



**Forskningsprojektet
CoDeAc**



eHälsotjänster

Fungerar det för alla patienter?

Samskapande i projektet Co-Design for Accessibility (CoDeAc)

Linda Pettersson, Doktorand CKF Dalarna, UU och ST-läkare Mora VC

Med den multidisciplinära gruppen i CoDeAc,
med huvudansvarig forskare:

Catharina Gustavsson, Ass Prof DU, CKF Dalarna, IFV UU



Forskningsprojektet
CoDeAc



UPPSALA
UNIVERSITET

Methods



Enkäter



Litteratur-
översikt



Tillgänglighets-
redogörelser



Barrier
walkthrough



Samskapande



Intervention
vs Care as usual

Methods



Enkäter



Litteratur-
översikt



Tillgänglighets-
redogörelser



Barrier
walkthrough



Samskapande



Intervention
vs Care as usual

With vs
without
impairments

use

difficulty of
use

With
impairments

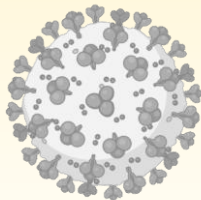
access to &
UX

(info, contact,
ordering
services and
web-portal)

accessibility
(medical
assessment
and treatment)

With vs
without
impairments

2021 vs
2019



Results

RESEARCH

Open Access

Disability digital divide: survey of accessibility of eHealth services as perceived by people with and without impairment



Linda Pettersson^{1,2,3*} , Stefan Johansson⁴ , Ingrid Demmelmaier²  and Catharina Gustavsson^{1,2,5} 

Abstract

Results

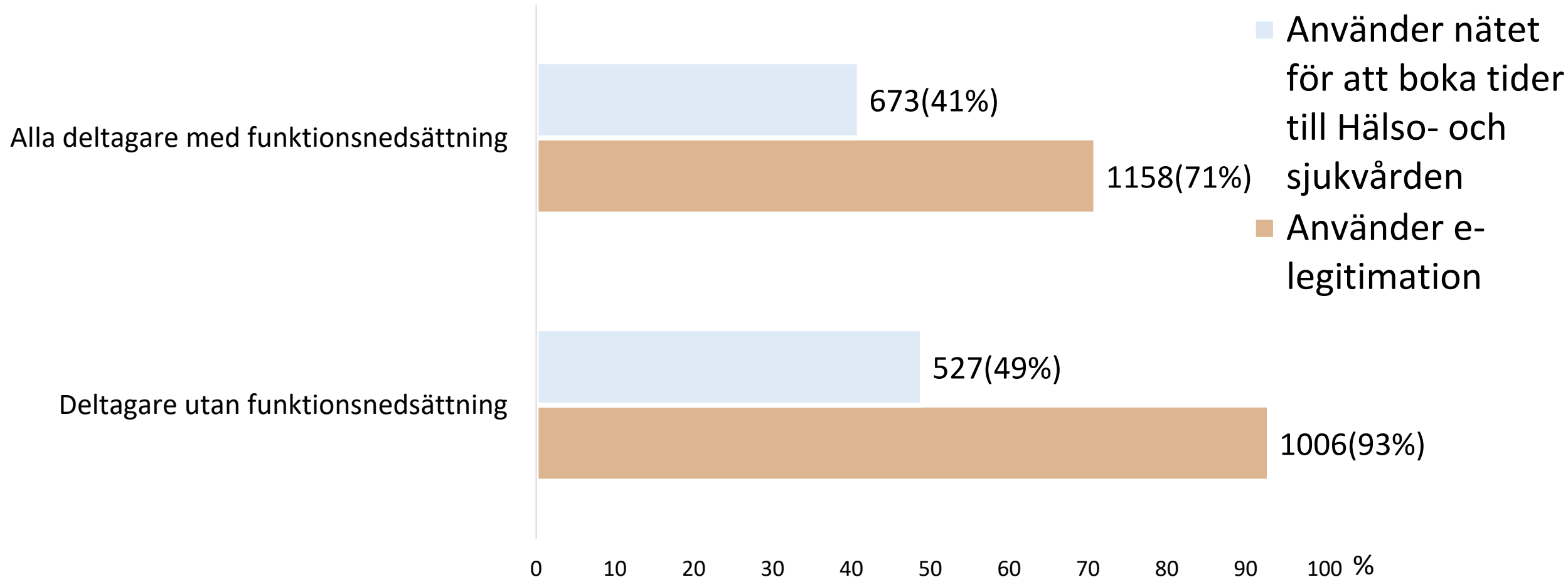
RESEARCH

Open Access



Disability digital divide: survey of accessibility of eHealth services as perceived by people with and without impairment

Linda Pettersson^{1,2,3*}, Stefan Johansson⁴, Ingrid Demmelmaier² and Catharina Gustavsson^{1,2,5}



