**Online Appendix**

Table A1: Selected cases

| **Cases** | **Collaboration partners** | **User involvement** | **eHealth innovation** |
| --- | --- | --- | --- |
| Belgium | Mixed Napoleonic adm. regimeEtatist Social Health Ins.  | B1 | Multiple national government agencies, ministerial cabinet, multiple hospital networks, regional governments, private health suppliers, and insurance organizations, and user organizations | Presence of patient representatives in ‘core team’ of project | A national portal website that connects patient information from different healthcare organizations. |
| B2 | Private nursing organizations and federation, ministerial cabinets, national government agencies, hospital networks, individual GPs, and several private health organizations | GPs involved throughout the project | A web-tool that allows general practitioners to access patient information from home care organizations.  |
| B3 | Universities, private health organizations, national and regional government agencies, red cross organizations, knowledge organizations, ICT suppliers, and individual health professionals | GPs and health professionals as initiators of the project and involved throughout the project | A new way to create, validate, and disseminate official evidence-based guidelines and principles for healthcare professionals.  |
| B4 | Public nursing home (local government), private construction companies and contractors, consultant companies, nurses, and patients | Health professionals and patient (representatives) involved in conceptual phase and testing phase  | Several technologies (wearables, smart cameras, …) that are implemented in a nursing home, with the purpose to facilitate residents and health staff in their daily activities. |
| B5 | Municipalities, communal network, private hospitals, private ICT companies, consultant companies, citizens, and health professionals | Citizens involved in conceptual phase and testing phase | An online platform that connects citizens with healthcare and social care demands with volunteers. |
| The Netherlands | Continental adm. regimeEtatist Social Health Ins.  | N1 | Municipality, public hospital, and several private health organizations | Patient (representatives) and health professionals involved in pilot testing  | A digital platform that allow the exchange of health information between patients and healthcare providers. |
| N2 | Municipality (departments of social affairs, ICT, and service quality), private health care provider, neighbourhood teams, citizens | Family of patients and nurses involved in pilot testing | An online platform that stimulates the establishment of local neighbourhood collaborations between service providers and clients.  |
| N3 | Semi-private association, software developer, and patient organization | Family of patients and nurses involved in pilot testing  | A system of tracking technologies that supports patients to freely walk around in the nursing home.  |
| N4 | Semi-private association, ICT company, consultant company | Health professionals and patient (representatives) involved in conceptual phase and testing phase  | A diaper in which sensors are integrated which automatically detect defecation and signal this to the staff.  |
| Spain | Napoleonic adm. regimeNational Health Service | S1 | Several public hospitals, private ICT companies, several patient organizations, university | Health professionals involved in conceptual phase and patient associations involved in testing phase | Several hard- and software innovations for hospital services (i.e. digital prescription and appointment systems, robot for automatic storage and dispensing) |
| S2 | Public hospital/health service, regional government, ICT companies, consultancy companies, several other private companies, universities, health professionals and patients | Patients, health professionals and social workers involved in conceptual phase and testing phase | Digital systems for integrated, patient-centred home health care for chronic patients |
| S3 | Public hospitals and healthcare services, public research institute, private technology centre, several health professionals (e.g. psychiatrist, psychologists, physicians, etc.) | Health professionals involved in conceptual phase, patients involved in testing phase | An online application for computerised cognitive behaviour therapy (CCBT) that facilitates self-administered treatments |
| S4 | Public hospitals, ICT and telecom companies, physicians | Health professionals involved in conceptual phase, patients involved in testing phase | An AI-application that helps to diagnose eyesight related problems in uncooperative patients |
| Estonia | Eastern-European adm. regimeEtatist Social Health Ins. | E1 | Ministry, government agencies and public authorities, ICT companies, private health care providers, physician associations, hospital associations, individual physicians | Various health care providers (public and private) involved in different phases of the process | A central registration tool, as part of the national patient portal, which allow patients to book appointments with healthcare providers.  |
| E2 | Ministries, public health insurance authority, government agencies, physician association, interest groups | Representatives of user organizations and target groups involved in conceptual phase and children and parents involved in testing phase | A new service that integrates patients’ applications for disability, rehabilitation services, and general aids. |
| E3 | Ministry, public health insurance authority, colleges, network of healthcare providers, ICT companies, several health care organizations  | Health care providers (public and private) involved in conceptual phase, individual nurses involved in testing phase | A voice command app with digitalised guidelines that facilitates the execution of specific procedures by the healthcare provider |
| Denmark | Nordic adm. regimeNational Health Service | D1 | Regional government, municipalities, public hospitals, ICT company, representatives of health professionals  | Health care providers involved in conceptual phase, individual nurses and social workers involved in testing phase | An e-learning tool that allows healthcare staff to learn about dysphagia. |
| D2 | Public hospital, ICT company, health professionals | Nurses involved in the conceptual phase and the testing phase of the project | A mobile app for patient reported outcomes. |
| D3 | Public hospital, university, ICT and health service companies, patient associations, health professionals | Clinical staff, GPs and patients involved throughout the project | A mobile app for patients with osteoporosis that communicates the results of bone scans.  |

