

BD₄QoL

BIG DATA FOR QUALITY OF LIFE

Newsletter #5 January '23 – June '23

1. ABOUT THE BD4QoL PROJECT

BD4QoL aims at **improving head and neck cancer survivor's Quality of Life** through person-centred monitoring, post-treatment support and personalised follow-up.

BD4QoL takes advantage of **technologies for social communication and unobtrusive personal monitoring** embedded in smartphones to **improve head and neck cancer survivor's Quality of Life**. Physical activity, social interactions, sleep, and health data are automatically collected by a mobile app for over two years after treatment and will be analysed to early intercept quality of life deterioration and health risks.

The project will last until December 2024. Would you like a closer look on how BD4QoL works and is implemented? See the project's presentation video: <https://youtu.be/90YmWxtytn0>

Give a look at the BD4QoL [leaflet](#) and [presentation](#) to know more about the first projects results!

For more information about BD4QoL, visit: www.bd4qol.eu

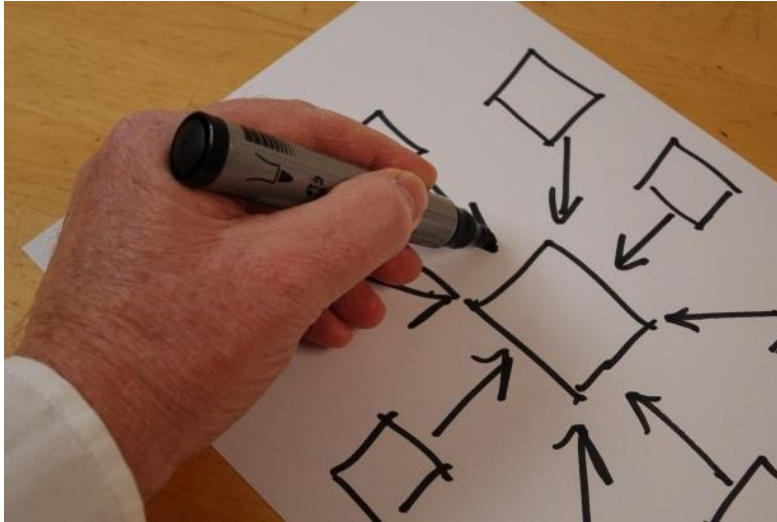
2. BD4QoL NEWS&EVENTS

2nd Technical review

The whole BD4QoL consortium underwent the 2nd Technical Review on March 13th. The Project Officer and the reviewers positively evaluated the work completed so far and provided us with recommendations on how to further improve it. We would like to thank them for a very interesting discussion and a constructive feedback.

As stated in the final report Project has achieved most of its objectives and milestones for the period with relatively minor deviations.

MME contributes to BD4QoL Market Study



As part of the project workplan, the BD4QoL Consortium is reflecting on the best mechanisms to disseminate and exploit the new knowledge that the project is producing, in order to increase the impact of its results for the benefit not only of Consortium's partners but also of the European society as a whole.

MME contributed to this effort by formulating two specific elements of the BD4QoL Market Study: the outline of the value proposition and the identification of the addressable market segments.

The value proposition for BD4QoL has been articulated around 7 different bundles of the basic project components (i.e., mobile apps, PoC application, chatbot, models, etc.) that represent self-contained solutions for targeting specific needs in cancer survivorship management, such as data collection and visualization, patient motivation and self-management, follow-up monitoring and alerting, prediction of QoL decay, etc.

The above bundles have then been compared to the unmet needs in the current market landscape, and relevant market segments most likely to benefit from the BD4QoL proposal have been identified, including patients and caregivers, healthcare providers and payers, healthcare authorities, pharma companies, patients' and medical associations, service providers.

The depth and breadth of this work will allow to proceed to the next step that, jointly with the competition analysis conducted by other partners, would allow to develop an effective business plan, for ensuring the full exploitation of project results.

A new study from Lombardy to surgically treat inoperable tumors



Policlinico di Milano, Vimercate Hospital and Ancona Hospital are united against cancer in a study related to tumours regarded as inoperable (25% of the total).