Results

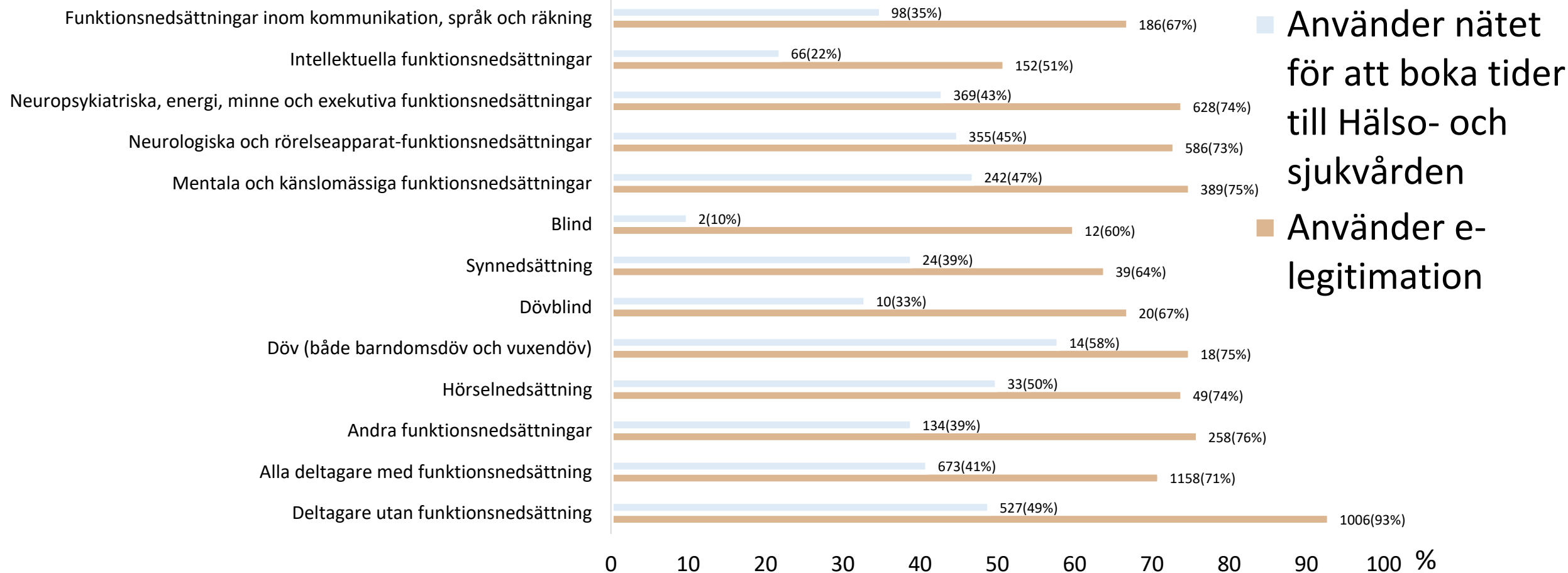
RESEARCH

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Disability digital divide: survey of accessibility of eHealth services as perceived by people with and without impairment