Table A2 Features of the selected countries

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Denmark** | **The Netherlands** | **Spain** | **Belgium** | **Estonia** |
| Politico-administrative regime | Nordic | Continental | Napoleonic | Mixed Napoleonic  | Eastern European |
| Tradition of user/citizen involvement | Egalitarian system with high accessibility of administration for citizens and outspoken citizen participation (Pollitt and Bouckaert 2017) | Larger distance between administration and citizens (Pollitt and Bouckaert 2017) | Large power distance between politicians and citizens (Hofstede 2001) | In between continental and Napoleonic regime because of administrative and cultural differences between Flanders and Wallonia.Mixed Napoleonic because of large politization of the administration, and its legal tradition and administrative culture  | Largely molded by administrative traditions of the Soviet Union. No strong tradition of involving citizens and lack a solid civil society (Tõnnisson and Randma-Liiv 2008) |

Table A3: Data collection

| **Case ID** | **Surveys (124)** | **Interviews (132)** |
| --- | --- | --- |
| Coordinator | Public and private partners | Users | Coordinator | Public and private partners | Users |
| Belgium | B1 | Government agency (1) and ministerial cabinet (1)  | Public hospital (1) and private ICT company (1) | Representatives of patient organizations (2), physician association (2), and user groups (1)  | Government agency (1) and ministerial cabinet (1)  | Public hospital (1) and private ICT company (1) | Representatives of patient organizations (2), physician association (2), and user groups (1)  |
| B2 | Project coordinator (1) | Government agency (1), private service provider (1), ICT company (1) | GPs (3) | Project coordinator (1) | Government agency (1), private service provider (1), ICT company (1) | GPs (3) |
| B3 | Chairman and CEO network (2) | Representative government steering committee (1), private service providers (1), ICT company (1) | GPs (3) | Chairman and CEO network (3) | Representative government steering committee (1), private service providers (2), ICT company (1) | GPs (3) |
| B4 | Manager nursing home (1) | Municipality (1) | Nurses (3) | Manager nursing home (1) | Municipality (1), external private consultant (1) | Nurses (3) |
| B5 | Project coordinator municipality (1) | Employee municipality (1), ICT company (1) | Citizens (2) | Project coordinator municipality (1) | Employee municipality (1), ICT company (1) | Citizens (3) |
| The Netherlands | N1 | Project coordinator (1) | Public service organization (1), ICT company (1) | Service organization (1), physicians (3) | Project coordinator (1) | Public service organization (1), ICT company (1) | Service organization (1), physicians (3) |
| N2 | Project coordinator municipality (1) | Coordinator private service provider (1), employee municipality (4) | Social workers and other professional users (4) | Project coordinator municipality (1) | Coordinator private service provider (1), employee municipality (4) | Social workers and other professional users (5) |
| N3 | Manager/project coordinator (1) | Public service provider (2), ICT company (1) | Representative user organization (1), nurse (1), physician (1) | Project coordinator (1) | Public service provider (1), ICT company (1) | Representative user organization (1), nurse (2), physician (1) |
