Deliverable 1.1 - Report on key factors, drivers, barriers and trends on digital health literacy

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List of Abbreviations

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<td>D</td>
<td>Deliverable</td>
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<td>WP</td>
<td>Work Package</td>
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<td>DHL</td>
<td>Digital Health Literacy</td>
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<td>HL</td>
<td>Health Literacy</td>
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<td>MOOC</td>
<td>Massive Open Online Course</td>
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<td>R&amp;D</td>
<td>Research and Development</td>
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<td>DG</td>
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<td>ICT</td>
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<td>WHO</td>
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<td>OECD</td>
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Executive Summary

To prepare a solid base for the design and use of MOOCs, the first activity foreseen in WP1 is to perform a review of the literature on key factors, drivers, barriers and trends on Digital Health Literacy. The purpose of this report is to carry out an analysis of current drivers and barriers affecting digital health literacy, with an attention to the identification of evidence-based digital health promoting factors and use of health information online. To produce this document, all IC-Health partners were involved in various tasks in order to contribute with their personal knowledge and expertise to extensively cover the various topics under investigation, and an extensive review of the literature was conducted in collaboration with all partners.

The aim of this work is therefore to set the scene and draw boundaries for future project activities by providing an easy and accessible material on current available data and evidence on the topic of Digital Health Literacy (DHL) relevant to IC-Health approach and conceptual model.

Here follows the list of sections included in the current report, along with a brief description:

1. **Introduction** - this section sets the scene for current report, providing the background of the IC-Health project, and a description of the methods used to produce the report. Also, limitations are discussed regarding the methodology used and the representativeness of results presented in the report.

2. **Initiatives of the European Union towards health information on the Internet** – this section comprises two sub-sections, one covering EU actions derived from policy frameworks (e.g. Digital Scoreboard, EU eHealth Action Plans, etc.), and the other providing a brief overview and reference list to EU funded projects relevant to Digital Health Literacy. This chapter is intended to offer the reader an overview of already exist at the European level which could be relevant to the project purposes.

3. **Definitions and models of Digital Health Literacy** – this section covers the foundational theories and conceptual models in the field of eHealth and DHL, also providing more recent proposals for the development of more advanced comprehensive models. The original model of DHL (Lily model) is presented, along with a description of all its aspects. Other models, all of which originated from the original Lily model, are also discussed.

4. **Definitions and models of Digital Literacy** – this section is intended to provide an integration and a complement to the previous chapter, by presenting existing conceptual models of Digital Literacy (in this case the digital mean is not intended to be used for health-related purposes). Several conceptual models are presented, including the European Commission DigComp 2.0. Finally, the chapter discusses the relation between Digital Literacy and DHL models, and the need to integrate those views for project purposes.

5. **Current measures of Health Literacy and Digital Health Literacy** – this section presents a brief overview of existing measures to assess both Health Literacy and Digital Health Literacy. It must be noted that a limitation to IC-Health project is the
current unavailability of validated tools to provide an objective DHL measure. Also, this chapter discusses limitations of current measurement tools.

6. **Relevant findings in recent surveys on digital health** – this section presents a selection of relevant findings from relevant international surveys conducted in about digital health and consumers’ search for online health information. While these results are not original to the IC-Health project, there are several purposes in presenting these surveys here: first, results from previous surveys help to better understand the current situation, trends and future development in the field of DHL; second, they may help in better designing future project activities, including the design of the IC-Health survey.

7. **DHL barriers and drivers relevant to IC-Health proposed approach** – this section covers the different aspects of IC-Health approach and conceptual model of Digital Health Literacy, by discussing current evidences and important aspects relevant to: 1) achieving IT literacy, 2) achieving health literacy, 3) appraising online health information, and 4) applying online health information for health management in everyday life. Each aspect is explored by presenting results from existing studies collected during the literature review process, and discussed in relation with the project aims, in particular with the development of IC-Health MOOCs.

8. **Implications for practice and project purpose** – this section is intended as a practical reference summary of all those elements of the current report that were considered as most important for practical use in the context of IC-Health project. These elements have been selected based on review findings and partners’ suggestions and represent a selection of elements that should be carefully considered for the future development and implementation of IC-Health project activities.

9. **Country based research on DHL and DL actions and policies** – this section provides an overview of findings from an original IC-Health research activity that sought to identify common elements and differences between IC-Health Countries regarding the availability of existing DHL and DL/e-education/e-inclusion activities and policies. Due to the volume of information collected, this chapter is intended as a summary of results, while all collected materials can be found in Annex I - Collection of partners’ case studies at the end of current report.
1 Introduction

1.1 Background and scope of current report

Information and Communication Technology for health and wellbeing (eHealth) is becoming a key area with high growth potential and possibilities for innovation in Europe, and which can enhance the quality of care. eHealth has indeed the potential to empower citizens to improve their management of health and disease, improve prevention, enable more accurate diagnosis and treatment and facilitate communication between healthcare professionals and patients. It can also contribute to a more equal access to healthcare while facilitating access to health information. This is especially true for persons with disabilities, for example persons with motor impairments who can have problems getting to the doctor physically and to persons with reading and writing disabilities who have problems reading information on paper but who can easily get access to digital information as long as it is provided in an accessible way.

However, a series of barriers to successful deployment of eHealth and to the improvement of citizens’ digital health literacy do exist. The European Commission drafted an action plan, named ‘eHealth Action Plan 2012-2020’, to address barriers to the full use of digital solutions in Europe’s healthcare systems. The Action Plan provides a roadmap to empower patients and healthcare workers, to link up devices and technologies, and to invest in research towards the personalised medicine of the future. Among the barriers identified by the document, the lack of awareness of eHealth opportunities and challenges for users remains one of the biggest barriers to a wider uptake of eHealth solutions. To tackle this problem the Action Plan highlighted the need for activities aimed at increasing citizens’ digital health literacy (1).

In this context, the scope of IC-Health is to provide support for the improvement of digital health literacy of citizens, by designing open access online courses ("MOOCs", massive open online courses) for different population cohorts. IC-Health aims to test a new model of digital health literacy intervention development and application based on co-creation of MOOCs to enhance EU citizens’ skills on how to search, understand and appraise online health information and increase awareness among EU citizens of the opportunities of eHealth tools. The identified population cohorts will be involved directly in the creation of the MOOCs content and structure both offline through the organisation of focus groups, workshops and meetings in the Member States and online through the collaboration of a community platform. They will then be involved in testing and using the MOOCs, where peer learning is a key aspect of the learning process.

1.2 Methods used for the production of the report and limitations

To produce this document, an extensive review of the literature was conducted. It must be stressed that, while extensive in scope and themes to be covered, the present report was due in very limited timeframe (initially 2 months at the beginning of IC-Health project, before the live kick-off meeting event took place), thus making it impossible to conduct a real systematic review of the literature.
To conduct such an extensive review, partners were initially asked to participate to a teleconference, and to use a template made by UNIUD and CE to establish the structure of the review, and to propose relevant papers (including peer-reviewed scientific papers, institutional reports, project reports, etc.) to be included for each section of the initial template.

In order to be able to include new suggestions and corrections to the report, all IC-Health partners were involved in the task by sharing a common document using a Google-based cloud service. Thus, partners were always able to look at the state of completion of the document and to comment and contribute with their personal knowledge and expertise in the development of the final report. UNIUD was in charge of answering to comments and suggestions made by partners, and to identify and validate those suggestions by accessing the scientific paper or institutional report, in order to extract the information deemed useful for IC-Health project purposes. In addition to partners suggestions, during the preparation of the report UNIUD conducted several searches using different databases (PUBMED, SCOPUS, Google scholar) in order to identify relevant papers (especially already existing systematic reviews) for each section, in order to be able to complete the different sections with up-to-date peer reviewed information and state-of-art scientific findings. As previously discussed, it was impossible for UNIUD to conduct these searches using a systematic approach (e.g. PRISMA statement for systematic reviews) and thus the findings of current report should be taken as partial and not representing the most possibly complete figure for the themes discussed.

Current report was initially delivered as a draft version in December 2016, circulated to all IC-Health project partners in January 2017 and later expanded to include partners comments and suggestions, along with two additional sections, namely a section on Digital Literacy (chapter 4 of current report) in close collaboration with TLU, and a section dedicated to a Country-based research on relevant initiatives related to digital health literacy and eHealth at project Country level (chapter 9 of current report).

To conduct the Country-based research, partners were requested to fill out a template selecting relevant case studies in their countries addressing existing online information available for both Initiatives on digital health literacy (DHL), and Initiatives on digital literacy/e-education/e-inclusion (DL) (in this case aimed at improving digital competencies without referring specifically to health using ICT). Additionally, partners were requested to provide information available in their countries on existing policies on digital health literacy and on digital literacy/e-/inclusion, as well as other relevant actions at national level concerning digital health literacy and/or eHealth. IC-Health partners were asked to fill a template and send it to UNIUD for inclusion of proposed actions and policies in current report. Although UNIUD controlled the quality of information received by partners (checking the existence and aim of proposed actions and policies, asking for integration when necessary), due to the heterogeneity of received information and language barriers (most of the proposed actions and policies materials are available only in original language) it was not possible to conduct an in-depth comparison of the material. Results were briefly summarized accordingly to the kind of promoter (public or private), action level (international, national or regional), type of action and description (categories were made depending on the material received through internal discussion), target population, setting
and presence of an evaluation plan (these last three were considered only for DHL and DL actions).

It must be noted that, although the consortium was able to collect a large number of actions and policies, those included in current report have not been collected using a systematic methodology and are a reflection of IC-Health partners knowledge. Thus, results of the Country-based research of current report should be considered only as partial and not representing the most possibly complete figure of DHL and DL actions and policies in place.
2 Initiatives of the European Union towards health information on the Internet

This chapter briefly investigates:
1) the EU policy framework regarding eHealth and digital health, and provides;
2) a description of several EC-funded projects related to health information and the internet.

2.1 EU Policy framework

2.1.1 Digital Scoreboard of the Digital Single Market

The Digital Scoreboard of the Digital Single Market, formerly known as Digital Agenda, is a data repository which is part of the broader Digital Single market Strategy and comprises several indicators on: connectivity, human capital, use of the Internet, integration of digital technology, digital public services and R&D. The Digital Single Market strategy, adopted on the 6 May 2015, includes 16 initiatives to be delivered by the end of 2016. The European Commission has identified the completion of the DSM as one of its 10 political priorities. The Digital Single Market strategy aims to open up digital opportunities for people and business and enhance Europe's position as a world leader in the digital economy. A Digital Single Market is one in which the free movement of persons, services and capital is ensured and where the individuals and businesses can seamlessly access and exercise online activities under conditions of fair competition, and a high level of consumer and personal data protection, irrespective of their nationality or place of residence. The Digital Single Market Strategy is built on three pillars. The first pillar relates to access, i.e. better access for consumers and businesses to digital goods and services across Europe, aiming to remove the key differences between online and offline worlds, to break down barriers to cross-border online activity. The second pillar is about the environment, meaning designing rules which match the pace of technology and support infrastructure development, creating the right conditions and a level playing field for digital networks and innovative services to flourish. Finally, the third pillar deals with economy and society with the aim of maximising the growth potential of the digital economy and ensuring that Europe's economy, industry and employment take full advantage of what digitisation offers.

2.1.2 EU eHealth Action Plans

The European Commission, DG Information Society, declared e-Health as a priority target already in 2002. Since the inauguration of the eEurope action plan in 2002 by DG INFO, the importance of health Information was mentioned in various communications of DG SANCO and ‘improving health information and knowledge’ became the first strand of the EC’s current Public Health programme (2000-2006). In this context, the first EU eHealth Action Plan 2004-2011 was drafted in 2004, becoming a key reference document on eHealth for the following six years. The Action Plan covered different topics, such as electronic
prescriptions and health cards to new information systems that reduce waiting times and errors, in order to facilitate a more harmonious and complementary European approach to eHealth.

As in recent years eHealth has become increasingly important to deliver top-quality care to European citizens, a second Action Plan, covering the period 2012-2020 (1), was drafted with a focus on supporting research, development and innovation in the field of eHealth, promoting international cooperation, achieving wider interoperability of eHealth services and ensuring wider deployment and facilitating uptake. Thus, the Action Plan provides a roadmap to empower patients and healthcare workers, to link up devices and technologies, and to invest in research towards the personalised medicine of the future. Based on results collected in the eHealth action plan consultation report (2), the 2012-2020 Action Plan states that “on the one hand, patient empowerment and digital health literacy are essential for successful eHealth deployment. On the other hand, eHealth faciliates patients managing their own conditions or healthy citizens benefiting from prevention measures. However, a significant barrier lies in the lack of awareness of eHealth opportunities and challenges for users (citizens, patients, health and social care professionals)”.

2.1.3 Flash Eurobarometer 404 on European digital literacy

Another important initiative carried out by the European Commission and targeting specifically the field of digital health literacy, was the launch of a survey conducted in the 28 Member States of the European Union between the 18th and the 20th of September 2014. The survey led to the draft of the Flash Eurobarometer report No 404 “European digital health literacy” taking stock of the main trends related to the search for health-related information in the EU.

The reason behind this initiative lies in the eHealth Action Plan 2012-2020, which identified a relevant lack of awareness of eHealth opportunities and challenges for users as one of the barriers to wider uptake of eHealth solutions and proposed to support activities aiming at increasing citizens’ digital health literacy. Thus, the Flash Eurobarometer report No. 404 “European citizens’ digital health literacy” aims to support this objective by assessing the extent to which Europeans already use the Internet and online resources to help manage their own health.

The report looks at the type of health-related information people most commonly look for, as well as where and why they look for it. It investigates how satisfied they are with the health-related information they found, and how likely they would be to use the Internet to look for health-related information in the future. The document also explores the reasons given by people who have not relied on the Internet, as to why they have not used the Internet to search for health-related information so far, what alternative means they have used, and whether they would use the Internet to look for health-related information in the future. Finally, it provides an overview of the level of Internet usage among Europeans, and also of the health of European citizens and other health-related issues (e.g. doctor visits, frequency of physical exercise). Further details on barriers to digital health literacy outlined in the report will be discussed later, in section 6 - Relevant findings in recent surveys on digital health.
2.1.4 European Commission study on Big Data in Public Health, Telemedicine and Healthcare

Finally, in this context, it is worth to mention a recent study report published by the European Commission in December 2016 on big data in public health, telemedicine and healthcare (https://ec.europa.eu/health/sites/health/files/ehealth/docs/bigdata_report_en.pdf). The study outlines policy recommendations in 10 areas: awareness raising, education and training, data sources, open data and data sharing, applications and purposes, data analysis, governance of data access and use, standards, funding and financial resources, and legal and privacy aspects. Using Big Data in health has many potential benefits. It may contribute to, for example, increasing the effectiveness and quality of treatments available for patients, widening possibilities for disease prevention by identifying risk factors at population, sub-population, and individual levels, improving pharmacovigilance and patient safety, and reducing inefficiency and waste.

The report outlined 10 recommendations that are aimed at maximizing opportunities Big Data can bring to public health in the EU – to improve the health of individual patients as well as the performance of Member States’ health systems. All recommendations are underpinned by principles such as the need to uphold ethical standards and the privacy or safety of citizens, and to include stakeholders – such as patient advocacy groups, when implementing them.

2.2 Research and Innovation: EU funded projects

The EU financially supports many research and innovation projects in the field of ICT for health and wellbeing (‘eHealth’), especially under the Horizon 2020 Programme. A list of relevant projects in the fields of health literacy and eHealth is provided below.

2.2.1 HLS-EU - European Health Literacy Survey

The European Health Literacy Survey (http://www.healthliteracyeurope.net/hls-eu) was conducted in 2011 in eight countries and aimed to measure health literacy at population level. The survey was developed in the context of the European Health Literacy Project (HLS-EU), which aimed to establish the issue of health literacy in Europe. The project was co-financed by the European Commission within the EU Health programme 2008-2013, lasted from 2009-2012 and was managed by a consortium of organisations from 8 EU countries with Maastricht University as project coordinator.

The European Health Literacy Survey was carried out in 2011 and used a questionnaire, the HLS-EU-Q47, which was based on a conceptual model of health literacy starting from an integration of existing conceptualisations and definitions of health literacy. The questionnaire measures health literacy as the ability to access, understand, appraise and apply health information to make decisions and act in terms of healthcare, disease prevention and health promotion. Data was collected from a representative sample of 1000
people in each of the eight countries participating in the project, yielding a database of 8000 people. The survey results have been used to inform European, regional and national health policies, to support political and professional decision-making and to bring the health literacy agenda into public discourse. The Health Literacy Survey Questionnaire has been translated into a large number of languages and used in a range of countries within and outside Europe.

The main findings of the “European Health Literacy” project (HLS-EU) will be taken into account by the IC-Health consortium with regard to its comparative assessment of health literacy in EU countries: the project indeed generated first-time data on health literacy in a number of European countries, providing indicators for national and EU monitoring and developing a model instrument for measuring health literacy for different populations in Europe.

2.2.2 IROHLA – Innovative Policies for Healthy Ageing

IROHLA (http://www.irohla.eu/home/), funded within the 7th EU Framework Programme for Research (FP7) between 2012 and 2015, was a project that focused on improving health literacy for older people in Europe. It took stock of on-going health literacy programmes and projects and identified and validated a set of 20 interventions, which together constitute a comprehensive approach for addressing the health literacy needs of the ageing population in Europe. These interventions became part of an evidence-based guideline for policy and practice for local, regional and national government authorities to start action. The project indeed contributed to the understanding of health literacy in different European contexts and develop a comprehensive model for addressing health literacy needs in older adults in various settings. It developed a manual for assessment of quality and feasibility of health literacy interventions and activities in the ageing population. In the end, the project came out with the selection of a set of relevant interventions which together constitute a comprehensive approach of addressing health literacy needs of the ageing population.

2.2.3 eWall - eWall for Active Long Living

eWall (http://ewallproject.eu) is the outcome of a EC-funded project that contributes to the prolongation of independent living of various patient types and senior citizens. It provides non-intrusive monitoring in the patient’s home, which can be accessed remotely. eWALL is in its final optimization in order to become a product that will improve the life of more than 50 users during its test phase.

eWALL is a product designed specifically for people with chronic obstructive pulmonary disease and myocardial infarction that brings back a normal and safe life at home. The system is composed of two main subsystems: eWALL Sensing Environment and eWALL Cloud. On one hand, the eWALL Sensing Environment is envisioned as a logical environment, deployed over a physical space, which is mainly responsible for explicit and implicit interaction with the primary user. On the other end, the eWALL Cloud is a central processing and data storage subsystem.
2.2.4 SmartCare - Delivering Integrated eCare

SmartCare project (http://www.pilotsmartcare.eu/home) aims to define a common set of standard functional specifications for an open ICT platform enabling the delivery of integrated care to older European citizens. A total of 23 regions and their key stakeholders have been involved to define a comprehensive set of integration building blocks around the challenges of data-sharing, coordination and communication. Ten regions have piloted integrated health & social services to combat a range of threats to independent living commonly faced by older people while the other will prepare for early adoption. In a rigorous evaluation approach, the pilots have produced and documented much needed evidence on the impact of integrated care, developing a common framework suitable for other regions in Europe. Guidelines and specifications for procuring, organising and implementing the service building blocks have been produced.

SmartCare outcomes will provide full support to cooperative delivery of care, integrated with self-care and across organisational silos, including essential coordination tools such as shared data access, care pathway design and execution as well as real time communication support to care teams and multi-organisation access to home platforms. The developed services will allow efficient cooperative care delivery and empower all older people according to their mental faculties to take part in effective management of their health, wellness, and chronic conditions and maintain their independence despite increasing frailty.

2.2.5 Diabetes Literacy

Diabetes Literacy (www.diabetesliteracy.eu) is a 3 year research project initiated in 2012 with financial support from the European Commission under its FP7 programme, to assess the effectiveness of different forms of self-management education in diabetes, and investigate potential moderators of effectiveness, notably the patient’s level of health literacy, the organizational characteristics of the setting in which the education is offered, and the implementation fidelity. Partners from six EU member states, Israel, the USA and Taiwan, contributed to the project, which involved a comprehensive analysis of national diabetes strategies and self-management education programmes in the EU; a multicenter clinical trial to evaluate the effectiveness of diabetes-self-management programs, compare program formats and investigate factors influencing the effectiveness of self-management education; and a test of an online self-management program accessible for patients with low health literacy.

The project results underscored a growing acceptance that self-management education is a core component of diabetes care, with many European countries incorporating self-management into their national programmes. While many different types of self-management education exist in Europe, their cost varies widely between countries and between the different types of programmes operating within countries. However, compared with the overall cost of diabetes care, the cost of these programmes is relatively low. No evidence was found that any one approach to self-management education is significantly more effective than another, which implies that relatively cheaper forms of self-management education, such as group programmes, are as effective as one-to-one
education. On the other hand, it was also seen that self-education programmes do not always reach the patients who are most in need, and that there is an under-representation of peer-led self-management support and education and of IT-based programmes. One of the conclusions from the project with direct relevance for the IC-Health project is that further consideration should be given to developing web-based diabetes education programmes for people with low health literacy levels. The study also showed that it is possible to develop IT-based programmes that engage people with lower health literacy, but are also acceptable for people with higher levels.

2.2.6 PALANTE - Patients Leading and Managing their healthcare through eHealth

PALANTE (https://www.palante-project.eu) project focuses on the implementation, scaling up and optimisation of seven demonstration pilots based on the concept of secure and user friendly online access by citizens to their medical/health data. The main goal is to empower patients so they will be able to make informed decisions about their health, take an active role in their care and collaborate effectively with their healthcare team thanks to the use of information and communication technologies.

PALANTE considers seven new pilots in different countries to cover different levels of patient empowerment. Globally, the project mobilizes 21 partners in 10 different countries, and 69,550 new users. All the pilots address the issue of patient's secure access to their own health information. Additionally, five of these pilots deal with integrated chronic disease management support, including comprehensive self-learning, education and monitoring systems that will be validated for diabetes, chronic heart failure, severe arthritis and respiratory diseases. Project also takes into account the challenge of patients' mobility by addressing interoperability among pilots.

2.2.7 DISCIPULUS - Roadmap for the Digital Patient

DISCIPULUS (http://www.digital-patient.net/index.html) project aimed at the challenge of the "Digital VPH Patient", which is intended as new ways of combining patient information space into a highly visual, coherent, meaningful way, of generating new clinical information and of supporting medical professionals by producing new clinical knowledge. The final product of the project was a "Roadmap for the Digital Patient", produced through a consultation process with scientists, computer modellers, clinicians and society.

2.2.8 ENS4Care

The ENS4Care (http://www.ens4care.eu/) project aimed at sharing good nursing and social work practices in eHealth services.

ENS4Care supported the exchange of information and experiences among different partners and provided an overview of the range/type of eHealth services currently being used for prevention. It shared good nursing and social work practices in eHealth services (telehealth and telecare) and – through the evaluation and consensus building – produced guidelines
focusing on: healthy lifestyle and prevention, early intervention and clinical practice in integrated care, skills development for advanced roles, and nurse ePrescribing.

2.2.9 VALUeHEALTH

VALUeHEALTH (http://www.valuehealth.eu/) is an EU funded R&D project within the Horizon 2020 Framework Programme. VALUeHEALTH is establishing how eHealth interoperability can create, deliver, and capture value for all stakeholders, to justify a sustainable market in scaling up cross-border interoperability. The consortium is developing an evidence-based business plan for sustainable interoperability, with sustainable revenue streams for developing and operating self-funding priority pan-European eHealth Services beyond 2020.

VALUeHEALTH will define the interfaces, standards and platform services and tools needed to deliver the prioritised use cases, and from this derive a design and deployment roadmap for the essential generic and healthcare specific services. The project will provide a gap analysis of standards, specifications and translations plus their urgency of need and estimated costs.

Moreover, it is investigating European experience of success strategies for promoting high-quality structured and coded Electronic Health Records, and of organisational changes needed to capitalise on richly interoperable health records, to produce a roadmap of scale-up adoption strategies, recommended incentives and who should fund them. In the end, the project will integrate and validate these results to produce a definitive Business Plan and Strategy for taking forward public-private investment in digital eHealth services and to ensure maximum value and optimal sustainability beyond 2020.

2.2.10 i-PROGNOSIS

i-PROGNOSIS (http://www.i-prognosis.eu/) is a recently approved H2020 project focusing on intelligent Parkinson early detection and novel supportive interventions. The project will revolve on three pillars: early Parkinson’s detection, supportive interventions and medical evaluation.

First, it will develop early and unobtrusive Parkinson’s disease detection tests based on the interaction of users with their everyday technological devices. At the same time it plans to design interventions to help Parkinson’s patients sustain their quality of life over the course of the disease, in collaboration with their doctors. Interventions include a series of novel approaches to sustain the quality of life of potential or early stage PD patients: the objective is to provide a holistic and personalised platform of supportive interventions that the user will take advantage of, in collaboration with his/her doctor and caregiver, over the course of the disease. To fulfil this aim, the project will carry out detection tests and interventions to guarantee the effectiveness of i-PROGNOSIS new approaches in capturing Parkinson’s symptoms and sustaining patients’ life quality.
3 Definitions and models of Digital Health Literacy

3.1 Lily model of Digital Health Literacy

Digital Health Literacy (DHL), also referred to as eHealth literacy, has been defined by Norman and Skinner in 2006 (3) as “the ability to seek, find, understand and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem”. Their definition was developed by modifying the US Institute of Medicine’s definition of health literacy (4).

Acknowledging that eHealth literacy is a concoction of multiple literacies, Norman and Skinner introduced the Lily Model (3) to represent the six literacy components involved in eHealth literacy: traditional literacy, health literacy, information literacy, scientific literacy, media literacy, and computer literacy. Within the model, eHealth literacy can be divided into two groups: analytic skills (traditional, media and information literacy) and context specific skills (computer, scientific and health literacy). The Lily model has also been endorsed by the WHO in 2013 in the publication “Health Literacy – The solid facts” (5).

![Lily Model](image)

Figure 1. Lily model of DHL as proposed by Norman and Skinner

3.1.1 Traditional literacy

Norman and Skinner (3) describe traditional literacy as a concept which “is the most familiar to the public and encompasses basic (or prose) literacy skills such as the ability to read text, understand written passages, and speak and write a language coherently (6)”. Also, they state that “Technologies such as the World Wide Web are still text dominant, despite the frequent use of sound and visual images on websites. Basic reading and writing skills are essential in order to make meaning from text-laden resources. A related issue has been proposed to be language itself.” Ongoing monitoring by W3Techs showed that in March 2015, just over 55 percent of the most visited websites had English-language...
homepages (7). Other top languages that are used at least in 2 percent of the one million most visited websites according to W3Techs are Russian, German, Japanese, Spanish, French, Chinese, and Portuguese. The figures from the W3Techs study are based on the one million most visited websites (i.e., approximately 0.27 percent of all websites according to December 2011 figures) as ranked by the web analytics provider Alexa.com, and language is identified using only the home page of the sites in most cases. As a consequence, it is not known if this information is valid for all websites, yet this could mean that English-speakers are more likely to find an eHealth resource that is understandable and meets their needs.

3.1.2 Information literacy

The United States National Forum on Information Literacy defines information literacy as "the ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand" (8) The American Library Association defines "information literacy" as a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information (9). Other definitions incorporate competencies that an informed citizen of an information society ought to possess to participate intelligently and actively in that society (10).

Norman and Skinner (3) stated that “like other literacies, this definition must be considered within the context of the social processes involved in information production, not just its application (6). An information literate person knows what potential resources to consult to find information on a specific topic, can develop appropriate search strategies, and can filter results to extract relevant knowledge. If one views the Web as a library, with search tools (e.g. Google) and a catalogue of over eight billion resources, the need for Web users to know how to develop and execute search strategies as well as comprehend how this knowledge is organized becomes imperative”.

3.1.3 Media literacy

Norman and Skinner (3) argued that “the wide proliferation of available media sources has spawned an entire field of research in the area of media literacy and media studies. Media literacy is a means of critically thinking about media content and is defined as a process to “develop metacognitive reflective strategies by means of study” about media content and context. Media literacy is a skill that enables people to place information in a social and political context and to consider issues such as the marketplace, audience relations, and how media forms in themselves shape the message that gets conveyed. This skill is generally viewed as a combination of cognitive processes and critical thinking skills applied to media and the messages that media deliver (11).

3.1.4 Health literacy

In their description of the Lily Model, Norman and Skinner (3) stated that “health literacy pertains to the skills required to interact with the health system and engage in appropriate self-care”. While more than 20 different definitions of health literacy exist (12), an
integrated definition has been recently proposed by Søresen and colleagues together with a European Health Literacy Glossary (13,14). In this integrated definition, health literacy “is linked to literacy and entails people’s knowledge, motivation and competences to access, understand, appraise, and apply health information in order to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course”. Norman and Skinner (3) also argued that health literacy is relevant as “consumers need to understand relevant health terms and place health information into the appropriate context in order to make appropriate health decisions. Without such skills, a person may have difficulties following directions or engaging in appropriate self-care activities when needed”.

### 3.1.5 Computer literacy

Norman and Skinner described computer literacy as “the ability to use computers to solve problems (15)”. Also, the authors argued that “given the relative ubiquity of computers in our society, it is often assumed that people know how to use them. Yet, computer literacy is nearly impossible without quality access to computers and current information technology. Computer literacy includes the ability to adapt to new technologies and software and includes both absolute and relative access to eHealth resources”. In an attempt to illustrate this, Skinner and colleagues found that while nearly every Canadian teenager has access to the Internet, far fewer have the quality of access or the ability to fully utilize it for health-related purposes (16,17).

### 3.1.6 Scientific literacy

Norman and Skinner describe scientific literacy as “broadly conceived as an understanding of the nature, aims, methods, application, limitations, and politics of creating knowledge in a systematic manner (18). For those who do not have the educational experience of exposure to scientific thought and methodology, understanding science-based online health information may present a formidable challenge. Science literacy is necessary to place health research findings in appropriate context, allowing consumers to understand how science is done, the largely incremental process of discovery, and the limitations—and opportunities—that research in evidence-based medicine can present”.

### 3.2 Other models of Digital Health Literacy

During the past years, different definitions and models have been proposed for the concept of DHL.

In 2014 Gilstad proposed to expand the Lily model to cover important competences, such as the bodily experience of a health challenge, the procedural literacy of handling the tools and technologies, the contextual and the cultural literacy and the communicative expertise (19). The author also proposed a redefinition of the concept of DHL based on the new model:
“eHealth literacy is the ability to identify and define a health problem, to communicate, seek, understand, appraise and apply eHealth information and welfare technologies in the cultural, social and situational frame and to use the knowledge critically in order to solve the health problem”.

