webinar - celiac disease and the microbiota (June 2022) | 390 | Scientific Community |
| 17 | Sanofi International Pediatrics Forum: Microbiota and its relationship with the CNS (June 2022) | 800 | Scientific Community |
| 18 | Participation in a Panel at the Conference for the European Association for the Social Studies of Science (EASST 2022) (06/06/2022) | 200 | Scientific Community |
| 19 | MICROBIOME SIGNATURE PROJECT: PROJECT OUTCOMES AND FUTURE OUTLOOK (07/06/2022) | 110 | Scientific Community, Industry, Investors |
| 20 | ONE Europe Conference (21/06/2022) | 570 | Scientific Community, Industry, Policy Makers |
| 21 | Invited remote talk at the "8th International Human Microbiome Consortium Congress" (27/06/2022) | 200 | Scientific Community, Industry |
| 22 | Presentation at MicrobiomeSupport Final Conference (28/06/2022) | 76 | Scientific Community, Industry, Policy Makers |
| 23 | Presentation at Holobiont 2022 (28/07/2022) | 210 | Scientific Community, Industry |

| | | | |
|----|---|-----|--|
| 24 | Pedialab Meeting (September 2022) | 130 | Scientific Community |
| 25 | V CONGRESSO NAZIONALE SIPNEI (September 2022) | 750 | Scientific Community |
| 26 | Presentation at ESMO Paris 2022 (09/09/2022) | 500 | Scientific Community |
| 27 | Révélations Paris 2022 (21/09/2022) | 350 | General Public |
| 28 | Presentation at ITOC Munich 2022 (22/09/2022) | 150 | Scientific Community |
| 29 | Presentation at InCIT Nantes 2022 (26/09/2022) | 100 | Scientific Community |
| 30 | Presentation at CICON New York 2022 (28/09/2022) | 250 | Scientific Community |
| 31 | International Celiac Disease Symposium (October 2022) | 250 | Scientific Community |
| 32 | WP4 Workshop – Defining a healthy Microbiome: Microbial Functions and Virome (06/10/2022) | 50 | Scientific Community |
| 33 | Presentation at SynBioDay 2022 (13/10/2022) | 145 | Scientific Community, Industry, Policy Makers, Investors |
| 34 | Invited remote talk at the "SEMM Technological Roundtable" (22/10/2022) | 150 | Scientific Community |
| 35 | Invited remote keynote talk at the “6th Brazilian Student Council Symposium: Omics and Data Science” (25/10/2022) | 100 | Scientific Community |
| 36 | Presentation at Cell Symposia Hallmarks of cancer 2022 (30/10/2022) | 500 | Scientific Community |
| 37 | UPAINUNuC meeting on Inflammaging (November 2022) | 190 | Scientific Community |
| 38 | Solgar meeting on Nutrition and health (November 2022) | 290 | Scientific Community |
| 39 | Italian Gastroenterology 2022 Meeting (November 2022) | 350 | Scientific Community |
| 40 | Presentation at MELiSSA 2022 (08/11/2022) | 580 | Scientific Community, Industry, Policy Makers, Investors |
| 41 | PRI OMICS Task group meeting (30/11/2022) | 26 | Scientific Community, Industry |

| | | | |
|----|---|------|--|
| 42 | Internal meeting SoHO team (EC) and national competent authorities on Tissues and Cells (07/02/2023) | 30 | Policy Makers |
| 43 | Presentation at IX International Human Microbiome Consortium meeting (June 2021) | 500 | Scientific Community |
| 44 | Presentation at AGGEI meeting young scientist Interactions Between Diet (November 2021) | 290 | Scientific Community |
| 45 | World of Microbiome 2022 Conference (30 April 2022) | 250 | Scientific Community, Industry |
| 46 | Workshop Consensus on policies needed to ensure regulation and control of ethical issues surrounding self-management tools (7 March 2023) | 18 | Scientific Community, Industry |
| 47 | Presentation at 12TH Probiotics, Prebiotics & New Foods (18 September 2023) | 50 | Scientific Community, Industry |
| 48 | Brochure displayed at Small-Scale, Big Impact: Innovative Approaches for Local Food Processing (26 September 2023) | 80 | Scientific Community, Industry, Policy makers, General Public, Investors |
| 49 | Presentation at EMBL Symposium "The human microbiome" (17 September 2023) | 300 | Scientific Community, Industry |
| 50 | Presentation at Microbiota Revolution 2023 (27 October 2023) | 350 | Scientific Community, Industry |
| 51 | Attendance at FENS 2023 (14 November 2023) | n/a | n/a |
| 52 | Guest Lecture at Philosophy in society (22 January 2024) | 12 | Scientific Community |
| 53 | Moderator during the Workshop on consortium authorship (24 November 2023) | 1697 | Scientific Community |