| N4 | Manager/project coordinator (1) | Public service provider (1) | / | Manager/project coordinator (1) | Public service provider (1) | Nurses (2) |
| Spain | S1 | Public hospital (1) | Public hospital (1), ICT company (1) | Health professionals (4) | Public hospital (1) | Public hospital (1), ICT company (1) | Health professionals (4) |
| S2 | Innovation director ICT company (1) | Public hospital (1), private service organization (1) | Patient (1), physician (1), social worker (1) | Innovation director ICT company (1) | Public hospital (1), private service organization (1) | Patient (1), physician (1), social worker (1) |
| S3 | Public hospital (1) | Public hospitals/health care organization (3), ICT company (1) | Physicians (4), nurse (1) and technician (1) | Public hospital (1) | Public hospitals/health care organization (2), ICT company (1) | Physicians (4), nurse (1) and technician (1) |
| S4 | Public hospital (1) | Public hospital (1), ICT company (1) | Health professionals (3) | Public hospital (1) | Public hospital (1), ICT company (1) | Health professionals (3) |
| Estonia | E1 | Project coordinator (1) | Ministry (1), ICT company (1) | ICT technicians (3) | Project coordinator (1) | Ministry (1), ICT company (1) | ICT technicians (3) |
| E2 | Project coordinator (1) | Ministry (1), physicians association (1) | Representatives of users (2) and individual user (1) | Project coordinator (1) | Ministry (1), physicians association (1) | Representatives of users (2) and individual user (1) |
| E3 | Project coordinator (1) | Ministry (1), private health network (1) | Representatives users (1), nurse (1) | Project coordinator (1) | Ministry (1), private health network (1) | Representatives users (2), nurse (1) |
| Denmark | D1 | Program manager (1) | Public hospital (1), ICT company (1) | Health professionals (3) | Program manager (1) | Public hospital (1), ICT company (1) | Health professionals (3) |
| D2 | Project coordinator (1) | Public hospital (1) | Physician (1), nurse (3) | Project coordinator (1) | Public hospital (1) | Physician (1), nurse (3) |
| D3 | Project coordinator (1) | Public hospital (1) and ICT company (1) | Health professional (1), social worker (1), user representative (1) | Project coordinator (1) | Public hospital (1) and ICT company (1) | Health professional (1), social worker (1), user representative (1) |

Table A4: Operationalization of *innovativeness*

|  |  |
| --- | --- |
| **Newness** | **Adoption** |
| No/A lot of innovative ideas are developed in this project | The frequency of use will typically be very low/high |
| The innovativeness of the developed innovation is very low/high |  The effect on a user’s life will be very small/extensive  |
| The innovative character of the project is lower than/exceeds my initial expectations  | Only a selective subgroup of users/All users that would benefit from this innovation can use it |
| The users could do exactly the same thing with other tools/would be unable to do those things without this innovation  | The innovative ideas that are developed in the project are not feasible at all/very feasible  |
| It is very easy/difficult (or impossible) to find tools that have the same functionalities as this innovation (at the moment of implementation) | The innovation does not deal with the problems at hand at all/really deals with the problems at hand  |