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Results

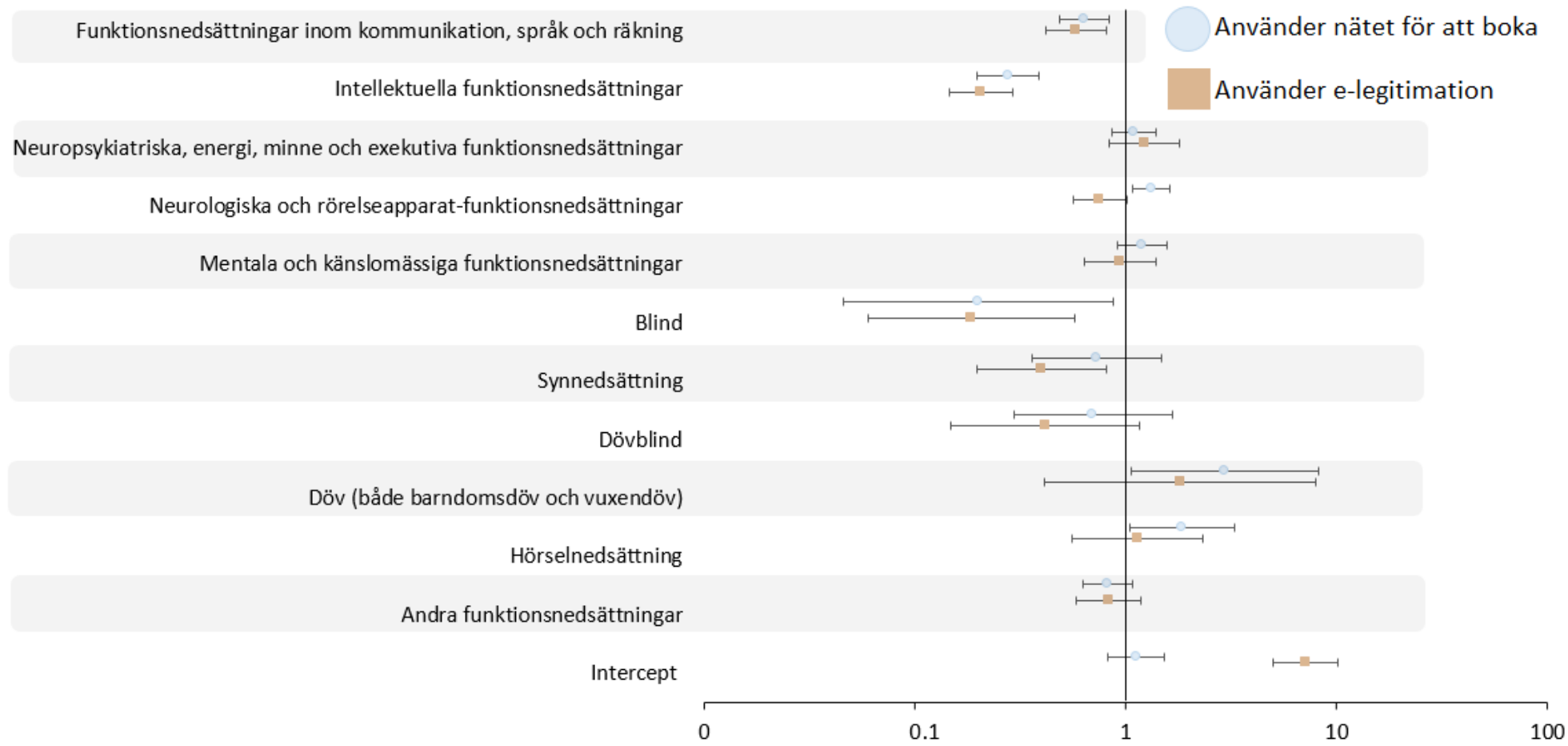
RESEARCH

Open Access



Disability digital divide: survey of accessibility of eHealth services as perceived by people with and without impairment

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Methods



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Samskapande



Intervention
vs Care as usual

Methods



Enkäter



Litteratur-
översikt

Studies that
address
accessibility

principles (eg
universal
design)

guidelines

standards
(eg WCAG,
ISO or
HTML5)



Tillgänglighets-
redogörelser

Websites of
public
healthcare
providers

conformance
to
requirements

progress in
Wayback
Machine



Barrier
walkthrough



Samskapande



Intervention
vs Care as usual

Methods



Enkäter



Litteratur-
översikt



Tillgänglighets-
redogörelser



Barrier
walkthrough

With
impairments
Inera
Platform24

cognitive
accessibility
of 1177
direkt



Samskapande



Intervention
vs Care as usual

Results

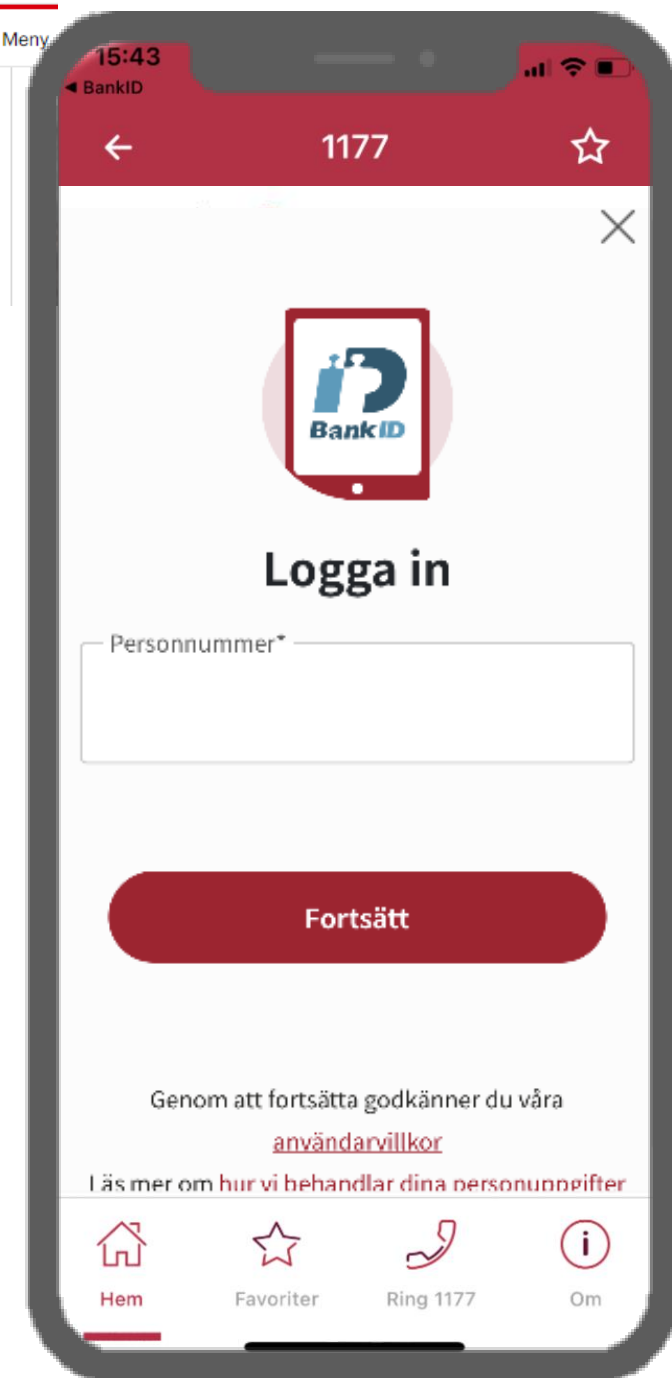
DAGENS NYHETER.[Nyheter](#)[Sverige](#)[Världen](#)[Ekonomi](#)[Kultur](#)[Sport](#)[Klimatet](#)[Ledare](#)[DN Debatt](#)[Meny](#)