Most recently, Bautista (20) attempted, although not systematically, to review the current literature in order to redefine the concept of DHL by integrating 14 different definitions of eHealth, health and digital literacy. In this broader definition, DHL “involves the interplay of individual and social factors in the use of digital technologies to search, acquire, comprehend, appraise, communicate and apply health information in all contexts of healthcare with the goal of maintaining or improving the quality of life throughout the lifespan”.

Compared with Norman and Skinner’s definition (3), the new definition highlights the following changes:

● Acknowledges the interplay of individual as well as social factors;
● Uses the term digital technologies rather than electronic sources;
● Includes ‘communication’ as part of the actions required;
● Changes the perspective from solving a health problem towards the application of information in different healthcare contexts (e.g. health promotion purposes);
● Recognizes eHealth literacy as a driver to improve or maintain quality of life;
● Uses the phrase “throughout the lifespan” to denote that it is a continuous endeavour.

Figure 2. Expanded Lily model of DHL as proposed by Gilstad (19)
Starting from the latter definition, Bautista propose the following conceptual framework for research in DHL:

![Framework for DHL research as proposed by Bautista et al (20).](image)

The proposed definition of eHealth literacy highlights several key aspects that are fundamental to improve research on the topic.

First, it recognises the interaction between individual and social factors in eHealth literacy and sees eHealth literacy as a “shared function of social and individual factors”. Bautista (20) argued that “from this perspective, research on the antecedents of eHealth literacy should focus on both individual and social factors”.

Second, the definition recognises the use of digital technologies (including, but not limited to, personal computers, mobiles, blogs, networking websites and social media) as part of eHealth literacy. For Bautista (20), this means that “an eHealth literate person should basic knowledge in using these technologies. In effect, when conducting eHealth literacy studies, it is important to assess respondents’ use of digital technologies as this component directly influences their eHealth literacy”.

Third, the definition points out that eHealth literacy is also relevant in healthcare contexts, such as health promotion, disease prevention, rehabilitation, etc. Moreover, it has a significant connection with individuals’ quality of life and age. On one side, the definition advocates a need for further research studies on the interconnections between eHealth
literacy and its impact on the quality of life. On the other side, research on eHealth literacy should also be conducted throughout the lifespan: indeed, Bautista (20) points out that “understanding the differences between each age group in terms of eHealth literacy will not only inform research but will inform practitioners to tailor-fit the development of eHealth applications. For instance, examining eHealth literacy among the elderly will greatly inform developers on how to further improve the usability of their applications”.

Finally, a set of actions is proposed to better define and differentiate behaviors and to allow identification of standard measures of processes that influence eHealth literacy, namely search, acquire, comprehend, appraise, communicate and apply. This is also in line with other conceptual framework of health literacy and research is required to better understand the real correspondence of DHL with proposed actions.
4 Definitions and models of Digital Literacy

As the field of digital technologies is changing fast, the concept of Digital Literacy (DL) is only one of the several terms often used to describe skills related to using digital technologies. Often concepts like information literacy, media literacy, digital skills, information skills, 21st century skills, digital competencies are used in similar context. Different authors have tried to conceptualize how various disciplines coming from media and literacy and library studies and also computer science have used previously named concepts in different contexts. Studies indicate that often, DL is used synonymously with the concept of digital competence and this approach is also taken here in order to be able to get some overview of this field of study.

Discourses about literacy tend to focus around the decoding and encoding argument, which could be referred as about reading and writing (21). In the context of IC-Health project it will be referred mostly to digital competence understanding it as the set of knowledge, skills and attitudes important today for being functional in a digital environment. Additionally, the concept of DL has been around longer as it is linked to media studies on one hand and the studies of traditional literacy on the other. Other common terms used include for example ICT skills, information literacy, digital skills, 21st century skills; the more recent publications, however, prefer talking about “competence” rather than “skills” (22). Aforementioned variety of concepts is also one of the reasons why Lankshear and Knobel (23) propose to talk about digital literacies, i.e. use plural instead of singular. The same authors also point out that there tends to be two kinds of definitions of DL: the more conceptual ones, which try to convey the general idea; and the standardised, operational definitions, which try to pin DL down in terms of performance and certain tasks.

Due to the goals of the IC-Health project - improve DHL, a task which has to involve some measurement - the definitions of interest here are more towards the operational kind. Therefore, below we will take a look at some of the more recent frameworks which try to describe in more detail what actually makes up DL or “digital competence”.

4.1 Existing conceptual models of Digital Literacy

Eshet-Alkalai (24) proposed a framework of DL based on literature and empirical observations of high school students as well as university students and adults over 30. He emphasises that DL means not only the ability to use digital devices, but is comprised of complex cognitive, motor, sociological, and emotional skills. The model breaks DL down to five subtypes:

- photo-visual literacy skill - ability to understand messages and instructions represented visually (e.g. when navigating graphic user interfaces);
- reproduction literacy skill - creative recycling of existing materials and information;
- information literacy skill - the ability to assess digital information in informed and effective manner;
- branching literacy skill - ability to navigate well in non-linear and multidimensional space;

Due to the goals of the IC-Health project - improve DHL, a task which has to involve some measurement - the definitions of interest here are more towards the operational kind. Therefore, below we will take a look at some of the more recent frameworks which try to describe in more detail what actually makes up DL or “digital competence”.

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- socio-emotional literacy skill - ability to evaluate information, collaboratively construct knowledge and be willing to share data and knowledge.

Later, sixth type literacy was added to the model (25):
- real-time thinking skill - ability to cope in an environment where we have to process large number of stimuli at the same time.

Another conceptualisation was proposed by Deursen and van Dijk (26) although they refer to “digital skills” rather than “Digital Literacy”. Their framework comprises:
- operational skills - skills for handling digital media;
- formal skills - skills for handling various structures of digital media (e.g. menus and links);
- information skills - skills for searching, selecting and evaluating digital information;
- strategic skills - skills to use digital information to achieve personal or professional goals.

Deursen and van Dijk (26) developed concrete lists of indicators (e.g. “Choosing a search system or appropriate website to seek information” as one of the indicators for information skills) to measure each of the skills and tested their framework on randomly selected 109 Dutch citizens. One interesting conclusion they reached was that operational and formal skills are required, but not enough for exhibiting information and strategic skills when using the internet.

Another contribution to the definition of the concept of DL came from Janssen et al. (27) In their study, they used a Delphi method and gathered insight from 94 experts to describe what exactly makes up digital competence. They ended up with twelve areas of digital competence of “digital competence building blocks”, each area describing certain knowledge, skills, and attitudes. These can be seen in Figure 4.

![Digital Competence Building Blocks](image)

Figure 4: Digital Competence Building Blocks (27)

In each of the areas identified, the experts pointed out that there are proficiency levels (essential versus advanced skills) as well as cognitive levels (from understanding to actual application and problem solving). Of course, the authors warn that their model should not
be taken as a consensus of all experts, as there were several issues in which the experts’ opinions differed.

4.2 European Commission DigComp 2.0 model

Most recently, the Joint Research Centre of the European Commission issued a second version of their “Digital Competence Reference Model for Citizens” or DigComp 2.0. Since the publication of its first version, DigComp framework has been used for policy formulation and support, instructional planning for education and training, and assessment and certification. The DigComp framework versions have served as a basis for many assessment instruments both for adults as well as children and adolescents (28).

The first version of Digcomp was published in 2013, following a thorough process: review of existing networks, consultation with stakeholders, expert workshop, a multi-stakeholder consultation for reviewing an initial draft and the final proposal which improved based on feedback (29). In this way, the DigComp 2.0 framework covers most of aspects highlighted by the earlier models.

The DigComp consists of five competence areas (Dimension 1), each area including from three to six competences (Dimension 2) and their descriptions:

- The area of “Information and data literacy” contains three competences “Browsing, searching and filtering data, information and digital content”; “Evaluating data, information and digital content” and “Managing data, information and digital content”.
- The area of “Communication and collaboration” includes six competences: “Interacting through digital technologies”; “Sharing through digital technologies”; “Engaging in citizenship through digital technologies”; “Collaborating through digital technologies”; “Netiquette” and “Managing digital identity”.
- The area of “Digital content creation” covers competences such as “Developing digital content”; “Integrating and re-elaborating digital content”; “Copyright and licences” and “Programming”.
- The area of “Safety” contains competences such as “Protecting devices”; “Protecting personal data and privacy”; “Protecting health and well-being” and “Protecting the environment”.
- The last area, that of “Problem solving”, includes the competences of “Solving technical problems”; “Identifying needs and technological responses”; “Creatively using digital technologies” and “Identifying digital competence gaps”.

4.3 Relation between Digital literacy and Digital Health literacy

Looking at these models of DL side by side with the models of DHL described in Chapter 3 of the current report, then we can see that most of the DL models included several dimensions in both Norman and Skinner’s lily model (3) as well as its extended version. Dimensions of “computer literacy”, “media literacy” and “information literacy” are in one way or other covered by all the frameworks described above. As current measures of DHL are not comprehensive of all constructs proposed for DHL models, in order to collect a more informative measure of DHL it may be appropriate to integrate these with the already existing DL measures presented here.
5 Current measures of Health Literacy and Digital Health Literacy

Currently, there are several tools that have been developed to assess and quantify different aspects of the construct of Health Literacy (HL). For this section of the report we used results reported in a recent systematic review by Altin et al. (30), who divided these measurement tools into three main categories, by differentiating the assessment approach into objective measures, subjective measures, and mixed measures using both subjective and objective elements. Also, partners where asked to provide their expertise by providing additional materials on both existing HL and DHL measures.

It should be noted that, while objective measures are usually considered to offer the best assessment of actual skills, collection of these measures can be difficult due to them being both time consuming and requiring strict protocols for administrations. Thus, measures to be used depend on a trade-off between actual possibilities for subjects’ recruitment and resource availability.

Subjective measures, while weaker on reflecting actual subject skills, have the advantages of being easier to administrate, and to consider the relation between the subject and the environment that would be otherwise lost with the use of an objective measure (e.g. the relation between a citizen and the healthcare system influence the actual possibility of service use independently of the actual skill level).

For the above mentioned reasons, we conclude that mixed measures or a combination of both objective and subjective measurement tools should be considered as best possible solution when feasible.

5.1 Measures of Health Literacy

For consultation of a comprehensive database of currently validated health literacy measures, please refer to [https://healthliteracy.bu.edu/](https://healthliteracy.bu.edu/)

5.1.1 Health literacy assessment by an objective measurement approach

In their review, Altin et al. (30) found that the direct testing of competencies related to the health literacy construct is used frequently in the academic literature. In this report, we report the authors description of six different tools used for the objective measures of health literacy, along with our description of two additional tools that we were able to identify as missing in the review (Rapid Estimate for Adult Literacy in Medicine REALM, and Newest Vital Sign NVS).

The first validated test of health literacy was the Rapid Estimate for Adult Literacy in Medicine (REALM) (31). The REALM is a word recognition test developed to assist medical professionals in estimating a patient’s literacy level. It comprises 66 word that should be
read aloud by the person taking the test and it is used to determine the reading ability of the person. As the 66-item test was considered too long for use in clinical practice, a shorter form of 6 items was also developed (REALM-SF) (32).

Another test developed during the early stages of health literacy studies is the Test Of Functional Health Literacy in Adults (TOFHLA) (33). The TOFHLA comprises a 50 items cloze test for text comprehension and a 7-item numeracy test.

The Newest Vital Sign (NVS) is another test developed to objectively measure literacy and numeracy skills using a food label as a test. The NVS is easy to administer and can be used as a screening tool for HL as its results have been shown to be predictive of TOFHLA. It comprises 6 questions aimed at finding and using text and numeric information (36).

From Altin et al. (30) [original source] “The Medical Term Recognition Test (METER) developed in the United States is a brief self-administered screening tool (2 min administration time) for the clinical setting and includes 40 medical words and 40 words without an actual meaning (non-words) while aiming the identification of the medical words (34). The format of the tool includes many words from the REALM. Thus, there is a high correlation \( r = 0.74 \) between the instruments.

The Short Assessment of Health Literacy in Spanish and English populations (SAHL-S&E) also uses a word recognition approach as applied in the REALM and combines these with a comprehension test using multiple choice questions designed by an expert panel (35). To guarantee word recognition as well as comprehension the examinees read aloud 18 medical terms and associate each term with another word similar in meaning. The English as well as the Spanish version of the test demonstrate high correlations to other health literacy indices, display high reliability values and are particularly suitable to screen individuals with low health literacy.

Other instruments were also developed to cover different aspects of HL, for example to measure health and financial literacy to verify the link between literacy and decision making in the context of health related and financial factors. This test examines health literacy by using 9 items dealing with health knowledge regarding health insurance in the US context, burden of disease as well as medication skills (37). The test to measure critical health competencies (CHC-Test) consists of 72 items presented in 4 scenarios dealing with skills such as the understanding of medical concepts, searching literature, basic statistics and the design of experiments and samples (38). The bilingual health literacy assessment (Talking Touchscreen) focuses on building a novel item pool in accordance with items used in the TOFHLA. It measures prose, document and quantitative literacy in the field of certain lifestyle diseases as well as insurance related issues and patient rights administering these items with a multimedia gadget (39)

5.1.2 Health literacy assessment by subjective measurement tools

In their review, Altin et al (30) found that “all identified instruments measuring health literacy by a self-report use a multidimensional concept of health literacy by integrating several domains and factors associated with health literacy”. In this report, we report the
authors description of five different tools used for the subjective measures of health literacy, along with the description of one additional tool developed at the European level (European health literacy survey, HLS-EU).

The HLS-EU is a self-report questionnaire consisting of 47 items. Based upon an integrated conceptual model of health literacy, it defines and allows to measure four dimensions of health literacy (access, understand, evaluate and apply health information) in three domains (healthcare, disease prevention, health promotion). The HLS-EU 47 items questionnaire (HLS-EU-Q47) has already been translated validated on a population sample of 8000 persons in eight European countries (Germany, Bulgaria, Austria, Greece, Spain, Ireland, Netherlands, Poland) and has an established conceptual and discriminative validity. While it demonstrates a robust reliability (Cronbach’s alpha of 0.97) for general health literacy, the Spearman’s rho correlation between the NVS and HLS-EU (r = .245) is relatively low, which indicates that objective (functional) health literacy and subjective (population) health literacy are different constructs (49). Two short forms exist of the European Health Literacy Questionnaire: a 16-item version (HLS-EU-Q16) which measures general health literacy reflecting the different dimensions of the 47-item full version and enabling a distinction between insufficient, limited and sufficient levels of health literacy; and a 6 item version (HLS-EU-Q6) which gives a general measure of health literacy. Both short forms have good correlations with the full version, but the 16-item version is more robust and better reflects the full health literacy model. The HLS-EU-16 has been translated to a large number of languages and has been used to study population health literacy in several countries in Europe, Asia and Africa.

From Altin et al. (30) [original source]: “The Multidimensional Measure of Adolescent Health Literacy (MAHL) assesses health literacy as a dynamic construct by addressing several domains: patient-provider encounter, interaction with the health care system, rights and responsibilities and health information. These are developed by analysing items of numerous already existing instruments, identifying relevant items and modifying as well as supplementing them by new items (40). The Health Literacy Management Scale (HELMS) consists of 8 scales with 4–5 items and aims to assess health literacy by using a comprehensive approach. It encompasses multiple domains such as patient attitudes towards health and their proactiveness as well as access, understanding and use of health information and access and communication with healthcare professionals (41). The Swiss Health Literacy Survey (HLS-CH) also addresses numerous domains such as information and (critical) decision making, cognitive and interpersonal skills as well as problem solving. In this regard health literacy is rather a package of competencies interacting with each other (42). The All Aspects of Health Literacy (AAHLS) measures health literacy based on the framework developed by Nutbeam (43) and measures functional, communicative and critical literacy by using 14 items derived from an analysis of already existing scales in the field of health as well as media literacy (44). To identify clinically useful questions that may be used in a clinical setting and to avoid the pitfalls, such as long administration times or the potential embarrassment of patients, which can occur with currently validated health literacy instruments Chew et al. developed a set of three questions for the screening of inadequate or marginal health literacy. These questions were also modified into a single question for the development of the Single Item Literacy Screener (45,46). Also, other screening questions have been developed based on the CAGE test for alcohol addiction (47).
This particular format was also further developed and tested in a computer administered format (48).

### 5.1.3 Health literacy assessment by a mixed measurement approach

Altin et al (30) argued that the combination of a direct testing and a self-report of health literacy skills “enables to combine the methodological advantages of both approaches by diminishing possible straits (50)”. In this report, we report the authors description of different tools used for the subjective measures of health literacy. From Altin et al. (30) [original source]: “The Health Literacy Skills instrument (HLSI) as well as the short form (HLSI-SF) are 25/10 item tools that use real life health stimuli to assess an individual’s health literacy addressing print, oral, quantitative and internet based information seeking skills. The short form is derived by analyzing the psychometric properties of the HLSI and selecting best performing items. Additionally, an 8 item self-report of the perceived performance among the skills addressed in the direct assessment of health literacy is conducted. Both approaches assess print literacy, numeracy and oral literacy as well as media literacy in a different manner demonstrating an acceptable internal consistency reliability (Cronbach’s alpha of 0.86 for the HLSI and 0.70 for the HLSI-SF) (51,52). The finding that objective (functional) health literacy and subjective (population) health literacy are different constructs also became apparent in a Canadian explanatory study aiming to define a health literacy measure by combining nine self-report items dealing with the access, understanding and appraisal of health information as well as communication skills in the patient provider encounter. Additionally, nine task performance (objective) items focus on understanding health related skills. A correlation between the measurement approaches could not be demonstrated (53). A further study developing an instrument for measuring the health literacy of Canadian high school students focuses on skills to understand and evaluate health information. It uses 11 health related passages from several sources (internet, health centers, health education and media materials) and develops 47 items examining the comprehension and interpretation of the presented information in the passages. A self-rating of health literacy skills is also included. Despite a satisfactory overall reliability value (Cronbach’s alpha 0.92), bivariate correlations of \( r = 0.256 \) between the self-rating and the direct testing does not indicate a strong coherence (54). The brief subjective measure of numeracy (SNS) and general health literacy (SLS) is an 11 item instrument combining a subjective measurement of functional literacy by using a screening questions format (45,46,55) and the subjective numeracy scale (SNS) (56) with numerous previously developed objective indices to scale down bias of self-reports demonstrating a robust internal reliability (57). Though the mixed measurement approach broadens the health literacy framework, as previously reported some of the studies indicate an absence of coherence between the underlying constructs subsequently detecting low correlations between the measurement approaches”.

A recent literature review of Health literacy screening instruments used for eHealth applications made by Collins et al (58) also found that current health literacy screening tools demonstrate different beneficial properties depending on the context of use. The authors argued that “evidence-based interventions to tailor electronic health information are still necessary to support individuals that are screened in the eHealth setting and are identified to have low health literacy skills”. The review concludes that screening questions (like those developed by Chew and Morris (45,46,55), or by Bennet and Lobach (47,48)) are “a
potentially effective and feasible methodology to detect patients at risk for inadequate and marginal health literacy and that the administration of these questions may be readily adapted to a computer-based format through audio-visual interaction”. Finally, it recommends that future health literacy instrument development and refinement should focus on a combination of validated and reliable screening questions and eHealth literacy measures (e.g. eHealth literacy scale (eHEALS)) questions for the purpose of developing a computer-based instrument to screen individuals accessing eHealth applications, and that further research should determine the best screening question(s) and the best synthesis of eHEALS methodologies for computer-based health literacy screening and assessment.

5.2 Measures of Digital Health Literacy

Currently, there are several tools that have been developed to assess and quantify different aspects of the construct of DHL. Within the field of health literacy, DHL studies are still very limited yet in the possibility to objectively measure the DHL construct, with only few extensively validated measures of DHL. It must be noted that those are all subjective, self-perceived competences measures, and that these should not be taken as valid objective measures of abilities or competencies of digital health literacy.

Keeping in mind current limitations in the field of DHL measures, for the purposes of IC-Health project, it is important to use state of the art DHL measures. Current measures of DHL are the following:

- eHealth literacy scale (eHEALS) (60)
- eHealth impact questionnaire (61)
- eHealth competency scale (62)
- Patient Readiness to Engage in Health Internet Technology (PRE-HIT) (63)

As already discussed, a common limitation of all these measures and a future area of needed research is to objectively measure the level accuracy of the information found in the web. If a person is confident in new knowledge gained from a source that is inaccurate, then that outcome can lead to poor health decisions (e.g. taking advice from anonymous individuals with no medical expertise on a web forum). In this case, it must be stressed that the most critical issue is the fact that these scales have rarely been assessed for their use in assessing real abilities. A recent study by Van Den Vaart and colleagues explored this issue using the eHeals scale, showing that there is still a need to develop objective or mixed measures that correlate with actual DHL abilities (59). In this study the researchers made a first attempt to develop some objective questions for the assessment of DHL competencies into a single mixed measurement instrument.

Also, a recent literature review by Karnoe and Kaiser (64) included several different measures of DHL used in stand-alone studies. These measures however were mostly not extensively tested as scales and for this reason are not included in the current report.
5.2.1 eHealth literacy scale

eHEALS can be considered currently as the most widespread tool for the measure of self-assessed DHL. It comprises 8 items on a single scale of users’ knowledge, comfort and skills at finding, evaluating, and using electronic health information. A translation and validation study of the scale in German found that the scale can be divided into 2 different sub-scales (65), yet it was not possible to find similar results from other studies using the English version of the scale.

Although the scale has been re-validated several times (66–68), the use of a self-assessed scale has led to some criticism as it does not represent an objective measure of real DHL competencies (59).

eHEALS has already been translated into several languages and is quick to administer (less than 5 minutes), thus representing the most easy and feasible measure of DHL at present.

5.2.2 eHealth impact questionnaire

The eHealth impact questionnaire (eHIQ) has been designed and developed to be used as an instrument to assess the effects of websites containing health information. The eHIQ is a self-administered questionnaire which is designed to be completed electronically as well as via a more conventional paper / pen route. The eHIQ questionnaire consists of 62 total items divided in two independently administered and scored parts (eHIQ-Part 1 and eHIQ-Part 2):

eHIQ-Part 1 (11 Items) where items represent general attitudes towards using the internet to access health information. Analyses confirmed the presence of two sub-scales in the eHIQ-Part 1: (1.1) Attitudes towards online Health Information and (1.2) Attitudes towards Sharing Health Experiences Online.

eHIQ-Part 2 (26 items) where items measure a person’s ease with using online information, particularly emphasising a person’s openness to learning and gaining support from other people’s experiences. Analyses found three sub-scales in the eHIQ-Part 2: (2.1) Confidence and Identification, (2.2) Information and Presentation, and (2.3) Understanding and Motivation.

These sub-scales are useful in assessing an individual’s feeling towards using the web for health information. It has previously been shown that attitudes towards using the internet are significantly associated with intention to use the internet for health information (69). A person’s orientation to online information may therefore influence the extent to which a person engages with a website and this may be investigated further using a more recent instrument such as the eHIQ-Part 1.

The first of three sub-scales identified in eHIQ-Part 2 was (2.1) Confidence and Identification. This scale measures the extent to which an individual identifies with others using a specific website and whether they feel that visiting the website has affected their confidence in discussing and managing their health. These issues were chosen as important
within the preliminary qualitative work supporting this research (70) and were further supported through research relating to patient empowerment when using health-related websites, particularly in research relating to online support groups (71,72). The concepts of identifying with others using a website (or their experiences) and gaining confidence to succeed in managing their health can be linked to Social Learning Theory (73,74). In this context, authors argued that the measurement of this scale is relevant as “encouragement is gained to adopt or mirror behaviors displayed by a person who they can relate to”.

The second sub-scale, (2.2) Information and Presentation, measures ease of use from the user’s perspective. Items also assess ease of understanding, perceived trustworthiness of information and the appropriateness of images used. Perceptions of trustworthiness have been linked to engagement with websites in previous research (75,76). The authors argued that “elements measured by the Information and presentation scale are therefore known to be important issues which contribute to the user experience”.

The third sub-scale, (2.3) Understanding and Motivation, measures the extent to which the respondent felt reassured, understood their condition better and felt motivated to manage their health after viewing a specific website. These items reflect aspects of the participant learning and belief or confidence in their capabilities to carry out intentions. This has been referred to the concept of self-efficacy (74,77) and perceived behavioral control in health behavior theory (78) and, in this context, can be considered an important aspect of motivation or intention to change (79).

### 5.2.3 eHealth competency scale

The eHealth competency scale builds on previous instruments such the eHEALS and on frameworks of Computer Mediated Communication competences (80) and cover four different dimensions that were shown to positively relate to ehealth communication activities: self-efficacy, knowledge, usage, motivation.

The eHealth competency scale is a self-assessed measure comprising 20 items subdivided into 4 subscales, one for each domain. In the validation study, each subscale relates differently to different ehealth communication activities (seeking health information, communicating health issues, making health decisions).

However, the self-assessed design of the scale has similar limitations as eHEALS, as it does not assess objective competencies or accuracy of information that can be considered important to the user.

### 5.2.4 Patient Readiness to Engage in Health Internet Technology (PRE-HIT)

The PRE-HIT instrument for measuring eHealth literacy was developed through an iterative process that aimed to develop an instrument with a broader scope than eHEALS (63). To develop the tool, four focus group interviews were conducted with patients with chronic conditions (diabetes, hypertension, heart failure, or coronary artery disease), and grounded theory methodology was used to analyze the output data. Additionally, a review of existing instruments within each of the themes from the focus groups was conducted to examine
different approaches to covering the domains. This led the authors to consider 98 candidate items, which were later reduced to 53 items that were finally selected for the candidate questionnaire. The questionnaire went through cognitive interviews and was adjusted accordingly and subsequently administered for further validation. Exploratory factor analysis of results identified 8 strong factors which were named by the investigators as follows:

1. health information need;
2. computer experience;
3. internet experience;
4. computer anxiety;
5. relationship with doctor;
6. cell phone expertise;
7. Internet privacy concerns;
8. no news is good news.

The questionnaire consisting of 53 items was later reduced to 28 items sorted into the above 8 factors. Cronbach’s Alpha was reported for each factor ranging from 0.57 to 0.87. Test-retest was conducted on a selected sample three months after initial sample, and reliability for test-retest ranged from 0.60 to 0.85 for the 8 subscales/factors. As a result, PRE-HIT is based upon the groundwork of eHEALS, yet it provides a further expansion of the understanding of eHealth literacy by identifying eight different factors of the same construct.
6 Relevant findings in recent surveys on digital health

This section describes the main findings of three relevant surveys conducted in Europe and America about digital health and consumers’ search for online health information. We decided to include three different sources for purposes of the current report. Along with Flash Eurobarometer 404 report on digital health literacy resulted from the launch of a survey at EU level in 2014, whose main findings have constantly been taken into account by IC-Health consortium in the drafting of this Report, two other surveys are worth to be mentioned as they describe interesting trends and behaviours related to consumers’ digital health, namely the Health on the Net Foundation Survey, and the Rock Health Consumer Survey.

6.1 Flash Eurobarometer 404 “European citizens' digital health literacy” [original source]

The Flash Eurobarometer 404 “European citizens' digital health literacy” (81) aims to assess the extent to which Europeans already use the Internet and online resources to help manage their own health.

It was carried out in the 28 Member States of the European Union between the 18th and the 20th of September 2014. The report looks at the type of health-related information people most commonly look for, where they look for it and why they look for it. It then studies how satisfied they are with the health-related information they found, and how likely they would be to use the Internet to look for health-related information in the future.

This report also explores the reasons given by people who have not relied on the Internet, as to why they have not used the Internet to search for health-related information so far, what alternative means they have used, and whether they would use the Internet to look for health-related information in the future.

Finally, the report provides an overview of the level of Internet usage among Europeans, and also of the health of European citizens and other health-related issues (e.g. doctor visits, frequency of physical exercise).

EU overall results are given and then further analyzed for single countries and according to sociodemographic data. A summary of the Flash Eurobarometer 404 main findings is presented below:

6.1.1 Use of the Internet to search for health-related information

- Around six out of ten respondents have used the Internet to search for health-related information within the last year. Of these, over half say they did so at least once a month.
- This percentage is highest in the 25-34-year age group and then decreases steadily.
6.1.2 Type of health-related information searched for on the Internet

- The main type of information searched for is general information on health-related topics or ways to improve one’s health and more specifically especially information on lifestyle choices such as nutrition, physical activity, smoking, etc.
- In second place comes the search for information on a specific injury, disease, illness or condition and in particular the search for information on the symptoms.

6.1.3 Sources used and person for whom the information was searched

- No matter what kind of health-related information they look for on the Internet, the ranking of the various sources used is very similar, with search engines clearly ahead, followed by specific and dedicated websites including blogs and forums.
- A vast majority of respondents who used the Internet to look for general health-related information did so for themselves, no matter what kind of health-related information they looked for.

6.1.4 Quality of the information found on the Internet

- Over three quarters of all respondents agree that the Internet is a good tool for improving their knowledge of health-related topics.
- Nearly nine out of ten people who looked for health information online say they were satisfied with the information they found.
- Roughly half of the people who were not satisfied with the information they found and say it was not reliable, that it was commercially oriented, or that it was not detailed enough.
- Eight out of ten people think that the health-related information they found online was useful and that it was easy to understand.
- 40% however, did not think the information came from a trustworthy source.
- The levels of satisfaction across the different elements varied significantly between the Member States.
- Relatively high numbers of people express satisfaction in the UK, Spain, Belgium, Austria and Finland, while relatively few do so in Slovakia, Slovenia, Lithuania, and Cyprus.
- A very substantial majority of people who previously used the Internet to look for health-related information say they would do so again.

6.1.5 Citizens' understanding of online health-related information

- Over nine out of ten people who used the Internet say they know how to navigate the Internet to find answers to health-related questions.
• More than nine out of ten respondents agree that their research on the Internet helps them improve their knowledge of health-related topics.
• Nine out of ten people agree that they know how to use the health-related information they find on the Internet.
• Over 80% also agree that they know where to find reliable health-related information on the Internet and that they can distinguish high-quality information from low-quality health-related information on the Internet.
• However, almost four out of ten people do not trust information from the Internet to make health-related decisions.

6.1.6 Alternative sources of health-related information

• Four out of ten people who did not use the Internet say that they don’t need to search for health-related information, while a third say that they don’t have access to the Internet.
• Two-thirds of people who did not use the Internet to look for health-related information did not look for health-related information through any means.
• Most people who obtained health information through means other than the Internet say they usually ask their doctor for this sort of information.
• Three out of ten people who did not previously use the Internet to look for health-related information say that they are likely to use the Internet next time.

6.2 Health on the Net Foundation Survey [original source]

The Health on the Net Foundation conducted a survey on digital health literacy in April 2011 (82). This was a project supported by the European Commission under the Information and Communication Technologies (ICT) Theme of the 7th Framework Programme for Research and Technological Development.