Collaboration with other EU-funded projects

During the entire duration of the project, partners were actively involved in events or campaigns organised by other EU-funded projects. The first contact was established with **MicrobiomeSupport**. During its final conference, held between the 27th and 29th of June 2022, Joël Doré (INRAE and coordinator of the Human Microbiome Action project) presented ways for the integration of microbiome science in improving future public health. Moreover,

Human Microbiome Action joined the Social Media campaign “#MicrobiomeAmbassador” launched by MicrobiomeSupport. In November 2023, Human Microbiome Action project collaborated with the EU-funded project **DOMINO** (<https://www.domino-euproject.eu/>) in the writing of an article addressed to lay audience that was published in the two websites: “Gut Health & Fermented Foods – An Emerging Factor for Health and Disease Prevention?” on December 20th, 2023 (link: <https://humanmicrobiomeaction.eu/news-gut-fermented-foods/>). During the Human Microbiome Action final conference (February 29th, 2024), representatives of the EU-funded projects **DOMINO**, **ONCOBIOME**, **GEMMA** and **MICROB-PREDICT** were invited to share their results.

Key Performance Indicators

At the beginning of the project, specific key performance indicators (KPI) have been developed for certain communication activities (Table 7).

Table 7: Key Performance Indicators

| Communication Tool | Indicator | Target | Status (M36) |
|-------------------------|---|---|---|
| Social Media Templates | Distribution of templates / Impressions | Template used by 75 % of partners / Over 5000 impressions by the end of M36 | 5 partners (29 %) reported the use of the social media templates / Impressions: >17000 |
| Posters/Roll-up | N. of designs / Number of events the designs have been used | +2 / 10 events by the end of M36 | 7 posters & 2 roll-up/10 events (i.e. Workshops, ONE Health, Final Conference) |
| Talks | N. of talks (i.e. from conferences or workshops) | 15 | 52 talks |
| Videos | N. of videos / views per video | 2 videos with 1k online views per video | 9 videos/ 1544 views |
| Project website | N. of visits + page visits | 1000 visitors + 25000 page views | 8200 visitors + 23000 views |
| Social Media | N. of Tweets with project specific hashtag (incl. Impressions and engagement statistic of social media posts) | 150+ project specific Tweets via @SciFoodHealth | 154 project specific posts on SciFoodHealth Twitter/X & LinkedIn + 8 project updates via SFSN |
| Participation to events | N. of events attended | 30 | 53 |

| | | | |
|--|--|--|---|
| Newsletters | N. of newsletters per year and subscribers | 2 per year / 1000 subscribers by M36 | 6 project newsletters / 385 subscribers Mentions in 7 SFSN Newsletters (Table 4) |
| Press release | Media predicted online reach | >25 million potential reach – number of people that can potentially read the article, based on the estimation of tracking software (Meltwater) | 1,217,333 potential reach |
| Visual materials | N. of designs | 2+ | >20 |
| Media | N. of non-scientific journal news | 10+ | 13 |
| Scientific publications/white & opinion papers | N. of conference papers and journal articles | 10+ Conference papers and journal articles | 12 |
| Guidelines & recommendations | N. of guidelines & recommendations | 5+ guidelines and recommendations | |
| Project factsheets | N. of factsheets | 10 (one for each major project outcome) | 10 |
| Final conference | Average N. of participants / N. of speakers | At least 120 participants / At least 7 speakers | 1,100+ participants both online and in-person / 22 speakers |

Sustainability Plan

The Human Microbiome Action project recognizes the importance of extending the impact of its findings and recommendations well beyond its funding period. The sustainability plan (D8.2) was designed to facilitate the seamless adoption of project outcomes by key stakeholders, ensuring that the knowledge generated in the areas of human microbiome research, standards, and regulatory aspects continues to shape policies and practices. The main goals of the Sustainability Plan are:

- To extend to the creation of a dynamic toolkit and a range of communication materials that will adapt to the evolving needs of the consortium and keep stakeholders engaged long after the project's conclusion.
- To outline the commitments to ensuring the lasting adoption of scientific, procedural, legal, regulatory, and other recommendations generated by the Human Microbiome Action project beyond its funding period.