SVERIGE
**Forskare: Hög tröskel att förstå
chattbot i 1177**
Publicerad 2023-10-24

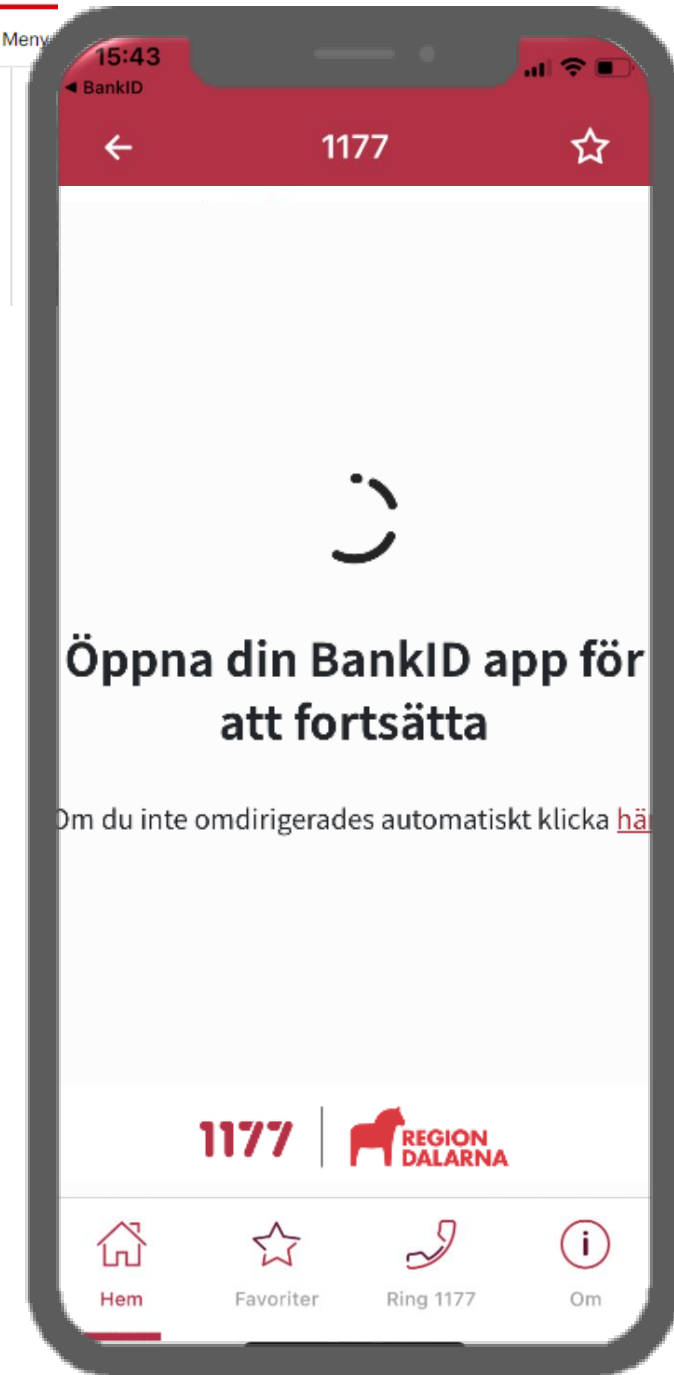
Results



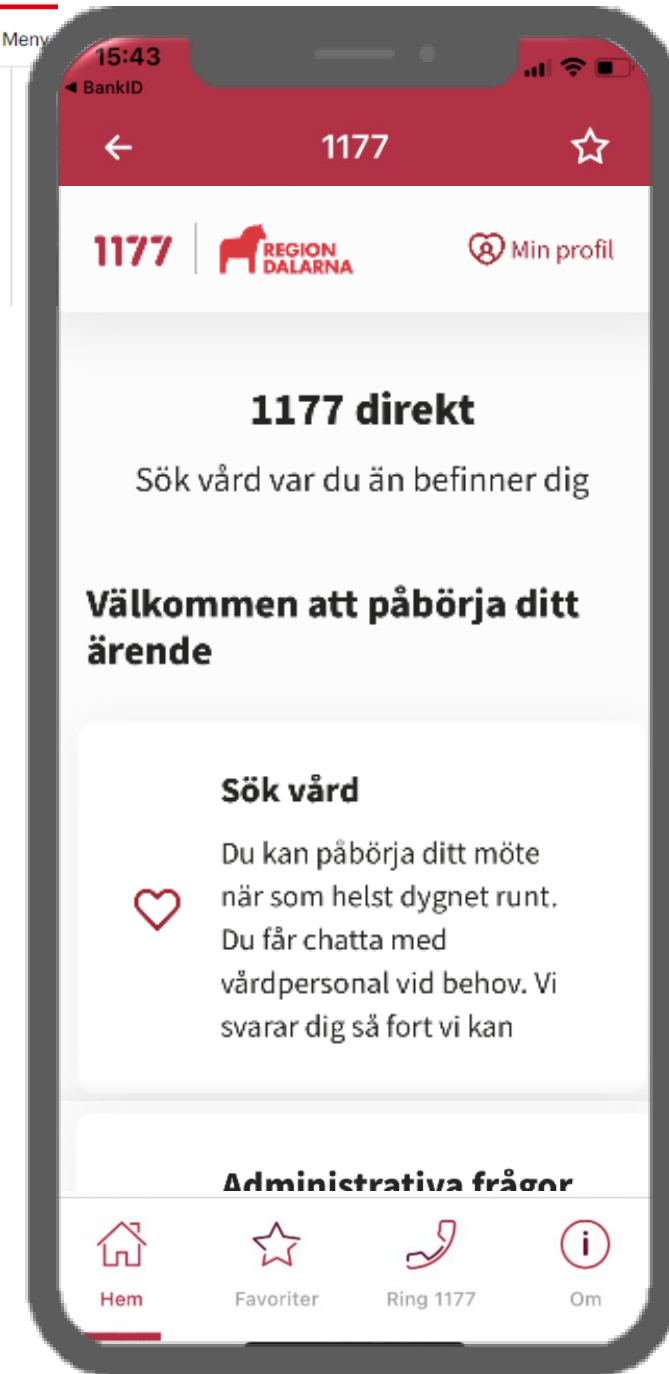
Results



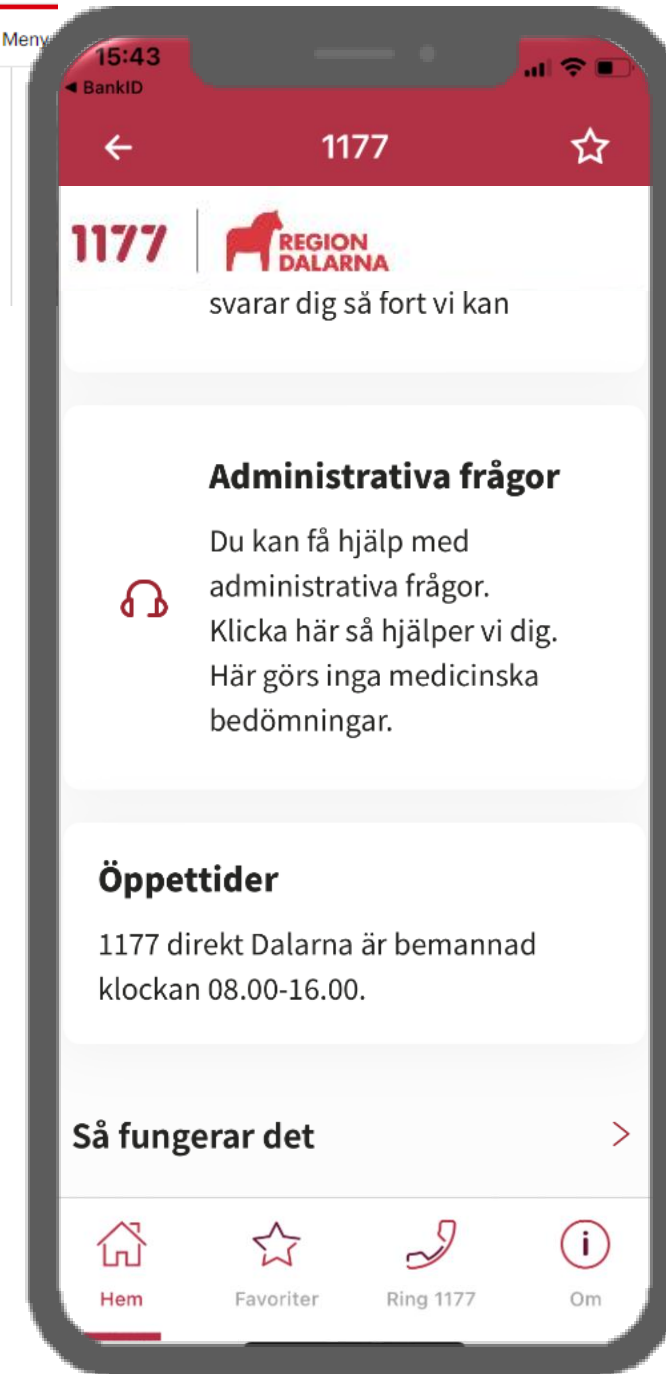
Results



Results



Results



Results



Results



Methods



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Litteratur-
översikt



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Barrier
walkthrough



Samskapande

With
impairments

visionary
prototype of
1177.se



Intervention
vs Care as usual

Results

The screenshot shows the 1177 Vårdguiden e-tjänster web application. The browser address bar shows the URL <https://e-tjanster.1177.se/mvk/>. The page has a red header with the 1177 VÅRDGUIDEN logo and a user profile for Linda Pettersson with links for Inställningar and Logga ut. A navigation bar contains links for Start, Meddelanden, Bokade tider, Egen provhantering, Stöd och behandling, and Övriga tjänster. The main content area is a grid of service tiles: Inkorg (with a link to Se meddelanden), Bokade tider (with a link to Se bokade tider), Genvägar (with instructions on how to add shortcuts), Hälsoval (with links to Väll/ändra hälsoval and Vårdcentral Mora), Mottagningar (with links to Hitta och lägg till and Blodcentral Mora), Journalen (with a link to Journalen), Egen provhantering (with a link to Beställ provtagning och se svar), Covidbevis (with a link to Till covidbevis.se), Läkemedelstjänster (with a link to Se information om recept), and Övriga tjänster (with a link to Alla övriga tjänster). A 'Regionen rekommenderar' section lists COVID-19 self-testing, COVID-19 testing for care and nursing, and other services like Hemtest, Gonorré, and Mammografi. The footer contains the text '1177 Vårdguiden - tryggt om din hälsa och vård', a description of the service, and links for Teknisk support, Läs mer om e-tjänster, Tillgänglighet, and Webbkartor.