The survey involved 385 participants from 42 countries around the world, majority – France (23 %), Spain (14 %), the USA (10 %) speaking French (34 %), Spanish (19 %), English (17 %) and German (13 %). Target audience were individuals looking for online health information both males (47%) and females (53 %) mostly aged between 20 and 59 (85 %), 79 % have completed higher education, working in healthcare (30 %) or IT (21 %) area.

The project investigated individuals’ behaviors with respect to Internet use, types of searched online health-related information and difficulties linked to this search.

Some data need to be mentioned concerning Internet use: 90 % of respondents declared that they have been using it for more than six years, thus 84 % rate themselves as good or professional users.
As for the sources preferably used for health and medical information, 82 % rate physicians as important or very important while 71 % rate the Internet. Specific reasons push individuals to use the Internet rather than other sources of information, and in particular: Internet is more practical and accessible at home (or at the office); Internet is used when people are looking for support (for rare, chronic diseases); lack of time; willingness to know other people experience.

People that participated in the survey highlighted that their search activities were mainly focused on general information about health issues, as well as long-term, chronic disease, healthy lifestyle and nutrition, short-term acute disease, kids’ health and, lastly, elderly health and care. The types of searched online health information were focused mainly on treatment/therapy, followed by detailed disease description, general information about a disease, drug information and therapy side effect.

Additionally, search engines such Google, Yahoo, are the most used for the search for online health information. Besides that, participants pointed out other means: web sites providing health information, Wikipedia, specialised search tool (HONselect, Medline Plus etc.), links from a health web site, forum and blogs.

When an answer is found, 42 % double check the information and verify results on trustworthy websites (based on personal perception) found by themselves. 21 % ask their medical doctor after performing the search. 13 % use another search engine and 10 % do not verify the answer and trust the search results.

Lastly, the study was able to provide a list of the top 10 difficulties when searching for health information:

1. Evaluation of the link for each search
2. Search results lack specificity
3. Poor organisation of search results
4. Overload with information quantity
5. Quality and explicitness/fullness of description
6. Questionable trustworthiness
7. Relevance of matches
8. Lack of quality filter
9. Distracting Ads
10. Lack of information in my mother tongue.

### 6.3 Rock Health Consumer Survey [original source]

Rock Health is an American venture fund based in San Francisco and specialised in support for entrepreneurs working at the intersection of healthcare and technology. In their second annual national consumer survey of over 4000 consumers, they investigated aspects related to digital health consumers' behaviors (83).
Among the main findings, the study points out that more and more people in America are using wearable devices, and they are also more willing to share their data and to take more control of their health. Forty-six percent of consumers are now considered active digital health adopters, having used three or more categories of digital health tools (e.g., telemedicine, wearables)—up from 19% in 2015. Even novel consumer technologies like virtual and augmented reality are being adapted for health uses such as relaxation (7%), mental health (4%), rehabilitation (3%), and pain management (3%). Additionally, a majority of Americans are interested in obtaining an electronic copy of their health record, and 20% have asked for or downloaded a copy in the last six months. Concerning privacy and security of health data, the report shows that a vast majority (77%) are interested in sharing their health information, especially to get better care from their doctor. However, health data ownership and control continues to be important to consumers, and nearly 87% of consumers’ state that they should be in control of who has access to their health data, and almost 86% say they should be told what health data is collected about them.

The 2016 year has also registered a significant growth in telemedicine. Video-based telemedicine adoption more than tripled from 7% in 2015 to 22% in 2016, with the majority of uses occurring in the last three months. The most popular telemedicine means is telephone (59%), followed by email (41%) and SMS (29%). The telemedicine medium with the highest satisfaction rate is live video, for which 83% of consumers expressed moderate or extreme satisfaction.

Besides the above-mentioned trends, patients continue to leverage Google. Fifty-six percent of Americans who searched online for information about their symptoms have then proposed their own diagnosis to their physician based on that information. Sixty-two percent of Americans have used the Internet to search for information about prescription drugs. Nearly half of Americans who have searched online for health information have asked their physician to prescribe or discontinue taking a specific drug based on information found.
Despite these recent patterns, the study underlines the fact that senior consumers still do not trust telemedicine and are less willing to search for online health information rather than younger consumers. While 84% of those aged 55 and older trust their physician to keep their health data secure, only 19% trust a technology company to do so. Comparatively, 82% of those under 55 trust their physician and 38% trust a technology company with their health information. Forty-two percent of millennials (aged 18-34) have used synchronous video telemedicine, compared to just a quarter of Gen Xers (aged 35-54) and under 5% of Baby Boomers (aged over 55). About half of millennials have emailed with a doctor, while a quarter of baby boomers have done the same. Only 5% of those aged 55+ have used live video in the past year, and only 3% indicate that they plan on using the technology in the future. Millennials are the most likely to have asked for a download or electronic copy of their health records (45%), compared to nearly a third of Gen Xers and a quarter of baby boomers. A third of millennials have downloaded a health app in the last 30 days, compared to 20% of Gen Xers and 7% of baby boomers.
Improved digital health literacy can empower citizens and enable them to better manage their health. Nevertheless, it must be recognised that the extension of digital resources to the health domain may increase health disparities, especially for those with limited health, digital and/or reading literacy.

A cost-effective and popular option for dissemination of health education is via the web and mobile devices. Leveraging the strengths of these new media requires a re-examining of the concept of literacy in web-based environments. eHealth literacy continues to emerge as an important issue in health education and promotion as more people use web-based and mobile health resources.

If the goal of eHealth literacy is to improve health outcomes by making health information and health decision-making tools easily accessible, issues of basic literacy, technical literacy, and linguistic and cultural barriers may further exacerbate difficulties encountered by groups already identified as suffering from health disparities. A failure to assess and implement strategies to address barriers to e-health literacy for vulnerable populations effectively serves to create more health inequalities. Examining the potential impact of e-health literacy on health behavior presents a unique challenge, because it involves a complex interplay of basic literacy skills, the ability to successfully navigate the dominant language framework (English) and culture utilized for web mediated communication, and sufficient levels of technology adoption and proficiency.

The IC-Health approach translates DHL models into four main milestones for an individual to be able to fully exploit the potential of digital health literacy:

1. achieving IT literacy;
2. achieving health literacy;
3. appraising online health information;
4. applying online health information for health management in everyday life.

7.1 Achieving IT literacy

First of all, people with limited ICT skills or low IT literacy prove to be more disadvantaged in seeking and finding health-related information using electronic resources. Many individuals still have difficulty using computers: as stated in the Report of the eHealth Stakeholder Group on Health inequalities and eHealth issued in 2014 by EPHA, in 2012 one quarter of Europeans had never used the Internet at all: the ubiquity of smartphones is likely to close this gap.
Also, the PIAAC OECD study from 2016 regarding adult users’ computer skills, claims that 70% of the inhabitants in an average OECD country have poor computer skills (84). Overall, around one in ten adults (10.0%) reported having no prior computer experience. This ranged from less than 2% in Sweden (1.6%) and Norway (1.6%) to more than one in three adults in Turkey (35.6%) and more than one in five adults in Italy (24.4%) and the Slovak Republic (22.0%).

According to Eurostat, in 2014, nearly two thirds (65%) of individuals in 28 Member States accessed the internet on a daily basis —with a further 10% using it at least once a week (but not daily)—(85). The percentage of citizens who accessed internet while on the move, in other words away from home or work and using the internet on a portable computer or handheld device via mobile or wireless connections was 51% of individuals aged 16 to 74. The most common mobile devices for internet connections were mobile or smart phones, laptops, notebooks, netbooks or tablet computers. There is thus an increasing number of citizens using mobile devices such as smart phones to access Internet.

According to a systemic review of studies on the impact of low literacy on health outcomes by Berkman (86), low literacy levels resulted in greater hospitalizations, lower receipt of preventive screening and vaccinations, reduced medication compliance, poor interpretation of health messages and higher mortality in the elderly.

In another study, Stern (87) identify three levels of digital inequality:

1) disparities in level of access to the Internet;
2) diffusion of new technologies (also updates and advancements of current technologies);
3) differences in levels of proficiency in web usage and new technologies.

Martin et al. (88) described various models of technology adoption. As unequal access to technology was and continues to be an integral part of the debate over the digital divide (89,90), the authors argued that the concept of access to the technology can be regarded to as the base level of adoption. In this context, while inequality of Internet access has declined over time, it has been shown that access is still not uniform in terms of speed of access (broadband vs. low speed connections), and type of access (public vs. private, shared use vs. autonomous use) across socioeconomic tiers (91). Also, Martin et al. (88) found that elderly and persons in low socioeconomic tiers are still subject to inconsistent levels of mobile access, and they suggest that “as web-based and mobile technology use diffuse at high rates in society, there is an increasing awareness that access is only part of the digital inequality equation”.

While important, a base level of adoption does not cover itself for disparities and unequal access to eHealth. In this sense, it has been argued that the ability of persons to use available technologies effectively and proficiently could be intended as intermediate to high levels of adoption. These intermediate to high levels of technology adoption have a direct impact on e-health literacy and could be regarded as the capacity to effectively search, navigate, and optimize web and mobile experiences. These capacities are essential to developing e-health literacy, as it has long been demonstrated persons with low literacy can make more mistakes during web based searches, use suboptimal search strategies, and exhibit greater reluctance to access additional links and high levels of difficulty interpreting the information they find online (92).
Other authors also argued other factors can also influence the achievement of IT literacy. The social constructivist perspective on information inequality proposes that being aware of cultural differences is essential to bridging the gap between the information rich and poor (90). This perspective may be very applicable to the web where the English as a primary language paradigm clearly dominates the web, and the ramifications for English as second language speakers is quite important when looking at disparities in e-health literacy.

In addition to language-related barriers, research on ethnicity as a single barrier factor may have less impact than language on e-health literacy. A study of internet based pediatric development screenings among low income families found English as a primary language, and maternal education were the dominant factors in program participation, not ethnicity (93). In the US, English as a second language barrier may also explain in part why some Hispanics categorized linguistically as “Spanish dominate” still expressed a greater preference for low technology health education modalities such as videos and taped phone messages (94). Also, it was noted that among non-English speakers, there’s a strong desire to use health search terms in the indigenous language (95). This for example can be an issue when search engines and sites do not recognize those terms. While translation tools are increasingly available to translate difficult words and phrases, the use of these tools in the past have been shown to be problematic with risks of mistakes and misunderstandings and thus it is not clear whether these tools can be regarded as a possible solution. Also, language and cultural concerns may prove as barriers (96).

It has been suggested that improving e-health literacy should be a comparable goal as technology continues to transform health promotion. Transferring health promotion efforts from offline to online and mobile devices does not automatically mitigate health literacy inequalities, even with improved access to technology.

To overcome potential barriers to use and access to eHealth, IC-Health will exploit this opportunity of ubiquitous Internet access by deploying the MOOCs through mobile applications along with classical web based tools. In doing so IC-Health will apply the principle of ubiquitous learning – U-learning - to increase interest and engagement of users with limited health, digital and/or reading literacy.

U-learning is a learning paradigm which takes place in a ubiquitous computing environment that enables learning the right thing at the right place and time in the right way. A ubiquitous learning environment (ULE, u-learning) happens anywhere and at any time, in order to build knowledge, think critically, solve problems and enhance various 21st century skills (97,98).

Ogata and Yano have identified five characteristics of ubiquitous learning, which is often supported by technological tools and WIFI connection (99):

- Permanency: The information remains unless the learners purposely remove it;
- Accessibility: The information is always available whenever the learners need to use it;
- Immediacy: The information can be retrieved instantly by the learners;
- Interactivity: The learners can interact with peers, teachers, and experts efficiently and effectively through different media;
- Context-awareness: The environment can adapt to the learners’ real situation to provide specific meaningful information.
With ubiquitous learning there are any longer separates divisions such as work/game or access to/creation of information, for instance. By means of using mobile devices such as mobile phones, tablets or laptops (m-learning), individuals have in fact changed the traditional learning space. Interconnection is another characteristic that u-learning highlights encouraging an extensive, global intelligence that is shaped and modified over time by means of sharing knowledge and abilities with others.

Also, ubiquitous learning may allow to better tailor messages and contents to the learners’ abilities by providing adaptive and personalized learning by automatically identify working memory capacity (WMC) from students’ behavior in a learning system. Working memory capacity (WMC) is a cognitive characteristic that affects students’ learning behaviors to perform complex cognitive tasks. However, WMC is very limited and can be easily overloaded in learning activities. Chang et al. described a generic approach designed to work with different learning systems (100).

This could be seen as in line with current psychological research on the so-called aptitude-by-treatment interactions (ATI). The kind of potential interaction that has received the most attention within the ATI involves the degree to which the teaching approach provides ample structure or guidance for the learner, where high ability learner would benefit more from less structured courses and vice-versa (101,102). Also, no robust evidence exists regarding differentiation and stratification of learners for different “learning styles” (102).

Massive Open Online Courses (MOOCs) are very recent technologically driven learning initiatives within higher education and can represent an effective tool for ubiquitous learning. MOOCs offer free and unlimited access to the intellectual holdings of the university, including access to the world's most renowned scholars and teachers. Although they are viewed in very contrasting ways among higher education scholars, administrators, faculty, and students, the formation and success of the companies Coursera, edX, and Udacity to provide rapid development of online courses and delivery to large numbers of people does seem to represent a technological breakthrough that should not be underestimated (103).

However, participation data reported thus far for MOOCs indicate exceptionally low completion rates. In a MOOC on the topic of circuits and electronics that DeBoer, Ho, Stump, & Breslow (104) report on, only 5% of the 108 008 people who registered for the course actually completed it. Also, about 30% of those who registered never clicked even once within the course site and an additional 19% never clicked on one of the course’s primary learning resources (eg, video lectures). In a review of 16 MOOCs offered by the University of Pennsylvania using the Coursera platform, the completion rate was 3–4%, with completion defined as a participant receiving a final grade of at least 80% (105). However, DeBoer et al. (104) argue that describing MOOC participation on the basis of registrations is inappropriate and misleading because a large number of these people are going through a “shopping period” where they explore the MOOC before committing to participate in it. They argue that “enrollment” should be defined as an “informed commitment to complete the course”, not as the number of people who ultimately register for the course. “If researchers consider MOOCs less as courses than open invitations to engage with particular online resources, then participation patterns are less predictors of achievement than outcomes variables in
themselves”. This is similar to results and conclusions reported by other studies showing that “completion” or a priori standards of participation mean little in open education environments (106,107).

A recent study investigating these issues (103) found that “shopping period” metaphor is much less useful when explaining the behaviors of MOOC participants who complete some of the course versus the entire course, as 52.7% of the people who begin participating in some meaningful way in the course actually finish the course. Another conclusion is that about half of those who do participate at some level in the MOOC do not follow the course structure or sequence designed by the instructor. Also, people who enroll in a MOOC with the declared intent to complete the MOOC are more likely to do so than those who do not declare this intent, and successfully completing initial course milestones contributes to the probability that people will complete the course regardless of their originally stated goals. These data suggest that MOOC instructors should design “low-stakes” activities and challenges to be introduced in the beginning phases of the course so as to coax participation with a high probability of success. The survey data also indicate that people report the most difficult obstacle to overcome when intending to complete a MOOC is time. Another interesting result of this study also reveal some important insights about the participants' beliefs about how MOOC providers should prioritize the issues of cost, access, and quality. Among the three competing design factors of high quality, low cost, and open access, participants want high quality first. The next priority is low cost followed by access. Furthermore, participants do not believe there is any inherent contradiction in believing all three outcomes can be achieved. Simply put, they want it all.

The low participation rates point to the need for strategies for encouraging or motivating sustained effort in the MOOC. Some designers and researchers are exploring the use of badges to promote motivation (108). Gamification strategies also hold promise (109), both superficial gaming (eg, assigning points to levels of participation and achievement) and serious gaming (eg, specific gaming activities in which participant learn and use course knowledge and skills). However, designers are cautioned not to assume that a participant is having an unsuccessful MOOC experience if they do not complete the course. As shown in this study and documented elsewhere (106,107), MOOC participants choose to enroll and participate in a MOOC for many reasons and needs, many of which are fulfilled without completing the MOOC. To overcome these shortcomings, it has been argued for future MOOCs to be designed as “mini-MOOCs”, or courses of study designed based on principles of instructional design with narrow foci to help large numbers of participants learn specific skills that can be tested online using automated means (110).

A recent EDUCAUSE report on MOOCs (111) stated that “overall, the research on the impact and value of MOOCs is in its infancy. We need deeper understanding, for example, of the MOOC’s role in teaching and learning”. Similarly, DeBoer et al. (104) suggest understanding the purpose and impact of MOOCs must go beyond conventional standards defining success in a course. Broad measures such as enrollment, participation, curriculum, and achievement do not capture user intent or activity within a MOOC.
7.2 Achieving health literacy

A second barrier to overcome relates to health literacy and to the second milestone in the IC-Health approach: understanding online health information. When it comes to understanding the health information found online, inequalities in digital health literacy might arise between people who are more educated and/or finished their education and people with limited reading literacy, as well as people who left school aged 15 or under (as showed in Eurobarometer 404). In this sense, we should not forget that even basic literacy skills such as reading, writing and numeracy still represent an obstacle for some people in Europe: as pointed out by the above-mentioned Report on Health inequalities and eHealth (112), in 2013 more than one million (one in five 15-year-olds), as well as over 75 million adult Europeans lack basic reading and writing skills.

It should be noted that different target groups of users may present different challenge in overcoming the health literacy barrier. For example teenagers consider the internet as a part of their daily life, and can adapt very quickly to new technology and use it to communicate. Also children from 7 to 11 years of age are confident with using mobile devices and the internet. Still, as the amount of information available online is overwhelming the problem in these groups is that too many choices do exist. According to the report of a research project focusing on eHealth literacy in childhood and adolescence, when looking at younger age groups such as children and adolescents, it is crucial to use a widened concept of eHealth literacy which encompasses the informed decision when and why to use electronic media for promoting health, and when and why not to use them based on comprehensive knowledge about screen related health risks and benefits for different age groups (meta level eHealth literacy). Longitudinal studies show a strong negative impact of excessive screen-media time on a large number of developmental and social outcomes, supporting a “less is more” approach for this age group (113).

A recent research involving 19 partners from 7 European countries on children of age 0-8 found that children’s use of Internet resources is not finalized to achieving health information but essentially entertainment. The relationship with health is actually the children’s negative perception of digital technology mirroring parents’ preoccupations and relates to the belief that overuse of these devices is associated with negative health issues, such as sight damaged or mental retardation or behavioral problems (114).

Also, data from the 2012 PISA OECD study demonstrate that problems and inequalities exists in generic and specific skills of internet navigation (115).

A recent systematic review of eHealth interventions to improve health literacy (116) sought to review empirically based eHealth intervention strategies designed to improve health literacy among consumers in a variety of settings. It must be noted that this review presents some limitations as it mainly included studies that did not use HL as an intervention outcome, but rather outcomes such as knowledge, self-efficacy or other similar constructs which are related but different from HL, and therefore there is still a need for further high quality studies in this field to confirm these preliminary findings. Compared to control interventions, the interventions using technology reported significant outcomes or showed
promise for future positive outcomes regarding health literacy in a variety of settings, for different diseases, and with diverse samples. This review has indicated that it is feasible to deliver eHealth interventions specifically designed to improve health literacy skills for people with different health conditions, risk factors, and socioeconomic backgrounds.

While there is evidence to suggest that low levels of health literacy are associated with inferior health outcomes, increased hospitalization rates, and non-adherence to medications across a number of diseases (117), relatively few effective interventions have been developed to address low literacy and even less have been developed that target ethnic minority populations prone to lower health literacy rates. The interventions that exist, however, rely primarily on communication and education alone and have mostly failed to achieve substantial and sustainable behavioral change. Increased interest in health literacy has emerged in part due to continuing changes in the delivery of health care services. These changes create new responsibilities for patients and their caregivers, which include finding and evaluating information, self-monitoring of health status, and understanding financial constraints and obligations. Thus, a person’s health depends more and more on his or her ability and willingness to carry out a complex set of related behaviors. This set of behaviors is essential for patients who often must make decisions about treatment with complex combinations of medications.

Strategies to promote health literacy at the individual patient level have relied heavily on paper materials such as pamphlets and brochures. Some recommend emphasizing the need for drawing upon communication and social science theories of information behavior, using a range of traditional and novel formats, gaining better understanding of the public’s health information needs, and developing medical informatics solutions for tailoring applications to patients’ needs and abilities (118). However, some studies have shown that the effectiveness and patient satisfaction with web-based health education materials are greater than if presented in a traditional format (119). For individuals who have learned to rely upon oral forms of communication or who have low literacy levels, written information sources may be of little or no use. Current trends indicate eHealth technology will continue to expand. Due to the multiple variables involved with health care, any health literacy application will need to be multi-faceted, comprehensive, and culturally and linguistically appropriate. As a result, it is important to understand patients’ individual health decision-making abilities.

The likelihood of interventions being effective did not appear to be related to the modality (touchscreen versus traditional computer) or the length/intensity of the intervention. A few studies that evaluated lower intensity interventions (such as the use of the 2-min video on HIV testing and prevention) were effective in changing behavioral outcomes. This finding is significant in that it will influence decisions about benefits versus costs of eHealth interventions to be adopted and supported. Applications that promote health literacy do not necessarily have the need to be extensive and expensive or require huge commitment in the way of training by providers who implement them. However, it is difficult to ascertain whether accessing eHealth interventions alone was successful or whether some of the improvements may have been, at least partly, due to the wider sources of information available on the Internet.
Tailoring content to make eHealth interventions more personally relevant seems to promote patient engagement and may relate to post-intervention behavior change, including among those from minority populations and with low levels of education and computer experience (120–122). Tailoring interventions to enhance their racial and ethnic relevance also seems to enhance their effects (e.g. for blacks and Hispanics in some US studies (123–125)). Computer-based algorithms that take a person’s specific goals or needs into account in addition to characteristics such as language, age, gender, ethnicity, reading ability, and health literacy level might thus prove more efficacious.

Although tailoring and cultural/linguistic adaptation can be effective, it may require substantial effort if the assessment of both individual characteristics and related tailoring is required. This has led researchers to investigate the effectiveness of computer-based culturally appropriate automated tailoring applications since computer-based tailoring can require much less effort and thus be considerably more cost-effective. Achieving robust, comparable samples to measure the efficacy of tailored eHealth interventions can be challenging. Methodological complications surface when evaluating the effectiveness of tailored messaging programs because, by definition, participants do not receive exactly the same intervention. More advanced analysis strategies need to be applied in order to adequately address this challenge.

There is also evidence to suggest eHealth interventions may be more effective particularly for individuals with very low literacy. What remains less clear is the extent to which patients will feel comfortable using a computer or handheld electronic device or will have access to interactive eHealth programs using these modalities. It is also likely that understanding how the health care system works in addition to eHealth interventions is an important aspect of health literacy. Before eHealth interventions can be hailed as a behavior change intervention of the future, the effective components and mechanisms need to be identified, rigorously tested, and its cost effectiveness established in different contexts.

In order to mitigate or avoid these problems, IC-Health needs to assure that the process of co-creation and the content of MOOCs that will be co-created are easily understandable by all target groups while at the same time generate a learning outcome for those. Having the end-users involved in the co-creation of MOOC will ensure user friendliness of the course and of the terms used but as a matter of fact there is an important content of scientific based terminology and concepts which cannot be too much simplified when transferred to the learners.

Co-creation interventions designed to support shared decision making (SDM) as increasing patient engagement in healthcare has become a health policy priority have showed promising results in addressing health inequalities. A recent meta-analysis of 19 SDM studies showed a moderate positive effect of shared decision-making interventions on disadvantaged patients (126). The narrative synthesis suggested that, overall, SDM interventions increased knowledge, informed choice, participation in decision-making, decision self-efficacy, preference for collaborative decision making and reduced decisional conflict among disadvantaged patients. Further, 7 out of 19 studies compared the intervention’s effect between high and low literacy groups. Overall, SDM interventions seemed to benefit disadvantaged groups (e.g. lower literacy) more than those with higher literacy, education and socioeconomic status. Interventions that were tailored to disadvantaged groups’ needs appeared most effective. SDM interventions may thus be...
more beneficial to disadvantaged groups than higher literacy/socioeconomic status patients. However, given the small sample sizes and variety in the intervention types, study design and quality, those findings should be interpreted with caution.

Also, in order to address health literacy challenges, IC-Health will make use of the principle and techniques of edutainment. Educational entertainment or edutainment is content designed to educate and to entertain. It includes content that is primarily educational but has incidental entertainment value, and content that is mostly entertaining but contains educational value. As stated by WHO “Educational entertainment (edutainment) approaches positively influence health literacy learning and action”. Studies indicate that edutainment, especially when it is combined with other methods and approaches such as movement-building strategies and interpersonal communication, has been highly effective in several contexts.

In some countries, for example, discussing immunization on soap operas has increased the number of mothers seeking vaccination for their children. The edutainment techniques have proved to be particularly helpful in working with groups with low health literacy skills such as children (127) and adolescents (128) who are two of the IC-Health target groups but also with specific group of patients (129).

A recent review comparing 22 studies on the effectiveness of entertainment education (EE) in communicating health information (130) found that EE messages had a significant small effect on persuasion (r = .12). The magnitude of this effect size is comparable to those found in other health meta-analyses. EE had a modest effect in increasing health knowledge, changing attitudes and intention, and affecting health behaviors. EE programs can be effective platforms to deliver important health-related information. This is especially true when individuals are exposed to the programs multiple times over a period of times. However, several areas in EE research need to be further explored as the number of such studies or sample size is small, and most of the studies used only behavioral intention as the sole persuasion measure. Controlled experiments can allow researchers to explore the causal relationships between critical variables. In order to understand the process of attitude and behavioral changes, there is clearly a need for more controlled experiments to uncover the cognitive and/or affective factors that mediate EE’s effects.

Another area that has the potential for additional research lies in identifying the conditions under which EE narratives may or may not work. So far, the literature suggests that EE has powerful impact on attitudes and behaviors. Some suggested that EE could be far more effective than traditional persuasion methods (131). Although this view is shared by many, it is important that researchers continue to explore the conditions under which entertainment-based stories work. For example, not all health behaviors are equally easy to change. Some require the commencement of a new type of behaviors (e.g., exercise more often), and others require individuals to give up a habitual behavior (e.g., quit smoking). More research is needed in order to identify how to use EE to change different types of health behaviors. Second, it is not known if culturally tailored stories work more effectively than other stories, and whether EE material delivered via social media and the Internet have the same effects on individuals. Finally, only four studies examined detection health issues and three examined organ donations as part of the EE message. In addition, all the
experimental studies focused on one particular issue (e.g., safe sex and teen pregnancy). Future research clearly needs to expand the types of health issues and consider using multiple episodes in experiments in order to offer a better understanding of the impact of EE in health communication.

IC-Health will build on these two approaches – edutainment and ubiquitous learning – by involving the users in the co-creation of MOOCs which:

- makes use of entertainment to educate;
- can be accessed anywhere through mobile phones, tablets, smart TVs;
- allows continuous co-creation and a peer collaborative learning.

### 7.3 Appraising online health information

In recent years, the quantity and quality of health information available on the Internet has increased substantially. As access to reliable, affordable, high-speed Internet access increases, the percentage of people using the Internet to search and subsequently learn from health-related information continues to grow rapidly as well. In the current years, the role of healthcare information, free and easily available, is becoming more central to patients, their families and friends, and even health care providers. In order to improve the delivery of content, researchers and scientists must first develop a thorough understanding of the searching-related needs and experiences of users. Recent studies have shed light on why and how consumers search for health information on the Internet. Health information seeking behavior depends on a variety of factors including subjective factors (e.g. intent for the search, experience in using and searching the Internet, and information preferences) and socioeconomic factors (e.g. age group, income level, education level, etc.).

Quality of existing websites have been reported to need improvement, especially concerning readability (132,133). Poor readability of eHealth information can pose a significant barrier for some citizens. This is of concern as a number of different medical conditions are associated with cognitive impairment. It is therefore clear that good readability must be a major design goal when developing online content for eHealth applications. The readability of eHealth information is typically quantified using a number of different readability indices. These so-called readability indices are used to quantify the reading level required for comprehending written information. Readability indices can be used to translate required reading level into definitions of reading competency that are associated with school level. This is significant, as recommendations regarding the required readability level of eHealth information are typically provided in terms of school level or age. Health education materials should be written at a 5th-6th grade reading level, however, research reveals that patient education materials are frequently written at reading levels above 8th grade (134). Other literature has suggested that a reading level that would be equivalent to the competency of 13 to 15 year olds should be targeted. The readability of eHealth information is known to be an important factor for user engagement with the provided information. However, recent research has suggested that the majority of currently provided eHealth information requires reading levels that are higher than the recommended target levels of readability.
Readability has been often reported as a barrier to DHL. There’s an increasing emphasis on methods to simplify health messages by simplifying language, but there’s no general agreement on the efficacy of this approach (135). While web-based environments provide an opportunity to present media rich visual and audio content, health education materials are still heavily text based. Starting from 2006, a study of 100 websites about leading incident cancers (breast, prostate, and colon) noted mean reading level grade scores from 10.7-12.9 depending on the assessment equations used in the analysis (136). These results were also more recently confirmed by several authors in different field of patient communication and education, showing that the issue is still relevant today (137–139).

A recent small qualitative study exploring the process of searching online health information in the US points out interesting trends (140). First, women are more likely than men to search for health information and online health consumers tend to be more educated, earn more, and have high-speed Internet access at home and at work. Although low-income individuals do use the Internet, some may have difficulty distinguishing between low and high quality information. Additionally, low-income disabled and homebound adults show lower rates of Internet use overall. Further, author stated that preliminary results from another unpublished study indicate that online health information seeking behavior differs significantly compared to general information searching. In particular, their data suggests that health-related queries are typically longer (ie, more words) and contextual in nature compared to general queries. There are various motivating factors for health information searching on the Internet. Aside from trying to learn more about a symptom or disorder specifically relevant to the person searching, half of online health information research is on behalf of a friend or relative. Moreover, searching is often used to track specific health-related factors. For example, 60% of adults reported tracking their weight diet or exercise routine online, and 33% reported tracking specific health indicators or symptoms such as blood pressure, blood sugar, headaches, or sleep patterns.

With regard to motivations for online health searching, a variety of factors play a role in initiating online searches for health information. The motivations that participants described generally fell into three main areas: (1) symptom troubleshooting, (2) searching to enhance a clinic visit, and (3) proxy searching.

