Multimedia Appendix 3: Barriers to and facilitators of patient portal implementation for each stakeholder group and ranked by number of subjects.

| Barrier and facilitators | Stakeholders | Total (n=21), n (%) |
|--------------------------|--------------|---------------------|
|                          | Medical professionals\(^a\), n (%) | Managers\(^a\), n (%) | IT\(^b\) employees\(^a\), n (%) |
| Innovation: patient portal |              |                     |                                   |
| **Barriers**             |              |                     |                                   |
| Guaranteeing privacy and security | 1 (14) | 5 (71) | 5 (71) | 11 (52) |
| Lack of accessibility    | 2 (29) | 4 (57) | 3 (43) | 9 (43) |
| Lack of perceived usefulness | 4 (57) | 1 (14) | 2 (29) | 7 (33) |
| Lack of interoperability  | 0 (0)  | 1 (14) | 1 (14) | 2 (10) |
| Lack of attractiveness   | 0 (0)  | 1 (14) | 0 (0)  | 1 (5)  |
| Lack of tailored content | 1 (14) | 0 (0)  | 0 (0)  | 1 (5)  |
| **Facilitators**         |              |                     |                                   |
| Perceived usefulness     | 7 (100) | 7 (100) | 7 (100) | 21 (100) |
| Perceived ease of use    | 2 (29) | 2 (29) | 1 (14) | 5 (24) |
| Attractiveness           | 1 (14) | 1 (14) | 2 (29) | 4 (19) |
| Participation of end users during implementation | 1 (14) | 1 (14) | 1 (14) | 3 (14) |
| Privacy and security     | 2 (29) | 0 (0)  | 1 (14) | 3 (43) |
| Good accessibility       | 0 (0)  | 2 (29) | 0 (0)  | 2 (10) |
| Credibility              | 0 (0)  | 2 (29) | 0 (0)  | 2 (10) |
| Content tailored to patients | 0 (0) | 1 (14) | 0 (0)  | 1 (5)  |
| Interoperability with EHR | 0 (0)  | 0 (0)  | 1 (14) | 1 (5)  |

Individual professional
| **Barriers**        |        |        |        |        |
|---------------------|--------|--------|--------|--------|
| Lack of knowledge   | 0 (0)  | 2 (29) | 2 (29) | 4 (19) |
| Lack of motivation  | 1 (14) | 0 (0)  | 0 (0)  | 1 (5)  |

| **Facilitators**    |        |        |        |        |
|---------------------|--------|--------|--------|--------|
| Positive attitude   | 3 (43) | 7 (100)| 3 (43) | 13 (62)|
| Motivation to change| 4 (57) | 2 (29) | 2 (29) | 8 (38) |
| Having knowledge    | 1 (14) | 2 (29) | 2 (29) | 5 (24) |

| **Patient**         |        |        |        |        |
|---------------------|--------|--------|--------|--------|
| Barriers            |        |        |        |        |
| Lack of sufficient eHealth literacy | 4 (57) | 5 (71) | 4 (57) | 13 (62)|
| Negative attitude/lack of need | 0 (0)  | 2 (29) | 0 (0)  | 2 (10) |

| **Facilitators**    |        |        |        |        |
|---------------------|--------|--------|--------|--------|
| Sufficient eHealth literacy | 2 (29) | 2 (29) | 0 (0)  | 4 (19) |
| Positive attitude/demand | 1 (14) | 0 (0)  | 1 (14) | 2 (10) |

| **Social context**  |        |        |        |        |
|---------------------|--------|--------|--------|--------|
| Barriers            |        |        |        |        |
| Negative attitude or opinion of medical professionals | 4 (57) | 3 (43) | 1 (14) | 8 (38) |
| Negative attitude or opinion of colleagues in general | 3 (43) | 0 (0)  | 3 (43) | 6 (29) |
| Varying opinions about IT security | 0 (0)  | 0 (0)  | 1 (14) | 1 (5)  |

| **Facilitators**    |        |        |        |        |
|---------------------|--------|--------|--------|--------|
| Positive attitude or opinion of colleagues in general | 0 (0)  | 2 (29) | 4 (57) | 6 (29) |
| Positive attitude or opinion of medical professionals | 1 (14) | 2 (29) | 2 (29) | 5 (24) |
| Good collaboration with colleagues | 0 (0)  | 2 (29) | 2 (29) | 4 (19) |
| Early adopters      | 0 (0)  | 3 (43) | 0 (0)  | 3 (14) |
| Varying opinions about implementation | 1 (14) | 0 (0)  | 0 (0)  | 1 (5)  |
### Organizational context

