[Implementation research]

D7.9 Annual Report 1 on Cluster Activities

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Prepared by (Name; email)	Clara Mercader (cmercader@idibell.cat)
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Nº	Cluster meeting participants	Organization	Project
1	Igor Grabovac	MUW	CO-CAPTAIN
2	Hanna Mües	MUW	CO-CAPTAIN
3	Johannes Lanzesdorfer	MUW	CO-CAPTAIN
4	Ramona Afzali	MUW	CO-CAPTAIN
5	Alejandro Gil Salmeron	IFIC	CO-CAPTAIN
6	Ascension Donate	UPV	CO-CAPTAIN
7	Gabriela Munares	KVC	CO-CAPTAIN (Online)
8	Laura Domínguez	KVC	CO-CAPTAIN (Online)
9	Marius Geantă	INOMED	4P-CAN
10	Iulian Oană	INOMED	4P-CAN
11	Maria Kazakova	PU	4P-CAN
12	Marina Ramiro Pareta	IDIBELL	PIECES
13	Clara Fábregas Ibáñez	ICO	PIECES
14	Clara Mercader Garcia	ICO	PIECES
15	Sean Semple	USTIRLING	PIECES
16	Rachel O'Donnell	USTIRLING	PIECES
17	Lisa Macaulay	USTIRLING	PIECES
18	Nico Latteur	ECL	PIECES
19	Marco Di Donato	EUREGHA	ONCODIR
20	Michele Calabrò	EUREGHA	ONCODIR
21	Thanassis Mavropoulos	CERTH	ONCODIR
22	Romana Hessler	SYNYO	ONCODIR
23	Rebecca Evelyn Papp	EHMA	PREVENT
24	Thibaud de Bondy	EHMA	PREVENT
25	Paolo Boffetta	UNIBO	CPW
26	Sabato Mellone	UNIBO	CPW
27	Magdalena Kostrzewa	UNIBO	CPW
28	Monireh Sadat Seyyedsalehi	UNIBO	CPW
29	Giulia Collatuzzo	UNIBO	CPW
30	Ángel Honrado	WeDo	CPW
31	María Pía Aristimuño	WeDo	CPW
32	Adonina Tardón	FINBA	CPW
33	Marta M. Rodríguez-Suárez	FINBA	CPW
34	Daniel Vencovsky	RPA Prague	CPW
35	Dana Mates	INSP	CPW
36	Alessandro Godono	UNITO	CPW

Nº	Cluster meeting participants	Organization	Project
37	Anna Schneider-Kamp	SDU	CPW
38	Viktória Ďurajová	FDRH	CPW
39	Jana Oravec Bérešová	RAPHBB	CPW

Authors List

Lead Author		
Name	**Beneficiary**	**Email**
Gabriela Munares Laura Domínguez	Kveloce	gmunares@kveloce.com ldominguez@kveloce.com
Co-authors (in alphabetical order)		
Name	**Beneficiary**	**Email**
Ángel Honrado	WeDo	angel@wedo-projects.com
Clara Fábregas Ibáñez	ICO	cfabregasi@idibell.cat
Clara Mercader Garcia	ICO	cmercader@idibell.cat
Hanna Mües	MUW	hanna.mues@meduniwien.ac.at
Igor Grabovac	MUW	Igor.grabovac@meduniwien.ac.at
Marina Ramiro Pareta	IDIBELL	mramiro@idibell.cat
Marius Geanta	INOMED	marius.geanta@ino-med.ro
Magdalena Kostrzewa	UNIBO	magdalena.kostrzewa@unibo.it
Manthos Bimpas	ICCS	manthos.bibas@iccs.gr
Marco Di Donato	EUREGHA	marco.didonato@euregha.net
Michele Calabrò	EUREGHA	michele.calabro@euregha.net
Thanassis Mavropoulos	CERTH	mavrathan@iti.gr
Rebecca Papp	EHMA	rebecca.papp@ehma.org

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List of Abbreviations

Abbreviation	Definition
4P-CAN	Personalized CANcer Primary Prevention research through Citizen Participation and digitally enabled social innovation
CFIR	Consolidated Framework for Implementation Research
CPW	Cancer Prevention at Work: Occupational health surveillance in the implementation of prevention of infection-related cancer
CO-CAPTAIN	Cancer prevention among individuals with mental ill-health: co-adapting and implementing patient navigation for primary prevention
CoP	Communities of Practice
CRC	Colorectal Cancer
DMP	Data Management Plan
EC	European Commission
EU	European Union
FAIR	Findable, Accessible, Interoperable, and Reusable
HCV	Hepatitis C Virus
Hp	*Helicobacter pylori*
HPV	Human Papilloma Virus
KPI	Key Performance Indicator
OMOP	Observational Medical Outcomes Partnership
NCI	National Cancer Institute
ONCODIR	Evidence-based Participatory Decision Making for Cancer Prevention through implementation research
PCP	Primary Cancer Prevention Programs
PCP-IT	Primary Cancer Prevention Programs – Implementation toolkit
PI	Principal Investigator
PIECES	Towards large-scale adaptation and tailored implementation evidence-based primary cancer prevention programmes in Europe
PREVENT	Improving and upscaling primary prevention of cancer by addressing childhood obesity through implementation research-the PREVENT approach
R&I	Research and Innovation
SOPs	Standard Operating Procedures
tbc	To be confirmed
WG	Working Groups
WP	Work Package
Y1	First year
Y2	Second year

Executive Summary

Deliverable D7.9 presents the conclusions from the first annual meeting of the "Prevention and Early Detection Cluster" that took place on September 23rd, 2024, in Vienna jointly worked and agreed upon the common annual meeting.

This report provides an overview of the Cluster and its projects, summarizing the key presentations from its first annual meeting. It reviews updates on project progress, outlines ongoing activities within the Cluster's Working Groups, and highlights planned actions for the second year. Additionally, the report summarizes the first-year achievements, particularly in citizen engagement, addressing inequalities, and fostering research and innovation collaboration. The main conclusions from the meeting are also presented.

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1 INTRODUCTION

1.1 MISSION CANCER & CLUSTER PRESENTATION

1.1.1 Mission Cancer

The European Union, through its Mission Cancer program, is funding six innovative projects in the field of cancer prevention and early detection, in a way of combating one of the most prominent causes of death and socioeconomic burden among Europeans, that is preventable to a great extent. Ergo, the "Prevention and Early Detection – Implementation Research" Cluster comprises the collaborative effort of the six participating funded projects to improve cancer screening through working collaboratively to extend each other's research and enhance their respective impact. The main cluster's objective is to contribute, scale-up and improve primary cancer prevention and early detection programmes, considering the specific needs of the target population, in particular economic, cultural and geographical condition, with the specific objective to develop policy recommendations aiming at informing policy and decision-making.

1.1.2 Cluster Presentation

The **CO-CAPTAIN** project aims to address disparities in care for people with mental illness in Europe through innovative solutions such as the Patient Navigation Model. This approach focuses on patient empowerment, removing systemic barriers and ensuring access to primary prevention services. With the collaboration of experts and local governments, the project uses scientific approaches to reduce the burden of cancer and improve the overall health of people with mental health problems, reducing costs in health and social care systems in Europe. In addition, it aims to integrate integrated cancer care pathways and provide policy recommendations at the European level.

The **CPW** project researches the cost-effectiveness and social acceptance of incorporating prevention of cancers associated with Helicobacter pylori, Hepatitis C virus and Human Papillomavirus into ongoing primary occupational health surveillance programmes. The project involves workers and their families, policymakers, occupational health organizations, health authorities, companies and workers' representatives, and cancer and patient organisations, among others, to identify the best strategies to increase the adherence of the population of workers in screening programs of infection-related cancers.

ONCODIR will identify risk factors associated with colorectal cancer and integrate multidisciplinary research methods and technologies (including health policy analytics, artificial intelligence, and decision support theories) to deliver evidence-based and personalized recommendations on colorectal cancer prevention. ONCODIR is developing a platform based on artificial intelligence and privacy principles. It will provide recommendation services based on input from citizens, clinicians, and policymakers. The project will consider factors such as lifestyle, nutrition, and economics.

PREVENT is a collaborative action to improve and upscale primary prevention of cancer by addressing childhood obesity. Through diligent implementation research and a comprehensive approach, this project aims to lay the foundation for a future where healthier lifestyles and brighter tomorrows await every child. The PREVENT project mission is rooted in epidemiological studies that have highlighted a clear link between obesity and increased risks of various types of cancer, including colon, endometrium, postmenopausal breast, and kidney cancer, among others.

4P-CAN'S mission is to understand barriers, whether legislative, socio-economic, commercial, or behavioural to the widespread adoption of cancer primary prevention measures across Central and Eastern Europe. By understanding barriers to policy implementation and individual adherence to healthy behaviours, 4P-CAN will improve primary prevention activities and reduce inequalities. With the collaboration of 17 organizations from 11 countries, including both EU and non-EU Balkan countries, as well as Western EU countries, 4P-CAN is dedicated to achieving these goals and fostering a healthier future.

The **PIECES** project aims to adapt and implement existing evidence-based programmes to improve implementation outcomes and by that, improve the reach and effectiveness of primary prevention programmes in real-world settings. It will address a wide range of risk factors and focus on the specific behaviour change mechanisms that promote healthy behaviours associated with a reduction of cancer incidence among the European Union (EU) population and beyond.

1.2 SCOPE

The scope of this deliverable is to summarize the main conclusions of the first 'Prevention and Early Detection' Annual Cluster Meeting that took place on September 23rd, 2024, in Vienna, Austria. During the meeting, each Working Group provided a detailed review of their first-year activities, including updates on achieved milestones, the current status of ongoing tasks, and plans for the second year of work.
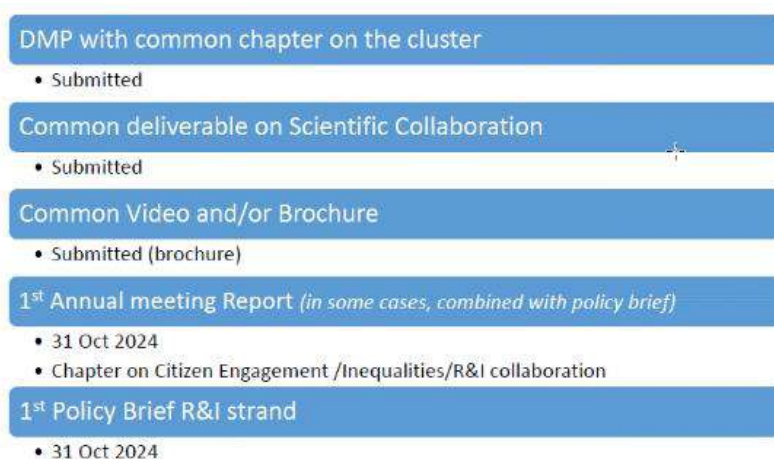
1.3 STRUCTURE

Following the overview of the "Prevention and Early Detection" Cluster as well as the projects comprising it, the following sections review and summarise the presentations of the first 'Prevention and Early Detection' Annual Cluster Meeting. Section 2 reviews the information given by EC representative Laura García, while Section 3 offers an update on the progress of each project within the cluster to date. Section 4 provides an overview of the ongoing activities in the Cluster's Working Groups, along with the planned actions for the second year (Y2). Section 5 summarizes the first year achievements of the cluster projects focusing on Citizen engagement, Addressing inequalities and Research and Innovation collaboration. Finally, Section 6 presents the key conclusions from the first Cluster meeting.

2 INFORMATION FROM THE EC

- EC representative, Laura García Ibañez, did a presentation about the EU Cancer Mission, which contains 50 projects across 8 clusters, one of them the Prevention and Early Detection Cluster, which is focused on implementation research.
- The Prevention and Early Detection Cluster is located in the first pillar of the EU Cancer Mission "Prevent what is preventable", jointly with two other clusters.
- She also reviewed the current situation of our cluster, including leaderships, and deliverable progress.

