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Intermediate update on the educational and training plans

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SP2.D6.3 Intermediate update on the educational and training plans

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Publishable Summary

The WP6 “Education, Training and Career Pathways” in Spoke 2 (SP2) coordinates all educational, training, and retraining initiatives, profiled on the SP2 research activities, following a coordinated effort with the WP6 of Spokes 1 and 3. The main aim is to address the lack of researchers and healthcare personnel qualified to use digital skills in the context of health prevention (from the primary across the other levels) and public health.

This intermediate report (Deliverable 6.3) presents an update on the implementation status of the educational and training plans under SP2-WP6, built up on the framework described in Deliverables 6.1 (mainly focusing on higher education programs) and 6.2 (focused on advanced training and professional retraining). The integrated strategy developed in these documents reflects the need for a comprehensive and sustainable model to strengthen digital competences in the healthcare sector, from university higher education to professional lifelong learning pathways.

1. Advanced Education

The Advanced Education section outlines the implementation and progress of higher education initiatives that support the digital transition in public health and primary prevention. These initiatives are designed to enrich postgraduate training opportunities and doctoral programs, equipping students and early-stage researchers with essential and advanced digital and computational skills, in alignment with the strategic goals of the DARE project.

To ensure a comprehensive and up-to-date overview of the educational initiatives across the Spoke 2 network, a dedicated survey was disseminated among all involved partners. This census aimed to collect structured information on the educational activities already implemented, those currently ongoing, and the courses and programs planned for activation within the framework of DARE. The data collected have been instrumental in updating the mapping of educational offerings, highlighting areas of synergy, identifying potential gaps, and informing the strategic alignment of WP6 educational pathways.

Based on the results of the survey, these programs will be developed in close coordination with the Scientific Committee and the partner universities, which play a crucial role in designing the courses, selecting instructors, and ensuring academic quality. This section details the most relevant and promising educational initiatives that have emerged from the survey.

1.1. Summer School on Digital Health

Following the previous editions, a Summer School on Digital Health will be organized in 2026 by the University of Palermo (UNIPA), in face-to-face format, with the objective of providing an intensive, interdisciplinary training experience aligned with the scientific goals of the DARE project.

The program will be open to postgraduate students, PhD candidates, early-career researchers, and professionals from the academic and healthcare sectors involved in the DARE consortium. It will be structured around a combination of lectures, interactive workshops, and case-based discussions, focusing on both theoretical and applied aspects of digital health and prevention, from the primary level across the other levels.

The Summer School will cover:

- Specific topics from Spokes 1, 2, and 3, providing an integrated view of the digital health strategies across the different domains of the DARE project;
- Needs and challenges of primary, secondary, and tertiary prevention, with a particular focus on community-based primary prevention, consistent with the mission of Spoke 2;
- Data-driven approaches and data management in healthcare, emphasizing the use of real-world data, interoperability between demographic, health, environment, climate data sources and flows, use of digital infrastructures and solutions for prevention, epidemiological

surveillance, and population health management based on the stratification of the risk to develop preventable diseases, while supporting at the same time the policy making level in the view of One Health approach.

- Interdisciplinary sessions on privacy and ethical issues, certification pathways for health device software, and the translation of digital technologies on the preventive and policy fields.

The Summer School will contribute to strengthening the digital competencies of participants, while fostering inter-spoke collaboration, and it will promote a shared understanding of the innovations developed within the DARE ecosystem. It will also represent a key opportunity to disseminate best practices, explore emerging challenges, and engage a new generation of professionals in the transformation of public health and prevention policies through digital tools.

1.2 Post Graduate Courses

Basing on the DARE experience, UNIPA updated the programs of the II level Master Course in Organization and management of health facilities and services. More in depth, topics on health promotion, health prevention, population-based prevention, diseases' surveillance systems, were refocused on digital health prevention, emphasizing the added value of digital tools and solutions to improve access to preventive services (i.e. vaccinations and oncological screening programs). Moreover, the impact on the national health system, both in terms of effectiveness and sustainability, of the digital health prevention, as declined by the DARE initiative was highlighted using case studies on technologies allowing interoperability between demographic, health, environment, climate data sources and flows, to provide evidence for population health management based on the risk profiling of the different communities by using AI methods while following the One Health approach. To this end, in-depth focuses were dedicated on the privacy and ethical issues in the era of health digital transition and interoperability. Lastly, SP2 DARE digital tools and solutions were contextualized in the digital framework supported by the PNRR (European Union Recovery Fund) interventions.

In the same direction, DARE researchers from UNIPA contributed to the definition of the digital health curriculum within the national PhD Course in Precision Medicine, led by UNIPA, including the research topics on digital health prevention developed within DARE Spoke 2. PhD candidates recruited through the DARE initiative are fully involved in the research activities conducted within a selection of the SP2 pilot projects.