Symptom troubleshooting means that once a particular symptom or disorder of interest is identified, participants reported that the Internet made it very easy to get more detailed information to help identify underlying causes. Also, findings of the study suggest that once a health care provider is involved, however, searching assumes a different role. In this context, participants reported using Internet searching as a means to enhance a clinic visit and be more well-prepared and well-informed during the entire healthcare experience with their providers. In these situations, Internet searching proved to be a valuable tool in preparing for the clinic visit. Participants agreed that such preparation facilitates “a more enriched experience” and allows patients to “become more knowledgeable” and “ask better questions” to providers. Concerning the content preferences, although every search is unique, participants overwhelmingly preferred sites based on two main factors: reputation and advertising (or lack thereof). Participants often commented that they tend to go for the sites that are most reputable. While the importance of reputation applied to all websites,
regardless if they were related to health, participants also reported placing a higher standard of quality on health-related information.

The study has indeed a series of limitations. First, the study population was limited to adults within the same County, and all participants were either employees or were family members of employees and patients at Mayo Clinic, where the study took place. Additionally, the sample was highly educated, with all participants having attained at least a community college degree, and 68% having completed graduate school. Despite these limitations, it is worth to mention some important findings emerged from the study. Most of participants see the Internet as a potentially valuable tool to find information about health and medical conditions; yet, they did point to the challenge of efficiently addressing their particular needs given the vast amounts of information. This reflects the challenge of streamlining and personalising information for a user base that is diverse both in terms of individual background and need.

A recent systematic review of current literature sought to review existing evidence on the association between low health literacy and (RQ1) people’s ability to evaluate online health information, (RQ2) perceived quality of online health information, (RQ3) trust in online health information, and (RQ4) use of evaluation criteria for online health information. The review provided indications of an overall (positive) association between health literacy (or one of its skills-based proxies) and both people’s ability to evaluate online health information (RQ1) and trust in the Internet as a source of health information (RQ3). On the other hand, evidence on the association between health literacy and both perceived quality of online health information (RQ2) and people’s use of evaluation criteria for online health information (RQ4) was inconsistent (141).

The content of the MOOCs themselves will address the third milestone of the IC-Health approach: appraise the online health information. This relates with possessing the skills to assess the reliability of the information – the media literacy skills according to WHO. “Media health literacy skills are needed to distinguish credible, reliable and independent information from sales-driven product marketing and advertising.”.

IC-Health MOOC will thus perform media literacy works towards deconstructing media communication, taking it apart to show how it is made. This will be achieved by pointing out independent municipal, national and international health information sources, such as WHO, the European Commission, as well as those existing quality standards and certifications, such as the Health on the Net standards. Those standards have been developed for quality control of health web sites but have not yet been applied globally and have not been sufficiently disseminated.

### 7.4 Applying online health information for health management in everyday life

Finally, yet importantly digital health literacy refers to the capacity to apply the information found in everyday life for an improved self-management of health.
A recent review and meta-analysis on the use of internet to promote health behavior change sought to analyse the impact of theoretical basis, use of behavior change techniques, and mode of delivery on efficacy (142). The review sought to conceptualise characteristics of internet-based interventions and to assess impact of these characteristics on behavioral change outcomes. Three intervention characteristics are defined: (1) the theoretical basis of the intervention, (2) the behavioral change techniques used, and (3) the mode of delivery.

Results of the meta-analysis showed small significant effect size both for interventions targeted at multiple behaviors and for each single behavior. Of all intervention types included in the study, only smoking abstinence interventions did not show a statistical significance, while interventions targeting multiple behaviors tended to have slightly smaller effects on behavior than did interventions that targeted a single behavior. Each study included was coded for being theory-based using an existing coding scheme (143). The coding was used to identify how theory and predictors (constructs that are not explicitly linked to a theory by the authors but are targeted for intervention because they predict behavior) were used in the design of the intervention. Interventions that used theory and predictors to select recipients for the interventions tended to have the largest effects on behavior. Interventions that made extensive use of theory tended to have larger effects on behavior than did interventions that made less extensive or no use of theory. Three theories emerged as theoretical basis of the interventions studied: social cognitive theory (SCT) (144), the transtheoretical model (TTM) (145), and the theory of reasoned action/planned behavior (TPB) (146,147). Effect sizes associated with interventions based on the TPB tended to have larger effects on behavior than did interventions based on the TTM that, in turn, had larger effects than did interventions based on SCT.

Behavioral change techniques used in interventions were coded using an expanded taxonomy instrument of behavior change techniques (148). The most commonly used behavioral change techniques were providing information on the consequences of behavior in general, prompting self-monitoring behavior, and identifying barriers and/or problem solving. The largest effects on behavior were observed for interventions that provided stress management or general communication skills training. Overall, the number of behavior change techniques employed had a significant positive effect size. Interventions that used more techniques tended to have larger effects on behavior than did interventions that used fewer techniques.

Mode of delivery was coded using a novel coding scheme developed by authors, dividing mode of delivery into (i) automated functions, (ii) communicative functions, (iii) use of supplementary modes. To better define interventions, each category included a list of delivery mode. In terms of automated functions, small, but significant, effects on behavior were observed for interventions that provided automated tailored feedback or an enriched information environment. Interventions that provided automated follow-up messages tended not to have significant effects on behavior. Of the communicative functions, interventions that provided access to an advisor to request advice tended to have small-to-medium effects on behavior, while smaller effects were observed for interventions that provided scheduled contact with an advisor or peer-to-peer access. Finally, use of additional modes appeared to have distinct effects on behavior change with Internet-based interventions that also used text messages having large effects on behavior, Internet-based
interventions using the telephone having small-medium effects, and interventions using e-mails as an additional mode of delivery tending to have small effects on behavior.

Another recent systematic review of reviews focused on online prevention aimed at lifestyle behavior and explored the reach, effectiveness, and use of Internet-delivered interventions aimed at lifestyle behaviors (e.g. dietary behaviors, physical activity, alcohol use, smoking, condom use, etc.) (149). This study focuses on public health impact of Internet-delivered interventions using the RE-AIM framework. The RE-AIM framework acknowledges that reach, effectiveness, adoption, implementation and maintenance are factors that all contribute to the public health impact of an intervention (150). Originally, the RE-AIM framework described adoption, implementation, and maintenance as factors at the organizational level. Internet-delivered interventions, however, can often be used as standalone, which means that adoption, implementation and maintenance also takes place, partly, at the individual level and could be also described as use of the internet-delivered interventions.

Regarding the reach aspect, most of time, a very homogeneous sample of the population is reached. It must be noted that in some cases this is not possible (e.g. there is a strong female dominance, especially in weight loss/management interventions). Participants of selected studies were predominantly highly educated, young, white, and living in high-income countries. They were approached primarily through traditional offline recruitment efforts; however, some studies use online advertising or suggest to use more modern recruitment strategies.

Overall, Internet-delivered interventions seem to have the potential to achieve behavior change. However, effect sizes were small, rarely moderate. Internet-delivered interventions compared to a no-treatment control condition had larger effect sizes than when compared with other interventions. In some cases, often including face-to-face elements, the control was equally or more effective than the Internet-delivered intervention. It is not exactly clear what effective elements were and for whom these were effective. For some, indications of effectiveness were found. From this review, tailored feedback, use of theory, interactivity, goal setting, and combination of online and in-person contact emerge as noteworthy promising constructs. It remains to be explored what elements work in what situation, and in what combination. Furthermore, it is also unclear when interventions become cost-effective. Long term effects are measured in a limited number of interventions; these effects are often unknown and the results that are available show very limited sustained effects (>6 months, following the RE-AIM framework individual maintenance standards). Studies indicate that effect sizes decrease with intervention length and post intervention or that behavior is not maintained at all because effect sizes were quite small initially. Embedding an Internet-delivered intervention in existing structures (e.g. schools, health care) might increase effectiveness. Whether increased reach or use are the underlying driving forces behind this increased effectiveness is uncertain.

One of the largest problems in Internet-delivered interventions is low actual use. There is a wide variety of terminology used to describe use-related constructs (e.g. adherence, exposure, and intervention attrition). Experimental research and theory development regarding intervention use was found to be very scarce. Given the dose-response relationship between use and effectiveness, the authors suggest that this could be crucial to improve Internet-delivered interventions aimed at behavior change. Factors suggested to
stimulate the use of an interventions were sending reminders, incorporating professional support, and embedding interventions in existing structures. Also, process evaluations should explore people’s user experience in order to be able to adjust interventions accordingly.

An illustrative description of the average Internet-delivered intervention states that a typical specimen is meant to be used once a week, is modular in setup, is updated once a week, lasts for 10 weeks, includes interaction with the system, a counselor, peers on the Internet, includes some persuasive technology elements, and results in approximately 50% of the participants adhering the intervention. Lastly, an issue regarding the use of an intervention is that this is the mostly not objectively measured, and if so, heterogeneously, very poorly or not at all described.

Use of social media (SM) has also been further explored as the increased acceptability of SM in health are leading to the development of innovative IT health solutions (151). In chronic disease management, SM offers advantages such as increased psychological well-being, social health, and cognitive health (152). SM data itself may be used in protecting citizens from public health threats or as a means of communication during epidemics (153,154). This may help improving notification times and make firsthand information available to the public. When SM is combined with gamification techniques to help patients have a healthier lifestyle, their engagement and motivation is potentially increased (155). SM is also one of the main pillars of crowdsourcing. It allows patients to seek multiple opinions from an online crowd, which could help inform them about their treatment or diagnosis options. Previous studies have shown that crowds can offer better advice than single individuals and, at times, can provide more accurate opinions than educated professionals (156–158). Nevertheless, despite these potential benefits, the challenges of these new opportunities may result in negative outcomes if not addressed properly. For instance, YouTube can be used to spread anorexia-related misinformation, tobacco promotion, and public exhibitions of unhealthy behavior (159,160).

Future SM use in chronic disease research is necessary to address patient-reported issues such as confusion and frustration regarding online information and the need to find up-to-date information in a timely manner. This could have a positive impact on improving the eHealth literacy of the online health consuming public. Also, the consequences of patient’s’ narcissism derived from SM use are worthy of consideration for future research. Crowdsourcing in healthcare provides patients with the power to harness the knowledge of crowds, and it can result in diagnosis and treatment options, but there remains a multitude of challenges. To solve these, authors propose the use of trusted health crowdsourcing platforms to provide medical advice to patients, especially vulnerable patients with rare diseases. Vulnerable patients are at risk of being manipulated by unscrupulous health crowdsourcing platforms promising to help them find diagnoses or treatments for medical conditions. Trusted platforms are needed to allow patients to seek medical advice from real patients and healthcare professionals. Mechanisms are needed, such as the HON Code Foundation, to verify trusted health crowdsourcing platforms. Most of the problems concerning gamification and SM may be overcome through proper design. Having healthcare professionals tailoring the gamified goals for each patient is highly recommended. Unfortunately, to the authors knowledge, there currently exist no health-specific gamification frameworks, and future research on this issue is encouraged. Also, incautious use of personal data for intervention purposes may result in unintended
consequence (especially sensitive for people with chronic diseases, since their searches can lead to the identification of their disorders).

Additionally, the use of SM tools for health purposes generates several problems and unanswered legal and ethical questions. Although SM can provide many benefits and opportunities, as previously mentioned, its main legal and ethical concerns rely on the risks related to misinformation and maintaining privacy, confidentiality, and the right to be forgotten. Thus, it is necessary that authorities and governments establish, in collaboration with patients’ associations and professional institutions, specific guidelines and policies to assist health professionals and help Internet users benefit from the use of SM for health. Taking these recommendations into consideration, different MOOCs will be developed for each target groups, thus allowing full adherence of the course content to the main interests and needs of the population cohorts. A questionnaire to assess health management and quality of life will be submitted to everyone taking the MOOC before and after the learning experience. According to the answers the MOOCs will send immediate feedbacks and advices for healthier lifestyles. Also, the peer learning opportunity offered within the MOOCs will facilitate the diffusion of good practices among more literate citizens.
8 Implications for practice and project purpose

- Based on previous sections’ findings, this section provides a list of implications for DHL research, practice and which has been considered as relevant for IC-Health project purposes.
- Due to the scope of current report, the list should not be considered as a comprehensive guide to DHL, but should be regarded as a list of important points that need to be considered regarding research and practice in the field of DHL. References presented in current section should also not be considered as exhaustive. For a comprehensive list of references we suggest to refer to previous report sections.
- There is still a need to define the concept of DHL in a comprehensive theoretical framework, requiring more robust measures of DHL covering the different facets and aspects of the construct. Starting from the definition adopted by Norman and Skinner (3), several authors highlighted the need to include other important aspects of DHL into current measures in order to improve assessment and interventions addressing DHL. This implies that future research and practice in the field of DHL should also include and investigate those different aspects. An example of expanded research framework has been proposed by Bautista (20).
- Existing models and measures of DL could and should be integrated together with current measures of DHL in order to reach a more comprehensive assessment of DHL.
- While, measures of HL could use objective, subjective or mixed method approaches with different correlation to real-world competencies (30), existing measures of DHL only rely on subjective self-assessed measurement approach. This is a limitation to current research in DHL, where the most used tool is the eHEALS by Norman and Skinner (60), and there is still a need to find measures that show good correlation with measured DHL and real-world competences in the use of digital health information (59). It is important to note that, in comparison with the eHEALS, more recent measures of DHL still need to confirm these results. Also, current measures of DHL do not address the issue of the accuracy of information found on the internet.
- At the moment, screening questions methodology for HL in combination with eHEALS methodology for DHL seem the most promising format for HL measurement in the field of computer-based HL and DHL screening and assessment (30,58). This implies that measures of HL and DHL can be obtained using eHealth applications, but there is still need to find the most adequate test combination to be used for screening purposes.
- Recent surveys on digital literacy show similar results, with an increase in the use of digital health information for all age groups and similar pattern of use of information technologies (e.g. use of search engines) when using the internet as a source of health related information. Yet, while the importance of the internet is ever increasing when looking for health-related informations, physicians are still the most trusted source of information. This implies that when providing health-related information using digital information technology, a combination of instruments including physician live or online consultation could be beneficial. Also, it would be
important for DHL future research and interventions to address common difficulties when looking for health information on the internet (82).

• Disparities in access to digital health information is still present, but trends show a steady decrease in the gap of technology use, with mobile technology at the first place when considering access (85). Still, access should be regarded only as a base level of adoption of information technologies, and differences in level of proficiency in web usage and the advent of even newer technologies should also be taken into account in future DHL research and practice as they have a direct impact and are essential in developing DHL (87).

• Readability of health-related content found on the internet is still a relevant issue when looking for health-related information (134). Language and, in less measure, ethnicity, should also be considered as possible limitations (93), while use of current translation services alone could result in mistakes and misunderstandings. These factors should be taken into account for better tailoring of future DHL interventions to overcome language and cultural concerns (96).

• Digital interventions like ubiquitous learning systems and MOOCs can better tailor their content and methodology based on their possibility to automatically adapt to learners’ abilities. Different experiences exist in the literature using either working memory capacity (100) or aptitude-by-treatment (102) approaches, while no robust evidence exist related to the so called “learning styles”. This implies that future DHL research and practice could be able to better tailor interventions to users.

• While MOOCs are still viewed in very contrasting ways among different stakeholders, they are rapidly developing. Evaluation of MOOCs is still in its infancy and better frameworks should be developed in order to capture the complexity of these new tools (104). However, some important consideration can be done regarding MOOCs design to better sustain completion and improve outcomes (e.g. early “low stakes” activities, mini-MOOCs, use of badges, gamification, etc) (103), and these findings should be considered when designing future MOOCs or similar DHL interventions.

• Differences in target groups should be carefully considered when addressing HL and DHL. For example, when considering children, DHL interventions could be counter-intuitive, and a conservative approach has been recommended, supporting a “less is more” approach for this age group” (113). This may imply that when targeting children, “younger” age groups (e.g. <11 y/o) may need less attention than “older” (e.g. >11 y/o) as younger groups make little use of digital technology to search for health-related information (114).

• eHealth interventions aimed at improving HL skills showed promising results (116). Interventions should be designed to be multi-faceted, comprehensive, and also culturally and linguistically appropriate. These interventions do not necessarily have the need to be extensive or require huge commitment to users. Also, it is important to note that eHealth interventions may be more effective particularly for individuals with very low health literacy, and could be an effective tool to reduce health inequalities. However, it is important to note that effectiveness of components and mechanisms of eHealth interventions still need to be identified and rigorously tested, and their cost effectiveness established in different contexts.

• Edutainment show promising results as an approach to health
communication (130), and has been proposed as a promising field with possible high impact for public health as it represent a stronger persuasion method for behavioral change in comparison with traditional ones (131). Yet, at the moment very few studies exist on edutainment interventions with use of the Internet. Future research in this field, it would be important to identify the conditions under which different narratives may or may not work, and whether results achieved using traditional media can be also reproduced with use of the Internet or social media.

- Online interventions using internet to promote health behavioral change should be based on sound theoretical basis in order to maximise results. Also, use of different and multiple techniques for behavioral change showed positive impact on outcomes, as well as interventions that made use of a larger number of automated functions (e.g. tailored feedback), communicative functions (e.g. access to an advisor), and supplementary modes of delivery (e.g. using internet + telephone) (142,149). These factors should all be taken into account in the design phase of any internet delivered intervention.

- Use of social media for public health purposes and online behavior is a growing and promising application field (151), and combination with other approaches (e.g. gamification) has already been explored and show positive impacts (155) despite the lack of a robust gamification framework for health. Crowdsourcing can also prove an effective complement when searching for health-related information on the Internet. Yet, as social media can also be used to produce negative outcomes and in order to address reported issues such as confusion and frustration regarding online health-related information, there is a need for trusted health platform (e.g. by adhering to the HON Code) to provide medical advice, especially for vulnerable patients.
9 Country Based Research on DHL and DL action and policies

9.1 Country-based research overview

This section of the report contains national case studies from the IC-Health project target countries, with the aim to highlight main strengths and shortcomings of existing online information available on digital health literacy and to provide additional details on other relevant initiatives related to digital health literacy and eHealth at project country level.

Partners were requested to fill out a template selecting relevant case studies in their countries addressing existing online information available for the following:

- Initiatives on digital health literacy (DHL), also considering activities aimed at improving health literacy using ICT;
- Initiatives on digital literacy/e-education/e-inclusion (DL), aimed at improving digital competencies without referring specifically to health using ICT.

Examples to be considered for the case study could be online or offline training courses, MOOCs, gamification or edutainment initiatives, etc. In case no relevant initiative could be identified to be included as a case study, partners were asked to describe their search strategy and make a statement on the unavailability of relevant accessible information.

Additionally, partners were requested to provide information available in their countries on existing policies on digital health literacy and on digital literacy/e-/inclusion, as well as other relevant actions at national level concerning digital health literacy and/or eHealth.

In this chapter, we report collected results divided into four tables (tables 1 to 4).

In tables 1 and 2 regarding DHL and DL actions, results are presented with the full name of the intervention/action linking to external resources, country interested, promoter (public/private, if available), level of implementation (regional/national/international), target population, setting (online/face to face), and presence of available evaluation results.

In tables 3 and 4 regarding DHL and DL policies, results are reported by country, with name of the policy, promoter (public/private), level of implementation (regional/national/international), along with a brief description of it.

The Country Based Research activity collected a total of:

- 27 actions on DHL;
- 13 actions on DL/e-inclusion;
- 12 policies for DHL (missing country-level policies for Belgium and Italy);
- 11 policies for DL (policies present for all countries involved).

For a detailed description of collected case studies, see also Annex I - collection of partners’ case studies at the end of current report.
9.2 Common and Country specific findings on DHL actions

IC-Health partners indicated the existence of 27 actions on Digital Health Literacy. Actions were divided into five distinct categories depending on the information given by partners. These categories are:

1. Promotion of self-management and networking
2. Health promotion
3. Promoting the use of existing Institutional resources and inclusion
4. Improving digital health skills
5. Provision of support for the development of other actions

Considering the countries together, the most frequent type of action focuses on promoting self-management and networking (n=16), followed by actions for health promotion (n=12), action for promoting the use of existing institutional resources and inclusion (n=7), actions for providing support to develop other actions (n=4), actions for improving digital health skills (n=3).

For the United Kingdom the considered action focuses on improving digital health skills. For Denmark the aim of the action is promoting the use of existing institutional resources and promoting participant inclusion.

For the Netherlands one action provides support to develop other actions, the other one promotes self-management and networking. For Sweden the action intends to improve digital health skills and to promote the use of existing institutional resources and participant inclusion.

For Belgium both the actions aim to promote self-management and networking, besides one focuses also on health promotion and the other on the use of existing institutional resources and participant inclusion.

For Italy the action considered intends to promote the use of institutional resources and participant inclusion.

For Spain a total of 19 actions were considered: of these, most actions intend to promote self-management and networking (n=13); 11 actions focus on health promotion, 3 on the support for the development of other actions, 3 on the promotion of existing institutional resources and participant inclusion, 1 on the improvement of digital health skills.

For most countries the promoter of the action is public (n=18). The remaining interventions come from a private promoter (n=8), two of which are situated in Belgium and the remaining six are situated in Spain. For one action in the Netherlands the assessment of the promoter was not possible.

Of the 27 actions considered, about half (n=13) are operating at regional level, the other half at national level, with only one that operates at the international level. All private actions are set at national level; of the 18 public actions, 13 are set at regional level and 5 at national level.

The targets of the DHL actions are divided into distinct groups. Some actions are targeting all citizens, while others only target specific groups: hard to reach population, patients (usually with a chronic condition) and/or caregivers, children and adolescents (or their parents), pregnant and lactating women, teachers and health professionals, with some actions targeting more than one only specific group. Most actions target the general
population (n=12) or patients (n=8), while fewer actions exist for hard to reach groups (n=3), children and adolescents (n=3), pregnant and lactating women (n=3), health professionals (n=3), with only one action specifically designed to target teachers.

The prevalent setting of interventions is “only online” (n=21). Five actions are “online and with face-to-face intervention”, one in the UK and the remaining four in Spain.

Evaluation results are available for 8 actions, while for the remaining 19 there is no evaluation data. Evaluation results are available only for actions based in UK and Spain.

The collected DHL actions together with a brief description can be found the table 1 (section 9.2.1). For a complete description of selected actions, see annex I at the end of current report.

### 9.2.1 Table1. Digital Health Literacy interventions and actions

<table>
<thead>
<tr>
<th>NAME</th>
<th>COUNTRY</th>
<th>PROMOTER</th>
<th>LEVEL</th>
<th>ACTION</th>
<th>TARGET</th>
<th>SETTING</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS Widening Digital Participation programme</td>
<td>UK</td>
<td>Public</td>
<td>Regional</td>
<td>TYPE OF ACTION: Improving digital health skills. DESCRIPTION: To Improve the digital health skills of people in hard-to-reach communities</td>
<td>people from hard-to-reach communities</td>
<td>online and face-to-face</td>
<td>Yes</td>
</tr>
<tr>
<td>e-Kurser, lær IT med Biblioteket: Sundhed (e-Courses, learn IT with the library: Health)</td>
<td>DK</td>
<td>Public</td>
<td>National</td>
<td>TYPE OF ACTION: Promoting the use of existing Institutional resources and inclusion. DESCRIPTION: Facilitate the use of the national health portal <a href="http://www.sundhed.dk">www.sundhed.dk</a> where all Danes have their personal health data collected</td>
<td>All citizens with a basic knowledge of the internet</td>
<td>online</td>
<td>No</td>
</tr>
<tr>
<td>e-Health4All</td>
<td>NL</td>
<td>Public</td>
<td>National</td>
<td>TYPE OF ACTION: Provision of support for the development of other actions. DESCRIPTION: Provide expertise with development of apps targeting: • Clients and patients • Health care providers • eHealth (ICT) experts</td>
<td>All citizens with low health literacy</td>
<td>N/A</td>
<td>No</td>
</tr>
<tr>
<td>Diabetes zelf in de hand</td>
<td>NL</td>
<td>N/A</td>
<td>National</td>
<td>TYPE OF ACTION: Promotion of self-management and networking. DESCRIPTION: Promote self-management of diabetes so the patient takes the right medicine, measure and keep</td>
<td>Diabetic patients</td>
<td>Online</td>
<td>No</td>
</tr>
<tr>
<td>Project Name</td>
<td>Country</td>
<td>Funding Body</td>
<td>Region</td>
<td>Type of Action</td>
<td>Description</td>
<td>Participants</td>
<td>Action Type</td>
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<tr>
<td>KISA (Kortare Integration, Snabbare till Arbete) (Shorter integration, faster at work)</td>
<td>SE</td>
<td>Public</td>
<td>Regional</td>
<td>TYPE OF ACTION: Improving digital health skills. / Promoting the use of existing Institutional resources and inclusion.</td>
<td>DESCRIPTION: Improve the effectiveness of the integration of newly arrived immigrants into work, and more broadly into the Swedish society. One of the sub-goals of the project is to increase the participants' health literacy and knowledge about the Swedish health system.</td>
<td>Newly arrived immigrants, focusing on asylum seekers</td>
<td>Online</td>
</tr>
<tr>
<td>moveUP (Gent Universiteit)</td>
<td>BE</td>
<td>Private</td>
<td>International</td>
<td>TYPE OF ACTION: Promotion of self-management and networking / Health promotion.</td>
<td>DESCRIPTION: Ensure a better recovery and healthier lifestyle thanks to preventive measures.</td>
<td>Patients needing rehabilitation after a knee surgery</td>
<td>Online</td>
</tr>
<tr>
<td>Sensoa – Zanzu (Anvers)</td>
<td>BE</td>
<td>Private</td>
<td>National</td>
<td>TYPE OF ACTION: Promoting the use of existing Institutional resources and inclusion / Promotion of self-management and networking.</td>
<td>DESCRIPTION: Encourage discussions (in group or individually) about sexual health among vulnerable migrants (e.g., asylum seekers, newcomers, etc.)</td>
<td>Vulnerable migrants (e.g., asylum seekers, newcomers, etc.)</td>
<td>Online</td>
</tr>
<tr>
<td>Tutto sui vaccini in parole semplici</td>
<td>IT</td>
<td>Public</td>
<td>Regional</td>
<td>TYPE OF ACTION: Promoting the use of existing Institutional resources and inclusion.</td>
<td>DESCRIPTION: Provide Italian citizens with scientific, evidence-based and transparent information on vaccines and vaccinations, as well as at indicating reliable online and offline sources of information about vaccines and vaccination. The action is part of a broader education/sensitization initiative promoted by Regione Veneto to counter vaccine-hesitancy.</td>
<td>The general population, but parents (therefore PLW) in particular. Also children and adolescents may be a target</td>
<td>Online</td>
</tr>
<tr>
<td>Escuela de pacientes</td>
<td>ES</td>
<td>Public</td>
<td>Regional</td>
<td>TYPE OF ACTION: Promotion of self-management and networking.</td>
<td>Patients, carers, relatives,</td>
<td>Yes</td>
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<tr>
<td><strong>Type of Project</strong></td>
<td><strong>Description</strong></td>
<td><strong>Target Audience</strong></td>
<td><strong>Online</strong></td>
<td><strong>Location</strong></td>
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<tr>
<td><strong>Universidad de los Pacientes</strong></td>
<td>DESCRIPTION: Improve people's knowledge of different diseases through education. This is also an opportunity for health professionals to know the disease from another point of view by looking at the personal experience of people who suffer different diseases.</td>
<td>Public, Regional</td>
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<tr>
<td><strong>Aulas de salud</strong></td>
<td>TYPE OF ACTION: Promotion of self-management and networking. DESCRIPTION: Training activities are developed for chronic and family patients, caregivers, health professionals and volunteers focused on three axes: the promotion of co-responsibility in self-care, patient-centered care and health literacy.</td>
<td>Public, Regional</td>
<td>Online</td>
<td>No</td>
<td></td>
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<tr>
<td><strong>Escuelas de salud</strong></td>
<td>TYPE OF ACTION: Promotion of self-management and networking / Health promotion / Provision of support for the development of other actions. DESCRIPTION: The aims of this initiative are the following: (1) to offer training in Primary Health Care in Health Education (individual, group and community), (2) to create a permanent offer to the citizen of actions and resources of education for group health, (3) to coordinate and disseminate interventions in Health Promotion and Disease Prevention among the various public agencies, and (4) to promote through the media stable programs on healthy living habits.</td>
<td>Public, Regional</td>
<td>Online</td>
<td>Yes</td>
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</tbody>
</table>

**IC-Health** | D1.1 - Report on key factors, drivers, barriers and trends on digital health literacy
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Type of Action</th>
<th>Description</th>
<th>Target Population</th>
<th>Delivery Method</th>
<th>Face-to-face</th>
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<tbody>
<tr>
<td>Paciente Activo Valencia Asturias Basque Country Castile and Leon</td>
<td>Promotion of self-management and networking / Health promotion.</td>
<td>TYPE OF ACTION: Promotion of self-management and networking / Health promotion. DESCRIPTION: Teach patients and caregivers to be able to understand their illness and make appropriate decisions about it.</td>
<td>To the general population, chronic patients and health professionals.</td>
<td>Online</td>
<td>No</td>
</tr>
<tr>
<td>Los Círculos de la VIDA SALUDABLE</td>
<td>Health promotion / Provision of support for the development of other actions.</td>
<td>TYPE OF ACTION: Health promotion / Provision of support for the development of other actions. DESCRIPTION: Promote health through educational interventions in the community, in the areas of tobacco, food, physical activity, alcohol and stress contained in &quot;The Circles of Healthy Life&quot;</td>
<td>To the general population and health professionals.</td>
<td>Online and face-to-face</td>
<td>Yes</td>
</tr>
<tr>
<td>Canarias saludable</td>
<td>Promoting the use of existing Institutional resources and inclusion / Health promotion.</td>
<td>TYPE OF ACTION: Promoting the use of existing Institutional resources and inclusion / Health promotion. DESCRIPTION: Provide information on public health directed to the general population</td>
<td>To the general population</td>
<td>Online</td>
<td>No</td>
</tr>
<tr>
<td>Developing healthy habits and physical education through</td>
<td>Health promotion.</td>
<td>TYPE OF ACTION: Health promotion. DESCRIPTION: Prevent childhood obesity based on motor games, and active videogames. It implies to promote the acquisition and</td>
<td>Children (ages 8-12)</td>
<td>Online and face-to-face</td>
<td>Yes</td>
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<tr>
<td>Project Description</td>
<td>Type of Action</td>
<td>Duration</td>
<td>Delivery Method</td>
<td>Contact Frequency</td>
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<tr>
<td>Educational Video-Games and Motor Plays for Hospitalized Children and Adolescents (VIDEM)</td>
<td>Promotion of self-management and networking / Health promotion.</td>
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<td></td>
<td>DESCRIPTION: Validate the effectiveness of the intervention model based on</td>
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<td>motor games and active video games to promote healthy attitudes and habits in</td>
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<td></td>
<td>children who suffer obesity/type II diabetes, in order to contribute to the</td>
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<td>domiciliary treatment adherence</td>
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<tr>
<td>Active videogames program for obesity treatment (PROViTAO)</td>
<td>Promotion of self-management and networking / Health promotion.</td>
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<td></td>
<td>DESCRIPTION: 8 to 12 years-old children suffering obesity and children who in</td>
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<td></td>
<td>addition have type II diabetes.</td>
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<tr>
<td>PyDeSalud</td>
<td>Promotion of self-management and networking.</td>
<td></td>
<td>Online</td>
<td>Yes</td>
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<td></td>
<td>DESCRIPTION: Promote citizen participation in healthcare. This platform uses</td>
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<td>scientific methodology and contains three information service modules: patient's</td>
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<td>experiences (videos/audios gallery), shared decision making (Decision AIDS),</td>
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<td>and Research needs, aimed at promoting health education for patients and</td>
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<td></td>
<td>families.</td>
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<tr>
<td>Dipex España</td>
<td>Promotion of self-management and networking.</td>
<td></td>
<td>Online</td>
<td>No</td>
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<td></td>
<td>DESCRIPTION: Improve the care of the patients, mainly in the most frequent</td>
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<td>diseases and that suppose a greater burden of care, family and social. This</td>
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<td>resource presents information based on the qualitative research of patient</td>
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<td>experiences. Personal stories about health and illness can benefit patients,</td>
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<tr>
<td></td>
<td>families and</td>
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<td></td>
<td>Patients, caregivers and relatives of people affected by type II diabetes,</td>
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<td>hypertension, palliative care and assisted reproduction.</td>
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<tr>
<td>Project Name</td>
<td>Ownership</td>
<td>Type</td>
<td>Actions</td>
<td>Health Professional</td>
<td>Healthcare Providers</td>
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<tr>
<td>Programa Paciente Experto</td>
<td>Public</td>
<td>National</td>
<td>TYPE OF ACTION: Promotion of self-management and networking / Health promotion. DESCRIPTION: Promote the role of the patient as the main responsible for self-care of his health and facilitate the acquisition of the necessary skills to manage the symptoms of the disease, incorporate healthy lifestyles and achieve a better quality of life, always in collaboration with health professionals.</td>
<td></td>
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<tr>
<td>OfraSalud</td>
<td>Public</td>
<td>Regional</td>
<td>TYPE OF ACTION: Promoting the use of existing Institutional resources and inclusion. DESCRIPTION: Provide information on public health directed to the general population.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nos cuidamos</td>
<td>Private</td>
<td>National</td>
<td>TYPE OF ACTION: Promotion of self-management and networking / Health promotion. DESCRIPTION: Promote a culture of health, self-care and well-being.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educar en salud</td>
<td>Private</td>
<td>National</td>
<td>TYPE OF ACTION: Improving digital health skills / Health promotion. DESCRIPTION: Provide a web resource to the educational community (parents, teachers and students) for the promotion of health based on the use of ICTs tools. Inform, communicate, form on health care and prevention, entertain and generate health.</td>
<td></td>
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<tr>
<td>Enfermera virtual</td>
<td>Private</td>
<td>National</td>
<td>TYPE OF ACTION: Promotion of self-management and networking. DESCRIPTION: This is a health-enhancing resource that enhances the ability of individuals, communities and populations to maintain health and well-being.</td>
<td></td>
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</tr>
<tr>
<td>Mami center</td>
<td>Private</td>
<td>National</td>
<td>TYPE OF ACTION: Health promotion. DESCRIPTION: The objective of this platform is to support and guide parents in the care of especially for parents with children in the early years of development.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personas que</td>
<td>ES</td>
<td>Private</td>
<td>National</td>
<td>TYPE OF ACTION: Promotion of self-management and networking. DESCRIPTION: Offer a platform of services that allow people affected by different types of diseases to better manage that disease and improve their quality of life</td>
<td>People who live with an illness</td>
</tr>
<tr>
<td>Social diabetes</td>
<td>ES</td>
<td>Private</td>
<td>National</td>
<td>TYPE OF ACTION: Promotion of self-management and networking. DESCRIPTION: Provide a digital tool for diabetes patients (also their families and professionals) to manage their illness.</td>
<td>People who have diabetes and their families</td>
</tr>
</tbody>
</table>

### 9.3 Common and Country specific findings on DL/e-inclusion actions

IC-Health partners indicated the existence of 13 actions on Digital Literacy / e-inclusion. All actions aim at improving digital competencies by delivering actions aimed at the improvement of digital skills. In addition, some actions also focus on promoting social inclusion, while others on providing ICT infrastructures or promoting the use of e-solutions. For actions in United Kingdom, Germany, Netherlands, Italy and Spain the considered actions focus on promoting social inclusion.