Start - 1177 Vårdguidens e-tjänster x +

← → ↻ 🏠 🔒 <https://e-tjanster.1177.se/mvk/> 🔍 ⚙️ ⭐ 📄 👤 ...

1177
VÅRDGUIDEN

Linda Pettersson
Inställningar | Logga ut

Start Meddelanden Bokade tider Egen provhantering Stöd och behandling Övriga tjänster

Inkorg ⓘ

> [Se meddelanden](#)

Bokade tider ⓘ

> [Se bokade tider](#)

Genvägar ⓘ

Du kan lägga till en genväg till en tjänst genom att söka upp tjänsten och klicka på stjärnan bredvid tjänstens namn.

Hälsoval ⓘ

[Väll/ändra hälsoval](#)

> [Vårdcentral Mora](#)

Journalen ⓘ

> [Journalen](#)

Egen provhantering ⓘ

> [Beställ provtagning och se svar](#)

Covidbevis ⓘ

> [Till covidbevis.se](#) 🌐

Läkemedelstjänster ⓘ

> [Se information om recept](#)

Övriga tjänster ⓘ

> [Alla övriga tjänster](#)

Mottagningar ⓘ

[Hitta och lägg till](#)

> [Blodcentral Mora](#)

Regionen rekommenderar ⓘ

> [1. Självpровtagning covid-19 för dig som är sjuk](#)

> [3. Självpровtagning covid-19 för dig som är sjuk \(vård och omsorgspersonal\)](#)

> [Hemtest Klamydia och Gonorré](#)

> [Mammografi Dalarna](#)

1177 Vårdguiden - tryggt om din hälsa och vård

1177 Vårdguiden är en tjänst från Sveriges regioner. Vi finns alltid med dig när du vill må bättre.

> [Teknisk support](#) 🌐

> [Läs mer om e-tjänster](#) 🌐

> [Tillgänglighet](#) 🌐

> [Webbkarta](#)

Results

Visionär 1177 prototyp

<https://xd.adobe.com/view/eb230250-437e-42d4-9ddd-50bfd1ebc624-be70/>

Methods



Enkäter



Litteratur-
översikt



Tillgänglighets-
redogörelser



Barrier
walkthrough



Samskapande

With
impairments

Suggested
content and