Lastly, UNIPA has started the process to renew the existing Memorandum of Understanding (MOU) between the Department of Pediatrics - Division of Biostatistics and Epidemiology in the University of Cincinnati College of Medicine (DP-UCCOM) and the Department of Health Promotion, Maternal and Infant Care, Internal Medicine and Medical Specialties University of Palermo (PROMISE - UNIPA) to strengthen the cooperation on developing research, educational, and training initiatives of mutual interest. New topics dealing on digital health prevention, AI, interoperability, bigdata

analysis, were added and the effects of MOU will be extended to the entire UNIPA community. Moreover, an exchange teaching program will be implemented. In this collaborative framework, discussions to activate an international PhD course in Digital Public Health and Management are ongoing between the two institutions.

Among the postgraduate education initiatives carried out within WP6 of Spoke 2, the University Hospital of Catania (AOUPCT), in collaboration with the University of Catania (UNICT), has organized an academic seminar on “Artificial Intelligence in Public Health: from Strategies to Implementation.” The event aimed to provide an overview of the potential applications of Artificial Intelligence (AI) in the field of Public Health and to stimulate reflection on the opportunities and challenges of integrating such technologies into healthcare systems.

The seminar, attended by over 200 participants, addressed the following objectives:

- Presenting the transformative potential of AI in Public Health, from policy planning to operational implementation.
- Exploring key application domains such as epidemiology, disease prevention, diagnosis, and healthcare management.
- Discussing the ethical, legal, and organizational challenges associated with the implementation of AI-driven systems in public health practice.

Building on the success of this initiative, it has been planned to replicate and expand the seminar into a broader educational program, which will also include online courses, designed in collaboration with other Spoke 2 partners and scientific societies. This future academic course will focus on essential skills in biostatistics, epidemiology, and medical coding, with the goal of strengthening methodological competencies and fostering the integration of AI and big data analytics in population-based cancer surveillance and prevention. A focus will be also dedicated to a specific training for cancer registry operators.

2. Enhancing and Supporting Human Resources

This initiative contributes to the strategic objectives of DARE by reinforcing the digital skillset of public health professionals, while promoting a culture of digital evidence-based decision-making, and interdisciplinary collaboration. More in details, the Task 6.3 “Enhancing and supporting human resources” was developed in the direction of delivering the advanced training activities mentioned in Task 6.1 “Establishing Education, Research and Career Pathways” and Task 6.2 “Professional retraining and advanced training courses”, specifically addressed to newly hired and DARE workforce. Herein are presented the educational, training, and retraining activities:

2.1. Educational, Training and Retraining Courses on Digital Health Prevention

As part of its commitment to digital capacity-building in the field of public health, SP2 has developed two asynchronous distance learning (FAD) courses on digital prevention, which are scheduled to be launched by the end of 2025. These courses are being developed in collaboration with Fondazione HEAL Italia and with the involvement of relevant scientific societies, starting with the Italian Society of Hygiene, Preventive Medicine and Public Health (SIItI).

The first course, titled “Digital Health and Artificial Intelligence for Prevention and Precision Medicine”, was structured into five modules (32 hours of training plus a 2-hour interactive session), with the aims to:

- Offer a structured overview of digital health ecosystems and innovations and their role on public health policies and national strategies such as the PNRR;
- Introduce the fundamentals and applications of Artificial Intelligence in healthcare, focusing on primary prevention moving towards the other prevention levels;
- Address the ethical, legal, and cybersecurity challenges related to AI and data use in public health and prevention, including GDPR, AI Act, and EHDS;
- Explore integrated digital infrastructures, predictive models, and AI-enhanced surveillance systems (e.g., population-based registries, environmental monitoring, lifestyle data, etc.);
- Examine practical applications such as digital vaccination strategies and personalized prevention pathways against noncommunicable diseases.

The second course, focusing on “Data Governance and Privacy in Digital Lifelong Prevention and Precision Medicine”, was structured in six modules (25 hours plus a 2-hour interactive session) with the aims to:

- Deepen understanding of the regulatory framework for public health (health promotion, health prevention, health surveillance, etc.) data management, with a specific focus on the GDPR and EHDS;
- Analyze the legal implications of AI-based tools in public health (health promotion, health prevention, health surveillance, etc.) and the concept of dynamic consent;
- Provide practical tools for secure and ethical data handling, particularly in the context of preventive and personalized medicine;
- Address cybersecurity, digital identities, and secondary data use for public health research.

Both programs will be delivered through a FAD platform and will feature contributions from leading experts in public health, digital law, epidemiology, AI, and biomedical informatics. These initiatives are fully aligned with the objectives of WP6 and represent a concrete step forward in building a digital-ready public health workforce.