Figure 1. Deliverables Progress

DMP with common chapter on the cluster
- Submitted

Common deliverable on Scientific Collaboration
- Submitted

Common Video and/or Brochure
- Submitted (brochure)

1st Annual meeting Report *(in some cases, combined with policy brief)*
- 31 Oct 2024
- Chapter on Citizen Engagement /Inequalities/R&I collaboration

1st Policy Brief R&I strand
- 31 Oct 2024

Source: Extracted from the presentation of Laura García Ibañez on 23rd September 2024

- Laura García highlighted that the 1st Annual Meeting Report (Conclusions) should include a chapter/annex about achievements related with Citizen engagement, Inequalities and Research and Innovation collaboration.
- About possible collaboration across project clusters, the EC representative communicates that although no concrete action has to be taken at the moment, collaboration across project clusters is expected in the future. Currently there are three clusters on Prevention and Early detection pillar, but new clusters will start in early 2025.
- The first cluster policy webinar will take place on 28th November 2024 (9.30 – 12.30 CEST). It will be coordinated by DG RTD (RTD-SANTE-CANCER-MISSION@ec.europa.eu).
- Laura García addressed some doubts presented by participants, including:
  - When a project ends, its role on the cluster also ends, so their tasks and/or roles should be redistributed between remaining projects.

- For the first year, the policy recommendation should be related to science implementation based on the challenges encounter by each project during its first year of activities and research. The goal is to inform policymakers about the emerging obstacles, allowing them to take measures that support researchers' efforts and objectives.

3 OVERVIEW OF CLUSTER PROJECTS

Co-Captain	
Outline	The CO-CAPTAIN project aims to co-adapt and implement the Patient Navigation Model for primary cancer prevention for individuals with mental ill-health in four European countries (Austria, Greece, Poland, Spain). As part of this project, qualitative interviews were conducted, which provide information on the importance of prevention, key barriers, and facilitators. Furthermore, focus groups were conducted to co-adapt the Patient Navigation Model. The co-adapted Patient Navigation Model is currently being implemented and will be evaluated. Based on the findings, health and social care policy recommendations will be developed to support the broader adoption and implementation of the model across Europe.
Activities	- **Qualitative interviews,** to determine barriers and facilitators to healthcare access and utilization, were conducted with 81 individuals (people with mental health problems, caregivers, care team members, representatives of mental health organisations and service managers). The results showed the following: o **Importance of Prevention**: Interviewees consider prevention to be a high priority, although health professionals often face difficulties in integrating it effectively into their daily practices. o **Key barriers**: Mental health problems have been experienced to lead to stigmatization and discrimination when accessing and utilizing healthcare. Physical health problems might not be taken seriously, and mental health problems might overshadow physical health problems, such as cancer. o **Facilitators**: Relationships to healthcare workers that are built on trust, joint decision-making, and adaptations of the health system to individual needs. - **Focus groups** were conducted with a total of 50 participants (people with mental health problems, caregivers, care team members, representatives of mental health organisations and service managers), to co-adapt the patient navigation model. Based on the insights gathered from the focus groups and the consortium's experience with patient navigation models from previous projects like CANCERLESS, CO-CAPTAIN has focused on facilitating access to healthcare services, enhancing health literacy, and empowering individuals with mental health challenges. In particular, patient navigators should have a professional background (e.g., medical/psychological/social) and skills such as empathy and the ability to develop supportive relationships. - **Next steps**: The implementation of the adapted Patient Navigation Model is currently in process and will be evaluated as part of the project. For the purpose of evaluation, CO-CAPTAIN also collaborates with CIDMA, who have developed a data management tool. This tool, registered by the UPV (Universitat Politècnica de València), allows for efficient data management, which is crucial

Co-Captain	
	for the implementation of programmes and the personalisation of mental health and cancer interventions. The tool is currently being tested and will be key in the pilot phase. Health and social care policy recommendations for the adoption and implementation of the Patient Navigation Model across Europe will be made based on the findings from the CO-CAPTAIN project.

CPW	
Outline	The CPW Project is designed to investigate innovative strategies for preventing infection-related cancers (eg., cancers caused by Helicobacter pylori- Hp, Hepatitis C Virus – HCV and Human Papilloma Virus –HPV) within occupational health programs across Europe. The project's primary goal is to assess these interventions' feasibility and effectiveness (including cost-effectiveness) by evaluating their outcomes, exploring public health impacts, and identifying sociocultural and behavioural barriers to their implementation. Pilot interventions will be conducted across different countries—Italy, Slovakia, Spain, and Romania—and also within a range of industries, including healthcare, manufacturing, metalworking, retail, and the financial sector. By targeting diverse workplace settings, the project will assess how preventive strategies can be tailored to the unique needs and risks of each industry. The data's insights will inform policymakers about targeted strategies for implementing these programs across the European Union, ensuring the scalability and adaptability of cancer prevention efforts across different countries and industries.
Activities	In the inaugural year of the CPW project, significant preparatory activities were undertaken to establish a robust framework for interventions. Key accomplishments include: **Development of Standard Operating Procedures (SOPs) and Questionnaires**: Tailored SOPs were created for each intervention, considering the diverse contexts of participating countries and industries. A comprehensive, cross-disciplinary baseline questionnaire was developed to collect critical data on participants' demographics, occupational details, health status, sociocultural resources, and health behaviours related to HP, HCV, and HPV. Additionally, a specific questionnaire for healthcare providers associated with implementing partners was designed with the goal of gathering specific data on barriers and facilitators affecting the implementation. Moreover, a tool for monitoring intervention costs is also under advanced development. **Comprehensive Literature Reviews**: Extensive reviews of existing preventive programs for HP, HPV, and HCV were conducted to identify best practices, knowledge gaps, and the sociocultural and behavioural, and economic factors influencing the success of cancer prevention and treatment initiatives. **Initiation of Baseline Data Collection**: The project has commenced the process of recruiting participants and initiating baseline data collection at the first implementing centers. The infrastructure for secure data collection and

CPW
management has been established using RedCap, which will facilitate systematic and efficient data handling across all participating sites over time. **Achievements:** A notable success during this year was the opening of the HPV vaccination center at F.D. Roosevelt Hospital in Banská Bystrica, Slovakia, marking a crucial step in both project implementation and its positive impact on citizens. **Communication and Stakeholder Engagement**: The project team developed tailored communication materials in multiple languages to support interventions in each participating country.

Oncodir	
Outline	ONCODIR aims to address the challenges of colorectal cancer in a Pan-European dimension through interdisciplinary co-creation activities by implementing tools and methodologies for: • Risk-based stratification for citizens • Integrated decision support tools for clinicians • Intelligent monitoring tools for policy makers All the above will contribute towards personalised prevention, successful interventions and implementation plans by incorporating the perspectives of citizens/patients, medical experts and policy makers through a participatory co-designing approach, reinforced by open innovation and FAIR data. Thus far, what has been achieved is reflected in the following overview: - Project introduction - Literature review and meta-analysis completed of Cancer Incidence Risk Factors - Identification of barriers - Results shared with policy makers to improve programmes.
Activities	ONCODIR is based on two main pillars: the interventions developed and how these interventions will be exploited. Several digital tools have been designed to respond to the needs of citizens, health professionals and policy makers. **Methodological Development:** ONCODIR's objective is to design a framework to aid in the formulation of a National Cancer Plan which will include multidisciplinary research methods: • Health policy analytics • Social and behavioural science • Decision support theories to deliver evidence-based cancer prevention programmes • AI-powered retrospective data analytics and Innovative AI-powered personalised prevention approaches **Comprehensive Literature Reviews**: Two comprehensive literature reviews have been conducted as part of the project. The first review focused on identifying

Oncodir

risk and protective factors associated with colorectal cancer, while the second examined European policies aimed at preventing colorectal cancer and promoting a healthy lifestyle.

Baseline Data Collection: Various CRC-related open datasets have been collected, which will be used as a baseline for the training of ONCODIR's AI solutions.

Technical Development: The integration aspect of ONCODIR's platform has been already tested, with most digital tools already being able to exchange information. Moreover, the mobile application integration is being tested next, during the following two months, with citizen recruitment having already started.

Achievements: During its 1st year ONCODIR started the development of a decision -support matrix for policy makers at local, regional and national level based on the Analytic Hierarchy Approach. Despite the matrix requiring more time for maturing, this first year its core elements were established. They consist of the most prominent decision-making criteria and the policies addressing inequalities and citizens' engagement as they emerged from an exhaustive review of the standing national cancer plans or equivalent documents of the 27 EU member states. The matrix will be perfected and validated in the next years of the project to provide in the end a decision-making tool applicable to different circumstances. During the first implementation phase, ONCODIR also engaged in the organisation of several focus groups with different stakeholders (clinicians, policy makers, citizens) to discuss current structural and behavioural barriers to participating in CRC prevention programmes and identify related mitigation measures and existing good or promising practices on which the project can further build. These engagements will also serve as a basis for the project's living labs approach.

4P-CAN	
Outline	4P-CAN is a four-year initiative aimed at reducing cancer risk at the national (macro), community (meso), and individual (micro) levels. The project combines the recommendations of the European Code Against Cancer with cutting-edge approaches such as implementation research, social and behavioural sciences, and advanced technology. Through co-created knowledge and the use of living labs, 4P-CAN develops personalized tools for cancer primary prevention. The project focuses on addressing modifiable cancer risk factors, including smoking, alcohol consumption, physical inactivity, excess body weight, preventable infections, and environmental pollutants like radon. Additionally, 4P-CAN seeks to identify barriers to policy implementation and individual adherence to healthy behaviours, with a focus on improving primary prevention and reducing inequalities, particularly in Eastern Europe.

Activities	In the first year of the 4P-CAN project, we focused on the **Living Lab in Leresti, Romania**, implementing several pioneering activities to advance primary cancer prevention through citizen engagement. Key activities included: • **Pilot Testing of Personal Network Analysis**: We launched (September 2023) a pilot study in Leresti to test the applicability of **personal network analysis** in understanding the community's social dynamics related to cancer primary prevention. • **Validation of Methodology**: The methodology for applying **personal and social network analysis** in the field of primary cancer prevention was validated (December 2023). This step ensured that the tool is effective in capturing relevant social networks that influence cancer primary prevention related behaviours. • **Data Collection in Two Waves**: Two rounds of data collection were conducted using personal network analysis in Leresti: the first in **September 2023** and the second in **March 2024**. These data waves provide insights into the evolving social connections influencing cancer primary prevention in the community. • **Comprehensive Stakeholder Mapping via NetMap**: An extensive **stakeholder mapping** exercise was carried out using the **NetMap method** and the **pentahelix model**. This effort mapped key actors at the European, national, and local/regional levels, identifying influencers and stakeholders essential for the success of cancer prevention efforts. • **Establishment of a Citizen Jury**: A **citizen jury** was formed within the Living Lab to foster direct engagement between citizens and the project. The jury provides a platform for community members to have a say in the design and implementation of cancer primary prevention activities. • **Two Cancer Prevention Interventions**: Over the first year, we organized **two town halls** with citizens, held in **October 2023** and **February 2024**, where community members were involved in discussions about cancer primary prevention. • **Adaptation and Implementation of a Personalized Communication Model**: Based on the data collected from the personal and social network analysis, we adapted the **personalized communication model** tailored to the needs of the community. This model was then implemented across the three cancer primary prevention interventions in the Leresti Living Lab. • **Activation of Non-Traditional Stakeholders**: Non-traditional stakeholders were actively involved in the project, notably the **local football team**, which became an ambassador for the 4P-CAN initiative. This helped engage a broader segment of the community and beyond Leresti, at county level. • **Collaboration with Media and Local Influencers**: We established a broad collaboration with the **media** and **local influencers**, ensuring that the project's message reached a wider audience and raised awareness of cancer prevention initiatives in Leresti. • **Policy Event and Early Systemic Dialogue**: We are organizing a policy event at the **European Parliament** in April 2024 to disseminate the first results from

the Living Lab and initiate an early dialogue with **high-level European policymakers** on scaling the project's impact across Europe.