design?
(for a new
usable and
accessible
eHealth
service for
physical
activity
promotion)



Intervention
vs Care as usual

Methods



Enkäter



Litteratur-
översikt



Tillgänglighets-
redogörelser



Barrier
walkthrough



Samskapande



Intervention
vs Care as usual

With
impairments

Hypertension

Suggested
content and
design?
(for a new
usable and
accessible
eHealth
service for
physical
activity
promotion)

usability &
accessibility

physical
activity

blood
pressure

Methods



Enkäter



Litteratur- översikt



Tillgänglighets- redogörelser



Barrier walkthrough



Samskapande



Intervention vs Care as usual

With vs
without
impairments

use
difficulty of
use

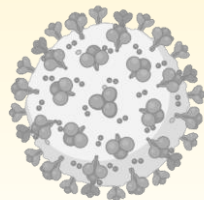
With
impairments

access to &
UX
(info, contact,
ordering
services and
web-portal)

accessibility
(medical
assessment
and treatment)

With vs
without
impairments

2021 vs
2019



Studies that
address
accessibility

principles (eg
universal
design)

guidelines

standards
(eg WCAG,
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HTML5)

Websites of
public
healthcare
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conformance
to
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With
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cognitive
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of 1177
direkt

With
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visionary
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1177.se

With
impairments

Suggested
content and
design?
(for a new
usable and
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eHealth
service for
physical
activity
promotion)

Hypertension

usability &
accessibility

physical
activity

blood
pressure

CoDeAc.