Within the framework of WP6 in SP2, a portfolio of training and retraining activities will be developed in collaboration with the GIMBE Foundation, leveraging its consolidated expertise in professional education and in the delivery of distance learning through synchronous online modalities. These courses will be offered via the coordinated activities provided by SP2 lead. This format allows the involvement of a broad and diverse audience of health professionals, researchers, and early-career academics, supporting continuous professional development in an accessible and scalable way.

A core element of this initiative is the adaptation of educational contents originally designed within SP1 to the thematic priorities of SP2. Courses developed and successfully implemented in SP1 (e.g., bibliographic research methods using biomedical databases, and the GRADE methodology for evaluating evidence and formulating recommendations) were revised and contextualized to strengthen their relevance for community-based digital primary prevention (i.e., health promotion, health prevention, and health surveillance). In particular, the adaptation ensured that methodologies for evidence synthesis, appraisal, and reporting are explicitly applied to prevention strategies and digital health interventions relevant to population and community settings.

In addition to these adapted activities, new modules will be introduced to address emerging cross-cutting themes, most notably the role of Artificial Intelligence (AI) in digital primary prevention. This introductory component will provide a broad overview of AI applications, explicitly linked to the domains of SP2: health promotion (AI-driven tools for tailoring preventive campaigns), health prevention (predictive modelling of risk profiles at population level), and health surveillance (AI-enhanced systems for real-time monitoring of health indicators).

The resulting courses emphasize:

- Evidence-based approaches to prevention and public health interventions, with a particular focus on community-based primary prevention (health promotion, health prevention, health surveillance, etc.);
- Digital competencies relevant to the use of real-world data, including health information systems, data literacy, and digital decision-making;
- Interactive and modular online formats, enabling flexible access and self-paced learning;
- Continuous professional development, with particular attention to the upskilling and reskilling of the current public health workforce.

All courses will be designed to encourage active participation and will be periodically updated to reflect evolving needs, new methodological standards, and technological developments identified within SP2. The training portfolio is co-designed with public health experts from SP2 and continuously revised to align with the emerging needs and technologies of the DARE ecosystem.

In this way, the initiative consolidates the integration between Spokes 1 and 2, while at the same time reinforcing the identity of SP2 as a hub for training in community-based digital primary prevention. By combining GIMBE's track record in evidence-based training with the innovative

scope of DARE, the programme aims to upskill and reskill the public health workforce, fostering a shared culture of digital prevention and supporting the long-term sustainability of health system transformation.

3. Educational Platform and Certifications

As BI-REX is partner of SP2, WP6 has followed the route tracked by SP1 using the specific learning environment called “LearningFlix”, conceived to provide specific innovative didactic multimedia approaches dedicated to education and training through collaborative learning (i.e., debates, case studies, simulations and live interaction with learners). This system allows for delivering certified educational and training pathways (courses and seminars) using the ECTS system (credits can be provided where appropriate) and open badges for shorter courses, previously recorded and supported by the access to didactic materials available in the private area.

In addition, WP6 in SP2 has engaged a cooperation with a further technological partner to use its know-how on innovative virtual and immersive education and training tools in support of advanced educational and training activities.

4. Conclusions

The dual dimension of WP6 — advanced education and professional training — is central to the mission of the DARE project: enabling a digital transition in public health, fostering human capital growth, and ensuring equity in access to innovation. In this context, the educational efforts presented have not to be merely considered as a set of isolated actions, but part of a wider, evolving system aligned with national and European Union goals for health system transformation.

The proposed higher education strategy focuses on enhancing university postgraduate curricula, PhD programs, and international learning opportunities, including summer schools and specialized master’s degrees. These initiatives were designed to equip new generations of researchers and public health professionals with essential and advanced digital skills — ranging from epidemiological surveillance to computational health data analysis — according to the principles of One Health. Furthermore, the establishment of new academic pathways and the strengthening of inter-university collaborations would play a key role in building a common educational ecosystem on digital prevention across the DARE consortium.

On the other hand, the proposed groundwork for public health professional training and retraining initiatives were addressed both to the DARE workforce and to a broader population of healthcare professionals, including newly hired personnel. These activities were designed to be agile, scalable, and inclusive — leveraging hybrid formats and asynchronous modalities to ensure flexibility and responsiveness to specific training needs.

While preserving the synergy with the other two DARE Spokes, particularly in relation to interdisciplinary training formats, ethics and data governance, and the promotion of a prevention-oriented digital culture, next steps will include to extend the coordination effort to the educational and training activities provided by the partners leading the projects funded by the SP2 cascade funding call.

In conclusion, Deliverable 6.3 marks a key milestone in the implementation of WP6 activities in SP2, consolidating the progress achieved and paving the way for the next steps. While much has been accomplished, the work ahead remains critical to ensure that education and training remain aligned with the evolving challenges of digital public health and prevention. As such, the WP6 team is committed to continuous monitoring, improvement, and integration of the educational and training portfolio within the broader objectives of the DARE project.