PIECES	
Outline	The PIECES project focuses on the **selection**, **adaptation and implementation** of evidence-based primary cancer prevention programs across diverse European regions. The project addresses modifiable cancer risk factors such as tobacco use, alcohol consumption, physical inactivity, HPV infection, and poor diet. PIECES aims to enhance the real-world effectiveness of cancer prevention programs by tailoring them to local contexts, ensuring better outcomes for European citizens.
Activities	1. **Repository development**: PIECES concentrated on creating and populating a **Repository of Evidence-Based Primary Cancer Prevention Programs (PCP)**. This repository is the result of a systematic review of existing cancer prevention interventions. Each program within the repository is accompanied by detailed logic models that outline the pathways through which these interventions are expected to achieve their desired outcomes. o The **systematic review** assessed interventions based on their effectiveness, scalability, and adaptability to various European contexts. Programs targeting major modifiable cancer risk factors—such as tobacco use, alcohol consumption, unhealthy diets, and sedentary lifestyles—were reviewed and selected for inclusion based on rigorous evaluation criteria. Additionally, the review focused on identifying interventions that can be tailored to address specific cultural, socioeconomic, and geographic challenges. The PCP repository is fed from 3 different sources: Cochrane library reviews, National Cancer Institute (NCI) evidence-based control programs, and interventions from PIECES implementation sites (*practice-informed*) o For each program, **logic models** were developed to map the intervention inputs, activities, theories of change, mechanisms of action, outputs, and expected outcomes. These models serve as a crucial tool for implementers, providing clear pathways to understand how each program works and the necessary conditions for its success. By including these models, PIECES ensures that local implementers have a robust framework to guide them in replicating or adapting the interventions effectively in their regions. 2. **Repository of implementation determinants**: PIECES developed a comprehensive repository of implementation determinants, which identifies and categorizes over 97 factors that impact the implementation of primary cancer prevention programs. These determinants were extracted from existing research using the Consolidated Framework for Implementation Research (CFIR), a widely recognized framework in implementation science. The repository covers multiple domains such as program characteristics, inner and outer settings, and individual-level determinants. This strategic repository serves as a guide for local implementers to recognize and address potential

barriers to adapting cancer prevention programs. By identifying key factors like stakeholder engagement and environmental conditions, PIECES helps implementers tailor interventions to specific community needs and optimize program outcomes.

3. **Repository of implementation strategies**: in the PIECES project provides evidence-based methods for overcoming barriers and enhancing the effectiveness of cancer prevention programs. It includes a comprehensive collection of strategies based on frameworks like the CFIR. Key focuses include stakeholder engagement, contextual adaptation, overcoming resource barriers, among others.

4. **PCP Implementation Toolkit (PCP-IT)**: The project developed the implementation framework and the "PCP-IT" platform to guide local implementers in selecting, adapting, and implementing cancer prevention programs suited to their specific cultural, socioeconomic, and geographic needs. The evidence-based PCP program repository, determinants repository and strategy repository developed during the course of this first year are embedded in the platform.

5. **Translation, testing and allocation of the toolkit** (*ongoing*).
   o All components of the PCP-IT, including the repository of programs, determinants, and strategies, are being translated into the local languages of participating countries.
   o After the translation process, the toolkit will undergo **testing and piloting** in various regions to assess the effectiveness and clarity of the translations.
   o Once translation and testing are completed, the PCP-IT will be **allocated** to local implementers. This involves providing access to the digital platform, training users in how to navigate and utilize the toolkit and ensuring that support systems are in place to assist with any challenges that arise during implementation. The toolkit's deployment is accompanied by training workshops or online tutorials to guide healthcare professionals in using the translated materials effectively.

6. **Evaluation of the PCP-IT** (*ongoing*): PIECES project focused extensively on evaluating the feasibility and effectiveness of the PCP Implementation Toolkit (PCP-IT). This evaluation aims to assess how well the toolkit supports the selection, adaptation and implementation of evidence-based primary cancer prevention programs across diverse settings and countries.

7. **Study protocol development:** To ensure that the PCP-IT can be applied more broadly and consistently across different regions, PIECES is currently developing a **study protocol**. This protocol is designed to provide a standardized framework for using and evaluating the toolkit's effectiveness across various countries and to ensure that implementation and evaluation comply with ethical standards.

PREVENT	
Outline	- Project Set up - Communities of Practice (CoP) - Identification of barriers and facilitators - Baseline assessment and metrics - Design the digital and social means - Set up three Living Labs - Results shared with policy makers to improve programmes.
Activities	PREVENT is based on the following main pillars in the first year: the set up and activation of the CoPs, the identification of the main metrics for assessment and the design of the interventions developed. Socio-tech tools have been designed to respond to the needs of citizens, health professionals and policy makers. • The CoPs encompass a diverse array of stakeholders, including physicians, oncologists, obesity associations, guardians, academic institutions, educators, nutritionists, policymakers, ministries, and more. Their primary role is to oversee the formulation, adjustment, execution, and evaluation of the PREVENT interventions and engagement policies. Moreover, these groups aim to suggest comprehensive strategies, actions, and potential legislative measures to enhance the scaling-up process. • A list of somatometric indicators that relate obesity in children and adolescents to cancer risk in adulthood has been provided. • A survey has been conducted to analyse and identify current primary policies regarding childhood obesity across different scales (medical, genetics, cultural and ethnic, regional, societal and economic), alongside with the bottlenecks and gaps they face while being implemented in schools. With regards to the clustering activities, PREVENT has a leading role to the organisation of all relevant activities regarding R&I. The project have collaborated and actively participated to all meetings organised by EC and the cluster projects.

4 REVIEW OF WORKING GROUPS' ACTIVITIES

4.1 DATA MANAGEMENT PLAN

Data Management Plan	
Presentation	Role of CPW: - Leads coordination of Data Management in the cluster - Organizes Working Groups (WG) meetings - Design collaborative strategies - Act as a consultation point for partner projects in specific cluster projects' data management issues (technical and legal requirements on data management, how to comply with FAIR principles, definition/description of variables and, standard data format and vocabularies). - Questions and requests: cpw.dmp@almahealthdb.it
Update	- Identification of differences and similarities in data management strategies across projects - Optimization of data comparability and interoperability, share and discussed with Principal investigators (PI) in cluster meetings - Work on common issues - Identification of collaboration points, such as: the creation of a community in a trusted repository for data sharing, potential overlaps in data variables across projects, options of standardizing information. - Common DMP Chapter was submitted, although it is a living document that may be adapted during the course of the cluster - CPW has proposed Zenodo as a data repository platform for cluster community – Pending to be approved by the rest of projects
Steps towards Y2	- Webinar on FAIR principles - tbc: To catalogue the possible anonymous and /or anonymizable sources from now until the end of the project - tbc: To identify overlaps with the sets of variables collected within the projects (each project starting with CPW will release their description of datasets) - tbc: To catalogue the current hypotheses regarding the standardization of datasets and related metadata (CPW plans to adopt OMOP standard) - tbc: To standardize the descriptions of datasets to be published on the common repository - Other actions may be proposed by the other members of the cluster
Main conclusions	During the recent Cluster meeting, participants agreed on several key proposals related to data management strategies and future collaboration. There was a general consensus on the need to address differences in data

	management approaches across the various projects, and to work collaboratively on issues such as data interoperability and standardization. A trusted repository for data sharing was proposed, with **Zenodo** suggested by CPW as the platform.
	The Common Data Management Plan (DMP) chapter has already been submitted, but it remains a living document that will be revised as needed throughout the cluster's activities. Moving forward, cataloguing anonymizable data sources, identifying overlaps in the variables collected across projects, and standardizing dataset descriptions for publication in the shared repository will be important steps.
	Further details will be discussed in the next DMP Working Group meeting, which will be scheduled once the current deliverables are completed. **CPW** will lead the process of advising on data-sharing practices among the projects and will also prepare a template, allowing each project to contribute its own input.
	The cluster also plans to focus on optimizing data comparability and promoting the use of **FAIR principles** to ensure that data is findable, accessible, interoperable, and reusable. The first discussion will be followed after the proposed workshop. All initiatives, along with other potential actions proposed by cluster members, will be discussed and finalized in the upcoming DMP Working Group meetings.

4.2 COMMUNICATION AND DISSEMINATION

Communication and Dissemination	
Objectives	- Increasing awareness about the cluster's scope, initiatives and expected impacts - Help individual projects spread their activities and results - Influence key stakeholders, especially policymakers
Update	- Target groups identified - Co-creation of cluster logo, deliverable and presentation templates, cluster brochure - Establishment of the umbrella branding (graphic elements, colours and typography) and guidelines, so it can be implemented consistently by each cluster project in different formats. - As agreed by the working group members, no cluster-specific social media profile, website or newsletter has been created. Instead, cluster-related information will be disseminated through the existing communication channels of the individual projects in order to reach a wider audience - Creation of cluster-related content for social media, newsletters and websites - A common hashtag has been created to help track all cluster-related social media posts: #CancerPreventionEU

Steps towards Y2	- Improving and updating the initial tools and channels
	- Disseminating synergies and cross-cutting activities among cluster projects
	- Effective monitoring of the process through specific KPIs
	- Other communication channels are also planned for the future:
	   o Joint scientific publications, prioritising open access
	   o Press releases
	   o Media appearances (articles in specialised journals and magazines, interviews)
	   o Events (workshops, conferences, symposia...)
	- Addressing communication-related needs of the other cluster workgroups

Main conclusions	- Effective communication is an important activity for the Prevention and Early Detection Cluster, keeping the Mission Cancer members informed and involved in cluster activities and highlighting the impact maximisation of synergistic efforts to key stakeholders and the public. - Joining forces between all six projects will be crucial to maximise the impact of communication and dissemination of results to relevant stakeholders.

4.3 ADDRESSING INEQUALITIES

Addressing Inequalities	
Objectives	- Detect and analyse health inequalities in cluster projects - Develop strategies to jointly address identified inequalities within the cluster
Update	- Webinar reviewing the concept of inequalities in health care and specifically in Cancer prevention and treatment - Cluster projects have been working on their Project Positionality Matrix, and their team's positionality to map potential issues that may influence interpretation of project results and identify possible improvement measures (work in progress) (4PCAN is pending to submit its matrix. Deadline: 31/10/2024) - Based on Positionality Matrix received, an early set of recommendations has been prepared in order to minimise negative effects of positionality, maximise inclusion and participation of vulnerable population, and enhance the influence on policy makers
Steps towards Y2	- Continue working on the Positionality Matrix - Further analysis of Matrix and elaboration of a Report to share ideas on what can be done till the next cluster meeting - Implementation of changes based on recommendation - Analysis of the early results of the cluster

Main conclusions	All actions carried out in the first year of the Prevention and Early Detection Cluster have laid the groundwork for a deeper understanding of inequalities in cancer care and prevention. The use of the Project's Positionality Matrix has helped project teams reflect on how their approaches and perspectives can affect the interpretation of results, encouraging greater inclusion of vulnerable groups. The organised webinar on inequalities has been key to aligning understanding within the cluster on these challenges. The central aim has been to develop strategies that maximise equitable participation and that projects not only contribute to science, but also promote tangible changes in public health policy. Building on this foundation, the second year will focus on implementing practical recommendations, improving the effectiveness of interventions and broadening the impact on policy making, ensuring that innovations reach those who need them most.

4.4 CITIZEN ENGAGEMENT

Citizen Engagement	
Objectives	- **Mapping Best Practices**: Identify and analyse successful **citizen engagement strategies in cancer primary prevention** from across the Cluster's projects - **Co-Creation of a Citizen Engagement Framework**: Collaborate to co-create a comprehensive **framework for citizen engagement** tailored to cancer primary prevention following the EC Code of Practice on Citizens engagement for knowledge valorisation - **Enhancing Community Participation**: Strengthen citizens engagement in Cluster projects by applying the co-created framework, ensuring citizens play an active role in **co-designing interventions** that reflect their needs and contribute to sustainable cancer primary prevention efforts.
Steps towards Y2	As part of our **Year 2 plan**, and building upon the webinar organized by 4P-CAN on **September 3rd** and the session during the Cluster meeting in Vienna on **September 23rd**, the next step will be the co-creation of a **Citizen Engagement Framework** aligned with the **EC Code of Practice on Citizen Engagement for Knowledge Valorisation**. **Some of the criteria that the Citizens Engagement Framework will take into account include:** • **Citizen Engagement Strategy**: Presence of a clear strategy and action plan for engaging citizens in knowledge valorization. • **Implementation Methods**: Use of appropriate participatory methods such as living labs, co-creation workshops, public consultations, or interactive digital platforms.