One action in the Netherlands focuses on promoting the use of e-solutions, while another action in Spain focus on providing ICT infrastructures.

Most actions are implemented by public actors (n=8); a few actions have private promoters, which are not-for-profit organizations (n=3). For two actions the assessment of the promoter was not possible as it was not clear who was directly responsible for the implementation of the action.

Of the 13 actions considered, five are operating at regional level and eight at national level.

The targets of the DL actions are divided into distinct groups, with only few actions targeting all citizens. Most actions in fact target specific groups: people with disability or accessibility needs, children and adolescents, young adults searching for work and long-term unemployed, elderly, teachers and the educational community, with some actions targeting more than one only specific group. Most actions target children and adolescent (n=6), followed by actions that target elderly (n=5), teachers and the educational community (n=4), all citizens (n=3), people with disability or accessibility needs (n=3), young adults searching for work and long-term unemployed (n=2).
In contrast with previously described DHL actions, the prevalent setting of intervention for DL actions is “online and with face-to-face intervention” (n=8), with a minority of “only online” actions (n=4). For one action in Spain the assessment of the setting was not possible.

Evaluation results are available for 5 actions, while for the remaining 8 there is no evaluation data. Evaluation results are available only for actions based in UK, Sweden and Spain.

The collected DL/e-inclusion actions together with a brief description can be found in table 2 (section 9.3.1).
For a complete description of selected actions, see annex I at the end of current report.

### 9.3.1 Table 2. Digital Literacy / e-inclusion initiatives and actions

<table>
<thead>
<tr>
<th>NAME</th>
<th>COUNTRY</th>
<th>PROMOTER</th>
<th>LEVEL</th>
<th>ACTION</th>
<th>TARGET</th>
<th>SETTING</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Digital</td>
<td>UK</td>
<td>Public</td>
<td>National</td>
<td>TYPE OF ACTION: improvement of digital skills / promoting social inclusion. DESCRIPTION: Deliver basic digital skills to people across the UK through the development of sustainable digital skills training solutions (use of ‘trusted intermediaries’)</td>
<td>those with disability and accessibility needs, young adults looking for work, adults over 65 years of age as well as third sector organisations (charities) and their beneficiaries</td>
<td>online and face-to-face</td>
<td>Yes</td>
</tr>
<tr>
<td>Ældresagen IT-kurser (DaneAge Association IT courses)</td>
<td>DK</td>
<td>Private (not-for-profit, direct membership organization)</td>
<td>Regional</td>
<td>TYPE OF ACTION: improvement of digital skills. DESCRIPTION: Deliver miscellaneous digital skills through IT courses organised by volunteers</td>
<td>Elderly</td>
<td>online and face-to-face</td>
<td>No</td>
</tr>
<tr>
<td>Stiftung Digitale Chancen</td>
<td>DE</td>
<td>Public</td>
<td>National</td>
<td>TYPE OF ACTION: improvement of digital skills / promoting social inclusion. DESCRIPTION: Make people interested in the Internet and to support them with their steps into the digital world.</td>
<td>General population and special support, courses, projects, e.g., for the elderly, women, youth or people with handicaps</td>
<td>online and face-to-face</td>
<td>No</td>
</tr>
<tr>
<td>Project</td>
<td>Country</td>
<td>Type</td>
<td>Level</td>
<td>Type of Action</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------</td>
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<td>--------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steffie</td>
<td>NL</td>
<td>N/A</td>
<td>National</td>
<td>improvement of digital skills / promoting the use of e-solutions.</td>
<td>* DESCRIPTION: Explain how to use chip cards, how to do e-banking, use of digital ID, how to access social insurance bank. Introduce youngsters to the various e-solutions and access points.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seniorweb Netherlands</td>
<td>NL</td>
<td>Private</td>
<td>National</td>
<td>improvement of digital skills / promoting social inclusion.</td>
<td>* DESCRIPTION: Develop computer skills, assist with practical solutions or background information. Volunteers finds solution together with the elderly by internet, by telephone or at home.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My child online</td>
<td>NL</td>
<td>Public</td>
<td>National</td>
<td>improvement of digital skills / promoting social inclusion.</td>
<td>* DESCRIPTION: Examine how youth between 2 and 18 years deals with new media in order to assist schools involved in new developments. They help teachers in primary and secondary school from the perspective and interests of children. My child online encourages children to excel in social media.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIL for me</td>
<td>SE</td>
<td>Public</td>
<td>National</td>
<td>improvement of digital skills.</td>
<td>* DESCRIPTION: This is an e-learning module for media- and information literacy (MIL). The objective is to provide schools with updated online learning material to teach pupils about source criticism. There is notably a focus on strategies to find and critically review information on the web.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wallonie numérique / digital wallonia - project #WallCode</td>
<td>BE</td>
<td>Public</td>
<td>Regional</td>
<td>improvement of digital skills.</td>
<td>* DESCRIPTION: Raise awareness about computer sciences, algorithms and programming languages among students and teachers.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**IC-Health** | D1.1 - Report on key factors, drivers, barriers and trends on digital health literacy

---
<table>
<thead>
<tr>
<th>Project Description</th>
<th>Country</th>
<th>Type</th>
<th>Region</th>
<th>Type of Action</th>
<th>Description</th>
<th>Target Group</th>
<th>Delivery Method</th>
<th>Impact Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonni su internet</td>
<td>IT</td>
<td>N/A</td>
<td>Regional</td>
<td>improvement of digital skills / promoting social inclusion.</td>
<td>The initiative is aimed at improving the digital literacy and capacities of elderly people. It also involves training of trainers.</td>
<td>Elderly</td>
<td>Online and face-to-face</td>
<td>No</td>
</tr>
<tr>
<td>Estrategia de Calidad y Seguridad en aplicaciones móviles de salud</td>
<td>ES</td>
<td>Public</td>
<td>Regional</td>
<td>improvement of digital skills.</td>
<td>Mobile Health Apps provides users with resources to improve quality and reliability guarantees in the use of mobile health apps.</td>
<td>General population</td>
<td>Online</td>
<td>No</td>
</tr>
<tr>
<td>Teaching and evaluating the digital competence</td>
<td>ES</td>
<td>Public</td>
<td>National</td>
<td>improvement of digital skills.</td>
<td>In order to encourage teachers' skills, the project aims to improve teachers' competences: evaluation of digital information, data and contents; sharing digital information and content; integration and reprocessing; and identification of gaps in digital competences.</td>
<td>Teachers and other people interested in this topic, to finally encourage the children's and adolescents' digital alphabetization</td>
<td>Online</td>
<td>Yes</td>
</tr>
<tr>
<td>Project Technology in the service of persons (TSP)</td>
<td>ES</td>
<td>Public</td>
<td>Regional</td>
<td>improvement of digital skills / providing ICT infrastructures / promoting the use of e-solutions.</td>
<td>Promote the use of information and communication technologies in Canary public education centers (no university). It specifies several objectives destined to provide networking and communication infrastructures, software, networks, equipment, formative activities (mainly for teachers), technical and management service, open digital resources and acquisition and management, facilitate models on teaching and learning.</td>
<td>N/A</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Red Conecta</td>
<td>ES</td>
<td>Private (not for-profit)</td>
<td>National</td>
<td>improvement of digital skills / promoting social inclusion.</td>
<td>Promote the social inclusion of all people, but especially at 13 to 30 years old, online and face-to-face</td>
<td>General population, but especially at 13 to 30 year olds,</td>
<td>Online and face-to-face</td>
<td>Yes</td>
</tr>
</tbody>
</table>
9.4 Common and Country specific findings on DHL policies

IC-Health partners indicated the existence of 12 policies for the selected Countries. Of the 12 policies identified most are set at national level (n=9) except three at regional level in Spain. Most policies identified have a public promoter (n=11), except one in the Netherlands. While for most Countries it is only possible to identify one policy, the Netherlands and Spain have respectively 2 and 6 policies. For Belgium and Italy no specific policy could be identified.

Most of the policies are focused on improving access to digital health information for citizens and patients (n=6), supporting the provision of digital solutions and innovation in healthcare (n=3), and providing recommendations on the deployment of eHealth and mHealth solutions (n=3). It should be noted that these categories are only indicative of the policies main goals, that in some cases may be broader in aims, scope and foreseen actions.

The collected DHL policies together with a brief description can be found in table 3 (section 9.4.1).
For a complete description of selected policies, see annex I at the end of current report.

9.4.1 Table 3. Digital Health Literacy policies

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>NAME</th>
<th>PROMOTER</th>
<th>LEVEL</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>UK Government digital inclusion strategy Action 15</td>
<td>Public</td>
<td>National</td>
<td>TARGET: improving access to digital health information for citizens and patients. DESCRIPTION: Help people online to access digital health information</td>
</tr>
<tr>
<td>DK</td>
<td>National strategy for digitalization of the health care system “Digitalisering med effekt”</td>
<td>Public</td>
<td>National</td>
<td>TARGET: supporting the provision of digital solutions and innovation in healthcare. DESCRIPTION: make coherent, efficient and standardised digital solutions available to health professionals in their delivery of healthcare services to the public.</td>
</tr>
<tr>
<td>Country</td>
<td>Description</td>
<td>Target</td>
<td>Description</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>DE</td>
<td>Digitale Welt und Gesundheit, eHealth und mHealth – Chancen und Risiken der Digitalisierung im Gesundheitsbereich</td>
<td>Public, National</td>
<td>TARGET: providing recommendations on the deployment of eHealth and mHealth solutions. DESCRIPTION: Give recommendations on: 1. Reliable and transparent Health information through eHealth and mHealth; 2. Better competencies of consumers/population to use digital health solutions; 3. Data protection</td>
<td></td>
</tr>
<tr>
<td>NL</td>
<td>The Dutch National Implementation Agenda for eHealth (2012-2015)</td>
<td>Public, National</td>
<td>TARGET: providing recommendations on the deployment of eHealth and mHealth solutions. DESCRIPTION: A three-year plan centred around self-management by patients and care substitution initiatives. Other issues addressed include using personal health records, developing data exchange standards, and preparing a long-term research and innovation agenda. Long-term care was reformed in 2015 in order to contain costs. See current overview of NL government goals for eHealth at <a href="https://www.government.nl/topics/ehealth/contents/government-encouraging-use-of-ehealth">https://www.government.nl/topics/ehealth/contents/government-encouraging-use-of-ehealth</a></td>
<td></td>
</tr>
<tr>
<td>NL</td>
<td>Nictiz</td>
<td>N/A, National</td>
<td>TARGET: supporting the provision of digital solutions and innovation in healthcare. DESCRIPTION: Nictiz is the national competence centre for standardisation and eHealth in the Netherlands. They support the healthcare sector in the use of IT to improve quality and efficiency within healthcare</td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>Vision for eHealth 2025</td>
<td>Public, National</td>
<td>TARGET: providing recommendations on the deployment of eHealth and mHealth solutions. DESCRIPTION: “Make Sweden the best in the world at using the opportunities offered by digitisation and eHealth to make it easier for people to achieve good and equal health and welfare, and to develop and strengthen their own resources for increased independence and participation in the life of society.” The emphasis of the policy is on the provision of e-health services, such as providing the patients digital access to their own files. Digital health literacy issues are affected by the policy, but not directly addressed in this strategy.</td>
<td></td>
</tr>
<tr>
<td>BE</td>
<td>n/a</td>
<td>Public, National</td>
<td>DESCRIPTION: No policies tackling specifically digital health literacy/eHealth literacy in Belgium. However, the importance of health literacy in general is increasingly recognized at the political level in Belgium</td>
<td></td>
</tr>
<tr>
<td>IT</td>
<td>n/a</td>
<td>Public, National</td>
<td>DESCRIPTION: Major initiatives implemented by the National Ministry of Health in the field of e-health are meant to facilitate the process of care and/or data management, but are not or little</td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>Project Name</td>
<td>Stakeholders</td>
<td>Scope</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
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</tr>
<tr>
<td>ES</td>
<td>Red de Escuelas de SALUD PARA LA CIUDADANÍA</td>
<td>Public</td>
<td>National</td>
<td>TARGET: improving access to digital health information for citizens and patients. DESCRIPTION: Provide patients, families and caregivers with a source of information and tools based on the best available evidence. It is a platform that offers verified, relevant, up-to-date, truthful and above all understandable information for the citizens to whom it is addressed. The objective of this platform is to promote the empowerment of patient through the use of this tool, so that patients, their relatives and their caregivers, have information both from the clinic and of the services and support, that allow them to manage in the most appropriate way according to their preferences and their reality.</td>
</tr>
<tr>
<td>ES</td>
<td>Estrategia NAOS</td>
<td>Public</td>
<td>National</td>
<td>TARGET: improving access to digital health information for citizens and patients. DESCRIPTION: Inform and sensitize people so that they do not lose the habits of Healthy life. They have a great amount of resources in format online directed to children, adolescents, families and professionals.</td>
</tr>
<tr>
<td>ES</td>
<td>Proyecto DELTA</td>
<td>Public</td>
<td>Regional</td>
<td>TARGET: improving access to digital health information for citizens and patients. DESCRIPTION: Improve the quality of people's diet, to prevent eating disorders, both excess and default, and its consequences.</td>
</tr>
<tr>
<td>ES</td>
<td>Juntos contra el aislamiento digital</td>
<td>Private</td>
<td>National</td>
<td>TARGET: improving access to digital health information for citizens and patients. DESCRIPTION: Promote a movement for the reduction of the digital divide in the field of health.</td>
</tr>
<tr>
<td>ES</td>
<td>CUIDARTE: Una estrategia para los cuidados en la Andalucía del siglo XXI</td>
<td>Public</td>
<td>Regional</td>
<td>TARGET: supporting the provision of digital solutions and innovation in healthcare. DESCRIPTION: The 21st Century Andalusia Care Strategy is a new vision of health care, closer to the daily needs of the Andalusian citizens, more warm, human and personal.</td>
</tr>
<tr>
<td>ES</td>
<td>Cuidando.org</td>
<td>Public</td>
<td>Regional</td>
<td>TARGET: improving access to digital health information for citizens and patients. DESCRIPTION: The Andalusian Agency for Healthcare Quality produced a document on Credibility of Information in Web Pages on Health: 1) Recommendations on Credibility of Information on Health Websites. 2) A space, aimed at patients and citizens, with resources, materials and quality web links to increase knowledge about health. With the creation of Cuidando.org, the editors of this space, we become Content Prescribers and Web Links for Patients, creating an easy navigation</td>
</tr>
</tbody>
</table>
9.5 Common and Country specific findings on DL / e-inclusion policies

IC-Health partners indicated the existence of 11 policies for the selected Countries. Of the 11 policies identified most are set at national level except one at regional level in Belgium. All policies identified have a public promoter. All Countries represented have at least one specific policy, with Denmark, Sweden and Italy having 2 policies covering different aspects of DL/e-inclusion.

Policies scope vary from improvement of digital literacy of citizens, with a focus on reducing digital divide (n=3), promotion of digital innovation and support to service development (n=3), improvement of digital competencies in the educational field (n=3), improvement of digital literacy of citizens, focusing on competencies for work and employment (n=3). One policy in Sweden focus on raising awareness on possible harmful effects of media exposure for the young.

The collected DL/e-inclusion policies together with a brief description can be found in table 4 (section 9.5.1). For a complete description of selected policies, see annex I at the end of current report.

9.5.1 Table 4. Digital Literacy / e-inclusion policies

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>NAME</th>
<th>PROMOTER</th>
<th>LEVEL</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>UK Government digital inclusion strategy</td>
<td>Public</td>
<td>National</td>
<td>TARGET: improvement of digital literacy of citizens, with a focus on reducing digital divide. DESCRIPTION: Reduce the number of UK citizens that lack basic digital skills and capabilities that are required to realise the benefits of the internet</td>
</tr>
<tr>
<td>DK</td>
<td>National public digitalization strategy 2016-2020 (Den fællesoffentlige digitaliseringsstrategi)</td>
<td>Public</td>
<td>National</td>
<td>TARGET: promotion of digital innovation and support to service development. DESCRIPTION: The strategic digital initiatives make it possible for the public sector to make joint investments in areas which are particularly complex and in which there are interdependencies across different authorities and sectors</td>
</tr>
<tr>
<td>Country</td>
<td>Description</td>
<td>Public/Private</td>
<td>National/Regional</td>
<td></td>
</tr>
<tr>
<td>---------</td>
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<td>----------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>DK</td>
<td>National Agency for IT and Learning</td>
<td>Public</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td>DE</td>
<td>Digital Agenda for Germany 2014 - 2017</td>
<td>Public</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td>NL</td>
<td>Teaching 2020: a strong profession</td>
<td>Public</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>ICT for Everyone – A Digital Agenda for Sweden (2011)</td>
<td>Public</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>Swedish Media Council</td>
<td>Public</td>
<td>National</td>
<td></td>
</tr>
<tr>
<td>BE</td>
<td>Digital Wallonia</td>
<td>Public</td>
<td>Regional</td>
<td></td>
</tr>
</tbody>
</table>

**TARGET:** improvement of digital competencies in the educational field.

**DESCRIPTION:** Promote digital development within the area of children and learning. The primary focus is on increasing the use of IT in education, and to support an effective operation of institutions by using IT.

**TARGET:** improvement of digital literacy of citizens, focusing on reducing digital divide and on competencies for work and employment.

**DESCRIPTION:** The policy is underpinned by the following strategic core objectives:
- Growth and employment: ensure digital value creation and digital networking to stimulate growth and drive efficiency in the digital world.
- Access and participation: ensuring widespread access to high-performance broadband network.
- Confidence and security: Increasing public confidence involves securing communication via digital networks, protecting access, and promoting the use of simple encryption methods.

**TARGET:** improvement of digital competencies in the educational field.

**DESCRIPTION:** This action plan sets out how teachers and principals can be further ‘professionalized’ with a view to achieving optimum quality within the education sector as a whole. It includes ICT training for teachers.

**TARGET:** improvement of digital literacy of citizens, focusing on competencies for work and employment.

**DESCRIPTION:** The policy aims at providing every citizen of working age with good digital skills in order to be employable or be able to start up and run businesses.

**TARGET:** raising awareness on possible harmful effects of media exposure for the young.

**DESCRIPTION:** It has a national responsibility to protect children and young people from harmful effects of the media and help them to become more aware media users, and in this context, they implement policies related to improving media and information literacy, including digital literacy.

**TARGET:** promotion of digital innovation and support to service development.

**DESCRIPTION:** It sets out the priorities and objectives of public policies and the framework for supporting private initiatives in favour of digital development. It provides services and support to public and private actors involved in the implementation of the digital strategy. It ensures their visibility and federates the initiatives implemented within the framework of the digital strategy.
<table>
<thead>
<tr>
<th>Country</th>
<th>Description</th>
<th>Target</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT</td>
<td>National Programme to enhance digital culture, education and competencies in Italy, promoted by ‘Agenzia per l’Italia Digitale’</td>
<td>National</td>
<td>Improvement of digital literacy of citizens, focusing on reducing digital divide and on competencies for work and employment. Description: It identifies four main areas of intervention: - skills for e-inclusion and digital citizenship - specific professional skills for ICT professionals and future professionals - cross professional skills for all and e-leadership - digital skills for PA, e-leadership contextualization</td>
</tr>
<tr>
<td>IT</td>
<td>Coalizione per le Competenze Digitali</td>
<td>National</td>
<td>Promotion of digital innovation and support to service development. Description: It promotes and enhances activities and projects realised by the members, with a view of collaboration and condivision.</td>
</tr>
<tr>
<td>ES</td>
<td>Common framework of teachers digital competence 2017</td>
<td>National</td>
<td>Improvement of digital competencies in the educational field. Description: Part of the National plan on Digitalization Culture in Schools, the policy aims to provide a descriptive reference to be used in education and in the evaluation, certification and accreditation processes</td>
</tr>
</tbody>
</table>
References


24. Eshet-Alkalai Y. Digital literacy: A conceptual framework for survival skills in the digital era. Journal of Educational Multimedia and [Internet]. 2004; Available from: http://search.proquest.com/openview/e544f06b7a07e1172d20f6a55d41d1e2/1?pq-origsite=gscholar&cbl=34242


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## Policies 1: tackling digital health literacy/eHealth issues in your country

### ITALY

- Initiative 1. ‘Tutto sui vaccini in parole semplici’
- Initiative 1. ‘Nonni su internet’

### BELGIUM

- Initiative 1. ‘Nonni su internet’
- Initiative 1. Wallonie numérique/digital wallonia

### UK

- Initiative 1. NHS Widening Digital Participation programme
- Initiative 1. OneDigital

### DENMARK

- Initiative 1. Ældresagen IT
- Initiative 1. Ældresagen IT-kerse (DaneAge Association IT courses)

### GERMANY

- Initiative 1. Digitale Welt und Gesundheit. eHealth und mHealth
- Initiative 1. Stiftung Digitale Chancen

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GOBCAN

DIGITAL HEALTH LITERACY CASE STUDY

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<tr>
<td>What is the <strong>level</strong> of this initiative?</td>
<td>Regional level (Andalusia). Available at national level</td>
</tr>
<tr>
<td>What are the <strong>objectives</strong> of this initiative?</td>
<td>The objective of this initiative is to improve people’s knowledge of different diseases through education. This is also an opportunity for health professionals to know the disease from another point of view by looking at the personal experience of people who suffer different diseases.</td>
</tr>
<tr>
<td>To which <strong>groups of citizens</strong> is this initiative addressed?</td>
<td>Patients, carers, relatives, associations and citizens in general.</td>
</tr>
<tr>
<td>Please describe the activity carried out in <strong>detail</strong></td>
<td>Face to face and online classes offered for: Childhood Asthma, COPD, Heart Failure, Type 1 Diabetes, Type 2 Diabetes, Colorectal Cancer, Fibromyalgia, Breast Cancer, Palliative Care, Caregivers, Chronic Kidney Disease, Anticoagulation.</td>
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<tr>
<td>What are the key <strong>results</strong> emerged from its implementation?</td>
<td>n/a</td>
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<tr>
<th>Initiative 2. Universidad de los Pacientes</th>
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<tbody>
<tr>
<td><a href="http://www.universidadpacientes.org">http://www.universidadpacientes.org</a></td>
<td></td>
</tr>
<tr>
<td>What is the <strong>level</strong> of this initiative?</td>
<td>Regional level (Catalonia). Available at national level</td>
</tr>
<tr>
<td>What are the <strong>objectives</strong> of this initiative?</td>
<td>Training activities are developed for chronic and family patients, caregivers, health professionals and volunteers focused on three axes: the promotion of co-responsibility in self-care, patient-centered care and health literacy.</td>
</tr>
<tr>
<td>To which <strong>groups of citizens</strong> is this initiative addressed?</td>
<td>The programme targets patients, caregivers and relatives of people affected by chronic diseases and pain.</td>
</tr>
<tr>
<td>Please describe the activity carried out in <strong>detail</strong></td>
<td>The programme contains different classrooms with informative resources in text format, brochures, videos, scales and other tools. It also provides advice to address the effects of cancer treatments and a health map to better understand the health system.</td>
</tr>
<tr>
<td>What are the key <strong>results</strong> emerged from its implementation?</td>
<td>n/a</td>
</tr>
</tbody>
</table>
### Initiative 3. Aulas de salud

http://www3.gobiernodecanarias.org/sanidad/scs/aplicacion.jsp?idCarpeta=1d83eb42-ee03-11dd-958f-c50709d677ea

**What is the level of this initiative?**
Regional level (Canary Island). Available at national level

**What are the objectives of this initiative?**
- Its objectives are: (1) to offer training in Primary Health Care in Health Education (individual, group and community), (2) to create a permanent offer to citizens and resources of education for health professionals, (3) to coordinate and disseminate interventions in Health Promotion and Disease Prevention among the various public agencies, and (4) to promote through the media stable programmes on healthy living habits.

**To which groups of citizens is this initiative addressed?**
General population and health professionals.

**Please describe the activity carried out in detail**
Activities are developed through different educational workshops put in place by health professionals and patients. They are based on working with experiential and supportive groups.

**What are the key results emerged from its implementation?**
The final evaluation will be carried out according to the indicators proposed by the Canary Health Service to give an exit to those actions that are clearly defined and with good execution prospects. For those actions in which the results of the evaluation are not positive, a re-intervention will be carried out on those points detected as weak.

### Initiative 4. Escuelas de salud

Cantabria: http://www.escuelacantabradesalud.es/aulas-de-salud
Galicia: http://escolasaude.sergas.es/Cursos-online
Castilla la Mancha: http://escueladesaludycuidados.com

**What is the level of this initiative?**
Regional level (Galicia, Cantabria, and Castilla la Mancha). Available at national level

**What are the objectives of this initiative?**
The action offers online educational activities with workshops and other resources of the most prevalent chronic pathologies, including interactive pedagogical tools. Its objectives are the following: 1) to contribute to improving the well-being and quality of life of patients with chronic diseases, dependents and their caregivers; 2) to create a network of co-responsible citizens and "competent patients and experts"; 3) to help professionals improving the results of their care practice by improving adherence to treatment; 4) to contribute to the maintenance and sustainability of public health systems and social services.

**To which groups of citizens is this initiative addressed?**
General population

**Please describe the activity carried out in detail**
The initiative entails educational activities with workshops through self-care training.
programs in order to promote well-being, prevent illness and support patients with chronic diseases and their caregivers. These classrooms have different sections, such as Information guides, Patient Experiences, Courses and activities ("Paciente Activo"), Associations and Blogs.

**What are the key results emerged from its implementation?**

n/a

### Initiative 5. Paciente Activo

Asturias:  
[https://www.asturias.es/portal/site/astursalud/menuitem.2d7ff2df00b62567dbdfb5102068a0c/?vgnextoid=e1679f3a48739410VgnVCM10000098030a0aRCRD](https://www.asturias.es/portal/site/astursalud/menuitem.2d7ff2df00b62567dbdfb5102068a0c/?vgnextoid=e1679f3a48739410VgnVCM10000098030a0aRCRD)  

**What is the level of this initiative?**  
National level (Valencia, Asturias, Basque Country, Castile and Leon)

**What are the objectives of this initiative?**  
The main objective of these courses is to teach patients and caregivers to be able to understand their illness and make appropriate decisions about it.

**To which groups of citizens is this initiative addressed?**  
General population, chronic patients and health professionals.

**Please describe the activity carried out in detail**

The programme tries to help chronic patients to better understand their illness and to take responsibility for their health through workshops. These courses are given by people with chronic illnesses or caregivers who have experienced the same experiences and difficulties as the rest of the group from a physical, psychological and social point of view.