- To identify key stakeholder groups to be kept engaged through various elements such as the initiated European Microbiome Centres Consortium (EMCC), a dedicated surveillance network, participation in scientific events, media outreach, and collaboration with other European-funded projects. These channels will help the project reach the target stakeholders effectively.

Conclusion

The Human Microbiome Action project has contributed to the field of microbiome research through its structured and effective communication and dissemination activities. The project has achieved a wide-reaching impact, evident from the extensive engagement metrics and positive feedback from various stakeholders. The strategic dissemination of research outputs led to increased visibility of the project's findings, while engagement activities have fostered a deeper understanding and collaboration across different sectors. The sustainability plan developed as part of the project promises to maintain the momentum gained, ensuring that the insights and benefits from the project continue to influence public health strategies and scientific advancements. As the project concludes, the consortium is well-positioned to continue leading Europe's efforts in pioneering microbiome research, with ongoing collaborations and initiatives poised to build on the successes achieved such as the European Microbiomes Centres Consortium and the European Microbiome-Dedicated Surveillance Network.

Annex

Annex I – World Microbiome Day Article I

Why Isn't Your Doctor Focusing on Your Microbiome?

Author: Joël Doré – Research Director at France's National Research Institute for Agriculture, Food and Environment and Human Microbiome Action project coordinator

Do you suffer from Irritable Bowel Syndrome (IBS) that affects your daily life? Or perhaps your child has been diagnosed with Autism, and you've heard that faecal transplantation could be helpful. Maybe you're undergoing chemotherapy for cancer, and you're concerned about the impact on your microbiota. You're not alone. Many people have similar concerns and wonder why their doctors aren't paying more attention to the microbiome. Microbiome science has advanced rapidly in recent years. Large-scale studies like The French Gut and the Million Microbiome of Humans Project are propelling this field even further. Scientists are also making efforts to communicate their findings to the general public through the press and TV. In fact, some companies now offer microbiome testing directly to consumers.

So, with all this progress, why isn't the microbiome fully integrated into medical practice yet?

The answer lies in the need for clinical evidence. As humans, we are teeming with trillions of bacteria and countless other microorganisms. These microbes are essential to our well-being, acting as regulators of our intestinal ecosystem. They control what can enter and establish in our bodies, while also playing roles as metabolic, immune, and neuro-vegetative regulators. They eat fibres, provide vitamins, balance our defences, and manage communication between the gut and all other organs.

However, when it comes to using the microbiome or microorganisms derived from it for preventive or therapeutic purposes, we are essentially dealing with drug development. Just like with any other medication, clinical trials are required to prove their effectiveness and safety. As many of us learned during the COVID pandemic, we must go through the rigorous phases of drug development (Phases I, II, and III) before treatments can be accepted and delivered to patients. The only exception is compassionate use, which allows access to the treatment when it has shown promising results in a Phase II trial and when there are no other viable options left. Despite the need for regulatory validation, we can be optimistic about the future integration of microbiota-host symbiosis management into clinical practice. The progress being made suggests that it won't be long before these innovative treatments become more widely available. However, until then, it is important to exercise patience and await formal regulatory approval for these therapies.

In the pursuit of advancing this field, the ongoing European Project [Human Microbiome Action](#) is dedicated to facilitating these developments. To stay on top of the recent developments in the field of human microbiome research, sign up for the [project's newsletter](#), follow the @SciFoodHealth channel (#HumanMicrobiomeAction) on [Twitter](#) or [LinkedIn](#) or reach out to the project partners via email: info@humanmicrobiomeaction.eu. In conclusion, the microbiome plays a crucial role in our health and well-being. While progress is being made in understanding its significance, clinical evidence is necessary to ensure the safety and effectiveness of treatments involving the microbiome. Efforts are being made to bridge this gap and bring microbiome-based applications into mainstream medical practice.