	• **Trans-disciplinarity and Collaboration**: Degree of collaboration across different sectors and domains, involving citizens, researchers, healthcare professionals, and decision-makers. • **Social Inclusion and Diversity**: Ensuring participation of diverse and vulnerable groups, promoting gender equality, and addressing barriers to engagement. • **Recognition and Incentives**: Mechanisms to acknowledge and reward citizen contributions, such as awards, certifications, or other recognition schemes. • **Evaluation and Impact**: Implementation of an evaluation framework with clear indicators and metrics to assess the effectiveness of engagement processes and their impact on cancer primary prevention. • **Use of Digital Technologies**: Integration of human-centric and sustainable digital solutions to facilitate citizen engagement and promote inclusivity. • **Sustainability and Scalability**: Potential for replication and scaling of engagement actions in other contexts or regions, supported by toolkits and best practices. Based on these criteria and the direct input from the projects within the Cluster, we will **co-create the Framework for Citizen Engagement in cancer primary prevention**. This framework will guide future initiatives, ensuring a unified, effective, and sustainable approach across all Cluster projects. By aligning with the European Commission's **Code of Practice on Citizen Engagement for Knowledge Valorisation**, we ensure that our strategies adhere to European best practices and address the real needs of citizens.
Main conclusions	All primary cancer prevention projects within the cluster are addressing **citizen engagement**, though they are currently at different stages of implementation. The importance of **living labs** is paramount for fostering active citizen participation, providing real-world environments where communities can collaborate directly. Engagement activities such as **town halls** and personalized communication strategies have been instrumental in effectively involving citizens. Additionally, the use of **social and personal network analysis** and other advanced social science tools has proven crucial in understanding community dynamics and enhancing engagement efforts. Recognizing the necessity for a unified approach, we will develop a comprehensive **framework for citizen engagement** starting in Year 2, following the European Commission's **Code of Practice on Citizen Engagement for Knowledge Valorisation**, to guide and strengthen citizen participation across all projects.

4.5 RESEARCH AND INNOVATION: POLICY RECOMMENDATIONS

As a final activity of the meeting, participants were divided into two groups to collaborate and identify synergies based on the challenges faced in each project. Each group focused discussing each project findings related to:

- Community level challenges
- National level challenges
- EU level challenges
- Identified good policies

The conclusions drawn from those working sessions are presented in Annex 1.

5 CLUSTER ACHIEVEMENTS - Y1

5.1 CITIZEN ENGAGEMENT

CO-CAPTAIN	CO-CAPTAIN has conducted interviews and focus groups with individuals affected by mental health problems, care givers and professionals to co-design and develop a more effective intervention model. Through these activities, the perspective of end-users has been captured, enabling interventions to be better tailored to their needs.
CPW	**Baseline Questionnaire Development and Initiation of Data Collection:** The CPW Project has successfully developed comprehensive baseline questionnaires targeting workers across different countries and industries. This initiative aims to collect critical data on participants' demographics, occupational details, health status, sociocultural resources, risk behaviors, and knowledge related to HP, HCV, and HPV with feedback. Gathered data will serve as the foundation for assessing the effectiveness of the interventions and helping to identify barriers to accessing health services. **Opening of the HPV Vaccination Center**: Establishing the HPV Vaccination Center at F.D. Roosevelt Hospital in Banská Bystrica, Slovakia, was a significant achievement and a key milestone in the project's implementation. This hospital is a crucial resource for health services in the region, and opening the HPV vaccination Hub will improve citizens' access to vaccinations and positively impact public health. **Development of Tailored Communication and Educational Materials:** The project team developed communication materials in multiple languages to support interventions across participating countries. This effort ensures that information is accessible and relevant to diverse populations, enhancing workers' engagement and participation in the research project. **Social Media Campaigns**: Ongoing social media campaigns have been conducted to promote the project, raise awareness, and educate the general population about HP, HCV, and HPV infections, as well as cancer prevention strategies. **Comprehensive Literature Reviews**: Extensive reviews of existing preventive programs for HP, HPV, and HCV were conducted to identify best practices and knowledge gaps. This research informs the project's approach and ensures that citizen engagement efforts are grounded in evidence-based strategies. **Stakeholder Mapping:** National and international stakeholders have been mapped to enhance collaboration and support for the project in the next years.

ONCODIR	ONCODIR's citizen engagement strategy targets individuals who do not have colorectal cancer to gather valuable feedback for testing the project's digital tools. To obtain this input, baseline questionnaires have been distributed to various groups, with university students playing a key role to highlight the importance of prevention among young people. Since ONCODIR's consortium spans various countries, interventions need to be developed into the respective languages for all communication materials, digital tools and questionnaires.
	Moreover, ONCODIR has established a Living Lab for a creative and participatory policy-centric dialogue for evidence-based policy making, focusing on citizen engagement, including patients and healthcare professionals. To create a more effective intervention model and to co-design the system, ONCODIR has conducted interviews and focus groups with both patients and healthcare professionals.
	Specifically, the Ministry of Health Greece (MoHGr) collected a total of 1000 responses by filling questionnaires aiming to identify common behavioural barriers.
	EUREGHA and EFPC have successfully conducted two focus groups in Italy and Slovenia respectively. Two more focus groups are planned by INCLIVA in Spain and MoHGr in Greece.
4P-CAN	In Year 1, the 4P-CAN project made significant strides in citizen engagement through its innovative Living Lab in Leresti. The establishment of the citizen jury empowered local residents to take an active role in shaping cancer prevention strategies, ensuring that their voices were heard in both the design and execution of interventions. Through two town halls, we directly engaged citizens (10% of the population living in Leresti) in meaningful discussions about cancer risk factors and prevention methods, fostering a sense of ownership and collaboration. Furthermore, leveraging non-traditional stakeholders, such as the local football team as ambassadors, allowed us to reach a broader and more diverse audience, building trust and strengthening the community's commitment to the project.
PIECES	In its first year, PIECES has focused on the development of a digital toolkit to facilitate the implementation of primary cancer prevention (PCP) programs. The toolkit emphasizes the importance of citizen engagement and provides guidance to engage relevant stakeholders throughout the process of selecting, adapting and implementing PCP programs. Among other components, the toolkit also includes an interactive module to foster a community of practice and enhance collaboration among implementers. Over the next years, the toolkit will be tested by implementers from diverse countries and disciplines.
PREVENT	PREVENT has already set up the living labs in 3 EC countries (Spain, Sweden and Greece) and work towards citizens engagement (children/adolescents, school units/heads/teachers/professors, parents

	and the wider communities). PREVENT has conducted interviews and focus groups with school heads, sociologists, psychology and educational experts, and health care professionals in order to develop a more effective intervention model. The perspective of the school communities has been initially captured in order to provide interventions that are tailored to their needs. PREVENT works in close collaboration with UNICEF to prepare better engagement strategies and tools (both digital and social ones).

5.2 ADDRESSING INEQUALITIES

CO-CAPTAIN	The project has addressed health inequalities by identifying key barriers such as stigma, discrimination and issues in provision of a care in the public health system. In addition, efforts have been made to tailor health services to the individual needs of people with mental health problems. As leader of the Inequalities work package in the Cluster, CO-CAPTAIN organised a webinar for all cluster members, in which issues related to reducing inequalities in access and provision of health services were discussed. In addition, it is leading further activities to map out inequalities and suggest how these can be overcome in all cluster projects.
CPW	**Pilot Interventions Across Diverse Settings**: The CPW Project has initiated pilot interventions in various industries, including healthcare, manufacturing, metalworking, retail, and finance. By tailoring these interventions to the unique needs of each sector, the project addresses specific barriers to engagement that may vary by workplace culture and employee demographics. The CPW Project developed comprehensive baseline questionnaires and conducted a thorough literature review to investigate sociocultural and behavioural factors limiting engagement with preventive health interventions. This research aims to uncover varying levels of awareness and cultural stigmas associated with HP, HCV, and HPV infections, providing a deeper understanding of the barriers and facilitators faced by different populations. **Feedback Collection Mechanisms**: The project has implemented mechanisms to gather feedback from participants on their experiences with health interventions. Special attention will be given to workers who test positive for HP and HCV infection or express willingness for HPV vaccination. **Training for Healthcare Providers**: The project has conducted numerous training sessions for healthcare providers (occupational physicians, nurses, and beyond) to equip them with the skills to effectively communicate the project while engaging with diverse populations and improving patient (employee)-provider interactions.

ONCODIR	The ONCODIR project during its first year focused on identifying and mapping behavioural & structural barriers and facilitators for CRC primary prevention, analysing habits such as lack of exercise and preference for fast food, collecting in parallel valuable insights regarding primary prevention in general. Despite conducting a dedicated survey on the general population of the consortium countries, clinicians and policymakers were invited as well to take part and assist in seeking effective facilitators and strategies. The analysis of preliminary data revealed more than 40 barriers (behavioural, financial, social, cultural, legal), more than 4 inequalities linked to primary prevention, and more than 20 facilitators. In addition, a series of focus groups sessions with healthcare experts from consortium countries that is planned for after M12 (started on M16) aims in identifying the population groups that mostly require support concerning primary prevention as well as already established effective strategies for addressing those barriers and inequalities in local, regional and national level.
4P-CAN	The 4P-CAN project in its first year focused on addressing **health inequalities**, particularly in underrepresented and vulnerable groups in **rural areas** like Leresti. The project's activities, including **personal network analysis**, provided a **deep understanding of local networks and barriers** to accessing cancer prevention services, especially among **elderly** populations and marginalized communities like the **Roma**. By focusing on these vulnerable groups and adapting our **personalized communication model** to meet their needs, we were able to deliver targeted interventions aimed at reducing disparities in cancer prevention. Our efforts to bring prevention services closer to these populations are helping to bridge gaps and improve health outcomes in regions often overlooked by traditional health initiatives.
PIECES	In its first year, PIECES has developed a digital toolkit aimed at reducing inequalities in the implementation of primary cancer prevention (PCP) programs. The toolkit provides guidance on selecting, adapting, and implementing programs, taking into account and addressing local inequalities. It includes evidence-based repositories of implementation barriers and strategies to overcome them, helping match specific barriers with appropriate solutions. Additionally, all toolkit components are being translated into the local languages of participating countries to ensure broader accessibility.
PREVENT	The PREVENT team has actively joined all relevant workshops/campaigns towards enhanced inclusivity, diversity and dealing with socio-economic inequalities. Through the direct inclusion of all needed political partners and the decision makers in the consortium, PREVENT will promote at higher level the equity issues in cancer prevention further to the lifetime of the cluster. PREVENT has addressed health inequalities by identifying key barriers such as socio-economic discrimination and health system dysfunctions.