The research, conducted in cooperation with other European health centers, has been published in *Cancers*, among the most important scientific journals in the domain: it has been based on a study of clinical stories of 290 patients who were declared non suitable for surgery.

After specific chemotherapy cycles 24% of those patients could be declared suitable to surgery.

Such a result could be reached thanks to the strict cooperation between Surgery and Oncology Departments of Vimercate Hospital, who promptly reevaluated the possibility of an intervention on the basis of new modified patients' conditions.

More info can be found on lombardiaspeciale.it.

Data security and privacy



On April 7, the International Health Day was celebrated. Personal data relating to health are considered as a special category and therefore specially protected. At the BD4QoL project, we are aware of the importance of treating the most sensitive data correctly.

BD4QoL considers and addresses ethical and legal aspects related to sensitive data collection, supervised remote patients' support by Point-of-Care (PoC) physicians and data transfer and integration, under privacy and security regulations established by General Data Protection Regulation (GDPR).

Data Protection Officers (DPOs) at participating hospitals, data management institutions and organizations (including industrial partners and SMEs, and Lombardy Region) are actively involved under the supervision of the Coordinator in the management of Ethics.

Inetum complies with all requirements relating to the processing of health data as set out by all ethics committees, and in particular the UK IRAS. Moreover, strict perimeter security tests have been carried out on the datacenter, and no vulnerability has been found at either the infrastructure or application level.

Among the deliverables that have been made during the project in terms of privacy and security we highlight:

- Agreement for sharing and use of confidential information and Data
- Privacy protection and ethics management specifications
- Data Protection Impact Assessment (DPIA)

Using Latent Class Analysis to define profiles of H&N cancer patients



SEPI partner started to exploit the new occupational dataset, which was built as a product of the project.

This longitudinal dataset comes from the linkage of socio-demographic information, employment and health data of a cohort of residents in Turin (Piedmont, Italy) from 2008 to 2020.

It is possible to select head and neck (H&N) cancer cases based on hospital discharges and outpatient visits, and to follow each person over time to see what happens in terms of employment in the following years.

With the aim of defining profiles of H&N cancer patients within the cohort, considering sociodemographic and health variables SEPI is testing a Latent Class Analysis (LCA).

LCA is a statistical procedure used to identify a set of mutually exclusive classes of objects (where both the number of classes and their properties are unknown), based on a set of observed variables. It can be considered an «advanced» clustering tool since it deals with all types of data, even dichotomous or categorical variables. Starting from a dataset of N units, K classes of units are identified with a similar pattern with respect to the observed variables introduced in the model.

BD4QoL attended CS_AIW meeting



BD4QoL participated in the CS_AIW meeting (Cancer Survivorship – AI for Well-being) held in Madrid. This cluster meeting gathers members from 11 EU projects, working on digital solutions for cancer patients' healthcare. The common aim of the cluster members is to address how technology can better support cancer patients to improve their mental health, well-being, and their overall quality of life.

This collaborative space was very valuable. We put in common lessons learned, shared best practices, and experiences regarding clinical trials, aiming for a shared user-center approach from

the perspective of cancer physicians, clinicians, SMEs, technology and data experts. The CS_AIW cluster joins efforts to bring technological advances forward to support cancer survivors, especially using AI-driven solutions, by addressing common factors such as possible side effects or symptoms, and individual life experiences that range from changes in relationship dynamics to new psychological needs.

CSS presented BD4QoL in two Italian workshops



BD4QoL has been presented by the CSS team in two relevant meetings held on May 2023, the "Hot Topics in Head and Neck Oncology" congress organized by the Policlinico and University of Bari and the Salone Internazionale del Libro held in Turin. During the first event, which gathered many members of the Italian community of Head and Neck surgeons, the project was presented as one of the most innovative research initiatives aimed at collecting valuable real-time data to predict quality of life in patients with head and neck cancer. The presentation concentrated on the general aspects of the protocol and on the way in which technology can help these patients to stay engaged for achieving an optimal quality of life.