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Annex II – World Microbiome Day Article II

Microbiome Self-Care: A Philosophical Perspective

Author: Hub Zwart –Professor at Erasmus Universiteit Rotterdam and Human Microbiome Action project's member

Philosophy is not the first thing that comes to mind when we think about microbiome research. Yet, there is more philosophy at work in microbiome research than we tend to think, while philosophical research may open new perspectives, that we should address to avoid bigger problems in the future.

It is likely that scientific insights will allow humans to become stewards of their own health in an evidence-based manner, resulting in improved lifestyles and prevention of disease. A range of microbiome-based tools to support people's health is already on the market, such as advice on lifestyle or food supplements. While such tools promise to empower citizens to manage their health, there are several unsolved questions. First of all: are claims made by researchers, or by producers of microbiome products trustworthy? Nowadays, many tools seem to promise more than they can actually offer, for instance because the advice provided is quite general rather than personalised. As the evidence for self-management tools is often fragile, there is a strong need to bring expertise from various disciplines into the debate and to consider the experiences of citizens using these tools.

Self- what?

Microbiome research generates interesting insights even on a more fundamental level. While the phrase “self-management” suggests that humans are in control of their microbiome, research challenges this idea. We are part of nature, embedded in and dependent on our external environment. At the same time, we are ecosystems, inhabited by millions of organisms who are part of us. We *have* a microbiome, but at the same time our microbiome is part of what we *are*.

Microbiome research fosters an interactive and symbiotic view of human existence, seeing human beings as holobionts, a term coined by biologist Lynn Margulis to emphasise interconnectedness and interdependence of all living beings. The microbes inhabiting us not only orchestrate digestion, but also influence mood and cognition.

“Love is a microbe too”

The realization that humans are not insulated entities, but the outcome of multiple interactions with microorganisms, both indigenous and external, has consequences beyond biology. Our traditional self-image is challenged. To some extent humans have always been aware of this, but current research makes our knowledge more precise.

While Vincent van Gogh being a patient in a mental hospital in France, he wrote a letter to his sister Wilhelmina in 1889: “When I suffer from attacks of melancholy and atrocious remorse, I tell myself that all these things might possibly be caused by microbes too, like love”. Apparently, a physician had informed him that “love is a microbe too”. For Van Gogh, this was a consolation, enabling him to make sense of mood swings. He would probably have been interested to hear about the gut-brain axis, linking emotional and cognitive centres of the brain with what happens inside the human gut.

The “forgotten” organ

The human microbiome has been named our “forgotten” organ, to which microbiome research calls attention. It is an “estimate” part of ourselves: both intimate and external, both “us” and “other”. This calls for stewardship

and self-care, rather than “microbiome management”. We cannot control the health and wellbeing of our microbiome by adding specific components. We should see it more as a relationship.

Microbiome research fosters self-care by increasing awareness for instance concerning the use of antibiotics. But microbiome research also urges us to rethink what we already know about our gut. Rather than defining microbiome health in terms of the presence or absence of “good” and “bad” microbes, we should adopt a relational and interactive attitude towards the living beings that inhabit us.

From practical experience to participatory research

Initially, practices of selfcare were based on experiences. Subsequently, laboratories produced reliable, evidence-based knowledge, resulting in a tension between lifeworld experience (practical knowledge) and laboratory findings (validated knowledge). In the current situation, although labs remain prolific producers of validated knowledge claims, it is important to find out how these results work out in practice, in the messy, complex lifeworld outside the lab. All citizens may become citizen scientists, participatory researchers, sharing their samples and their experiences. This offers opportunities for participatory research, seeing citizens as life-world experts, using public intelligence as a decisive source of information. Insights from single individuals may provide insights about the dynamics of the microbiome in a particular societal context.

In this way, microbiome research may alter the traditional relationship between researchers and research subjects, affording a more active and participatory role to bio-citizens.

For further information on the Human Microbiome Action project, please visit www.humanmicrobiomeaction.eu



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Annex III – EUFIC Article

What are prebiotics and probiotics and are they important for health?