5.3 R&I COLLABORATION

CO-CAPTAIN	During the first year, CO-CAPTAIN has made progress in creating research and innovation collaborations with partners and experts in the implementation of cancer prevention models in vulnerable populations. These collaborations have facilitated the integration of expertise in mental health and healthcare, strengthening the multidisciplinary approach of the project.
CPW	CPW has a leadership role within the Cluster for the Data Management Plan (DMP) Common Chapter. CPW coordinated data management efforts among partners, organized working group meetings, consulted on data management issues, and designed collaborative strategies for future cooperative efforts. The joint DMP chapter was successfully submitted. In Year 1, CPW made significant progress in Research and Innovation collaboration among partners, undertaking various preparatory activities to establish a robust framework for interventions. Key activities included developing SOPs for each intervention, considering the diverse contexts of participating countries and industries. A comprehensive baseline questionnaire was created to collect critical data on participants, while a healthcare provider-specific questionnaire was designed to gather insights on implementation barriers. A cost-monitoring tool is also in development. Extensive reviews of preventive programs for HP, HCV, and HPV were conducted to identify best practices and key challenges, supporting the project's goal of evaluating innovative, cost-effective cancer prevention strategies within occupational health programs.
ONCODIR	Continuous feedback: a feedback loop was established in which results from the app and information from the doctor-patient interaction are sent to policy makers to adjust and improve prevention programmes. The project has now completed a comprehensive literature review and is transforming these results into practical recommendations for clinicians. Laboratory testing is underway, and the application is expected to be tested in the next two weeks, with a view to launching a pilot soon.
4P-CAN	In Year 1, 4P-CAN made significant progress in Research and Innovation (R&I) collaboration, particularly through the use of personal and social network analysis. These tools provided deep insights into local networks, helping to understand how social relationships influence cancer prevention behaviours. In addition, we conducted stakeholder mapping using the NetMap method and the pentahelix model, allowing us to identify and engage key actors at the European, national, and regional levels, ensuring a coordinated and comprehensive approach to cancer prevention. The project also fostered a strong multidisciplinary collaboration, bringing together social scientists, public health experts, medical doctors, health communicators, and nurses to ensure our interventions were grounded in diverse expertise and practical realities. We validated our methodologies with international experts and submitted the first three scientific

	publications for review, marking an important step in disseminating our findings.
PIECES	In its first year, PIECES has developed an innovative digital solution that integrates an evidence-based repository of primary cancer prevention (PCP) programs, along with repositories of implementation determinants and strategies. This comprehensive toolkit has been reviewed by project partners as well as a board of international experts in implementation science and health promotion.
PREVENT	PREVENT is leading the R&I collaboration among the participating projects. During the first year, PREVENT has made progress in creating research and innovation collaborations with partners and experts in the implementation of cancer prevention models with regards to obesity and other metabolic disorders. Most of these collaborative activities will run in the second year.

6 CONCLUSIONS

The first annual meeting of the "Prevention and Early Detection Cluster" served as a valuable platform for updating the progress of each project within the cluster, with a focus on the various working groups: Citizen Engagement, Addressing Inequalities, Research and Innovation Collaboration, and the Data Management Plan. During the meeting, each working group presented its main achievements over the past year and outlined its detailed work plans and objectives for the second year.

The first year was critical for laying the groundwork, establishing a solid foundation, and fostering collaboration between the projects. It provided an opportunity to share experiences, exchange knowledge, and identify synergies across the different areas of focus. By building this strong base, the projects are now well-positioned to advance further. As we move into the second year, there is a shared expectation that the groundwork laid in the first year will lead to more tangible outcomes.

PREVENTION and EARLY DETECTION CLUSTER

CO-CAPTAIN

CPW
CANCER PREVENTION at WORK

ONCODIR

PREVENT

pieces

4PCAN

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ANNEX 1: POLICY RECOMMENDATIONS

	Working Group members [Research & Innovation]	Acronym
1	Dora Spyropoulou	NKUA
2	Rebecca-Evelyn Papp	EHMA
3	Manthos Bimpas	ICCS
4	Alexandra Olson	EHMA
5	Andreas Raptopoulos	WEL
6	Gabriela Munares	KVC
7	Laura Domínguez	KVC
8	Anna Schneider-Kamp	SDU
9	Alessandro Godono	UNITO
10	Adonina Tardón	FINBA
11	Monireh Sadat Seyyedsalehi	UNIBO
12	Paolo Boffetta	UNIBO
13	Alessandra Cataneo	UNIBO
14	Magdalena Kostrzewa	UNIBO
15	Stefanos Vrochidis	CERTH
16	Thanassis Mavropoulos	CERTH
17	Christoniki Maga-Nteve	CERTH
18	Giorgos Dritsakis	CERTH
19	Alexis Melitsiotis	CERTH
20	Dimitris Dimzas	CERTH
21	Petros Printezis	CERTH
22	Adriana Boata	INOMED
23	Marius Geanta	INOMED
24	Lulian Oană	INOMED
25	Christiaan Vis	AUMC
26	Jordi Piera	IDIBELL
27	Marina Ramiro Pareta	IDIBELL
28	Clara Mercader	ICO
29	Cristina Martínez	ICO
30	Igor Grabovac	MUW
31	Hanna Mües	MUW

Authors List

Lead Author		
Name	**Beneficiary**	**Email**
Dora Spyropoulou	**NKUA**	**dorspyr@med.uoa.gr**
Rebecca-Evelyn Papp	**EHMA**	**rebecca.papp@ehma.org**
Manthos Bimpas	**ICCS**	**manthos.bibas@iccs.gr**
Co-authors (in alphabetical order)		
Name	**Beneficiary**	**Email**
Marina Ramiro Pareta	IDIBELL	mramiro@idibell.cat
Christiaan Vis	AUMC	p.d.c.vis@amsterdamumc.nl
Thanassis Mavropoulos	CERTH	mavrathan@iti.gr
Marilly Psomiadi	MoH-GR	psomiadim@moh.gov.gr
Laura Domínguez	KVC	ldominguez@kveloce.com
Gabriela Munares	KVC	gmunares@kveloce.com
Hanna Mües	MUW	hanna.muees@meduniwien.ac.at
Igor Grabovac	MUW	igor.grabovac@meduniwien.ac.at

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1.0	Dora Spyropoulou	31/10/2024	Final review and submission

List of Abbreviations

Abbreviation	Definition
EC	European Commission
WP	Work Package
CO-CAPTAIN	Cancer prevention among individuals with mental ill-health: co-adapting and implementing patient navigation for primary prevention
CPW	Cancer Prevention at Work: Occupational health surveillance in the implementation of prevention of infection-related cancer
ONCODIR	Evidence-based Participatory Decision Making for Cancer Prevention through implementation research
4P-CAN	Personalized CANcer Primary Prevention research through Citizen Participation and digitally enabled social innovation
PIECES	Towards large-scale adaptation and tailored implementation evidence-based primary cancer prevention programmes in Europe
PREVENT	Improving and upscaling primary prevention of cancer by addressing childhood obesity through implementation research- the PREVENT approach

CONTENTS

1.INTRODUCTION

The goal of this deliverable is to present a set of initial policy recommendations under the collaborative efforts from the 6 projects within the "Prevention and early detection" cluster of the Mission Cancer initiative, based on the Research and Innovation strand. This policy brief is intended to amplify the overall impact on the Mission Cancer's aspirational objective of enhancing the lives of over 3 million individuals by 2030.

Firstly, the main challenges each project faced in community, national and EU-level are presented, alongside with identified opportunities. Following by the outcome of our workshop in Research & Innovation during our 1st annual meeting in Vienna. Table 3 introduces the policy recommendations each project formulate based on their findings so far and finally a list of our first common policy recommendations as a cluster are presented.

2. RESEARCH FINDINGS AND POLICY RECOMMENDATIONS

2.1 RESEARCH FINDINGS

In this initial policy brief, formulating recommendations based on the Research and Innovation Strand of the 'Prevention and Early Detection' Annual Cluster Meeting (Year 1), the projects addressed challenges at the community, national, and EU levels, along with the opportunities identified during their research phase.

Community-level challenges focus on local or regional barriers, such as insufficient resources, low awareness, or lack of local support, which hinder the implementation of interventions and research. On the national level, projects identified difficulties in scaling interventions, largely due to variations in healthcare systems, misalignment of policies, or funding limitations. At the EU level, pan-European challenges emerge, including policy fragmentation, regulatory hurdles, and the need for greater standardization across member states. Additionally, the projects highlighted existing opportunities and action points at local, national, and EU levels that could be adapted or scaled to support broader cancer prevention efforts.

The research findings from the six clustering projects are presented below in three tables. Table 1 details the findings of each individual project. Table 2 summarizes the common findings identified and agreed upon during the "Research & Innovation" working group workshop, led by PREVENT, at the Cluster Annual Meeting held in Vienna on 23rd September 2024. Table 3 outlines each project's policy recommendations, including their potential impact and advantages.

Table 1. Project-Specific Research Findings

	Community-Level Challenges	National-Level Challenges	EU-Level Challenges	Identified Opportunities
CO-CAPTAIN	1. Limited access to mental health and cancer prevention services: In rural or resource-limited communities, access to quality preventive services is uneven. 2. Lack of awareness of the importance of prevention, early detection and promotion of mental health. 3. Stigmatisation of people with mental health problems: Persistent prejudice prevents people from seeking or receiving appropriate medical help, which complicates cancer prevention and treatment. 4. Lack of integration of services: Fragmentation of local mental and physical health services, hindering a comprehensive approach to cancer prevention.	1. Insufficient public policies for equitable access: Health policies that do not guarantee adequate coverage for prevention, especially in vulnerable groups. 2. Limited resources for mental health programmes: Inadequate funding in many countries, resulting in few psychological support programmes for cancer patients. 3. Geographic disparities in health service provision: Significant differences in the quality and availability of services between urban and rural areas.	1. Lack of harmonisation of health policies: Lack of a common framework unifying prevention and treatment strategies across EU countries. 2. Difficulty of transnational coordination: There is limited coordination between European countries to address common challenges in mental health and cancer prevention. 3. Gaps in funding for public health projects: Lack of efficient funding allocation mechanisms to support long-term preventive initiatives.	1. Building community support networks: Strengthen the role of local health networks and NGOs to provide integrated cancer prevention and psychological support programmes. 2. Implementing digital solutions: Developing digital platforms to facilitate access to mental health and cancer prevention services, especially in remote areas. 3. Strengthening collaboration between EU countries: Leveraging programmes such as Horizon Europe to facilitate collaborative research and innovative practices in public health. 4. Training of health professionals: Expand training programmes for physicians and psychologists in interdisciplinary approaches combining cancer prevention and mental health.

CPW				
	1. Low awareness of infection-related cancers and primary prevention, particularly regarding H. pylori's role. 2. Barriers to accessing cancer screening and preventive services, including hesitancy toward HPV vaccination. 3. Fear, shame, and stigma around sexually transmitted infections (HPV, HCV), hindering individuals from seeking prevention and treatment. 4. Caregiving strain and fear of infection transmission within the household, adding emotional and logistical burdens on families.	1. Low attention to and investment to infection-related cancers, particularly stomach and liver cancer. 2. Lack of stakeholder involvement in infection-related cancer prevention efforts, especially for H. pylori. 3. Weak representation of occupational medicine in healthcare and cancer prevention efforts. 4. Limited engagement of employers and occupational health services in national cancer prevention. 5. Sociocultural attitudes and norms complicating health and vaccination efforts.	1. Lack of occupational-based policies for cancer prevention. 2. Scarce implementation of screening for infection-related cancers, especially in Eastern Europe. 3. Lack of attention to H. pylori as a carcinogen, with limited screening programs. 4. Scaling interventions to the supranational level is difficult due to healthcare system variations and policy misalignments within the EU. 5. Scientific guidelines may need updates, such as for H. pylori testing and HPV vaccination in adults. 6. Scarce literature regarding occupational-based cancer screening for the targeted infections (H.pylori, HCV, HPV).	1. Expanded role of the occupational physician in promoting cancer prevention, with potential company-supported cancer screenings integrated into annual health services. 2. Collection of workers' occupational history, clinical, and lifestyle information for comprehensive health risk profiling. 3. Contribution to the European Beating Cancer Plan to reach HPV vaccination rates of 90% for girls and increase vaccination of boys by 2030. 4. Find new evidence on infectious-related cancer epidemiology in high-risk countries, enabling updates to data and guidelines. 5. Multicomponent interventions involving healthcare professionals and public authorities for comprehensive cancer prevention. 6. Increase participation in cancer screening and vaccination campaigns beyond HPV, HCV, and H. pylori.