During the second event, an international book fair which every year gathers nearly 200,000 visitors, the main characteristics of the BiDi chatbot has been presented in the context of a talk focused on how digital technologies are impacting on clinical research.

Dissemination of BD4QoL project scope and results within the scientific event held in Ioannina, Greece about Smart-Health



A scientific event on SMART HEALTH was held in Ioannina on May 26, 2023. Organized by the Speech Therapy group at the University of Ioannina, the event showcased the "Smartspeech" project. This project focuses on developing an expert system for automating the diagnosis of learning and communication disabilities in children. The project utilizes continuous data collection from kids

through a serious animation tablet game and a smartwatch for biodata gathering. The event included talks on key enabling technologies like IoT, sensor-based data collection, and Artificial Intelligence. Academic professionals, students, and health-related experts attended the event. Dr. Despina Elisabeth Filippidou from DOTSOFT presented the BD4QoL project, and Mr. Stavros Katsaridis demonstrated the mobile apps developed in the project. There are many questions in relation with the added values of nowadays health remote management systems, as well as the possibilities of AI in empowering patients in their journey to become healthier.

Measuring behaviour for patient self-empowerment: Android vs iOS platforms



One of the results of the BD4QoL market analysis has been the appreciation of differences existing among the two major mobile OS platforms – iOS and Android – when it comes to behaviour measurement, which is needed to implement several mHealth applications that target patient empowerment and self-care.

This can be seen, for instance, by examining toolkits that have been specifically implemented to allow such measurement. Three of them are:

- [Funf Open Sensing Framework](#), a ready-made platform for conducting data collection experiments ranging from health and wellness, social and psychological studies. It allows the collection of sensors data such as location, movement, phone use, social proximity and performs data transfer to selected data repositories for data analysis, visualization and notifications. The platform is only available for Android OS
- [Radar-Base](#), allows passive collection of user's behavior data from a number of mobile smart devices (smartphones, smartwatches, wristbands etc.) for both iOS and Android. The platform collects data from movement sensors, light sensors, phone interaction (on-off; use of applications), social activities (SMS log, number of contacts in agenda, number of Bluetooth devices connected), weather. However, for iOS most of the data cannot be collected in background, as needed by BD4QoL, and two data categories, necessary for BD4QoL (App usage and Phone logs, needed for social activity estimation) cannot be collected at all (see figure)
- [Beiwe](#), is specifically designed to collect high-throughput data from smartphones, both iOS and Android. This open-source platform supports collection of a range of passive data including accelerometer, GPS, power state, phone usage, screen on/off, identifier, wi-fi connections, Bluetooth connections, proximity, gyro, magnetometer, device motion, reachability. However, limitations similar to those mentioned for Radar Base do apply, as they depend on intrinsic limitations of the different mobile OSs.

For the above reasons, BD4QoL decided to support only Android phones and to develop a custom mobile app, that overcomes additional limitations that affect this OS too, especially when a large number of models, including the less modern ones, need to be supported.

Maternity beyond disease



Favouring maternity beyond diseases that once used to be considered as an obstacle to parenthood: this is an important project taking place in Lombardy at the IRCCS San Matteo in Pavia along with local university.

The Regional Minister for University, Research and Innovation Alessandro Fermi declared: "we look with great interest to the research applied in the health sector, which aims to make healthcare closer to people.- To reach this goal we aim at providing more effective care thanks to themany researchers working in our hospitals."

Thanks to the initiative many young women and men, affected by different types of cancer affecting reproduction, may cryopreserve gametes.

It is an important starting point giving hopes concerning future life on the reproductive level, even though much still has to be done at targeted research. As such, likelihood to become parents even after cancer affecting reproduction has consequences on the quality of live of those patients who have been treated effectively.

3. BD4QoL PUBLICATIONS

Do you want to know more about the first outputs of the BD4QoL project? Have a look at [deliverables published](#) by BD4QoL project so far!

4. BD4QoL activities on social network

BD4QoL social channels are constantly updated with all the **latest news**. Follow us for more updates!

- [Twitter](#)
- [Instagram](#)
- [LinkedIn](#)
- [YouTube](#)