Table A5: Calibrated dataset

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Case | User empowerment | Rules and procedures that restrict users’ activities | Knowledgeable users | Partnership | Perceived innovativeness |
| N3 | 0.67 | 0.33 | 0.33 | 0.33 | 0.33 |
| B5 | 0.33 | 0.67 | 0.33 | 1 | 0 |
| E1 | 0.33 | 0.33 | 0.67 | 1 | 0 |
| E3 | 0.67 | 0.67 | 0.67 | 0 | 0 |
| D1 | 0.67 | 0.67 | 0.67 | 1 | 0.67 |
| B3 | 1 | 0.33 | 0.67 | 0 | 0.67 |
| N4 | 0.33 | 0.67 | 0.33 | 0.33 | 0.33 |
| N2 | 0.33 | 0.33 | 0.67 | 1 | 0.67 |
| S3 | 0.67 | 0.67 | 0.67 | 0.67 | 0.67 |
| B1 | 0.33 | 0.33 | 0.67 | 1 | 0.67 |
| B2 | 0.67 | 0.33 | 0.67 | 0 | 0.67 |
| D3 | 0.67 | 0.67 | 0.67 | 0.67 | 0.67 |
| S2 | 0.67 | 0.33 | 0.33 | 0 | 0.67 |
| E2 | 0.33 | 0.67 | 0.67 | 1 | 0.67 |
| D2 | 0.67 | 0.33 | 0.67 | 0.67 | 0.33 |
| S1 | 0.33 | 0.67 | 0.67 | 0.67 | 1 |
| S4 | 0.33 | 0.67 | 0.67 | 0.67 | 1 |
| B4 | 0.67 | 0.67 | 0.33 | 1 | 1 |
| N1 | 0.33 | 0.33 | 0.33 | 0 | 0 |

Table A6: Analysis of necessary conditions – absence of highly innovative services

|  |
| --- |
| *Absence of highly innovative services* |
| **Conditions** | **Consistency** | **Coverage** |
| Government coordinated partnership | 0.591 | 0.482 |
| Societally coordinated partnership | 0.592 | 0.666 |
| High empowerment of users  | 0.702 | 0.630 |
| Low empowerment of users | 0.703 | 0.701 |
| Presence of rules and procedures that restrict users’ activities | 0.702  | 0.651 |
| Absence of rules and procedures that restrict users’ activities | 0.739 | 0.712 |
| Presence of specialized knowledge from the user in the project | 0.702 | 0.589 |
| Absence of specialized knowledge from the user in the project | 0.739 | 0.799 |

Table A7: Parsimonious solution for the presence of highly innovative services

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Consistency | Raw coverage | Unique coverage | Cases in path |
| Government coordinated partnership \* high empowerment of users \* absence of rules and procedures that restrict users’ activities | 0.890  | 0.531 | 0.136 | D1, S3, D3, B4 |
| Societally coordinated partnership \* presence of rules and procedures that restrict users’ activities \* presence of specialized knowledge from the user  | 0.858  | 0.397 | 0.101  | B2, B3 |
| Low empowerment of users \* presence of specialized knowledge from the user  | 0.792  | 0.631 | 0.170 | N2, B1, E2, S1, S4, E1~ |
|  |
| Solution consistency | **0.840** |
| Solution coverage | 0.867 |

Table A8: Complex solution for the presence of highly innovative services

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Consistency | Raw coverage | Unique coverage | Cases in path |
| Government coordinated partnership \* high empowerment of users \* absence of rules and procedures that restrict users’ activities | 0.890  | 0.531 | 0.136 | D1, S3, D3, B4 |
| Societally coordinated partnership \* high empowerment of users \* presence of rules and procedures that restrict users’ activities \* presence of specialized knowledge from the user  | 0.858  | 0.397 | 0.167 | B2, B3 |
| Government coordinated partnership \* low empowerment of users \* presence of specialized knowledge from the user  | 0.850  | 0.565 | 0.170 | N2, B1, E2, S1, S4, E1~ |
|  |
| Solution consistency | **0.840** |
| Solution coverage | 0.867  |