ONCODIR	1. **Accessibility:** Free of charge or low-cost community prevention programs are inaccessible to citizens due to narrow eligibility criteria and/or complex registration processes. 2. **Limited awareness**: Communication campaign do not properly address targeted populations' information needs while not being tailored to their health literacy levels. 3. **Lack of dedicated education programs**: established programs are short in duration and raise very specific topics. There should be health education programs not only in schools but also across all establishments and population groups of interest, i.e., day care centres, facilities for the disabled, prisons, pregnant women, the elderly, etc. 4. **Cultural challenges:** Language barriers, dietary influences, marginalization. 5. **Social challenges:** Lack of social support while heavily relying on family for health-related decisions. 6. **Hesitancy**: Fear of cancer, stigmatization and lack of	1. **Healthcare professionals' competencies:** The required competencies for addressing properly the cultural and health-literacy related barriers impeding CRC primary prevention are scarce among them. Dedicated trainings are required. 2. **Limited face-to-face interactions with patients**: Professionals having limited time due to their heavy workload affects individuals' negatively as they value personalized interventions, especially when preventive care is considered. 3. **Occupational health:** The available programs are limited despite employees recognizing them as positively affecting them towards preventive and positive health behaviors. 4. **Tailored approaches required**: Despite citizens being in favour of genetic testing and personalized care	1. **Lack of a common standard for prevention**: 2. EU countries address cancer differently. Many of them have established national cancer plans incorporating initiatives of different policy fields through different perspectives-not all of them address preventive care. Iniciatives should be taken to ameliorate the fragmented legislative setting. 3. **Private sector involvement**: Regulations are required to encourage and facilitate public-private-partnerships. 4. **EU Code Against Cancer Update**: There is a need for the update of the code in a way that encompasses more novel approached (i.e., digital health) while impedes the grave variations of the awareness and engagement campaigns through setting specific standards. 5. **Financial barriers**: More resources should be provided to communities of member states for preventive care. 6. **Environmental & Occupational Health**: Incentives for investing in environmental and occupational health is important to be provided to the member states.	1. **Society engagement**: Engagement and collaboration between different public and private entities in a "whole-of-society" approach to properly address prevention barriers. 2. **Policymaker Involvement:** Preventive services should be offered by all administrative levels an mainly where people reside and reside. 3. **Clinical studies support**: Encourage the conduction of clinical studies to produce evidence-based needs assements while the effectiveness of different measures is studied as well. 4. **Infrastructure support**: Infrusture for physical activity is required for individuals to leverage and be supported in adopting positive health behaviors. 5. **Cross-country collaboration**: Foster opportunities for collaboration especially for the development and validation of genetic tests. 6. **Education and awareness programs**: Campaigns tailored to the populations' respective health information

community outreach programs increase hesitancy towards prevention.

7. **Adaptability issues**: Adopting and maintainingg preventive behaviors requires significant resoures that are scarce in contemporary lifestyles (e.g., sufficient income, substancial time, being stress free, etc.).

8. **Distrust in the healthcare system**: There is limited trust to healthcare professionals mainly due to issues of patient-provider communication and lack of patient-centered care.

9. **Fear of cancer**: Adoption of avoidant behaviors.

10. **Low engagement of community leaders**: Collaborations and synergies are limited as a "whole-of-society approach" hasn't been adopted so far.

11. **Technical barriers**: Poor digital health literacy competencies, limited resources at community level.

healthcare professionals appear hesitant towards such approaches.

5. **Lack of prioritisation by national policymakers**: Policy makers appear more concerned with budgeting and resources issues thus being less supportive of preventive care.

7. **Additional support for the development of novel technologies**: It's important to support the development and validation of genetic tests to provide individual care to citizens.

needs that enable them to surpass cultural and language barriers while promote equity.

4P-CAN				
	1. Desire for continuity beyond a temporary project. 2. Lack of engagement from local healthcare professionals. 3. Low trust in the healthcare system and widespread disappointment. 4. Cultural barriers and resistance to change. 5. Limited local infrastructure and resources.	1. Barriers in local and regional implementation of European projects, often due to fragmentation and lack of coordination. 6. Excessive politicization of healthcare issues, including cancer, hindering effective action. 7. Poor integration between national initiatives and projects, leading to fragmented efforts and inconsistent outcomes. 8. Ineffective traditional (top-down) implementation of primary cancer prevention programs, compounded by limited long-term policy support.	1. Insufficient funding and resources, especially in Eastern Europe. 2. Difficulty aligning national priorities with EU health strategies in Eastern Europe. 3. Limited cross-border collaboration and data sharing	1. Identification of local influencers beyond the "usual suspects." 2. Deep understanding of local networks influencing cancer prevention and risk awareness. 3. Direct engagement with citizens for co-creation of tailored cancer prevention strategies. 4. Enhanced outreach to underserved populations through locally adapted interventions.

PIECES				
	1. **Limited resources**: There are insufficient financial and human resources at the local level to support the widespread implementation of prevention programs. 2. **Low awareness and stakeholder engagement**: Many local communities have low awareness of the importance of primary cancer prevention programs. Additionally, socioeconomic and cultural factors, such as low health literacy, complicate engagement with preventive measures. 3. **Lack of implementation expertise**: Many communities lack the local expertise to access, adapt and implement evidence-based cancer prevention programs effectively. 4. Despite a significant amount of research being conducted, **many interventions at the community level are not based on strong evidence** or lack the practical adaptation needed for real-world settings. This gap in implementation science knowledge at the grassroots level limits the ability to tailor programs to specific community needs and	1. **Funding limitations**: National health budgets often prioritize immediate healthcare needs over preventive care, making it difficult to allocate sufficient resources for long-term cancer prevention strategies. 2. **Inconsistent training and knowledge gaps**: Nationally, many implementers lack the necessary training and knowledge of implementation science, making it difficult to effectively roll out cancer prevention programs.	1. **Policy fragmentation**: At the EU level, inconsistencies in healthcare policies and cancer prevention guidelines hinder effective cross-border collaboration. Regulatory barriers and lack of uniform policies create challenges for scaling initiatives. 2. **Need for greater coordination**: More consistent collaboration across EU member states is needed to optimize the dissemination and implementation of best practices in cancer prevention. Furthermore, the lack of expertise in implementation science at the EU level hinders the effectiveness of scaling programs. 3. **Lack of standardization**: Varied definitions and understandings of "healthy lifestyle" and cancer prevention across EU countries complicate the harmonization of health campaigns and interventions. 4. Many evidence-based primary cancer prevention programs fail to publish the necessary materials and resources required for others to reproduce and scale interventions.	1. **Repository of Primary Cancer Prevention (PCP) programs**: PIECES has established a comprehensive, evidence-based repository that supports local adaptation and implementation of cancer prevention programs. This offers a significant opportunity to improve the uptake and success of primary prevention across various settings in EU. 2. **Expanding the repository**: Other projects working on cancer prevention programs, provided they produce evidence-based outputs, could be added to the PIECES repository. This would allow for a broader selection of programs that can be adapted and utilized by implementers across Europe and beyond, increasing the repository's utility and impact. 3. **Toolkit adaptation:** The PIECES PCP Implementation Toolkit (PCP-IT) provides a structured process for selecting and adapting cancer prevention programs to different local contexts, enhancing their relevance and impact. 4. **Cross-border collaboration**: There is a growing opportunity

contexts, often resulting in poor outcomes.		5. **Long-term infrastructure and support** for the PCP-IT toolkit is challenging due to the need for continuous updates, development, and EU-level funding mechanisms. Reliance on temporary funding makes it difficult to ensure sustainable infrastructure. PPP could be explored, but require substantial negotiation and coordination efforts across multiple stakeholders. 6. **Capacity building:** Establishing a permanent platform for training and upskilling implementation science practitioners across EU member states is essential but resource intensive. Without consistent funding and institutional support, it will be difficult to maintain the capacity-building programs needed to train healthcare workers to effectively use and adapt the toolkit. 7. **Data sharing/ethics requirements for non-medical research:** Complex ethical and regulatory standards impede effective data sharing and collaboration in non-medical research based in healthcare environments.	for EU-wide collaboration in cancer prevention, with PIECES acting as a model for implementing and scaling prevention strategies through cross-border cooperation.

PREVENT	1. **Sustaining and maintaining premises and infrastructure:** making structural changes and building the infrastructure needed for the schools (e.g. cafeterias, canteens, playground) and the change of obesogenic environment (e.g. lanes, parks, spaces for physical activity). 2. **Different attitudes towards ideal body weight and body image:** that causes lack of understanding from students and their families about the necessity to make healthier menus in schools. 3. **Unhealthy foods** are considered by parents as an act of love towards their children. 4. **Disadvantaged neighbourhoods with high vulnerability and conflict** have different perceptions about obesity. 5. **Students with different cultural backgrounds and different dietary habits** do not easily accept proposed changes for healthier food choices. 6. **Aggressive food marketing** and especially extensive promotion and marketing of ultra- processed food. 7. **Negative influences by the media.**	1. **Limited financial resources** for hiring and training personnel, purchasing materials and tools needed, continuing educational activities for teachers, parents and other targeted populations. 2. **Lack of coordination and cooperation** between relevant stakeholders for the successful implementation and evaluation of the intervention/policy. 3. **Unsuccessful dissemination efforts** in reaching all nutrition-related professionals. 4. **Lack of an organizational system to monitor** the implementation of the intervention/policy. 5. **Lack of actions** to raise awareness among parents and professionals.	1. **Limited financial resources** for hiring personnel, training personnel, and for long term infrastructure buildings. 2. **Lack of transnational collaboration and coordination.** 3. **Insufficient data sharing** between EU countries. 4. **No adequate research** available for providing **evidence on the effectiveness** of interventions/policies.	1. **Community-based interventions:** Community-based interventions that promote healthy lifestyles (such as urban gardens, family exercise programs, and fresh food markets) have proven effective. Involving schools, local governments, and families in these initiatives can be key to generating a positive impact. 2. **Early education in nutrition and health:** Introducing nutrition education programs in schools at an early age can form healthy habits that last throughout life. These programs should be inclusive, accessible and culturally adapted to the diversity of communities. 3. **Public policies and regulations:** Implement public policies that restrict the marketing of unhealthy foods aimed at children or limit their "intake" in spaces such as schools and/or subsidize fresh and healthy foods. Increase taxes on sugary drinks and/or ultra-processed foods.

Table 2. Common Findings and Agreed Insights from the Research & Innovation Working Group

Community-Level Challenges	National-Level Challenges	EU-Level Challenges	Identified Opportunities
• **Financial barriers:** Limited funding for preventive measures and promoting healthy lifestyle changes, followed by challenges in financing follow-up care and screening after medical interventions or treatments, as well as maintaining and further developing healthcare infrastructure. • **Low awareness of primary prevention:** General lack of awareness about the importance of primary prevention, with unclear and inaccessible messaging. • **Lack of targeted education programs:** "One size fits all" approaches do not work. There is uncertainty about at which level to start when educating the public. • **Cultural and social challenges:** Low health literacy and disengagement from healthy behaviours due to social and cultural factors, including social ties and networks. • **Preventive measures hesitancy**: Reluctance to adopt	• **Primary healthcare providers' high workload**: Primary healthcare providers, including general practitioners, are managing a heavy workload. Additional stakeholders are needed to support tasks related to preventive healthcare and patient education. • **Limited acceptancy of introducing new specialists in the healthcare sector**: Other health professionals and specialists face resistance when attempting to take over certain healthcare tasks. • **Occupational medicine involvement**: Employers and occupational health services are not sufficiently involved in national cancer prevention efforts. • **Lack of Healthcare provider education** in implementing preventive measures. • **Insufficient infrastructure**, including medical deserts, a shortage of specialists, outdated equipment, limited technological resources, and inadequate facilities for promoting a healthy lifestyle, such as physical activity and providing healthy school meals, hinders the implementation of	• **Implementation of evidence-based recommendations**: More needs to be done to implement evidence-based guidelines, especially in food-related health policies. • **Private sector influence**: Regulations are needed to ensure that the private sector promotes evidence-based healthy food choices, rather than profit-driven options. • **Inconsistent health campaigns**: Health engagement campaigns vary greatly across the EU, with insufficient collaboration on shared goals. • **Economic barriers**: Lack of economic incentives that encourage individuals and businesses to adopt and support preventive health measures. • **Unified EU-level policy adoption**: There is a need for the development of unified, evidence-based minimum recommendations at the EU level, enabling consistent adaptation and	• **Involvement of community leaders**: Engage and collaborate with community leaders, including healthcare providers, mayors, school principals, and sports clubs, to actively promote cancer prevention education and raise awareness to raise awareness and educate the public about preventive healthcare. • **Policymaker engagement**: Engage a broad range of national policymakers, including Ministries of Education, Health, and Finance, to support and advance the implementation of cancer prevention initiatives. • **Evidence-based advocacy**: Use robust, evidence-based data to advocate for policy changes at the EU level. • **Infrastructure support**: Encourage the development of infrastructure and financial incentives to support telemedicine, healthcare applications, and other essential services, such as modernizing healthcare facilities, improving internet

preventive actions like vaccines and screening tests.