Begripsam

Extremanvändare med
erfarenheter av kognitiv
tillgänglighet



Catharina Gustavsson

Docent i Medicinsk vetenskap



Linda Pettersson

Forskarstuderande och
vårdcentralsläkare



Marika Jonsson

Forskarstuderande sjukgymnast
och utvecklingsledare



Funktionsrätt Skåne

Företrädar 35 organisationer och
40 000 medlemmar i Skåne



Ingemar Pettersson

Professor i Ortopedi



Per-Olov Hedvall

Docent Rehabiliteringsteknik och
design



Stefan Johansson

Tillgänglighetsexpert och doktor i
människa datorinteraktion



Jan Gulliksen

Professor i Människa-
Datorinteraktion



Jerker Westin

Docent Medicinsk informatik



Veronica Milos Nymberg

Forskare och distriktsläkare



Karl Gummesson

Postdoc-forskare



Lena von Koch

Professor Hälso- och
sjukvårdsforskning

Tack!

linda.a.pettersson@regiondalarna.se



UPPSALA
UNIVERSITET

Forskningsprojektet
CoDeAc

Extras

Välkommen till nya 1177

✓ Starta!

Logga in

1177 - CoDeAc

https://xd.adobe.com/view/eb230250-437e-42d4-9ddd-50bfd1ebc624-be70/screen/f1e232e4-ce78-422b-80df-638...

1177
Vårdguiden

Sök

Aviseringar

Hjälp

Mina inställningar

Lyssna

Linda Brehmer
Logga ut

Startsida

Meddelanden

Tider

Vårdcentral

Mottagningar

Läkemedel

Journaler

Hitta och lägga till
övriga tjänster

Mina händelser

Förnya receptet för Remdevidir

Intyget om sjukresor går ut om 50 dagar

Läkartid kl. 15, tisdag 30 juni 2020

Läkartid kl. 10, torsdag 2 juli 2020

Mitt högkostnadsskydd

Öppenvård

Läkemedel

i Du behöver betala **930 kr** för att få frikort

i Rätt till frikort gäller till och med:
Tisdag, 23 juni 2021

930 kr	Högsta belopp: 1150 kr Frikort
220 kr	Betalt belopp

i Mer information

1177

Vårdguiden

🔍

Sök

🔔

3

Aviseringar

❓

Hjälp

⚙️

Mina inställningar

🔊

Lyssna

👤

Linda Brehmer

➡️ [Logga ut](#)

🏠

Startsida

>

✉️

Meddelanden

>

📅

Tider

>

🏠

Vårdcentral

>

👥

Mottagningar

>

📖

Läkemedel

>

📋

Journaler

>

+

Hitta och lägga till
övriga tjänster

>

📘

Här kan du se allt om ditt läkemedel, kostnader och du kan förnya recept.

Välj från listan

📖

Aktuella recept

📖

Utgångna recept

📊

Högekostnadsskydd för läkemedel

📄

Kvitton

Logga in

Xd 1177 - CoDeAc

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1177
Vårdguiden

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Aviseringar

Hjälp

Mina inställningar

Lyssna

Linda Brehmer

Logga ut

Startsida

Meddelanden

Tider

Vårdcentral

Mottagningar

Läkemedel

Journaler

Hitta och lägga till
övriga tjänster

Tillbaka

Ipren

Alvedon

Ponstan

Depon

Mina aktuella recept

Ipren, 400 mg, tablett

Ipren 400mg

Ipren 400mg

Mer information

Förnya recept

Klicka på en bild för att förstora den

Innehåller 30 st filmdragerade tabletter

Recept- och uttagsinformation

Hämta läkemedlet tidigast: Måndag 25 september, 2020

Ditt läkemedel beräknas ta slut: Fredag 5 oktober, 2020

Receptet går ut: Fredag 24 oktober, 2020

Logga in

1177 - CoDeAc

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1177
Vårdguiden

Sök

3

Aviseringar

Hjälp

Mina inställningar

Lyssna

Linda Brehmer

Logga ut

Startsida

Meddelanden

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Vårdcentral

Mottagningar

Läkemedel

Journaler

Hitta och lägga till
övriga tjänster

Capio Vårdcentral Kungsholmen

e-tjänster

Kontakta oss

Hitta oss

Prisinformation

Om vårdcentralen

Boka tid direkt

?