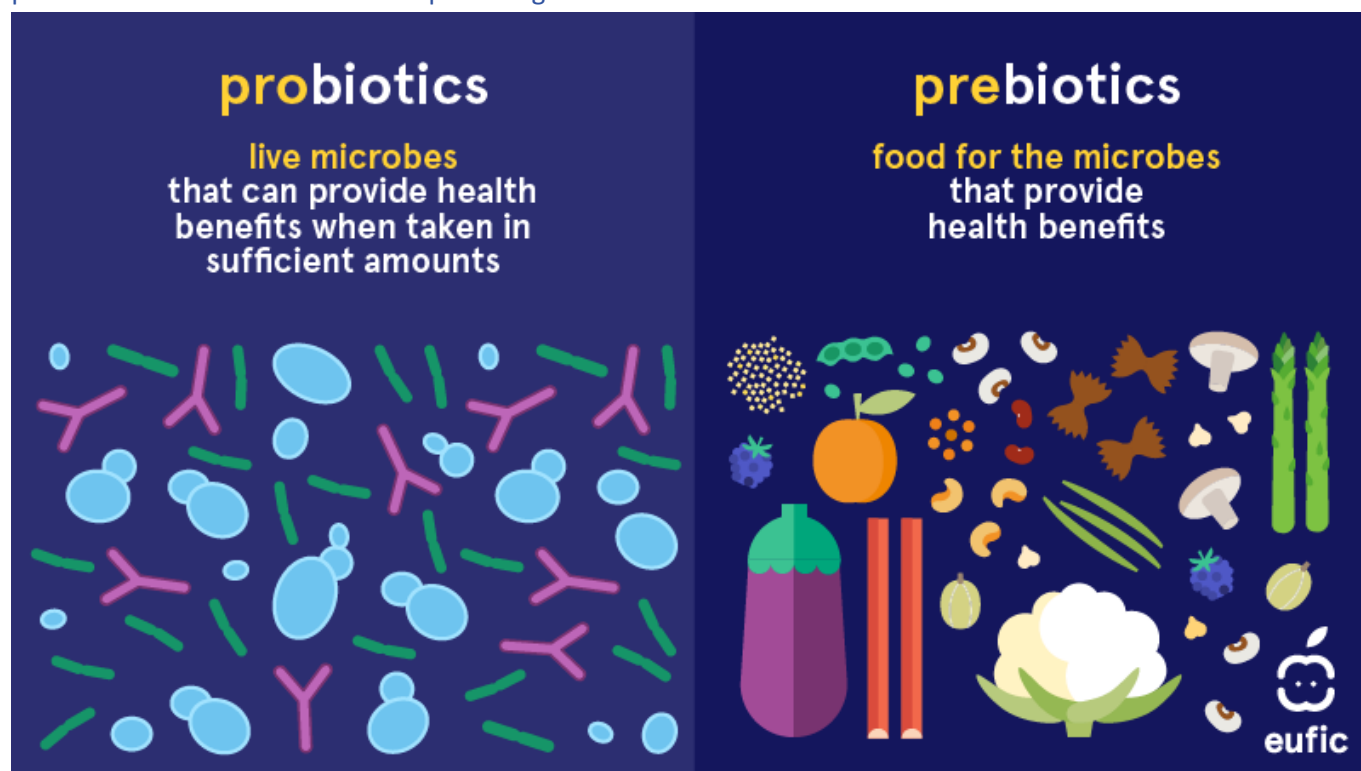
The human body, and mainly the digestive tract, is home to trillions of microorganisms. Bacteria, fungi and viruses, as well as the less known archaea and protozoa, all live side by side in our gut. These tiny living organisms, collectively known as the gut microbiota, can have a great impact on our health and well-being.¹ Over the past few decades, researchers have been investigating how we can influence our gut microbiota through diet. In this article we explain what are prebiotics and probiotics, and explore their potential to improve our health.

What are prebiotics and probiotics?

Prebiotics and probiotics are different groups of substances with distinct roles.

Prebiotics are non-digestible fibres that act as food for microorganisms, promoting their growth and activity.² **Probiotics** on the other hand, are living microorganisms that, when consumed in adequate amounts, can provide health benefits.³

In simpler terms, prebiotics are the food source for our gut bacteria, while probiotics are the live bacteria that offer health benefits when consumed. Think of your gut as a garden: probiotics are the seeds you plant, while prebiotics are the fertilizer that helps them grow.