- **Adaptability and acceptability issues:** Challenges in tailoring health information to meet the specific needs of diverse stakeholders and ensuring that it is both relevant and accepted by communities, considering varying cultural and social contexts.
- **Distrust in the healthcare system**: Scepticism toward the healthcare system, leading to lower engagement in prevention.
- **Fear of professional consequences:** Concerns about negative work-related outcomes when disclosing private health challenges.
- **Difficulty in engaging community leaders:** Difficulty in collaborating with relevant stakeholders (e.g., community leaders) to spread health messages through informal channels.
- **Technical barriers**: Limited internet access for healthcare applications, hindering the implementation of digital tools.

preventive measures and advancements.

- **Integrating new systems**: The healthcare system is slow to adopt systemic, integrated interventions such as telemedicine.
- **Tailored approaches needed**, particularly in cancer prevention.
- **Lack of prioritisation by national policymakers**: Prevention initiatives may receive less attention from national policymakers, who may be focused on short-term outcomes and immediate visibility in the social media.
- **Challenges in implementing a national cancer prevention plan**: In many EU countries, the absence of a dedicated national cancer prevention plan, combined with a lack of sufficient investment and funding, hinders the development and implementation of comprehensive cancer prevention strategies, limiting the effectiveness of long-term preventive measures.
- **Industry resistance**: Certain industries resist national health campaigns and preventive measures, particularly when policies affect their interests.

implementation into national regulations across all member states.

- **Inconsistency in the definitions (and understandings) of "Healthy Lifestyle" across EU countries** create inconsistencies in policy implementation.
- **Limited employer involvement in educational programs at the EU level**: Across the EU, employers are not sufficiently engaged in offering or supporting educational programs that promote employee health and wellness.
- **Lack of support for implementing new technologies at the EU level**: There is a need for greater financial and structural support across the EU to build a robust system for implementing telemedicine and healthcare apps.

connectivity in underserved areas, and upgrading outdated medical equipment across all EU member states.

- **Cross-country collaboration**: Create opportunities for EU countries to collaborate on defining and promoting healthy lifestyles, ensuring consistency in health promotion campaigns.
- **Education and awareness programs**: Promote national and EU-wide educational programs for employees and citizens to improve health literacy and engagement with preventive measures.
- **Enhancing message understanding and acceptance**: Develop clear, culturally sensitive communication strategies to improve public understanding and acceptance of cancer prevention messages, ensuring they resonate with diverse audiences and drive effective behavioural change.

2.2 POLICY RECOMMENDATIONS

In Table 3, each project suggests a few policy recommendations based on the input they have received in the first year.

Table 3: Policy Recommendations from Each Project

Policy Recommendations

CO-CAPTAIN	- Policies for integration of mental health and cancer prevention services: Promote the creation of integrated community health centres where mental health services and cancer prevention programmes are offered jointly. - This would reduce fragmentation of services and facilitate a comprehensive approach for patients. - Community education and awareness programmes: implement national education and awareness campaigns on the importance of early cancer detection and mental wellbeing, especially targeting vulnerable groups (youth, women, rural areas). - Low awareness is a key barrier to prevention, and these campaigns can help increase participation in preventive programmes. - Adequate funding for mental health and cancer prevention programmes: Increase public funding for mental health and cancer prevention programmes, prioritising attention to disadvantaged and rural communities. - Many countries do not allocate sufficient resources to these programmes, contributing to lack of access and health inequalities. - Expand the use of digital technologies and telemedicine: develop and promote telemedicine and digital health platforms to provide remote mental health consultations and cancer prevention services. - Digital technologies can facilitate access to health services in geographically isolated or resource-limited areas. - Creating psychosocial support networks for cancer patients: Establish nationwide patient navigation programmes, where trained professionals help patients coordinate their treatment and receive emotional support. - Patient navigation is key to reducing anxiety and improving health outcomes for people with cancer, especially in vulnerable populations. - Advocate for the creation of a unified cancer prevention and mental health policy across the EU, ensuring equity in access to these services regardless of country or region. - Different approaches and quality levels between EU countries lead to disparities in access and treatment, which could be addressed by a common strategy. - Encourage public-private partnerships in health: Encourage collaboration between governments, the private sector and NGOs to fund and develop technological and social innovations in cancer prevention and mental health. - Multisectoral collaboration can facilitate research, development and implementation of new public health solutions.

	- Gender mainstreaming in health policy: create specific policies that address gender disparities in access to cancer prevention and mental health services, especially for women in vulnerable settings. - Women face greater barriers to accessing these services in many countries, contributing to higher rates of premature mortality and health inequalities. - Increase investment in research that explores the interactions between mental health and cancer, as well as longitudinal studies that assess the impact of preventive interventions. A better understanding of these interactions can improve the personalisation of treatments and public health policies. - Policies for equitable access to palliative care and post-treatment support: establish clear guidelines to ensure that cancer patients at all stages of the disease have access to palliative care and post-treatment psychosocial support. - Palliative care is essential to improve patients' quality of life, and post-treatment support helps prevent mental health problems such as depression or isolation.
CPW	- To strengthen cancer prevention in the European Union, incorporate comprehensive cancer screening into mandatory occupational health surveillance, including screening for oncogenic infections like Helicobacter pylori (H. pylori), Hepatitis C Virus (HCV), and Human Papillomavirus (HPV). Implement regulations that mandate consistent health monitoring to facilitate early detection and enable preventive measures such as screenings, vaccinations, and treatments. - Foster safe work environments to reduce infection risks, address overall employee health, and provide opportunities for education about cancer prevention. Establish databases compiling occupational history, lifestyle factors, and clinical information to support personalized preventive medicine. - Ensure that privacy protections are in place to maintain worker confidentiality. Implement robust data security measures to balance effective health monitoring with individual rights.
ONCODIR	- Streamline the registration processes and broaden eligibility criteria for community-based prevention programs. - Establish outreach programs and mobile clinics to reach semi-urban and rural areas. - Develop tailored interventions-campaigns adequate to the health literacy levels of the targeted populations that properly address their health information needs. - Design and implement sustainable health education programs in different sectors covering multiple health issues. - Offer health information in multiple languages while culturally adjusted; special provisions are required when dietary guidelines are communicated. - Engage with community leaders from marginalized and vulnerable communities to create health programs that are truly inclusive. - Create support groups, peer networks and offer counseling by community health workers to shift away from the family influences.

	• Offer occupational preventive care programs that are flexible enough to accommodate different lifestyles as well as financial incentives for both employees' and employers' participation. • Incorporate effective health communication training in healthcare professionals' education. • Set up patient advisory councils across communities. • Offer counseling services for cancer-related anxiety and promote positive messaging on early detection and treatment. • Engage community leaders and help to broker partnerships between providers, businesses and other healthcare organizations. • Have more digital resources available at community level while encourage cultivating the digital health literacy competencies of individuals. • Educate businesses of all sizes about cancer prevention and create wellness programs. • Develop physical activity infrastructure and make it available at low or no cost. • Encourage the adoption of telemedicine by means of pilot projects, financial incentives and training. • Encourage the development and piloting of genetic tests. • Advocate for prevention initiatives, highlight long-term cost benefits, and provide economic incentives like tax credits and subsidies.
4P-CAN	• Prioritization of local and regional implementation actions using implementation research tools such as living labs • Promotion of social science tools for in-depth understanding of local environment (personal and social network analysis, NetMap, personalised communication model)
PIECES	• Encourage open access to program results, methodologies, materials and resources: National and EU-level bodies should encourage or mandate the publication of both positive and negative findings from implementation projects. This will help prevent duplication of ineffective strategies and enhance the knowledge base available for successful cancer prevention interventions. Moreover, evidence-based primary cancer prevention programs should include a full publication of materials and resources. These should be made openly accessible to allow other institutions, regions, and countries to reproduce and adapt these interventions. This will increase the scalability and broader use of effective programs. • Establish and maintain National and EU-level repositories for cancer prevention programs: In addition to the PIECES repository, policymakers should create or integrate national and EU-level repositories of evidence-based cancer prevention programs. The PCP Implementation Toolkit (PCP-IT) repository developed by PIECES could act as a reference or even be integrated as the primary tool for this purpose. This would enable cross-border sharing of successful interventions and support collaborative efforts to fight cancer across Europe. Such repositories should include comprehensive details on how to implement and adapt programs for different contexts, making them useful for stakeholders at all levels.

- Strengthen implementation science capacity: To improve the success of cancer prevention programs, local healthcare providers and policymakers need enhanced training in implementation science. National governments should invest in capacity-building programs that equip healthcare professionals and community leaders with the skills needed to adapt and implement evidence-based interventions . This will address the gap in local expertise and ensure more successful program adaptation at the community level.
- Allocate specific resources for program scalability and adaptation (before implementation): Policymakers should ensure that funding streams are aligned with the long-term goals of scaling successful prevention programs. This would involve allocating resources specifically for the adaptation, training and ongoing support of evidence-based programs at both the national and local levels.
- Developing a permanent, EU-wide platform for the training and upskilling of healthcare implementers is crucial for the successful use and adaptation of the PCP-IT toolkit. This capacity-building initiative should be supported with consistent funding and institutional backing. Additionally, a collaborative effort across member states is needed to standardize training programs and ensure that healthcare professionals are adequately prepared to implement cancer prevention programs using the toolkit.
- Fund and support cross-border collaboration: Encourage greater coordination between EU member states in cancer prevention efforts. Cross-border collaboration should be prioritized to ensure the effective sharing of best practices and the joint development of new interventions, helping address policy fragmentation and ensuring consistent preventive measures across the EU.
- EU should work toward harmonizing ethical and regulatory standards across member states. Establishing a unified framework that simplifies the ethical approval process while ensuring compliance with GDPR and other privacy regulations would facilitate more efficient data sharing. This could include the creation of standardized ethical guidelines and protocols tailored for non-medical research, which would enable smoother cross-border collaboration and foster innovation in cancer prevention programs.

PREVENT

Protected timeframes: Ban in all EU countries the broadcasting of advertisements for ultra-processed products during children's prime time viewing. Promote the consumption of fresh and seasonal products on television channels and social networks.

Engage community leaders and help create more and better spaces for physical activity that will be accessible to all and without cost.

Promote the use of digital tools for tailored interventions and implementation research.

Promote the collaboration between public and private sector in health and primary prevention.

Invest in educating stakeholders, health proffessionals, community about early cancer detection and the benefits of a balnced nutrition and physical activity in day to day life.

Develop a one-stop cancer information centre on prevention.

2.3 POTENTIAL IMPACT AND ADVANTAGES OF THE RECOMMENDED POLICIES

This section outlines the potential impact and key advantages of the recommended policies, focusing on how these policies can contribute to cancer prevention efforts, improve public health outcomes, and support sustainable healthcare practices.