**What are the key results emerged from its implementation?**  
Paciente Activo Asturias (Pacas) won the "Prize Nursing Development Award".

### Initiative 6. Los Círculos de la VIDA SALUDABLE

[http://circulosdelavida.es/](http://circulosdelavida.es/)  

**What is the level of this initiative?**  
Regional level (Canary Islands). Available at national level

**What are the objectives of this initiative?**  
The aims of this initiative are:  
- to promote health and prevention of noncommunicable diseases (NCDs) or chronic diseases  
- to support health promotion through educational interventions in the community, with a focus on tobacco, food, physical activity, alcohol and stress.

The purposes of each of these topics are to: 1) Inform, sensitize, and educate the child, youth and adult population regarding health care; 2) explain the advantages of a healthy life; 3) understand and preventing health risks to the health and to improve the perception
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 727474

<table>
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<th>To which groups of citizens is this initiative addressed?</th>
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<tr>
<td>General population and health professionals.</td>
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</table>

**Please describe the activity carried out in detail**

This action has elaborated didactic materials in different supports (printed on paper and digitized), as well as educational resources to support community interventions. All the developed materials available in digital format, videos with theoretical and practical contents of each theme, slides, workshops (face-to-face and online).

**What are the key results emerged from its implementation?**

The present initiative is being evaluated using two different measurement instruments: "Questionnaire for Assistants" and "Questionnaire for Professionals".

**Initiative 7. Canarias saludable**

http://www.canariassaludable.org/

**What is the level of this initiative?**

Regional level (Canary Islands). Available at national level

**What are the objectives of this initiative?**

It is a platform of the Canary Islands Health Service providing with information on public health to citizens.

**To which groups of citizens is this initiative addressed?**

General public, and in particular people living in the Canary Islands.

**Please describe the activity carried out in detail**

This platform is composed of different sections:
1) strategies at the local level, offering information on immunization days, intervention programs for the prevention of childhood obesity;
2) information on the campaigns that are under way at the level of the autonomous community of the Canary Islands (world diabetes day, world day without drugs, without tobacco, etc.);
3) information on nutrition and healthy nutrition;
4) sexual reproductive health;
5) healthy lifestyles offering varied information on the promotion of healthy living habits (healthy eating, physical activity, the importance of rest, etc.)

**What are the key results emerged from its implementation?**

n/a

**DIGITAL LITERACY / E-EDUCATION / E-INCLUSION CASE STUDY**

**Initiative. 1 Estrategia de Calidad y Seguridad en aplicaciones móviles de salud**

http://www.calidadappsalud.com/distintivo/login?accion=logar&idTipoSolicitud=9
http://www.calidadappsalud.com/distintivo/catalogo
http://www.calidadappsalud.com/listado-completo-recomendaciones-app-salud/
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<th><strong>What is the level of this initiative?</strong></th>
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<tr>
<td>Regional level (Andalusia). Available at national level</td>
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<tr>
<th><strong>To which groups of citizens is this initiative addressed?</strong></th>
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<tr>
<td>General population</td>
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<tr>
<th><strong>Please describe the activity carried out in detail</strong></th>
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<tr>
<td>The AppSaludable Quality Seal is the first Spanish seal that freely recognises all public or private health apps that ask for it. The process is mainly based on the self-assessment of the app in accordance with recommendations included in the guide, and the assessment carried out by a committee of Agency’s experts in order to identify possible improvements. This badge is based on the 31 recommendations already published in the Guide of recommendations for the design, use and evaluation of health apps, which are structured in 4 blocks: Design and relevance; Quality and security of information; Provision of services and Confidentiality and Privacy.</td>
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<tr>
<th><strong>What are the key results emerged from its implementation?</strong></th>
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<tr>
<td>Andalusian Agency for Healthcare Quality grants the AppHealth Badge with the instructions to be able to install it in the application. Las apps de salud con el Distintivo <a href="http://www.calidadappsalud.com/distintivo-appsaludable/">http://www.calidadappsalud.com/distintivo-appsaludable/</a></td>
</tr>
</tbody>
</table>

**POLICIES AND ADDITIONAL INFORMATIONS**

**Policy 1. Red de Escuelas de SALUD PARA LA CIUDADANÍA**

http://www.escuelas.msssi.gob.es/home.htm

*National level.* This initiative is the product of a collaborative action in which the different options available in the National Health System of Spain participate. It is a proposal of the Ministry of Health, Social Services and Equality of Spain whose purpose is to provide patients, families and caregivers with a source of information and tools based on the best available evidence. It is a platform that offers verified, relevant, up-to-date, truthful and above all understandable information for the citizens to whom it is addressed. The objective of this platform is to promote the empowerment of patient through the use of this tool, so that patients, their relatives and their caregivers, have information both from the clinic and of the services and support, that allow them to manage in the most appropriate way according to their preferences and their reality. Three sections are offered: 1) How I can take care of myself (Information about general and specific care, quality and safety); 2) Know more to decide better (Tools to help decision-making are available in this section); 3) Resources

**Policy 2. Estrategia NAOS**

http://www.aecosan.msssi.gob.es/AECOSAN/web/nutricion/seccion/educaNAOS.htm

*National level.* The Ministry of Health, Social Services and Equality of Spain initiated in 2005 the NAOS Strategy, which is a strategy for Nutrition, Food, Health and Obesity, to inform and sensitize people so that they do not lose the habits of Healthy life. They have a great amount of resources in format online directed to children, adolescents, families and professionals.
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 727474

Other relevant action 1. Proyecto DELTA

http://www3.gobiernodecanarias.org/sanidad/scs/contenidoGenerico.jsp?id Carpeta=32c1e8fa-cc0f-11e1-adc8-491c0b90f3e&idDocument=8a401e6b-1af8-11e2-a0b1-b9b294c3b92c#1

Regional level. The Delta Project of Nutrition Education was developed in the Canary Islands and it was born as a proposal for intersectoral action, derived from the need to improve the quality of people's diet, to prevent eating disorders, both excess and default, and its consequences.

Other relevant action 2. Juntos contra el aislamiento digital


National level. It is an initiative of the pharmaceutical company Menarini. This project aims to provide individuals and entities with a model of application of digital health initiatives (eHealth) to respond to their concerns and needs. With this intention, they want to promote a movement in favour of the reduction of the digital divide in the field of health. Group of 40 explorers converted to sherpas of health 2.0, in different areas: pharmaceutical industry, health industry, communication in health, physiotherapists, patients, pharmacy, scientific societies, nursing, medicine. These professionals (sherpas) will be in charge of becoming ambassadors of this movement against digital isolation in health.

Additional policies and actions 1: CUIDARTE: Una estrategia para los cuidados en la Andalucía del siglo XXI

The 21st Century Andalusia Care Strategy is a new vision of health care, closer to the daily needs of the Andalusian citizens, more warm, human and personal.

http://www.juntadeandalucia.es/salud/channels/temas/temas_es/P_2_ANDALUCIA_EN_SALUD_PLANES_Y_ESTRATEGIAS/Cuidarte/cuidarte?idioma=es&perfil=org&tema=/temas_es/P_2_ANDALUCIA_EN_SALUD_PLANES_Y_ESTRATEGIAS/Cuidarte/&contenido=/channels/temas/temas_es/P_2_ANDALUCIA_EN_SALUD_PLANES_Y_ESTRATEGIAS/Cuidarte/cuidarte&desplegar=/temas_es/P_2_ANDALUCIA_EN_SALUD_PLANES_Y_ESTRATEGIAS/

Additional policies and actions 2: Cuidando.org

Andalusian Agency for Healthcare Quality

- Provide quality resources for patients and citizens to help them improve their knowledge of their health
- Prescribe links Health Webs that can be used by patients and citizens either to improve their health or to resolve doubts about their health.

The Andalusian Agency for Healthcare Quality produced a document on Credibility of Information in Web Pages on Health: 1) Recommendations on Credibility of Information on Health Websites. 2) A space, aimed at patients and citizens, with resources, materials and
quality web links to increase knowledge about health. With the creation of Cuidando.org, the editors of this space, we become Content Prescribers and Web Links for Patients, creating an easy navigation web with an understandable language and continuously incorporating materials that can be used by patients to improve their knowledge in health.

**ADDITIONAL RESOURCES**

**Additional resource 1: PyDeSalud**

www.Pydesalud.com

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<tr>
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<tbody>
<tr>
<td>National level (Canary Health Service, FUNCANIS and REDISSEC, European Regional Development Fund).</td>
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<table>
<thead>
<tr>
<th>What are the <strong>objectives</strong> of this initiative?</th>
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<tbody>
<tr>
<td>Promote citizen participation in healthcare. PyDeSalud.com is a web platform aimed at people with chronic diseases with a high socioeconomic impact, such as breast cancer, depression, diabetes, screening in colorectal cancer. This platform uses scientific methodology and contains three information service modules: Patient’s experiences (videos/audios gallery). Shared decision making (Decision AIDS), and Research needs, aimed at promoting health education for patients and families.</td>
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<tr>
<th>To which <strong>groups of citizens</strong> is this initiative addressed?</th>
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<tbody>
<tr>
<td>Patients, users, caregivers and health professionals.</td>
</tr>
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</table>

**Please describe the activity carried out in detail**

PyDeSalud is a web platform (open and free) of integrated services to promote knowledge, autonomy and active participation of people on their health problems. This website is organized in modules and lines of work that aim to identify the issues and problems that concern the population when they are sick, providing patients and their families with relevant, culturally appropriate and complete information on those aspects that are most important to them.

**What are the key **results** emerged from its implementation?**

The acceptability and effectiveness of decision aids have been evaluated with mixed methods (qualitative and quantitative) through acceptability studies and randomized controlled trials (RCTs). The platform is accredited in compliance with the eight ethical principles promoted by the HON Foundation to improve the quality of web pages with health contents. The multidisciplinary team that integrates PyDeSalud has also received the 'Accredited Medical Web' certification (WMA, granted by The Official Colegio de Metges de Barcelona) and the HONcode (The Health on the Net code) certification: http://www.gobiernodecanarias.org/noticias/historico/Sanidad/58101/pydesalud-recibe-premio-medes-divulgacion-espanol-conocimiento-biomedico

It has also received the Medes award for the best initiative in promoting the use of the Spanish language for the dissemination of biomedical knowledge: http://www.pydesalud.com/tag/premio-medes/
Additional resource 2: Dipex España
http://www.dipex.es/

What is the level of this initiative?
National level, in coordination with Healthtalkonline in the United Kingdom.

What are the objectives of this initiative?
One of the main objectives of this action is the improvement of patients’ care. The objectives of DIPEx are to: 1) Share experiences of illness or health problems and offer support to patients and caregivers; 2) Respond to questions and problems that concern people who are sick or have a health problem and help them make informed care decisions; 3) Provide evidence-based and reliable information on diseases and health problems; 4) Be a resource for continuing professional education; 5) Promote better communication between patients and health professionals.

To which groups of citizens is this initiative addressed?
The programmes target patients, caregivers and relatives of people affected by type II diabetes, hypertension, palliative care and assisted reproduction.

Please describe the activity carried out in detail
This web resource presents information based on patient experiences. By following the links, they can view, hear and read a variety of personal health and disease experiences, helping to understand the symptoms and signs, treatments and ways to control the disease, as well as support groups and relevant scientific publications.

What are the key results emerged from its implementation?
This is a web site that has received multiple awards (http://www.healthtalk.org/)

Additional resource 3: Programa Paciente Experto
http://www.fbjoseplaporte.org/docs/dossier_pacient_expert_cast.pdf
http://www.gacetasanitaria.org/es/panorama-las-iniciativas-educacion-el/articulo/S0213911113000150/

What is the level of this initiative?
National level (the Patient Expert Programme is carried out in autonomous regions of Murcia, Barcelona, Valencia, Asturias, Andalusia, Galicia, Castile-La Mancha, Basque Country, and Catalonia)

What are the objectives of this initiative?
Promote the role of the patients as the main responsible for self-care of their health and facilitate the acquisition of the necessary skills to manage the symptoms of the disease, incorporate healthy lifestyles and achieve a better quality of life, always in collaboration with health professionals.

To which groups of citizens is this initiative addressed?
Patients, caregivers and relatives of people affected by different chronic diseases (cardiovascular diseases, stroke, hypertension, diabetes, asthma, chronic obstructive pulmonary disease, cancer, osteoarthritis, arthritis, fibromyalgia, renal failure, etc.).

Please describe the activity carried out in detail
This resource offer a wide selection of course activities, workshops and forums, with a diversity of approaches and methods, and taking into account broader aspects such as
patient safety, caregiving or disease prevention. Therefore, the number of sessions, duration and activities are different in each "Expert Patient" program.

What are the key results emerged from its implementation?

The results show improvements in aspects related to the health and quality of life of patients, as well as a reduction in the use of health resources and services. The system provides for a basic assessment of participants' satisfaction with the educational and organizational aspects of the program. In addition, an evaluation of the impact of the programme on improving health and quality of life as well as the use of health services is recommended. This additional evaluation may be quantitative or qualitative.

---

**Additional resource 4: OfraSalud**

http://zonadesaluddeofra.blogspot.com.es/

What is the level of this initiative?

Local level (Initiative of the OFRA Health Centre, Santa Cruz of Tenerife, Spain). Available at national level.

What are the objectives of this initiative?

This is a blog of the OFRA Health Centre providing information on public health.

To which groups of citizens is this initiative addressed?

General population.

Please describe the activity carried out in detail

This blog is composed of different sections with videos, Slideshows, visual information about different diseases and medical advice.

What are the key results emerged from its implementation?

n/a

---

**Additional resource 5: Nos cuidamos**

http://www.noscuidamos.com/

What is the level of this initiative?

National level.

What are the objectives of this initiative?

Promote a culture of health, self-care and well-being

To which groups of citizens is this initiative addressed?

To the general population.

Please describe the activity carried out in detail

This is a website for general public where different resources are provided to learn how to lead a healthy life and achieve physical, mental and social well-being. The website offers articles, monographs, videos, multimedia galleries, tests. Noscuidamos.com does not focus on diseases and how to treat them, but it provides relevant information about what to do to avoid falling sick and how to maintain physical care. They also offer two tools in app format: 1) My Pyramid about diet and nutrition; 2) Dr quiz which is a game to improve users' knowledge about health and well-being.

What are the key results emerged from its implementation?
**Additional resource 6: Educar en salud**

http://www.educarensalud.org/

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<tr>
<th>What is the level of this initiative?</th>
<th>National level. It is located in Valencia (Spain).</th>
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<tbody>
<tr>
<td>What are the objectives of this initiative?</td>
<td>Provide a web resource to the educational community (parents, teachers and students) for the promotion of health based on the use of ICTs tools.</td>
</tr>
<tr>
<td>To which groups of citizens is this initiative addressed?</td>
<td>Educar en Salud is addressed to teachers, but also to the other actors involved in health education at school, such as parents, students, doctors, nurses, psychologists and, in general, all professionals involved in the educational process and on issues related to the child’s health.</td>
</tr>
<tr>
<td>Please describe the activity carried out in detail</td>
<td>This platform provide quality information on health and related issues that may be of interest to members of the educational community, such as prevention and promotion of health in school, occupational health, humanitarian medicine, environment, consumption, road education, etc. At the same time, the portal offers tools that allow the interaction and exchange of experiences between users (boards, forums), as well as the possibility of exchanging information in the form of opinion articles, teaching materials, educational experiences, letters to the director, news and announcements or suggestions.</td>
</tr>
<tr>
<td>What are the key results emerged from its implementation?</td>
<td>n/a</td>
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**Additional resource 7: Enfermera virtual**

http://www.infermeravirtual.com/esp

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<tr>
<th>What is the level of this initiative?</th>
<th>National level. It is located in Barcelona (Spain)</th>
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<tbody>
<tr>
<td>What are the objectives of this initiative?</td>
<td>The Virtual Nurse (VN) is a health-enhancing resource that strengthen the health and well-being of individuals, communities and populations.</td>
</tr>
<tr>
<td>To which groups of citizens is this initiative addressed?</td>
<td>General population, with special materials for adolescents and pregnant women.</td>
</tr>
<tr>
<td>Please describe the activity carried out in detail</td>
<td>As a health promotion and education portal it wants to be a virtual space of knowledge and interaction with the user, as well as a working tool for nurses and available to all professionals in the health, education and social sector. The virtual nurse offers free mobile App (IOS and android) aimed at both citizens and health professionals, in order to promote the autonomy and independence of people in health decision-making. Using the APP, the user can consult health tutorials in an easy and understandable way and in different formats (videos, infographics or health advice). With the application it is also possible to scan QR codes and receive health-related notifications. The APP allow the health professionals to</td>
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prescribe nursing content in a simple way through a mobile or tablet. Virtual Nurse, collaborates with public and private institutions through an extensive program of sponsorships and collaborations. They also design tailor-made health knowledge products for corporations that want to incorporate health promotion and education into e-health, good practices, or relationships with employees and/or clients.

What are the key results emerged from its implementation?

n/a

### Additional resource 8: Mami center

http://www.infermeravirtual.com/esp

What is the **level** of this initiative?
National level. It is located in Valladolid (Spain)

What are the **objectives** of this initiative?
The objective of this platform is to support and guide parents in the care of their children.

To which **groups of citizens** is this initiative addressed?
Parents with children and pregnant women.

Please describe the activity carried out in detail
Mamicenter is a community of parents and professionals providing information on the health of children. In the community parents or pregnant women can consult paediatricians and health professionals about children's health and pregnancy. The tool is aimed at improving health habits, sharing concerns with other parents and professionals, seeking advice and alleviate possible problems that might arise.

What are the key results emerged from its implementation?

n/a

### Additional resource 9: Personas que

https://www.personasque.es/#

What is the **level** of this initiative?
National level.

What are the **objectives** of this initiative?
Offer a platform of services that allow people affected by different types of diseases to better manage that disease and improve their quality of life.

To which **groups of citizens** is this initiative addressed?
People who live with an illness. Specifically: diabetes, obesity, hepatitis, dermatitis, allergies, depression, infertility, celiac disease, etc.

Please describe the activity carried out in detail
This platform offers 3 services providing different contents:  
1) Community: To know and interact with other people who live with the same illness;  
2) Control: To keep a record of the symptoms, medication or the results of your analysis that allows an effective follow-up of the disease;  
3) Magazine: offers online information on the contents of each disease. 

The creation of the content is supervised by a medical group of experts. This platform also
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 727474

offers free mobile applications so people can take control and follow-up of their disease.

What are the key results emerged from its implementation?

Personas que is a private initiative that does not provide public information on the results of evaluations of its services. Its main result indicator is the number of users of the platform

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**Additional resource 10: Social diabetes**

https://www.socialdiabetes.com/es

What is the level of this initiative?
National level.

What are the objectives of this initiative?
Provide a digital tool for diabetes patients (and also for their families and for professionals).

To which groups of citizens is this initiative addressed?
People suffering from diabetes and their families

Please describe the activity carried out in detail
Social Diabetes is a webpage that offers online health resources for patients with diabetes so that they can improve the self-management system of their disease, offering guide and personalized information on the amount of insulin that is needed. The website also offers a space for professionals so that they can follow up on their patients with diabetes.

What are the key results emerged from its implementation?
n/a

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**ULL**

**DIGITAL HEALTH LITERACY CASE STUDY**

**Initiative 1. VIDEM**

Developing healthy habits and physical education through Educational Video-Games and Motor Plays for Hospitalized Children and Adolescents (VIDEM).

Link: www.videm.es In addition, the project is described in detail at the article published at: http://dx.doi.org/10.1016/j.chb.2015.08.052

What is the level of this initiative?
Subregional level. In this pilot study the sample selection was conducted on a school in an urban area of Santa Cruz de Tenerife.

What are the objectives of this initiative?
The main objective of this initiative is to prevent childhood obesity based on motor games, and active videogames. It implies:

- to promote the acquisition and retention of healthy lifestyles in overweight/obese children through health education;
- to evaluate the influence of educational intervention programs in overweight/obese children;
- to promote social awareness of the importance of preventing childhood obesity.
**To which groups of citizens is this initiative addressed?**

Children (ages 8-12)

**Please describe the activity carried out in detail**

**Participants.** 24 children aged from 8 to 12 with a body mass index indicative of overweight. Exclusion criteria: children without computer and internet or a television at home; children with a cognitive impairment that prevents participation in the project; participation during the last 12 months in a clinical trial.

**Design.** Quasi-experimental research, longitudinal, prospective study. Participants were distributed between the experimental (receiving intervention) and the control group (non-intervention).

**Intervention duration.** The three months intervention was organized in three phases (the entire project took one year):

1. **Base-line.** Information were collected about: anthropometric measurement and questionnaires about the environment, risk factors, unhealthy habits, protective factors, and level of knowledge among children and their families.

2. **Intervention.** During three months the experimental group participated in:
   - 16 group sessions, twice a week in school setting. Each one lasted 90 minutes and included training on healthy habits (30 min), motor games (40 min) and the platform Tangible Goals: Health (Tango:H) which is an active videogame with content related to healthy habits (20 min).
   - 16 home sessions (45 min, twice a week): defined sessions using a commercial active videogame (Wii Fit Plus, 30 min) and a collaborative multiplayer online videogame (Pirate Island, 15 min).
   - Family training: a single educational session (90 min), addressing healthy lifestyle habits, obesity as a disease, and false beliefs about videogames.

**Gamification.** The entire training program was gamified using: points, badges and leaderboards, time, challenges and positive feedback. The game modes used were: individual, competitive and collaborative. The role play and narrative inspired in Pirate Island were used, giving the context for several ranges that the children could achieve through gamification of activities.

**Materials.** (Provided by the project) For the group sessions: Kinect sensor, TANGO:H, and sensors; and for the home sessions: Wii console, Wii balance board, the commercial videogame Wii Fit Plus, collaborative videogame Pirate’s Island.

**Professionals.** The project was developed by an interdisciplinary group that included medicine, psychology, computer science and education (physical education and specific didactics) professionals.

**Funding.** Ministry of Education and Science of Spain (national financing)

**What are the key results emerged from its implementation?**

This initiative was evaluated using quantitative and qualitative methodology. We will summarize only some of them, associated to the main results.

1. **Biometric variables:** Different height and weight measurements. Little not significant changes.

2. **Effort perceived by the subjects.** Average: very soft.
1.3. Heart rate sensor and accelerometer. Average group values collected during 15 sessions were: 1) Distance: 0.65 km/h; 2) Mean HR: 107.17 bpm; 3) FC Max: 157.52 bpm and 4) Calories: 52.52 kcal

2. Learning about healthy habits/improving healthy lifestyle. Significant differences in the rates of diet quality were found between the control and experimental groups after the intervention (not at the baseline). It is an evidence of the intervention effectiveness in this topic.

3. Increasing motivation through gamification intervention program and achieving compliance with the home activities. Both objectives where attained considering changes in the children's emotions associated with the program sessions and to the adhesion to the implementation of activities at home.

Initiative 2. PROViTAO
Active videogames program for obesity treatment (PROViTAO)
Link: http://provitao.ull.es/

What is the level of this initiative?
The project consists in two interventions implemented at subregional level in Tenerife. The first with clinical referred population from the health area of the Hospital Universitario de Canarias and the second with participants selected among school children at La Laguna city.

What are the objectives of this initiative?
The main objective is to validate the effectiveness of the intervention model based on motor games and active video games to promote healthy attitudes and habits in children who suffer obesity/type II diabetes, in order to contribute to the domiciliary treatment adherence.

To which groups of citizens is this initiative addressed?
8 to 12 years-old children suffering obesity and children who in addition have type II diabetes.

Please describe the activity carried out in detail

Participants. 38 children have participated among the two editions. In each edition the participants were distributed between the experimental and the control group. All of them were 8-12 years-old and had obesity. It was required that participants had basic technological devices at home (computer, internet) and television.

Design. Quasi-experimental research, longitudinal, prospective study.

Intervention duration. One year
1. Baseline evaluation included: Anthropometric measurements, blood analysis and questionnaires about the environment, risk factors, health related habits, protective factors, and level of knowledge among children and their families.
2. During three months the experimental group participated in: 8 group sessions, once a week at the Faculty of Education at the University of La Laguna. Each session lasted 120 min and included training on healthy habits through an initial explanation and games (60 min), motor games (40 min) and TANGO:H active videogame with content related to healthy habits (20 min).
3. A retest was conducted at the end of this phase (both groups).
4. During the next three months the experimental group participants were guided and helped to design a personal project for habit change, consisting in the planning of a physical activity. Promoting for that purpose an active exploration of their environment resources for healthy behaviors using digital assets and real visits. The activities were implemented/proposed at a Moodle environment, and videoconferences among little groups of participants and a project responsible were conducted weekly. Along this phase the families participated in monthly group sessions that included digital and health alphabetization. Simultaneously children attended group session oriented to encourage their self-confidence, self-esteem, and autonomy for behavioral changes.

5. During the third phase (three months) each participant implemented his/her personal project. Monthly face to face sessions were conducted.

6. Follow-up evaluation.

Gamification. The gamification system was similar to the one described at the VIDEM project.

Materials. (Provided by the project) For the group sessions: Kinect sensor, TANGO:H videogame used with health related contents; sensors. The Kahoot platform was also used. For the home sessions: Wii console, Wii balance board, the commercial videogame Wii Fit Plus; different free games and activities available online that promote healthy habits; Moodle platform.

Professionals. Computer Science professionals, Physical Education and Specific Didactics teachers, and Health professionals from medicine, nursery, psychology, physiotherapy.

Funding. Fundación CajaCanarias with the collaboration of Promoción de la Salud del Servicio Canario de Salud and the Hospital Universitario de Canarias (HUC).

What are the key results emerged from its implementation?

This initiative is currently being evaluated using quantitative and qualitative methodology. There are biomedical measurements (weight, height, skin folds, bone diameters, muscle and body perimeters, body composition and body mass index, physiological measurements, perceived exertion, and blood analysis), psychological evaluations, information about the emotional state during group sessions, and about the knowledge and use of healthy habits.

### DIGITAL LITERACY / E-EDUCATION / E-INCLUSION CASE STUDY

#### Initiative 1. MOOC: Teaching and evaluating the digital competence.

MOOC: Teaching and evaluating the digital competence.


What is the level of this initiative?

National initiative (also open to participants from other countries).

What are the objectives of this initiative?

The project tries to improve teachers’ next competences in order to encourage them to promote the students’ digital literacy:

- evaluation of digital information, data and contents;
• sharing digital information and contents;
• integration and reprocessing;
• identification of gaps in digital competences.

To which groups of citizens is this initiative addressed?
This MOOC is addressed to teachers and other people interested in this topic, to finally encourage children and adolescents’ digital alphabetization.

Please describe the activity carried out in detail

Participants. In the edition carried out in 2015, 1,922 people from fifteen different countries got enrolled in the course; 7% finished all the programmed activities. The course was free and a badge was the signal of compliance.

Time/duration. Six weeks, with an estimated dedication of 5 hours per week.

Activities. The contents are presented via a series of videos. Activities and challenges are proposed and each participant should disseminate them through a personal blog (developed for themselves) and using social networks.

In order to achieve the objectives, a group of activities has been designed: to increase/gain knowledge about the foundations and characteristics of the digital competency and it’s conceptual frame; to be able to plan projects and didactic activities to improve and promote student’s digital competency; to be able to identify and analyse good practices in ICT’s use at the classroom; to be able to establish the criteria for the digital competence evaluation; to know and use online applications and resources to design activities and projects; to be able to identify the teachers’ digital competence areas, abilities and descriptors; finally, to improve the participant’s digital competence.

Personnel involved. The MOOC has been designed by Education professionals, formed in Pedagogy; the dynamics are driven by Physical Education, Sociology and Biology professionals, all of them specialized in digital learning.

Use of technologies. Users are driven through the use of different educative platforms, social and professional networks, applications and online resources. It requires to use Internet and computer, and to have some skills using digital environments.

Funding. This initiative has been developed in the context of the National Institute of Educative Technologies and Teachers Training, within the Ministry of Education, Culture and Sports. The latter is the funding entity of the MOOC.

What are the key results emerged from its implementation?

The results concerning the first edition of the course are available at http://blog.educalab.es/intef/2015/06/19/analisis-datos-finales-mooc-enseñar-y-evaluar-la-competencia-digital/

Some results, attending to the participants’ implementation and informed satisfaction, shows that the active participants who finished the course and reported the evaluative questionnaire gave in general a positive evaluation, with a Net Promoter Score +55. The average rating about the intent to recommend the MOOC to other colleagues was 8,75 (scale 0-10). Users highlight the videos’ quality, the activities’ typology, the used methodology and the interactions using social networks and professionals’ communities.

Other indications of the good results of this initiative is that the fourth edition of the course is under development. Among the four editions, almost 15.000 people participated; most of them are teachers from the Spanish Educative System.
**Initiative 2. Digital alphabetization and informational competencies.**

**Report:** Digital alphabetization and informational competencies.


**What is the level of this initiative?**
This initiative was conducted at a national level in 2012.

**What are the objectives of this initiative?**
This initiative aimed to provide:
- conceptualization of digital alphabetization and its desirable contents, agents and objectives;
- definition of teachers’ role in this process and how they are instructed in this alphabetization;
- Definition of parents’ and families’ dealing role in the management of the increasing complexity that ICT plays in their children's different learning contexts and which are the related scholar demands.

**To which groups of citizens is this initiative addressed?**
The research is conducted implying parents of children aged 8-17.

**Please describe the activity carried out in detail**
A survey was conducted to analyse the family’s role in the digital alphabetization of their children. The investigation was implemented as follows.

**Participants.** Parents with children aged 8-17 years, residents in Spain. The country's territory was divided in several regions in order to organize the sampling. It was made attending to the target population ratios in the defined areas, and to a predefined sampling frame.

**Time/duration.** The survey administration was conducted during two periods (July 6-29 and September 5-19), both along the mornings (9 to 14) and afternoons (16.30 to 20.30) with an average duration of the completed surveys about 17 minutes.

**Relevant variables.**
- Independent variables: sex, age, life cycle, social status, education level, nationality, parents’ management and attitude towards ICT, their participation in social networks, educational relationship with their children, whether an educative model exists, and the time dedicated to educate.
- Dependent variables/survey content were organized around several issues: ICT equipment that the minor can access; children ICT use level at home; access time; freedom in the ICT use; parents opinion about the internet value to their children’ studies and learning; parents’ knowledge about formative contents in internet and videogames; impact in the informational contents; parents’ valuation about the ICT development and value at school; conflicts, abuse, crimes and addictions through the internet in children’s education; and powerlessness feelings and need for training.

**Personnel involved.** Theoretical revision has been conducted by two digital alphabetization experts (Manuel Area and Alfonso Gutiérrez), and the research was designed and interpreted by the Universitary Family Institute from the Comilla Pontifical University.
(Fernando Vidal and colleagues).