#### Barriers

| Barriers                                                                 | 1 (14) | 2 (29) | 3 (43) | 4 (57) | 5 (71) | 6 (86) | 15 (71) |
|-------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|---------|
| Lack of resources                                                      |        |        |        | 4 (57) | 5 (71) | 6 (86) | 15 (71) |
| Lack of time and increased workload                                    | 1 (14) | 4 (57) | 1 (14) |        |        |        |         |
| Innovation-averse culture                                               | 1 (14) | 4 (57) | 1 (14) | 6 (29) |        |        |         |
| Lack of suitable specialist staff                                      | 1 (14) | 2 (29) | 3 (43) | 6 (29) |        |        |         |
| Adjusting organization of care processes is difficult                  | 2 (29) | 1 (14) | 2 (29) | 5 (24) |        |        |         |
| Structure of the organization                                          | 2 (29) | 1 (14) | 2 (29) | 5 (24) |        |        |         |
| Change in task and new responsibilities                                | 1 (14) | 1 (14) | 2 (29) | 4 (19) |        |        |         |
| Organization is not ready for implementation                            | 2 (29) | 2 (29) | 0 (0)  | 4 (19) |        |        |         |
| No strategic plan and lack of organizational priority                   | 0 (0)  | 2 (29) | 0 (0)  | 2 (10) |        |        |         |

#### Facilitators

| Facilitators                                                            | 1 (14) | 2 (29) | 3 (43) | 4 (57) | 5 (71) | 6 (86) | 15 (71) |
|-------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|---------|
| Management support                                                     | 2 (29) | 3 (43) | 3 (43) | 8 (38) |        |        |         |
| Communication to promote the portal                                     | 1 (14) | 4 (57) | 1 (14) | 6 (29) |        |        |         |
| Sufficient resources                                                    | 1 (14) | 0 (0)  | 5 (71) | 6 (29) |        |        |         |
| Innovation-oriented culture                                             | 2 (29) | 2 (29) | 1 (14) | 5 (24) |        |        |         |
| Suitable specialist staff                                               | 0 (0)  | 1 (14) | 0 (0)  | 1 (5)  |        |        |         |

### Economic and political context

#### Barriers

| Barriers                                                                 | 1 (14) | 2 (29) | 3 (43) | 4 (57) | 5 (71) | 6 (86) | 15 (71) |
|-------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|---------|
| Financial difficulties                                                  | 5 (71) | 6 (86) | 3 (43) | 14 (67)|        |        |         |
| Restrictions imposed by laws and regulations                             | 0 (0)  | 3 (43) | 1 (14) | 4 (19) |        |        |         |
| Third-party dependency                                                  | 0 (0)  | 1 (14) | 1 (14) | 2 (10) |        |        |         |
| Lack of generic guidelines                                              | 0 (0)  | 1 (14) | 0 (0)  | 1 (5)  |        |        |         |

#### Facilitators

| Facilitators                                                            | 1 (14) | 2 (29) | 3 (43) | 4 (57) | 5 (71) | 6 (86) | 15 (71) |
|-------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|---------|
| Facilitating laws and regulations                                       | 1 (14) | 2 (29) | 1 (14) | 4 (19) |        |        |         |
|                              |       |       |       |       |
|------------------------------|-------|-------|-------|-------|
| Conducive financial arrangements | 0 (0) | 2 (29) | 1 (14) | 3 (14) |
| Good collaboration with third parties | 0 (0) | 1 (14) | 1 (14) | 3 (14) |
| Supporting healthcare policies | 0 (0) | 3 (43) | 0 (0) | 3 (14) |

\(^a n=7\)

\(^b\) IT: information technology