CO-CAPTAIN:

- Cancer Prevention: Policies will promote early detection of cancer, thereby improving survival rates through awareness and education.
- Improving Mental Health: Integrating mental health care with cancer prevention will increase the quality of life and well-being of patients.
- Equity in Access to Care: Policies will reduce disparities in access to health services, ensuring quality care for all communities.
- Health System Strengthening: Implementation of patient navigation systems will improve the efficiency and quality of care in the health system.
- Cross-Sector Collaboration: Fostering collaboration across sectors will allow for a more integrated and effective approach in the fight against cancer and mental health.
- Awareness and Education: Awareness campaigns will increase knowledge about cancer and mental health motivating the population to seek medical care.
- Sustainability of Health Care: Prioritising prevention will help reduce the burden on health systems, promoting their long-term sustainability.
- Innovation in Healthcare: Investments in research and new technologies will enable more effective and personalised cancer treatments.
-

CPW:

Putting workers into the center of cancer prevention programs by involving them in mandatory occupational health surveillance might facilitate early detection and intervention for infection-related cancer. Public health outcomes might include reduced cancer incidence, improved HPV vaccination coverage, and safer work environments, potentially lowering healthcare costs and supporting sustainable healthcare practices. Such policy could also decrease the number of average sick days. The project will raise awareness of important risk factors for cancer and improve general health education of working population.

ONCODIR:

To make prevention programs more effective and sustainable it's imperative that we make them more accessible at local -community level through simplifying the registration process and expanding the eligibility criteria. It's also essential to reach remote and underserved populations through outreach programs and mobile clinics. Targeted communication campaigns need to be designed to address specific health literacy levels, using various channels like social media, community radio, and local newspapers, while comprehensive health education programs should be developed for schools, day care and senior citizens' centres, facilities for the disabled, and prisons, covering a wide range of health topics, sustained over time to reinforce learning. Additionally, providing multilingual resources and culturally sensitive dietary guidelines will ensure inclusivity and better health outcomes for diverse populations.

Adopting a "whole-of-society" approach by actively involving community leaders in health initiatives is crucial. Engaging community leaders from marginalized groups is key to promoting inclusive health programs. Establish community support groups & peer networks, and train community health workers to offer guidance and assistance, reducing the reliance on family for health-related decisions. Flexible prevention programs that accommodate diverse lifestyles, coupled with financial incentives, can encourage participation. Facilitating partnerships between community organizations, local businesses, and healthcare providers can enhance collaboration. Providing digital literacy training programs and ensuring the availability of digital resources at community centres will improve community members' competencies in using health technologies.

To improve patient-centered care, healthcare providers should be trained in effective communication and empathy whilst patient advisory councils should be established to involve patients in decision-making and build trust in healthcare services. Moreover, offering psychological support and counselling services for cancer-related anxiety, along with positive messaging on early detection and treatment options, can help reduce avoidant behaviors.

Promoting the adoption of telemedicine and other integrated healthcare systems through pilot programs, funding incentives, and training is essential. Advocacy for the inclusion of prevention initiatives in national health agendas, highlighting their long-term cost benefits, is necessary. Developing and funding comprehensive national cancer prevention plans with clear objectives and measurable outcomes, establishing accountability mechanisms, and engaging with industries to align health campaigns with their interests will support public health initiatives. Strengthening the implementation of evidence-based guidelines in food-related health policies, fostering collaboration among EU member states to harmonize health campaigns, and standardizing definitions of a healthy lifestyle across EU countries through educational campaigns are critical steps forward.

4P-CAN:

Recommendation 1: Prioritization of local and regional implementation actions using implementation research tools such as living labs

Potential Impact: Prioritizing local and regional implementation actions through **living labs** can significantly enhance the effectiveness of cancer primary prevention efforts by fostering **context-specific solutions**. Living labs encourage real-world experimentation, where local communities (local stakeholders and citizens overall) actively participate in the co-creation of interventions. This ensures that cancer primary prevention initiatives are not only scientifically sound but also aligned with the needs, behaviors and preferences of local populations. This approach allows for adaptive implementation, where solutions can be continuously refined based on feedback from the community, leading to **higher adoption rates** and long-term sustainability. Moreover, this approach is particularly crucial for rural areas and vulnerable populations such as the elderly and the Roma community, who are often hard to reach through traditional campaigns, including those promoting the European Code Against Cancer.

Advantages: One of the key advantages of utilizing living labs is the **engagement of diverse stakeholders**, using the pentahelix model: academia, public sector, civil society and business sector, highlighting in addition the key role of the orchestrator. By working collaboratively, these groups can better address specific challenges such as access to cancer primary prevention, cultural specificities, and local health system capacities. Furthermore, living labs create opportunities to **test and scale innovations** efficiently within a localized setting before broader implementation, reducing risks and enhancing the **transferability of successful interventions** to other regions. This method can support **more equitable health and care delivery** and improve **cancer primary prevention outcomes**, particularly in under-resourced areas.

Recommendation 2: Promotion of social science tools for in-depth understanding of the local environment (personal and social network analysis, NetMap, personalized communication model)

Potential Impact: The promotion of **social science tools** like personal and social network analysis, NetMap, and personalized communication models will enable a **deeper understanding of the social dynamics** within local communities (local stakeholders and citizens). These tools allow us to map out **key influencers** and networks that can play a crucial role in spreading health information and fostering behavior change. By leveraging these insights, cancer primary prevention campaigns can be **better tailored** to the specific cultural, social, and relational contexts of different communities, leading to more effective outreach and engagement (personalised communication model).

Advantages: A major advantage of these tools is their ability to **uncover hidden barriers and opportunities** within local environments, offering a more nuanced view of how individuals and institutions interact. This can be crucial for improving **communication strategies**, especially in regions where traditional approaches may have failed. Using personalized communication models ensures that messaging is more relevant and relatable, enhancing trust in healthcare initiatives. Additionally, this approach can support the **building of strong local coalitions of willing** that are critical for long-term sustainability, ensuring that cancer primary prevention efforts are deeply rooted in the community and supported by its most influential members.

PIECES:

The recommended policies for cancer prevention are expected to have significant positive impacts on public health, particularly in improving the scalability and effectiveness of preventive interventions. These policies provide a strategic framework that addresses current gaps in knowledge, resources, and collaboration across local, national, and EU levels. The following outlines the key advantages and potential impact of each recommendation:

1. By mandating the publication of both positive and negative results, along with the methodologies, materials, and resources used in cancer prevention programs, policymakers will enable greater transparency and accessibility. This approach will:

   o **Improve knowledge sharing**: Open access will allow stakeholders across regions to learn from successful interventions and avoid ineffective strategies, creating a more efficient and evidence-based approach to cancer prevention.

   o **Enhance scalability**: Making resources widely available will enable other institutions to adapt and reproduce evidence-based programs, increasing their reach and impact.

   o **Optimize use of research**: Policymakers and healthcare providers will benefit from a rich database of cancer prevention initiatives that can be adapted to local contexts, ensuring that valuable research translates into practical, effective actions.

2. The creation of centralized repositories for cancer prevention programs, with PIECES' PCP Implementation Toolkit (PCP-IT) serving as a reference or even as the primary tool, will:

   o **Promote cross-border collaboration**: These repositories will enable countries to share best practices and successful interventions, fostering collaboration across borders to combat cancer at an EU-wide level.

   o **Support evidence-based implementation**: Having a central repository will ensure that programs are based on strong evidence, enabling healthcare providers and policymakers to implement interventions that have been proven effective.

- o **Facilitate adaptation**: By providing detailed guidelines on how to adapt and implement programs in different contexts, these repositories will empower local implementers to customize interventions to meet the unique needs of their communities.

3. Investing in capacity-building initiatives that focus on implementation science will ensure that healthcare providers and policymakers can:
   - o **Improve program effectiveness**: Local healthcare professionals will have the necessary skills to adapt evidence-based interventions for their communities, leading to better health outcomes.
   - o **Address local challenges**: By equipping local stakeholders with training in implementation science, they will be better positioned to overcome local barriers, such as cultural or socioeconomic challenges, ensuring more successful program adaptation.
   - o **Sustain long-term impact**: Strengthened knowledge will contribute to the sustainability of cancer prevention programs, ensuring that they are effectively maintained and expanded over time.

4. Ensuring that specific funding is directed towards the scalability and adaptation of successful cancer prevention programs will:
   - o **Ensure long-term program success**: Programs will be more likely to succeed when they receive financial support not only for implementation but also for the necessary adaptation and ongoing evaluation.
   - o **Enhance program reach**: Dedicated resources will allow programs to be scaled more effectively across different regions, ensuring a broader population benefits from proven cancer prevention strategies.
   - o **Create sustainable healthcare solutions**: With sufficient funding, programs can be continuously improved and adapted to address emerging health trends, ensuring that cancer prevention efforts remain relevant and effective in the long run.

5. Prioritizing cross-border collaboration will:
   - o **Reduce policy fragmentation**: Harmonizing cancer prevention efforts across EU member states will lead to more consistent policies, improving the overall effectiveness of preventive measures.
   - o **Accelerate innovation**: By fostering collaboration among countries, new and innovative cancer prevention strategies can be jointly developed and shared, ensuring that best practices spread rapidly across the EU.
   - o **Strengthen the EU's position in cancer prevention**: A unified approach to cancer prevention will reinforce the EU's leadership role in public health, setting a strong example for global cancer prevention efforts.

PREVENT:

By proposing primary targeted, multi-actor and context-aware interventions along with respective engagement policies for weight control management during childhood and adolescence (closely related with diet and physical inactivity), reduces the incidence of cancer in adulthood. Focusing on early education and awareness in community level and in health professionals, increases user acceptability of the delivered primary interventions, issuing improved counselling and guidelines, and engaging upscaling of the proposed interventions. The recommendation on a cancer information centre will contribute to open science repositories, develop collaborations with other EU initiatives as well as exchange knowledge and expertise with similar research initiatives.

2.4 COMMONLY RECOMMENDED POLICIES

This section presents the commonly identified policy recommendations agreed upon by the various projects. These policies reflect shared priorities and strategies aimed at addressing cancer prevention at the community, national, and EU levels. The recommendations are designed to be scalable and adaptable, fostering collaboration across sectors to promote effective and sustainable cancer prevention measures.

1) Community education and awareness programmes: implement national education and awareness campaigns on the importance of early cancer detection especially targeting vulnerable groups (youth, women, rural areas). Design and implement sustainable health education programs in different sectors covering multiple health issues.

2) Fund and support cross-border collaboration: Encourage greater coordination between EU member states in cancer prevention efforts. Cross-border collaboration should be prioritized to ensure the effective sharing of best practices and the joint development of new interventions, helping address policy fragmentation and ensuring consistent preventive measures across the EU.

3) Encourage the development of infrastructure and financial incentives to support telemedicine, healthcare applications, and other essential services, such as modernizing healthcare facilities, improving internet connectivity in underserved areas, and upgrading outdated medical equipment across all EU member states.

4) Fund and support cross-border collaboration: Create opportunities for EU countries to collaborate on defining and promoting healthy lifestyles, ensuring consistency in health promotion campaigns.

5) Establish and maintain National and EU-level repositories for cancer prevention programs: This would enable cross-border sharing of successful interventions and support collaborative

efforts to fight cancer across Europe. Such repositories should include comprehensive details on how to implement and adapt programs for different contexts, making them useful for stakeholders at all levels.

6) Harmonizing ethical and regulatory standards across EU member states. Establishing a unified framework that simplifies the ethical approval process while ensuring compliance with GDPR and other privacy regulations would facilitate more efficient data sharing. This could include the creation of standardized ethical guidelines and protocols tailored for non-medical research, which would enable smoother cross-border collaboration and foster innovation in cancer prevention programs.

7) Encourage public-private partnerships in health: Encourage collaboration between governments, the private sector and NGOs to fund and develop technological and social innovations in cancer prevention and mental health. Multisectoral collaboration can facilitate research, development and implementation of new public health solutions.

3 CONCLUSION

In conclusion, this first policy brief tried to formulate recommendations based on the opportunities identified during the first research phase of each project. Our collaborative efforts aim to contribute on the fight against cancer with measures that are easy to adapt, upscale and promote cross-sector collaboration in national and European level, facilitating research and innovation in future cancer prevention programs.

As the projects continue growing, recommendations would be formulated in even more specialized level addressing cancer prevention always in an evidence-based manner.

PREVENTION and EARLY DETECTION CLUSTER