Prebiotics: how do they work?

Prebiotics are non-digestible food components, such as certain dietary fibres. Once they arrive in the intestine, they become food for beneficial microorganisms in the gut and are broken down into chemicals that stimulate

their growth and activity.⁴ By eating a variety of prebiotic foods, we can feed the beneficial microorganisms in our gut, helping to create a healthier and more diverse microbiota. This can lead to better intestinal health and metabolism and also help prevent harmful bacteria ("pathogens") from growing in our gut. Even though the term prebiotics encompasses a broad range of compounds, they all contribute to good digestive health. Some functions of prebiotics include supporting nutrient metabolism and regulation of our immune system, and influencing our disease risk. Prebiotics boost the production of health-promoting substances like short-chain fatty acids (SCFAs), that have been linked to reduced risk of **colorectal cancer**.⁴ Evidence suggests that prebiotics also help with **constipation** by promoting more regular, frequent and well-formed bowel movements.⁵

Probiotics: what do they do and how do they work?

Probiotics are microorganisms that can benefit our health in many different ways. There are seven commonly used types of probiotic microorganisms: *Lactobacillus*, *Bifidobacterium*, *Saccharomyces*, *Streptococcus*, *Enterococcus*, *Escherichia*, and *Bacillus*.⁶ Each of these also consists of dozens of strains which can positively affect the gut microbiota, boost the immune system or have other health benefits. However, it's important to remember that the effects of each probiotic strain are unique and can vary based on the amount consumed and that research into these understanding these effects is still in early stages.

To be considered a probiotic, a food or product should contain a specific minimum amount of microorganisms, the so-called colony-forming units (CFU), for its claimed health benefit. For example, consuming yoghurt with at least 10⁸ CFU of living *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Streptococcus thermophilus* bacteria, commonly used microorganisms as yoghurt starter cultures, has been found to improve digestion of lactose in people with lactose maldigestion.⁷

Some probiotic strains might also help improve symptoms of diseases such as ulcerative colitis⁸ or irritable bowel syndrome⁹, and regular consumption of probiotics has been shown to lower the likelihood of upper respiratory tract infections¹⁰ like the common cold. Probiotics are also used to lower the risk of antibiotic-associated diarrhoea.¹¹

There is still more research needed to fully understand the effects of probiotics on these and other health outcomes such as blood cholesterol, body weight, and body fat, but the modulation of our gut through pre- and probiotics has a huge potential for many positive benefits of our health.¹²

What foods contain prebiotics and probiotics?

Prebiotics are found in many foods, for example in beans, grains (such as oats, barley, rye), vegetables (such as greens, onions, garlic, artichokes, sugar beet, asparagus, peas, chicory), and some fruits (such as bananas, apples and berries).

Fermented foods, for example yoghurt, kefir, sauerkraut or kimchee, contain a wide variety of living microorganisms, but not all of them can be considered as **probiotic**. This can be because their specific strains have not been identified or linked to a specific health benefit, they don't contain the microorganisms in sufficient amounts, or the microorganisms cannot withstand the acidic environment of our stomach which breaks them down before they can reach our intestines. Some specific probiotic strains are added to some **functional foods** (such as fermented milk products or yoghurts) and are also available as supplements.

Are prebiotics and probiotics safe?

In healthy people, prebiotics and probiotics are usually safe to consume and rarely cause health problems.¹³ However, some people may temporarily experience gas and intestinal discomfort when adding more into their diets. In people with severe illnesses or compromised immune systems, probiotics may increase the risk of infections. In these cases, consult your doctor or health professional for further advice.

Conclusion

The various microorganisms in our gut have a crucial role in our health and well-being. Prebiotics feed the good bacteria already existing in your gut while probiotics directly introduce new strains of beneficial microbes that may result in health benefits. Both pre- and probiotics show promising health effects but require more research to fully unveil their role and impact on the gut microbiome, general health as well as specific diseases. This is why international research projects such as the EU-funded [Human Microbiome Action](https://www.humanmicrobiomeaction.eu) project are important to improve our understanding of the human microbiome and its impact on human health. Each person however can help to establish and maintain a healthy and diverse gut microbiota by consuming a balanced diet with a high variety of plant-based foods.



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