**Online Appendix**

Table A1: Selected cases

| **Cases** | | | **Collaboration partners** | **User involvement** | **eHealth innovation** |
| --- | --- | --- | --- | --- | --- |
| Belgium | Mixed Napoleonic adm. regime  Etatist 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. regime  Etatist 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. regime  National 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. regime  Etatist 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. regime  National 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 🡪 0  New perspectives 🡪 0.33  Some technical knowledge 🡪 0.67  A 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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