**Funding.** Collaboration between Fundación Telefónica and Fundación Encuentro.

**What are the key results emerged from its implementation?**

(Results are available at the referred link)

The theoretical review establish two challenges:

- the digital alphabetization should be oriented to the educative use of ICT
- it is needed to advance from computerised homes to informational families.

The main conclusions derived from the survey research are: (1) Our society progress towards the ICT infrastructure full coverage in domestic and scholar contexts for minors; (2) the digital divide consists more in the educational stiles than in the low classes accesses or infrastructures; (3) parents perceive risks in the Internet, but don’t feel powerless in the face of ICT, moreover they demand specific information that improves their possibilities of taking advantage of the formative potential for children; (4) minors use informatics but don’t learn informational competencies; (5) the improvement of family’s profit from technologies depends on an attitude change and skills learning (for example: mutual communication, deliberation, formulation of the familiar mission and project, entrepreneur, participation, critical activity, openness to the world and interaction with it, co-responsibility, innovation, and expressiveness). (6) The objective should be reaching informational families, not computerized homes.

**Initiative 3. Project Technology in the service of people (TSP)**

**Project Technology in the service of people (TSP)**


**What is the level of this initiative?**

This project has been implemented at regional level in the Canary Islands, conducted by the Consejería de Educación, Universidades y Sostenibilidad del Gobierno de Canarias.

**What are the objectives of this initiative?**

TSP Project promotes the use of information and communication technologies in Canary public education centres (no university). It specifies several objectives destined to provide networking and communication infrastructures, software, networks, equipment, formative activities (mainly for teachers), technical and management service, open digital resources and contents creation and management, facilitate models on teaching and learning. The defined objectives specify the users and educative contexts implied in each case. In general they affect pre-school, elementary and secondary education, High School and Vocational Training centres, new creation centres; administration staff, students with special educational needs. Finally some objectives imply to research and experiment emergent technologies with educative application and to define possible transfer so school strategies; to design and implement a communication plan to give the information about the TSP actions to educative centres, and to design and implement an evaluation and monitoring plan for the ICT resources implantation processes, their application at schools and technical and educative services delivered to users.

**To which groups of citizens is this initiative addressed?**

Thw Educational Community (teachers, students and administration staff) in preschool, primary and secondary school and vocational training.
Please describe the activity carried out in detail

Activities:
- teachers training and e-learning,
- providing learning materials,
- creating, disseminating and indexing digital contents and educative resources,
- supporting the ecoescuela 2.0 environment tools,
- designing and managing technological services offer through networks,
- managing information and knowledge,
- providing counselling and support to the teachers
- designing and managing collaborative workspaces.

What are the key results emerged from its implementation?
Along 2014, 2,781 training hours were conducted, including mixed courses, specific training events and e-learning or online courses.

POLICIES AND ADDITIONAL INFORMATIONS


This is a national level document developed in the context of the National Institute of Educatice Technologies and Teachers Training, within the Ministry of Education, Culture and Sports.
Link: http://blog.educalab.es/intef/2016/12/22/marco-comun-de-competencia-digital-docente-2017-intef/
Full document link: educalab.es/documents/10180/12809/MarcoComunCompeDigiDoceV2.pdf

Other relevant actions: (SALUD-in)

Interactive virtual rehabilitation platform based in social videogames for health and physical education and in natural interaction techniques (SALUD-in)
Link: http://saludin.es/
Implemented at regional level in the Comunidad Autónoma de Canarias and funded by the Agencia Canaria de Investigación, Innovación y Sociedad de la Información (ACIISI), cofinanced by the European Regional Development Fund (ERDF; 2010)

This project pursues to perform a platform with therapeutic games that patients can use from home, with other patients and supervised by experts. Moreover, the platform allows a small group of physiotherapists to manage multiple patients, providing to the system algorithms and processes that facilitate the objective evaluation of the therapy effectiveness and the automated progress management.

SALUD-in project is based in virtual worlds, motion games controllers and biomedical sensors. The patients can learn, train and interact with others, staying at the hospital or at home. The principal subsystems are:
- A movement detector system and biomedical data based in controller devices with low cost biomedical and motion sensors.
- A platform with therapeutic games that will encourage the patient. It gives deferent
virtual environments where the motor and social activities take place, with avatars that replicate in real time the patients’ movements.
- A remote clinical managing and monitoring system to the patients’ rehabilitation exercises and clinical history.

ULPGC

DIGITAL HEALTH LITERACY CASE STUDY

Initiative 1. Escuela de pacientes
Escuela de pacientes (Patients school) www.escueladepacientes.es

What is the level of this initiative?
This is an initiative of the department of health of the regional government of Andalusia (the largest autonomous community in Spain with more than 8 million inhabitants). It started in 2008.

What are the objectives of this initiative?
It is addressed to improve health and quality of life of people suffering from a chronic disease.
It was created as a meeting point, a space to share experiences among patients, families, caregivers and professionals.
Through the School of Patients, patients become experts in their illness and are able to help other patients. Similarly, caregivers can transmit their knowledge and skills to others who are starting care. The school has specific sections for diabetes, cardiovascular diseases, etc. The main objective of the Patient School is to contribute to the generation and exchange of knowledge and experiences on the management of different diseases. This is intended to enable all people to play a more active and responsible role. A way to learn and teach the best ways to take care of themselves.

To which groups of citizens is this initiative addressed?
Patients with chronic diseases, The following diseases are included: children asthma, COPD, Cardiac disease, diabetes types I and II, colorectal cancer, breast cancer, fibromyalgia, palliative care, chronic kidney disease. Caregivers. Health professionals.

Please describe the activity carried out in detail
Training actions (courses, workshops) aimed at patients, caregivers, families and associations; professionals of the Public Health System of Andalusia who can share the "other side" of the disease with the public, an aspect often hidden by the more scientific-technical look.

The activities and resources offered by the School of Patients are:
• Face to face and virtual training: courses, workshops, seminars
• Conferences and Meetings
• Editing materials: videos, manuals, guides
• Library of resources about the disease and journals
• Spaces of expression: stories and photos
They also have internet forum and specific blogs on a variety of topics: besides the specific diseases included, there are blogs on healthy cooking, sexual school, Summer school and a specific blog on e-activation of patients and families.

**What are the key results emerged from its implementation?**

Apparently, there is no official evaluation of the global project in the web.

There are several partial evaluations published in scientific journals.

A scientific article published in 2016 in the journal *Atencion Primaria*(1) evaluates the Schools of Patients for the specific case of Diabetes Mellitus type 2 patients. Peer training has a positive impact on physical activity, the use of health services, and self-management, with some gender differences. The peer-training strategy is considered positive, as it strengthens the patient-health provider relationship, generates group support and self-confidence, and improves the emotional management. Patients identify two areas of potential improvement: access and continuity of training strategies and more support and recognition from health providers and institutions.

Another article(2) evaluates the fibromyalgia case, and concludes that emotional stress and lifestyle improved after the training, the number of visits to the doctor dropped and disease self-management increased.

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**DIGITAL LITERACY / E-EDUCATION / E-INCLUSION CASE STUDY**

**Initiative 2. Red Conectada**

Red Conecta (e-inclusion): [http://fundacionesplai.org/e-inclusion/red-conecta/](http://fundacionesplai.org/e-inclusion/red-conecta/)

Created in 2001

**What is the level of this initiative?**

This project has been created by a private non for profit foundation, called *Fundacion Esplai*, whose objectives are to promote citizenship committed to social inclusion, socio-educational action and responsible use of information and communication technologies, with a special dedication to children and youth, and betting on the Third Sector.

Level: national (Spain)

**What are the objectives of this initiative?**

It’s a network of socially based telecentres in the Spanish territory whose purpose is to promote the social inclusion of all people using Information and Communication Technologies (ICT).

**To which groups of citizens is this initiative addressed?**
Red Conecta is aimed at the general population, but especially at 13 to 30 year olds, women with difficulties in accessing the world of work, long-term unemployed and people with social difficulties.

Specific objectives are:

- To achieve digital literacy of citizenship through the Practical Computer. To use the computer from 0 and with different operating systems;
- Improving employability through ICT by improving users' curricula and official and international certification in Microsoft digital competencies;
- Responsible Internet: Security, privacy, rights, duties and responsible use;
- Learn to use social networks and Internet for businesses and small businesses;
- ICT Practices: Use applied to day-to-day management, from electronic procedures to multimedia edition
- Mobile Devices: Digital literacy through mobile devices and tablets
- Senior Project APPTIVATED.
- ICT Innovation: Creatively use ICT. Resources for learning programming, video games, ...

Please describe the activity carried out in detail

Telecentro Red Conecta is a space with computer and / or technological equipment where a dynamic person guides the process and accompanies the people in their learning, plans the activities and adapts them to the needs of each group, advises the citizens and contacts and Encourages networking with close associations. Red Conecta encourages networking with the associative network, institutions, business sector and local administrations. The dynamising person (professional of the telecentre) is the key factor to drive the learning process, both from the technical point of view, and especially to accompany the participants. They provide personalized attention, have a good knowledge of the environment, with specialization in aspects of social inclusion. They are responsible for planning activities, organizing groups, contacting nearby associations and maintaining equipment. In some of the centres there are volunteers collaborating with or carrying out the work of the person energizing.

For the development of these main lines the continuous training of professionals is essential to incorporate new lines and/or offer their knowledge to other professionals. The training of ICT professionals is developed through the Academy of Telecenters and Social Organizations.

What are the key results emerged from its implementation?

In February 2003 an evaluation was published with very positive results on use of internet skills in young people and satisfaction:

http://www.cruzroja.es/pls/portal30/docs/PAGE/SITE_CRE/ARBOL_CARPETAS/BB_QUE_HACE_CEMOS/B10_INTERVENCION_SOCIAL/POBREZA/PRACTICAS/12-ESPALI%20EVALUACION%20RED%20CONECTA.PDF
ITALY

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DIGITAL HEALTH LITERACY CASE STUDY

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<tr>
<th>Initiative 1. ‘Tutto sui vaccini in parole semplici’</th>
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<td>‘Tutto sui vaccini in parole semplici’:</td>
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<th>What is the level of this initiative?</th>
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<tr>
<td>The initiative is funded by Regione Veneto, but is potentially available to all Italian population. It is broadly addressed to all citizens, but primarily to parents of U5 children.</td>
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<th>What are the objectives of this initiative?</th>
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<tr>
<td>The initiative is meant at providing Italian citizens with scientific, evidence-based and transparent information on vaccines and vaccinations, as well as at indicating reliable online and offline sources of information about vaccines and vaccination.</td>
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<tr>
<th>To which groups of citizens is this initiative addressed?</th>
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<td>The general population, but parents (therefore PLW) in particular. Also children and adolescents may be a target.</td>
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<th>Please describe the activity carried out in detail</th>
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<tr>
<td>The initiative, funded by Regione Veneto, was implemented in 2016 with the collaboration of ‘Zadig’ (an agency specialized in Scientific Information, based in Milan). The action is part of a broader education/sensitization initiative promoted by Regione Veneto to counter vaccine-hesitancy. The MOOC was launched in 2016, but is still available online. According to the promoters, it is the first and only experience of this sort in Italy and internationally. The MOOC is offered free of charge to all people who agree to register to the specific portal. The MOOC is composed of 3 sections: (i) provision of information on vaccination in general and specific vaccines and/or vaccine-preventable diseases (documents can be read online and/or downloaded), (ii) a section of 5 puzzles meant at testing users’ knowledge on vaccination/vaccines; (iii) an interactive and multimedia ‘serious’ game putting users in the shoes of those that cannot be immunized. This last part was developed by a specialized agency, expert in gamification. No information is currently available on the number of participants, personnel involved and costs. However, CCM could get in touch with Zadig to get more information on the initiative (contacts are already established).</td>
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<th>What are the key results emerged from its implementation?</th>
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No data/information is available about the results of the initiative. Indeed, it is not clear either whether the pilot phase is over, and/or if any mid-term evaluation has been conducted. However, CCM could get in touch with Zadig to get more information on the initiative (contacts are already established).

**DIGITAL LITERACY / E-EDUCATION / E-INCLUSION CASE STUDY**

**Initiative 1. ‘Nonni su internet’**

‘Nonni su internet’


**What is the level of this initiative?**

The initiative is implemented by the association ‘Mondo digitale’ in collaboration with University La Sapienza (ROME). The initiative started in 2007 and is still ongoing. Every year new classes are organized in many Italian regions, in collaboration with local partners ([http://nonnisuinternet.mondodigitale.org/](http://nonnisuinternet.mondodigitale.org/)).

**What are the objectives of this initiative?**

The initiative is meant to improve the digital literacy and capacities of elderly people. It entails also training of trainers.

**To which groups of citizens is this initiative addressed?**

Elderly

**Please describe the activity carried out in detail**

The initiative is structured as a multilevel component initiatives, benefitting:
- teachers/educators (identified and properly trained);
- tutors (students that are selected to assist the elderly);
- elderly (final beneficiaries of the course).

9 manuals have been developed to train teachers, tutors and elderly people. The course is commonly administered face-to-face in schools or in any venue availed by partner associations (e.g. Poste). It is structured in 15 lessons, of 2 hours each (30h course). Video-lessons have also been produced to enable long-distance learning ([http://www.mondodigitale.org/it/risorse/materiali-didattici/videolezioni-pc](http://www.mondodigitale.org/it/risorse/materiali-didattici/videolezioni-pc)).

**What are the key results emerged from its implementation?**

In 10 years, all over Italy 30.000 > 60 elderly have completed the course, 21.000 students have been involved as tutors and 2.100 teachers have been selected as coordinators. No information about external / official evaluation of the initiative is available. Further, it is not clear which is the proportion of beneficiaries that utilized – partly or exclusively - the video-lessons.

### Policies AND Additional Informations

#### Policies 1: tackling digital health literacy/\(e\)Health issues in your country

1. Apparently, major initiatives implemented by the National Ministry of Health in the field of e-health are meant to facilitate the process of care and/or data management, but are not or little focused on health education and prevention:
2. Guidelines for the certification of the professional competencies of ‘\(E\)-Health operators’:
   - [http://www.aicanet.it/e-health](http://www.aicanet.it/e-health)
3. IPASVI (National Nursing Association) has promoted the EU guidelines on e-health, based on the EU ‘\(E\)NS4care’ project: [http://www.ipasvi.it/attualita/progetto-ue-ens4care-le-linee-guida-degli-infermieri-per-l-e-health-id1659.htm](http://www.ipasvi.it/attualita/progetto-ue-ens4care-le-linee-guida-degli-infermieri-per-l-e-health-id1659.htm). However, it is not clear whether any official inclusion of the EU guidelines at national level has followed.

#### Policies 2: tackling digital literacy/e-inclusion issues in your country

1. National Programme to enhance digital culture, education and competencies in Italy, promoted by ‘Agenzia per l’Italia Digitale’, in collaboration with national institutions, business associations, trade unions, no-profit associations and RAI tv:
2. Appeal ‘BastaBufale’ launched by Laura Boldrini to promote the commitment of Italian institutions and parties to issue policies meant to prevent the dissemination of fake news/information on the web:
   - [http://www.bastabufale.it/#appello](http://www.bastabufale.it/#appello)
Belgium

UCL

Digital Health Literacy Case Study

Initiative 1. Well Done MSD Health Literacy Awards

In Belgium, the “Well Done MSD Health Literacy Awards” competition was established since 2012 and rewards the best projects aiming at improving citizens’ health literacy, highlighting the importance and impact of this concept and ultimately at improving the healthcare system. This initiative is based on collaboration between partners from the main healthcare organizations with a jury chaired by Belgian health literacy experts. Link: http://welldoneawards.be/fr/la-litteratie-en-sante/

There are 3 categories of awards: (1) First line award with projects involving first line healthcare stakeholders (general practitioner, nurses, pharmacists, etc.), (2) Specialty care award with projects involving second line healthcare stakeholders (e.g., specialist practitioners), and (3) Community award with initiatives taken by public organizations or patients’ organization.

Two initiatives/projects related to health literacy using ICT were selected and rewarded in 2016:

1. moveUP (Gent Universiteit) https://www.moveup.care/

What is the level of this initiative?

1. moveUP (Gent Universiteit): The project has been developed within a large hospital in Gent, Belgium, by orthopaedic surgeons, physiotherapist and engineers, and it was made available worldwide afterwards following positive results.
2. Sensoa – Zanzu (Anvers): The project has been implemented at the national level and is available online.

What are the objectives of this initiative?

1. moveUP (Gent Universiteit): For patients, the project aims at meeting their needs for information regarding their revalidation and ensuring a better recovery and healthier lifestyle thanks to preventive measures. For medical stakeholders, it aims at improving the effectiveness of health management throughout the patient’s journey.
2. Sensoa – Zanzu (Anvers): The project aims at encouraging discussions (in group or individually) about sexual health among vulnerable migrants (e.g., asylum seekers, newcomers, etc.), which is often difficult due to language and cultural barriers, and limited health-related knowledge and limited health literacy.

To which groups of citizens is this initiative addressed?

1. moveUP (Gent Universiteit): It is addressed to patients needing revalidation after a knee surgery.
2. Sensoa – Zanzu (Anvers): The project is addressed to vulnerable migrants (e.g.,
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 727474

asylum seekers, newcomers, etc.), and is also a tool that can be used by health professionals working with this target group.

<table>
<thead>
<tr>
<th>Please describe the activity carried out in detail</th>
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</thead>
<tbody>
<tr>
<td>1. <strong>moveUP (Gent Universiteit):</strong> moveUP is a coach app aiming at offering tailored information and personalized exercises for patients in rehab after a knee surgery. The rehab program is automatically adjusted to patients’ actual physical activity and reported pain level, in order to minimize the risk of experiencing pain due to overtraining. Patients can use a wearable technology and a tablet app to receive a personalized report on their activities and movements, painkillers intake, reported pain level, and their progress in their rehab program.</td>
</tr>
<tr>
<td>2. <strong>Sensoa – Zanzu (Anvers):</strong> Zanzu is a website and an app available on smartphone and tablet providing information about sexual health (body, family planning and pregnancy, infections, sexuality, relationships and feelings, rights and law) in migrants’ mother tongue (with dictionary and translations available) and via different means (pictures, oral explanations, etc.). The website/app is very accessible and helps migrants improving the self-management of their sexual health, and it is also a useful tool for professionals working with them.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What are the key results emerged from its implementation?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>moveUP (Gent Universiteit):</strong> The initiative has not been systematically evaluated, but qualitative information about patients’ and healthcare professionals’ use is available on their website. Patients reported that the app was very easy to use and user friendly, and that it led to a quick and efficient recovery after their knee surgery. Health professionals also had positive feedbacks about the app and for instance said it was the best way to offer a personalised, painless and smooth rehabilitation path for patients, and it allowed physicians to constantly monitor the evolution of their patients.</td>
</tr>
<tr>
<td>2. <strong>Sensoa – Zanzu (Anvers):</strong> As far as we know, the initiative has not been evaluated.</td>
</tr>
</tbody>
</table>

DIGITAL LITERACY / E-EDUCATION / E-INCLUSION CASE STUDY

<table>
<thead>
<tr>
<th>Initiative 1. Wallonie numérique/digital wallonia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wallonie numérique/digital wallonia (<a href="https://www.digitalwallonia.be/wallonienumerique/">https://www.digitalwallonia.be/wallonienumerique/</a>), which is a strategy aiming at promoting digital development and initiatives in Wallonia (Belgium). As part of this strategy, they developed the project “#WallCode” that aims at increasing awareness about computer sciences and programming skills in schools.</td>
</tr>
</tbody>
</table>

What is the level of this initiative?
The initiative is regional (Wallonia).

What are the objectives of this initiative?
As technology and digital devices are omnipresent, digital literacy and skills are essential to live, work, and function in society. The objective of #WallCode is therefore to raise awareness about computer sciences, algorithms and programming languages among students and teachers.

To which groups of citizens is this initiative addressed?

The project is addressed to children/adolescents (kindergarten, elementary and secondary school) and teachers.

Please describe the activity carried out in detail

#WallCode is organized as a one-week seminar during which students and teachers are taught the basis of programming, coding, and algorithms, following a problem-based learning.

What are the key results emerged from its implementation?

The initiative has been evaluated in terms of attendance: 3500 students (from schools in Wallonia) participated in #WallCode in 2016, among which 1719 were from elementary schools. However there is no systematic evaluation available, although they reported that students enjoyed the experience and found it stimulating, exciting, and motivating ([https://www.digitalwallonia.be/3500-eleves-wallcode/](https://www.digitalwallonia.be/3500-eleves-wallcode/)).

**POLICIES AND ADDITIONAL INFORMATIONS**

### Policies 1: tackling digital health literacy/eHealth issues in your country

As far as we know, there are no policies tackling specifically digital health literacy/eHealth literacy in Belgium. However, the importance of health literacy in general is increasingly recognized at the political level in Belgium:

- Health literacy was (indirectly) mentioned as an area of priority actions in the Belgian government declaration (9th October 2014).
- Health literacy was mentioned as an indicator of healthcare quality by the Belgian Health Care Knowledge Center (Centre Fédéral d’Expertise des Soins de Santé; KCE), and considered as a crucial factor to improve citizens’ health and increase patients’ empowerment. Link: [https://kce.fgov.be/sites/default/files/page_documents/KCE_259B_rapportperformance2015.pdf](https://kce.fgov.be/sites/default/files/page_documents/KCE_259B_rapportperformance2015.pdf)
- Healthcare funds/insurances (i.e., mutualités) have the task of promoting health literacy in the Belgian population, and often collaborate in projects related to this topic (initiatives and actions, or research projects). For instance, the Mutualité chrétienne/Christelijke mutualiteit, in collaboration with UCL, conducted a study about health literacy levels in the Belgian population in 2014 (Link: [https://www.mc.be/actualite/communique-presse/2014/connaissance-sante.jsp](https://www.mc.be/actualite/communique-presse/2014/connaissance-sante.jsp)).

### Policies 2: tackling digital literacy/e-inclusion issues in your country

Initiatives and policies are tackling digital literacy in Belgium, for instance the strategy “Digital Wallonia” that sets the framework for all the Walloon Government’s actions in terms of digital development in Wallonia (regional level). More than 500 million euros are mobilized...
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 727474

Digital Wallonia is divided into 3 complementary axes:

➢ Strategy: Adopted collectively by the Walloon Government, it sets out the priorities and objectives of public policies and the framework for supporting private initiatives in favor of digital development.
➢ Platform: Collaboratively managed by the Walloon digital ecosystem, it provides services and support to public and private actors involved in the implementation of the digital strategy.
➢ Mark: Driven by all the actors of the digital transformation of Wallonia, it ensures their visibility and federates the initiatives implemented within the framework of the digital strategy.

https://www.digitalwallonia.be/wallonienumerique/
UK

ULSTER

DIGITAL HEALTH LITERACY CASE STUDY

Initiative 1. NHS Widening Digital Participation programme

| NHS Widening Digital Participation programme |
| http://nhs.goodthingsfoundation.org |

What is the level of this initiative?

The NHS Widening Digital Participation programme was a regional level initiative coordinated by the NHS England and the Tinder Foundation (the Tinder Foundation has now been rebranded as the Good Things Foundation). The reach of this initiative was across different locations in England. The NHS Widening Digital Participation programme has focused on regions in England that were considered to be comprised of hard-to-reach communities that tended to have worse health outcomes when compared to other regions in England.

What are the objectives of this initiative?

The objective of NHS Widening Digital Participation programme was to improve the digital health skills of people in hard-to-reach communities. This initiative was formed because the health services that are provided by the NHS England are increasingly provided online. The initiative was deemed to be necessary as there is a significant correlation between people that are digitally excluded and people at risk of poor health. The aim of the initiative was to address this issue by providing otherwise digitally excluded people with the digital skills that allow them to take charge of their own health.

To which groups of citizens is this initiative addressed?

The NHS Widening Digital Participation programme was targeted at people from hard-to-reach communities. The initiative did therefore not specifically target a particular target group. Nevertheless, the priority target groups of the NHS Widening Digital Participation programme were defined as:

- People with learning difficulties
- Dementia carers
- Disadvantaged young people
- Digitally excluded people generally

A breakdown of the socioeconomic composition of the people that were reached by the programme is summarised in Table 1.
Table 1. Socioeconomic composition of the people reached by the NHS Widening Digital Participation programme.

<table>
<thead>
<tr>
<th>Audience</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jobseekers</td>
<td>81.7%</td>
</tr>
<tr>
<td>Older people</td>
<td>71.8%</td>
</tr>
<tr>
<td>Low-income families</td>
<td>51.9%</td>
</tr>
<tr>
<td>People with learning disabilities</td>
<td>40.5%</td>
</tr>
<tr>
<td>People with poor mental health</td>
<td>39.7%</td>
</tr>
<tr>
<td>General population</td>
<td>39.7%</td>
</tr>
<tr>
<td>Non native English speakers</td>
<td>33.6%</td>
</tr>
<tr>
<td>Black, Asian and minority ethniccommunities</td>
<td>31.3%</td>
</tr>
<tr>
<td>Disabled people</td>
<td>28.2%</td>
</tr>
<tr>
<td>Volunteers/staff from other organisations</td>
<td>22.1%</td>
</tr>
<tr>
<td>Carers</td>
<td>20.6%</td>
</tr>
</tbody>
</table>

Note. One individual can belong to more than one audience.

Please describe the activity carried out in detail

Number of subjects that were involved in the NHS Widening Digital Participation programme:
The NHS Widening Digital Participation programme did train 221,941 different people to use digital health resources and tools. The 221,941 people were trained over a time period of three years. In addition, a total number of 8,138 people were trained as Digital Health Champions or volunteers to help to promote the use of digital health resources.

Duration of the NHS Widening Digital Participation programme:
The NHS Widening Digital Participation programme was conducted from July 2013 to April 2016.

Personnel involved:
The information regarding the NHS Widening Digital Participation programme that is publicly available does currently not specify the number of personnel that were involved in the delivery of this initiative. However, the programme was supported by > 15,000 volunteers that were part of a previously established network of local centres that were run and managed by the Tinder Foundation. The NHS England was able to utilise upon the large local network of the Tinder Foundation as this programme was conducted in cooperation with the Tinder Foundation.

Use of technologies:
The NHS Widening Digital Participation programme made use of MOOCs that were provided using the “https://www.learnmyway.com” digital learning environment that is maintained by the Tinder Foundation.

How was the initiative implemented:
The NHS Widening Digital Participation programme was implemented based on three main strategies. One aspect of the NHS Widening Digital Participation programme was the development of an online training programme that was aimed for teaching / improving basic digital skills for health of the programme participants. This online training programme was subsequently made available and used during the lifespan of the NHS Widening Digital Participation programme to train the participants of the programme basic digital health skills. In addition, 175 digital health-information training networks were established. These networks were established in locations such as public centres, libraries and care homes. The purpose of these centres was to provide face-to-face support for improving digital skills or to provide group workshops on digital skills. The reach of the NHS Widening Digital Participation programme was increased through different digital health events and a marketing campaign.

How was the initiative financed / costs of the initiative:
The NHS Widening Digital Participation programme was funded through a £2.7 million grant that was provided by the NHS England. However, a cost analysis was conducted in the final report of the NHS Widening Digital Participation programme. This cost analysis was based upon questionnaire responses of the participants. The conducted cost analysis indicated that the number of Accident & Emergency (AE) department visits decreased in 6% of the participants of the programme. In addition, it was found that 21% of the participants made less calls or visits to their GP. The study modelled the annual cost savings to the decreased demand of GP and AE services to be £6 million per year. This finding indicates a positive return of investment for the NHS Widening Digital Participation programme.

Reasons for the implementation of the NHS Widening Digital Participation programme:
The NHS England does provide an increasing number of services online. However, it is known that there is a significant correlation between people that are digitally excluded and people at risk of poor health. This means that population groups that could potentially benefit most from online health services have no or only limited access to such services. The NHS Widening Digital Participation programme was funded to provide digitally excluded people with the required digital health literacy skills such that these population cohorts can make use of available online health services.

What are the key results emerged from its implementation?
The outcomes of the NHS Widening Digital Participation programme were assessed through a number of different methods. One survey was administered to 1965 subjects. The gathered quantitative survey data was analysed and presented numerically, while free-text survey responses and qualitative interview transcripts were analysed to identify common themes. In addition, in-depth and semi-structured interviews with staff at these participating centres were conducted to gain further insight into the effectiveness of different teaching and engagement activities. Focus groups with learners were also conducted to gain the learners perspective of usefulness of different teaching and outreach activities. The data that was gathered through the different assessment activities was summarised to assess the effectiveness of the programme under the three outcome categories below.

1) Scale, impact and behavior change
2) Reaching the furthest first
3) Digital inclusion of new models of care
The following section of this document provides a summary of the key project outcomes in each of the three outcome categories.

1) Key project outcomes under the scale, impact and behavior change category
The NHS Widening Digital Participation programme has, during the lifetime of the project, trained 221,941 people to use digital health resources. This number is based upon the single visit counts on the health related web pages of the programme. The programme also trained 8,138 volunteers that increased the reach of the programme. An analysis of the reached cohort of subjects was conducted. The reached subjects were categorized into the categories social exclusion (82%), recipients of means-tested benefits (60%), disabled (60%), unemployed (34%), aged 65 and over (19%). Given that these categories are not identical to the priority target groups (people with learning difficulties, dementia carers, disadvantaged young people and digitally excluded people generally) it is difficult to comment upon the success of reaching subjects from the priority target groups. However, the socioeconomically picture of the reached subjects (refer to Table 1) appears to fit people that could be described as being socioeconomically excluded. The programme was able to achieve a behavior change for some of the participants. It was reported that 6% of learners made fewer visits to A&E, 10% of learners made fewer calls to NHS 111 and 21% of learners made fewer calls or visits to their GP. This behavior change was translated into an annual cost saving of £6 million to the NHS due to the decreased demand in visits to the GP visits and the A&E department.

2) Key project outcomes under the reaching the furthest first category
The composition of the programme participants (refer to Table 1) indicates that the NHS Widening Digital Participation programme was successful in reaching people from a socioeconomically challenged background. Qualitative data that was collected through surveys and through engagement with the volunteers suggests that the programme was successful in reaching the priority target groups. It was found that when working with people with dementia that a ‘multi-sensory’ approach achieved the best learning outcomes. In addition, it was found that a lack of time and disposable income did prevent carers to attend digital health training sessions. This issue was tackled using different strategies such as outreach events or access to support networks. For people with learning difficulties or disabilities it was found that it was difficult to achieve the desired learning outcome using textual online content. Voice-activated options for online training were found to lead to the best learning outcomes for people with learning difficulties or disabilities. It was found that mobile phones offered the best method to introduce digital health resources to young people (including those at risk of offending). In addition, effective partnerships such as links with sheltered housing provided a useful insight to assess the success of the different engagement strategies. The findings above highlights that it was possible to reach the different priority target groups of the NHS Widening Digital Participation programme by using different engagement strategies that were tailored to the diverse needs of each of the different priority target groups.