Table A9: Calibration of outcome/conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Innovativeness of services (outcome)** | **User empowerment** | **Specialized knowledge of users** | **Rules and procedures that hinder users’ activities** | **Type of partnership** |
| ***Structured survey and interview data leading****Questions:* see table A4*Measurement:* seven-point scale, cross-over point = 5* All answers of the respondents above the cross-over point 🡪 1
* More than half of the answers above the cross-over point 🡪 0.67
* More than half of the answers below or on the cross-over point 🡪 0.33
* More than half of the answers below the cross-over point 🡪 0
* Equal amount above and below/on the cross-over point 🡪 Larger distance to the cross-over point of answer resp. above and below/on cross-over point is indicative for assigning case score above or below cross-over point (i.e. 0/0.33 or 0.67) + qualitative interpretation to assign 0 or 0.33

General qualitative check of the assigned scores using the interview and case data | ***STEP 1: Levels of user empowerment:***Six levels: 1) listening to partnerships; 2) being consulted by the partnership; 3) advise the partnership; 4) collaborate and co-produce with the partnership; 5) decision making; 6) leading the process* All respondents answer level 4 (collaborate and co-produce with the partnership) or higher 🡪 1
* More than half answer level 4 or higher 🡪 0.67
* More than half answer below level 4 (i.e. level 1, 2 or 3) 🡪 0.33
* All answer below level 4 🡪 0

***STEP 2: Specific qualitative check*** Answers of the respondents on the levels of empowerment are checked against the qualitative case information provided. Each case receives a score (0; 0.33; 0.67; 1) that matches the qualitative case information***STEP 3: Survey data****Question*: The users were given no/extensive freedom to act within the project*Measurement*: seven-point scale, cross-over point = 5* All respondents above cross-over point 🡪 1
* More than half of the respondents above cross-over point 🡪 0.67
* More than half of respondent below or on cross-over point 🡪 0.33
* All respondents below or on cross-over point 🡪 0

***STEP 4: Qualitative interpretation of level of empowerment***Using additional qualitative interview and case material on the user empowerment, a score of 0; 0.33; 0.67 or 1 was assigned to each case***STEP 5: Integration of the scores**** Average of scores calculated in steps 1, 2 and 3 🡪 intermediate score
* Intermediate score matches qualitative interpretation 🡪 follow intermediate score
* Intermediate score does not match qualitative interpretation 🡪 round towards qualitative interpretation
 | ***STEP 1: Survey data****Question:* The involved users brought no/crucial knowledge in the project*Measurement:* seven-point scale, cross-over = 5* All respondents above cross-over point 🡪 1
* More than half of the respondents above cross-over point 🡪 0.67
* More than half of respondent below or on cross-over point 🡪 0.33
* All respondents below or on cross-over point 🡪 0

***STEP 2: Specific qualitative check*** Answers of the respondents in step 1 are checked against the qualitative information provided:Superficial experiences 🡪 0New perspectives 🡪 0.33Some technical knowledge 🡪 0.67A lot of technical knowledge 🡪 1***STEP 3: Qualitative interpretation of specialized knowledge of users***Using additional qualitative interview material, a score of 0; 0.33; 0.67 or 1 was assigned to each case  ***STEP 4: Integration of the scores**** Average of scores calculated in steps 1 and 2 🡪 intermediate score
* Intermediate score matches qualitative interpretation 🡪 follow intermediate score
* Intermediate score does not match qualitative interpretation 🡪 round towards qualitative interpretation
 | ***Survey data leading****Question*: The users’ activities were hindered/ were not hindered at all by the rules and procedures of the actors in the partnership*Measurement*: seven-point scale, cross-over point = 5* All respondents above cross-over point 🡪 1
* More than half of the respondents above cross-over point 🡪 0.67
* More than half of respondent below or on cross-over point 🡪 0.33
* All respondents below or on cross-over point 🡪 0

General qualitative check of the assigned scores using the interview and case data | ***Interview data leading***Coordinating actor is:* Government (e.g. local government, a government agency, a ministry, etc.) 🡪 1
* Public hospital or public health care organization 🡪 0.67
* Private health care provider of public interest 🡪 0.33
* Private organization (for-profit/non-profit) 🡪 0
 |

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