3) Key project outcomes under the digital inclusion of new models of care category
The NHS Widening Digital Participation programme found that it was beneficial to offer health services and the provision for digital health training on the same site. General
practitioners (GPs) can, for example, identify patients with the need of training in digital health literacy and directly refer them to a training centre. This new holistic model of care was described to have the potential of reducing GP appointments and therefore reducing the costs associated with the healthcare system. It was also found that this approach was particularly successful in improving the digital inclusion of otherwise digitally isolated persons. An important finding of the NHS Widening Digital Participation programme was that while such referrals are a very effective way to ‘prescribe’ digital health literacy training, it requires the formation of strong partnerships between digital health literacy training centres and medical professionals. This is because it was found that medical professionals initially had objections to participate in the referral process, as they were concerned about online safety and security. However, these concerns could be overcome if a pathway for digital health literacy training would be defined as one possible medical treatment pathway by the healthcare system.

DIGITAL LITERACY / E-EDUCATION / E-INCLUSION CASE STUDY

### Initiative 1. OneDigital

OneDigital

https://www.digitalchampionsnetwork.com/one-digital-programme

**What is the level of this initiative?**

OneDigital is a national level initiative.

**What are the objectives of this initiative?**

The objective of the OneDigital initiative is to deliver basic digital skills to people across the UK through the development of sustainable digital skills training solutions. The developed training solutions are delivered by so-called ‘Digital Champions’ in order to reach the target populations. The Digital Champions were recruited using a standardised training programme that has been developed by the OneDigital initiative.

**To which groups of citizens is this initiative addressed?**

The OneDigital initiative targets those with disability and accessibility needs, young adults looking for work, adults over 65 years of age as well as third sector organisations (charities) and their beneficiaries.

**Please describe the activity carried out in detail**

**Number of subjects involved:**
Over 1,100 Digital Champions have been recruited and more than 10,000 people have been trained with digital skills between January 2016 (start of the training phase) and November 2016.

**Duration of the intervention:**
The programme started in late 2015. The training of the digital champions took place during 2016. The initiative was designed to be sustainable and as such has no set end date. The
online resources that are used to support the initiative will therefore continue to exist after the end of the initiative. This allows for the duration of this initiative to be open ended.

Activities:
The partner institutions of the OneDigital initiative delivered individual and specific projects that were tailored to the end-user needs. This was supported through one common framework (supported by online resources) that was provided to the Digital Champions. Meetings with the end-users we used to deliver the basic digital training. On average, learners were helped with three basic digital skills. The three most common digital skills that were improved though the OneDigital initiative were web searching, emailing and social media usage. An extensive literature review of the OneDigital initiative did now provide a detailed description of the methodologies that were used during the training sessions. It is speculated that this is due to the fact that the third-party institutions may have adopted different methodologies (specifically tailored to address the needs of their end-user group) for the delivery of the basic digital skills training.

Personnel involved:
The philosophy of the OneDigital initiative was to use ‘trusted intermediaries’ to promote and to deliver basic digital skills to people that are lacking these essential skills. The initiative empowered, supported and inspired trusted intermediaries to become so called Digital Champions. These Digital Champions worked as multipliers that delivered the basic digital training. Three different Digital Champions were recruited (professionals, staff from third sector organisations and volunteers). This recruitment strategy was important, as one of the project aims was to assess the effectiveness of the three different Digital Champions types. It was, at the start of the OneDigital initiative, speculated that Digital Champions that are recruited from the staff of existing frontline would allow for a highly effective and sustainable way of delivering basic digital skills.

Use of technologies:
The online support material that was used by the OneDigital initiative is delivered over the so-called Digital Champions Network. The Digital Champions Network provides six self-study online courses to help Digital Champions to develop their personal digital skills and the essential techniques to engage others. The online courses include self-assessment tests and interactive resources such as videos. In addition, the online resources do allow the Digital Champions themselves to earn recognitions (in the form of Open Badges) for their own progress in learning digital skills. Digital Champions also get access to an online system that allows them to record teaching and engagement activities. This online system is also used to evaluate the success of the learners.

Funding of the OneDigital initiative:
The OneDigital initiative was financed using a £2 Million grant from the Big Lottery Fund.

Reason for the implementation of this initiative:
This initiative was implemented to enhance the basic digital skills of charities and of people that are in need of such skills. In addition to delivering basic digital skills training, the project was also aimed to assess the contribution that existing frontline organisations in the third sector could make when delivering basic digital skills. A secondary aim of the project
was to assess the effectiveness of different types of Digital Champions (professionals, third sector staff and volunteers) in the delivery of basic digital skills.

<table>
<thead>
<tr>
<th>What are the key results emerged from its implementation?</th>
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<tbody>
<tr>
<td>Results of the OneDigital initiative:</td>
</tr>
<tr>
<td>The OneDigital initiative has, from January 2016 (start of the training phase) to November 2016 supported more than 10,000 people to improve their digital skills. On average, learners were helped with three basic digital skills. The three most common digital skills that were improved though the OneDigital initiative were web searching, emailing and social media usage. The training was achieved using the help of more than 1,000 digital champions that were trained by the OneDigital initiative.</td>
</tr>
<tr>
<td>The OneDigital initiative was independently evaluated. The evaluation was based upon stakeholder interviews, meeting observations and site visits with surveys, online diaries and self-audits. The evaluation assessed different factors such as the effectiveness of the different Digital Champion models. In addition, the success of the initiative in delivering digital skills training to the digital champions and the beneficiaries was assessed. The outcomes of this evaluation are (for the Scottish aspect of the OneDigital initiative) available as an executive summary [1].</td>
</tr>
<tr>
<td>The evaluation found that the different forms of Digital Champions offered different advantages to the project. Professional Digital Champions were found to be highly effective when delivering basic digital skills training. The large base of Digital Champion volunteers allowed to significantly increasing the reach of the OneDigital initiative. Digital Champions that were recruited from host institutions were found to be a potential way of sustaining the digital skill training after the end of the project.</td>
</tr>
<tr>
<td>Another finding of the survey was that the participation in the OneDigital initiative allowed over 80% of the participants to increase their confidence in digital skills and to develop an understanding of the benefits that digital skills have to offer.</td>
</tr>
</tbody>
</table>

References.

<table>
<thead>
<tr>
<th>Examples of relevant initiatives on e-education and e-inclusion initiatives in your country</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Digital Oasis initiative is a local initiative that is implemented at a local learning centre. Volunteer staff help members of the public with issues that are related to computer / digital skills. The staff at the local learning centre does assists the public in the use of online opportunities or in the utilisation of commuter equipment.</td>
</tr>
<tr>
<td>A link to the Digital Oasis initiative is provided below.</td>
</tr>
</tbody>
</table>
POLICIES AND ADDITIONAL INFORMATIONS

Policies 1: tackling digital health literacy/eHealth issues in your country
The UK Government has developed a national digital inclusion strategy. The aim of this strategy is to reduce the number of UK citizens that lack basic digital skills and capabilities that are required to realise the benefits of the internet. The UK Department of Health has, as a direct consequence of the UK Digital Strategy, implemented a number of different actions that aim to address the targets that are set out by the UK Government Digital Strategy. One of these actions (Action 15) aims to help people go online to access digital health information. The Widening Digital Participation programme that was previously described in this document was implemented under Action 15 of the Widening Digital Participation programme.
A link to a corporate report that describes the actions of the UK Department of Health in response to the UK Government Digital Strategy is provided below.

Policies 2: tackling digital literacy/e-inclusion issues in your country
The UK Government has developed a national digital inclusion strategy. The aim of this strategy is to reduce the number of UK citizens that lack basic digital skills and capabilities required to realise the benefits of the internet.
A link to the document that describes the UK Government digital inclusion strategy is provided below.

(Optional) Other relevant actions aimed at digital health literacy/eHealth in your country
The national health service (NHS) in the UK has developed “NHS Digital” as a non-departmental public body that provides national information, data and IT systems for the UK health and care services. This service supports the health and care system and helps patients to make informed choices about their care. In addition, the target of NHS digital is to provide a ‘core national offer’ of health and care digital services. This will enhance / increase the digital services that are currently provided by the NHS.
A link to the web-presence of “NHS Digital” is provided below.
https://digital.nhs.uk/home
DENMARK

SCANBALT

DIGITAL HEALTH LITERACY CASE STUDY

Initiative 1. e-Courses, learn IT with the library: Health

<table>
<thead>
<tr>
<th>Initiative 1. e-Courses, learn IT with the library: Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-Kurser, lær IT med Biblioteket: Sundhed, <a href="https://www.ekurser.nu/tema/272">https://www.ekurser.nu/tema/272</a></td>
</tr>
</tbody>
</table>

What is the level of this initiative?

National level (online)

What are the objectives of this initiative?

Mainly facilitating the use of the national health portal [www.sundhed.dk](http://www.sundhed.dk) where all Danes have their personal health data collected.

Sundhed.dk is the official portal for the public Danish Healthcare Services and enables citizens and healthcare professionals to find information and communicate. The portal facilitates patient-centred digital services that provide access to and information about the Danish healthcare services. In addition, they here can search in the online patient guide book, get an overview of vaccinations received, see compared prices for dentist treatments, see who has viewed the personal health journal, and decide on organ donation.

Beyond courses on sundhed.dk there are courses on how to book time at the GP online, how to order online the national health insurance card and how to order online the EU health insurance card.

To which groups of citizens is this initiative addressed?

All citizens with a basic knowledge of the internet. For each course is indicated the level, all health-related courses are designated “Beginners” or “lightly trained”.

Please describe the activity carried out in detail

12 courses are offered where 7 deals directly with the use of the portal sundhed.dk. Each course consists in short easy to understand videos lasting 1-3 minutes.

All courses are for free. The courses are offered by the public libraries so tax financed.


What are the key results emerged from its implementation?
A target is that before end of 2015 80% of all communication between patient and health care service shall be digital using sundhed.dk.

In 2015 sundhed.dk had 1,2 million unique users per month on average out of a population of 5,6 million.

### DIGITAL LITERACY / E-EDUCATION / E-INCLUSION CASE STUDY

**Initiative 1. Ældresagen IT-kurser (DaneAge Association IT courses)**

| Ældresagen IT-kurser (DaneAge Association IT courses) | https://www.aeldresagen.dk/aktiviteter-og-kurser/find-aktiviteter-og-kurser/soeg?kategori=it&side=1#resultater |

DaneAge was founded in 1986 and is a not-for-profit, direct membership organization. DaneAge is independent, non-partisan and neutral regarding party politics, religion, and ethnic origins.

The organization has 755.000 members and membership is open to all adults (age 18+). DaneAge has 215 local chapters across Denmark and more than 18.000 volunteers working in the local chapters, doing voluntary social work, providing local membership activities, local advocacy, etc.

**What is the level of this initiative?**

Subregional.

Local chapters run the IT-courses based on volunteers.

**What are the objectives of this initiative?**

Use of PC, tablets, smart phone, use of public portals including sundhed.dk, use of online access to banks, use of various programmes, use of e-mail and SMS,

**To which groups of citizens is this initiative addressed?**

Elderly. Every 2nd Dane over 65 years is a member of DaneAge.

**Please describe the activity carried out in detail**

As per 22.2 418 local IT-courses are listed organised by volunteers.

**What are the key results emerged from its implementation?**

Annual report 2015 indicates that 1670 volunteers has contributed to IT education for the year resulting in 9968 courses. 171 local chapters offer the courses.

**Examples of relevant initiatives on e-education and e-inclusion initiatives in your country**
### POLICIES AND ADDITIONAL INFORMATIONS

#### Policies 1: tackling digital health literacy/eHealth issues in your country

National public digitalization strategy 2016-2020 (Den fællesoffentlige digitaliseringsstrategi) [http://www.digst.dk/~media/Files/Strategier/Ny-digitaliseringsstrategi-2016-2020/Strategien/Digi_opslag_DK_web.pdf](http://www.digst.dk/~media/Files/Strategier/Ny-digitaliseringsstrategi-2016-2020/Strategien/Digi_opslag_DK_web.pdf)


#### Policies 2: tackling digital literacy/e-inclusion issues in your country

The National Agency for It and Learning [http://www.stil.dk/](http://www.stil.dk/) is an agency under The Ministry of Education. It promotes digital development within the area of children and learning. The primary focus is on increasing the use of IT in education, and to support an effective operation of institutions by using IT.

The tasks of the National Agency for IT and Learning follow the general objectives and policies of the Ministry of Education.

**Mission:** Through the use of IT in learning we create professional education for all, and we promote equality between men and women.

**Vision:** We are the best in the public sector at creating value through IT, digitalization and data.

[http://www.stil.dk/Service/English](http://www.stil.dk/Service/English)
**DIGITAL HEALTH LITERACY CASE STUDY**

<table>
<thead>
<tr>
<th>Initiative 1. Digitale Welt und Gesundheit. eHealth und mHealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digitale Welt und Gesundheit. eHealth und mHealth – Chancen und Risiken der Digitalisierung im Gesundheitsbereich (Veröffentlichungen des Sachverständigenrats für Verbraucherfragen beim Bundesministerium der Justiz und für Verbraucherschutz)</td>
</tr>
<tr>
<td><strong>What is the level of this initiative?</strong></td>
</tr>
<tr>
<td>National level</td>
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<tr>
<td><strong>What are the objectives of this initiative?</strong></td>
</tr>
<tr>
<td>To give recommendations on:</td>
</tr>
<tr>
<td>1. Reliable and transparent Health information through eHealth and mHealth</td>
</tr>
<tr>
<td>2. Better competencies of consumers/population to use digital health solutions</td>
</tr>
<tr>
<td>3. Data protection</td>
</tr>
<tr>
<td>Ad 2: Germany lacks behind internationally with health literacy including digital health literacy. Germany in general is only average in daily internet use with 59% of population who is a daily user equal to EU 28 average. DK scores 77 % and NL 79 % (European citizens’ digital health literacy, EU Commission 2014).</td>
</tr>
<tr>
<td><strong>To which groups of citizens is this initiative addressed?</strong></td>
</tr>
<tr>
<td>Recommendations are for all groups but report to be taken action on by authorities. For all consumer groups throughout the lifecycle - from the early childhood education to adult education – digital health literacy level should be strengthened.</td>
</tr>
<tr>
<td><strong>Please describe the activity carried out in detail</strong></td>
</tr>
<tr>
<td>This is work summarized in a report given recommendations on health literacy including digital health literacy. The report is financed by Bundesministerium der Justiz und für Verbraucherschutz.</td>
</tr>
<tr>
<td>The main barrier in Germany appears to be lack of coordinated national initiatives towards digital health literacy thus the driver is still at the policy level.</td>
</tr>
<tr>
<td>However it should be noticed that at the academic level work is in progress, e.g. the HLCA consortium and its eHealth literacy intervention (HLCA Media Protect) which is a setting-oriented intervention addressing kindergartens / primary schools in order to facilitate transformation of these settings into screen media sensible environments.</td>
</tr>
<tr>
<td>The HLCA consortium is about to finish ground work in many of the sub projects by the end of this year and will use the data to inform e-learning interventions addressing mental</td>
</tr>
</tbody>
</table>
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 727474

Health literacy/eHealth literacy of non-health professionals (MOOCs and other formats). However, more information will be available only in 2018. http://www.hlca-consortium.de/en/

What are the key results emerged from its implementation?

National Action Plan on Health Literacy is in progress, see http://www.nap-gesundheitskompetenz.de/
Following a problem analysis of the situation in Germany, a group of experts will identify target actions and describe the corresponding tasks and strategies with which the health literacy of the German population can be improved. The results and plan of action are to be finalized by the end of 2017.

German Federal Minister of Health Hermann Gröhe is the patron of the endeavour. However it is unclear to what extent this includes digital health literacy. This may actually be an opportunity for IC Health and it could be advisable that the results from the IC Health Survey in Germany is presented to the National Action Plan stakeholders.

DIGITAL LITERACY / E-EDUCATION / E-INCLUSION CASE STUDY

**Initiative 1. Stiftung Digitale Chancen**


What is the level of this initiative?

National

What are the objectives of this initiative?

The goal of the Stiftung Digitale Chancen (Digital Opportunities Foundation) is to make people interested in the Internet and to support them with their steps into the digital world.

To which groups of citizens is this initiative addressed?

Special support, courses, projects, e.g., for the elderly, women, youth or people with handicaps. Internet for all.

Please describe the activity carried out in detail

Overall:
- help people to learn more about the Internet
- support providers of public Internet Access Points in social institutions that enable people to use the Internet.
- address experts from politics, business and the academia who work on the digital integration theoretically and practically. We provide various data and information for their work and stimulate public and private efforts to bring the power of communications to under-served communities.

Service for Internet Beginners

- addresses and opening times of Public Internet Access Points in Germany
- special support, courses, projects, e.g., for the elderly, women, youth or people with
handicaps. Internet for all

Enabling Access
- Internet Access Points enable people who are underrepresented in the Internet to get access - e.g., the elderly, or disadvantaged youth. Therefore the Stiftung Digitale Chancen supports the formation and the management of Internet Access Points in social institutions.

Service for non-commercial Internet cafés
- Information and advice on technical aspects, financing, courses and management issues - by phone, e-mail or on our website

Advice and instructions as well as practical checklists
- Insight into existing successful Internet projects via the database of the Internet Access Points and best practice examples
- Internet platform for networking

Training campaign for youth multipliers
- Together with Accenture, the Stiftung Digitale Chancen developed a training for youth multipliers for acquiring Internet competence by project learning. This training addresses the employees of institutions working with (disadvantaged) youths. The training campaign aims at improving the job prospects of young people.

Knowledge Network for experts
- www.digitale-chancen.de provides comprehensive data and analyses on the digital inclusion. Knowledge and experience are combined with the main focus on finding out the causes for not using the Internet and to develop suitable countermeasures. Experts support the Foundation as editorial partners by supplying authentical and carefully prepared data and materials on the different aspects of the Internet use and the underrepresented population groups.

A long number of courses are held related to digital literacy; these can all be found at http://www.digitale-chancen.de/content/events/index.cfm/secid.151

<table>
<thead>
<tr>
<th>What are the key results emerged from its implementation?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
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</tbody>
</table>

**POLICIES AND ADDITIONAL INFORMATIONS**

**Policies 1: tackling digital health literacy/eHealth issues in your country**

See previous information on National Action Plan on Health Literacy
### Policies 2 tackling digital literacy/e-inclusion issues in your country

**NETHERLANDS**

**SCANBALT**

**DIGITAL HEALTH LITERACY CASE STUDY**

<table>
<thead>
<tr>
<th>Initiative 1-2. E-Health4All; Diabetes zelf in de hand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two examples are included in this study, as they have different focus but both related to key drivers and barriers from different perspectives:</td>
</tr>
<tr>
<td>e-Health4All</td>
</tr>
<tr>
<td><strong>Diabetes zelf in de hand</strong></td>
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<table>
<thead>
<tr>
<th>What is the level of this initiative?</th>
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<tbody>
<tr>
<td>National level (online)</td>
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</table>

<table>
<thead>
<tr>
<th>What are the objectives of this initiative?</th>
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</thead>
<tbody>
<tr>
<td><strong>e-Health4All</strong></td>
</tr>
<tr>
<td>• find digital applications hard to use,</td>
</tr>
<tr>
<td>• do not know how to use an app properly or how to navigate a website,</td>
</tr>
<tr>
<td>• can not understand the information provided.</td>
</tr>
<tr>
<td><strong>Diabetes zelf in de hand</strong></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>To which groups of citizens is this initiative addressed?</th>
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<tbody>
<tr>
<td><strong>e-Health4All</strong></td>
</tr>
<tr>
<td><strong>Diabetes zelf in de hand</strong></td>
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<tr>
<th>Please describe the activity carried out in detail</th>
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</table>
e-Health4All
Provides expertise with development of apps targeting:

- Clients and patients
- Health care providers
- eHealth (ICT) experts

A concrete example The Health Communicator app https://youtu.be/_EdmDCAaofU

Diabetes zelf in de hand
The initiatives promotes self-management of diabetes so the patient takes the right medicine, measure and keep the blood sugar under control, register and go to regular controls.

What are the key results emerged from its implementation?

**e-Health4All**
No specific evaluation available. However, the annual e-health monitor report provides an overview on status of e-health in the Netherlands, see 2015 edition here: https://www.nictiz.nl/SiteCollectionDocuments/Rapporten/eHealth-monitor%20ENGELS%202015.pdf

Diabetes zelf in de hand
Same as above.

**DIGITAL LITERACY / E-EDUCATION / E-INCLUSION CASE STUDY**

**Initiative 1-3. Steffie ; Seniorweb Netherlands ; My child online**

Three examples:

**Steffie**, https://www.steffie.nl/

**Seniorweb Netherlands**, https://www.seniorweb.nl/

**My child online** http://mijnkindonline.nl/

What is the level of this initiative?

**Steffie**, National

**Seniorweb Netherlands**, National

**My child online**: National

What are the objectives of this initiative?

**Steffie**
Explain how to use chip cards, how to do e-banking, use of digital ID, how to access social insurance bank. Introduce youngsters to the various e-solutions and access points.
<table>
<thead>
<tr>
<th>Seniorweb Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>SeniorWeb is a national association with 150,000 members, 425 training sites and 3,050 volunteers. It has been active since 1996 with the aim to understand the digital world so that everyone can experience the convenience and fun of computer and internet.</td>
</tr>
</tbody>
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<tr>
<th>My child online</th>
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<tbody>
<tr>
<td>My Child Online has as a goal that children can use media for their own development, their own welfare and that of others.</td>
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<table>
<thead>
<tr>
<th>To which groups of citizens is this initiative addressed?</th>
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<tbody>
<tr>
<td>Steffie: Mainly Youngsters</td>
</tr>
<tr>
<td>Seniorweb Netherlands: Seniors</td>
</tr>
<tr>
<td>My child online: Children</td>
</tr>
</tbody>
</table>

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<tr>
<th>Please describe the activity carried out in detail</th>
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<tbody>
<tr>
<td>Steffie: Short videos explaining the use of e-solutions within a number of areas for functioning in society, see e.g. video for use of IBAN <a href="http://www.zowerktiban.nl/">http://www.zowerktiban.nl/</a> but also general information on e.g. healthy living, use of alcohol etc.</td>
</tr>
<tr>
<td>Seniorweb Netherlands: Develop computer skills, assist with practical solutions or background information. Volunteers find solution together with the elderly by internet, by telephone or at home. There are 400 locations across Netherlands giving computer courses, workshops and walk-in hours. SeniorWeb members can follow different courses online through the website. Each course consists of several classes.</td>
</tr>
<tr>
<td>My child online:</td>
</tr>
<tr>
<td>My Child Online examines how youth between 2 and 18 years deals with new media in order to assist schools involved in new developments. They help teachers in primary and secondary school from the perspective and interests of children. My child online encourage children to excel in social media.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>What are the key results emerged from its implementation?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steffie: n/a</td>
</tr>
<tr>
<td>Seniorweb: n/a</td>
</tr>
<tr>
<td>My child online: n/a</td>
</tr>
</tbody>
</table>

**POLICIES AND ADDITIONAL INFORMATION**

**Policies 1: tackling digital health literacy/eHealth issues in your country**

Long-term care was reformed in 2015 in order to contain costs. Care at home, preferably by informal carers, is now given greater priority over
institutional care, which was seen as having become over-used. See review at http://www.euro.who.int/__data/assets/pdf_file/0016/314404/HIT_Netherlands.pdf. It is not clear whether this targets specifically digital health and self management.

The Dutch National Implementation Agenda for eHealth was released in June of 2012. It sets out a three year plan centred around self-management by patients and care substitution initiatives’. Other issues addressed include using personal health records, developing data exchange standards, and preparing a long-term research and innovation agenda see https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2012/06/07/nationale-implementatieagenda-e-health-nia/nationale-implementatieagenda-e-health-nia.pdf

See current overview of NL government goals for eHealth at https://www.government.nl/topics/ehealth/contents/government-encouraging-use-of-ehealth

<table>
<thead>
<tr>
<th>Policies</th>
<th>tackling digital literacy/e-inclusion issues in your country</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT teacher training in the Netherlands is included in the action plan “Teaching 2020: a Strong profession” <a href="https://www.educ.cam.ac.uk/centres/lfl/about/events/pastlflsupperseminars/PDFs/Teaching_2020_The_Netherlands_Ministry.pdf">https://www.educ.cam.ac.uk/centres/lfl/about/events/pastlflsupperseminars/PDFs/Teaching_2020_The_Netherlands_Ministry.pdf</a></td>
<td></td>
</tr>
<tr>
<td>In 2012 Netherlands won the world award on e-participation due to the United Nations Public Service delivery ranking on that subject.</td>
<td></td>
</tr>
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<table>
<thead>
<tr>
<th>Other relevant actions: NICTIZ – national competence centre for standardisation and eHealth in the Netherlands</th>
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</thead>
<tbody>
<tr>
<td>Nictiz is the national competence centre for standardisation and eHealth in the Netherlands. They support the healthcare sector in the use of IT to improve quality and efficiency within healthcare, see <a href="https://www.nictiz.nl/over-nictiz/english">https://www.nictiz.nl/over-nictiz/english</a></td>
</tr>
</tbody>
</table>
**SWEDEN**

**FUNKA**

## DIGITAL HEALTH LITERACY CASE STUDY

<table>
<thead>
<tr>
<th>Initiative 1. KISA: Kortare Integration, Snabbare till Arbete - Shorter integration, faster at work</th>
</tr>
</thead>
<tbody>
<tr>
<td>KISA (Kortare Integration, Snabbare till Arbete) (Shorter integration, faster at work)</td>
</tr>
<tr>
<td><a href="http://kisaprojektet.se/">http://kisaprojektet.se/</a></td>
</tr>
</tbody>
</table>

**What is the level of this initiative?**

Regional project implemented by the county of Uppsala

**What are the objectives of this initiative?**

The Kisa project aims at improving the effectiveness of the integration of newly arrived immigrants into work, and more broadly into the Swedish society. One of the sub-goals of the project is to increase the participants’ health literacy and knowledge about the Swedish health system. This includes being able to find and understand health-related information, knowing where to turn to for assistance, and being able to take preventive action to improve their own health situation. The project is financed by the European Social Fund.

**To which groups of citizens is this initiative addressed?**

Newly arrived immigrants, focusing on asylum seekers.

**Please describe the activity carried out in detail**

The project involves developing online guiding material on how to find and use health-related information, especially in the context of finding your way around in the Swedish healthcare system. In 2016, interviews were conducted by the health services to understand what kind of information the participants of the initiative required. The information gathered was then categorised into different themes such as where and when you should contact a caregiver, and how the healthcare system is working. Work is currently ongoing to finalise the themes, and the first targeted information material will be published online on the eHealth portal of the Uppsala county during the first half of 2017. The next step after that will be to develop further educational material, such as films.

**What are the key results emerged from its implementation?**

The initiative is still ongoing, no evaluation data is available yet.
# DIGITAL LITERACY / E-EDUCATION / E-INCLUSION CASE STUDY

## Initiative 1. MIL for me

MIL for me  
https://statensmedierad.se/ovrigt/inenglish/milforme.1636.html

<table>
<thead>
<tr>
<th>What is the level of this initiative?</th>
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<tbody>
<tr>
<td>National level, implemented by the Swedish Media Council (a government agency whose primary task is to promote the empowering of minors as conscious media users and to protect them from harmful media influences).</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>What are the objectives of this initiative?</th>
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<tbody>
<tr>
<td>This is an e-learning module for media- and information literacy (MIL). The objective is to provide schools with updated online learning material to teach pupils about source criticism. There is notably a focus on strategies to find and critically review information on the web.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To which groups of citizens is this initiative addressed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pupils from the age of 12 to 18; teachers; librarians</td>
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</table>

<table>
<thead>
<tr>
<th>Please describe the activity carried out in detail</th>
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</table>
| This e-learning package has been developed by the governmental agency “the Swedish Media Council” and can be freely accessed from their website. The initial initiative ran from 2014-2015. Since then, modules have been updated and supplemented with new material. Although the initiative covers media in general, it is targeted to the handling of online content.  

The e-learning package includes 5 parts:  
1) E-learning module for teachers  
2) E-learning module for pupils  
3) Teacher material with exercises for the classroom on media and information literacy  
4) Suggestions on how to continue to work on MIL in schools  
5) E-learning resource with web-based pedagogical material.  

There is also an easy-to-read version adapted for groups with reading or learning difficulties. A teacher guide to the material in English can be found on the following website:  
https://www.betterinternetforkids.eu/documents/167024/714404/MIL+for+me_Chapter+online+relation.pdf/555f4639-fe8b-411d-b65c-e564e7a072cf  

In 2016, the Swedish Media Council was charged with the task of updating the material and continuing to develop material for preventive work against radicalisation, racism, crimes of hatred and violent extremism. |

<table>
<thead>
<tr>
<th>What are the key results emerged from its implementation?</th>
</tr>
</thead>
</table>
The initial initiative ran from 2014-2015. The initiative was evaluated according to both quantitative and qualitative objectives.

Quantitative objectives:
- At least 4000 unique viewings on the website. Result: 14596 viewings.
- Presentation of the material to 1000 persons in the target groups. Result: presentation to 3865 persons

Qualitative objectives:
An external organisation conducted telephone interviews with participants of the initiative. The objective was that the user evaluations should score an average of at least 5 out of 7. Result: The average score was 5.9.

MIL for me also won a prize for the best educational material in media and information literacy for children in a competition organised by the European Insafe network.

POLICIES AND ADDITIONAL INFORMATION

Policies 1: tackling digital health literacy/eHealth issues in your country
The main policy initiative regarding eHealth is “Vision for eHealth 2025” that was developed by the Swedish Government in 2016. The objective is: “to make Sweden the best in the world at using the opportunities offered by digitisation and eHealth to make it easier for people to achieve good and equal health and welfare, and to develop and strengthen their own resources for increased independence and participation in the life of society.” The emphasis of the policy is on the provision of eHealth services, such as providing the patients digital access to their own files. Digital health literacy issues are affected by the policy, but not directly addressed in this strategy.

Areas of action in the strategy include: regulatory frameworks; working towards a more consistent use of terms (incl. data structure and exchanges) and the setting up standards.

Policies 2: tackling digital literacy/e-inclusion issues in your country
There are no specific policies tackling digital literacy directly. E-inclusion issues are addressed in a number of different policies. For example, the Swedish information society strategy” ICT for Everyone – A Digital Agenda for Sweden” of 2011 states that “Everyone of working age must have good digital skills to be employable or be able to start up and run businesses” Also, the Swedish Media Council has a national responsibility to protect children and young people from harmful effects of the media and help them to become more aware media users, and in this context, they implement policies related to improving media and information literacy, including digital literacy.