Av- eller omboka tid

?

Beställ journalkopia

?

Begär intyg

?

Förnya recept

?

Logga in

1177 - CoDeAc

https://xd.adobe.com/view/eb230250-437e-42d4-9ddd-50bfd1ebc624-be70/screen/efd79426-80a2-4cc7-b80b-c8a...

1177
Vårdguiden

Sök

3

Aviseringar

Hjälp

Mina inställningar

Lyssna

Linda Brehmer

Logga ut

Startsida

Meddelanden

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Vårdcentral

Mottagningar

Läkemedel

Journaler

Hitta och lägga till
övriga tjänster

Tillbaka

Capio Vårdcentral Kungsholmen - Boka tid

Steg 1

Steg 2

Steg 3

Steg 4

Steg 5

Steg 1: Välj ett datum från kalendern

«<Juni 2020>»

MånTisOnsTorsFreLörSön

1234567

891011121314

15161718192021

22232425262728

2930

Vad betyder färgarna?

Idag

Det finns lediga tider

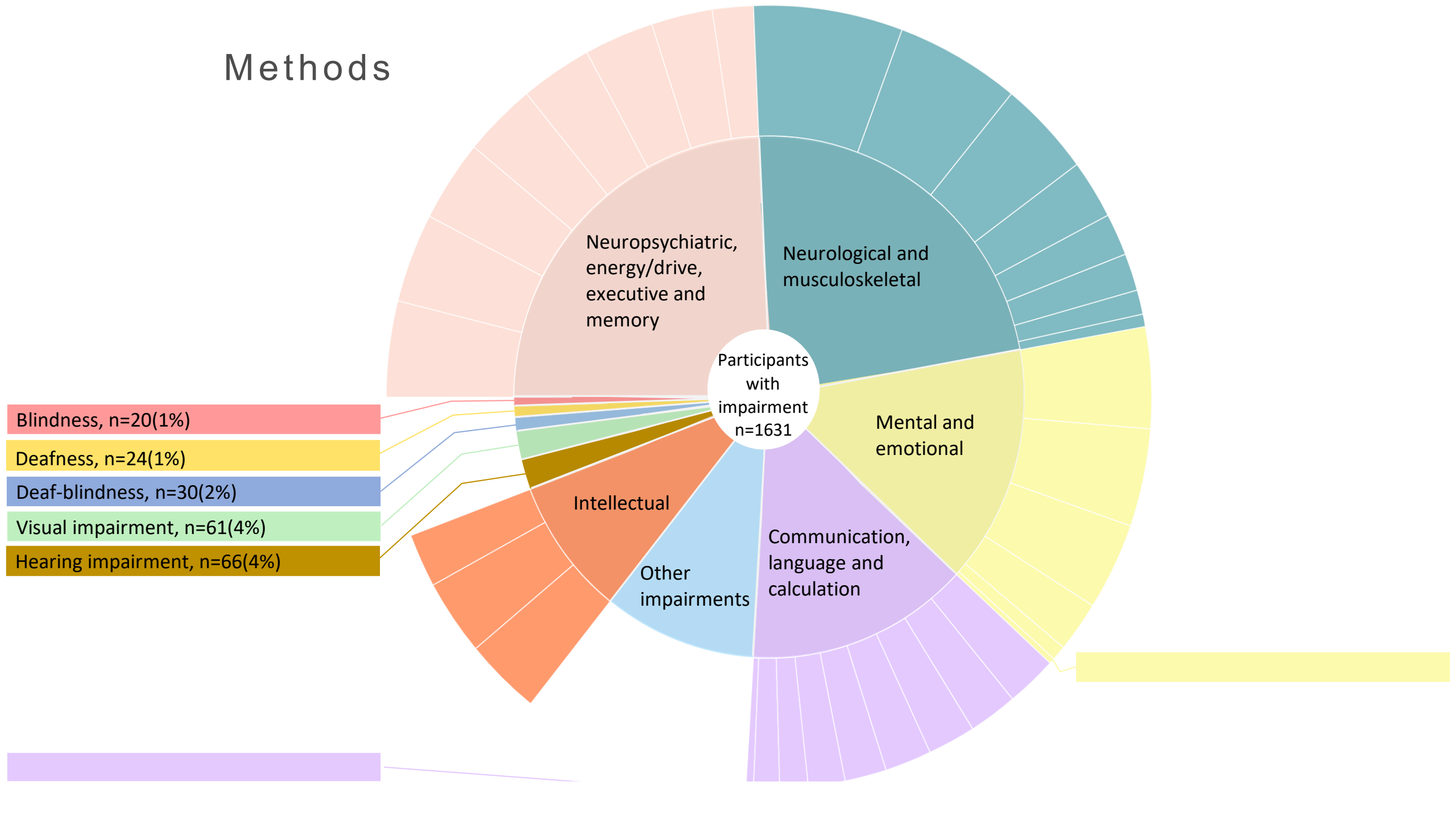
Alla tiderna är upptagna

Vald tid

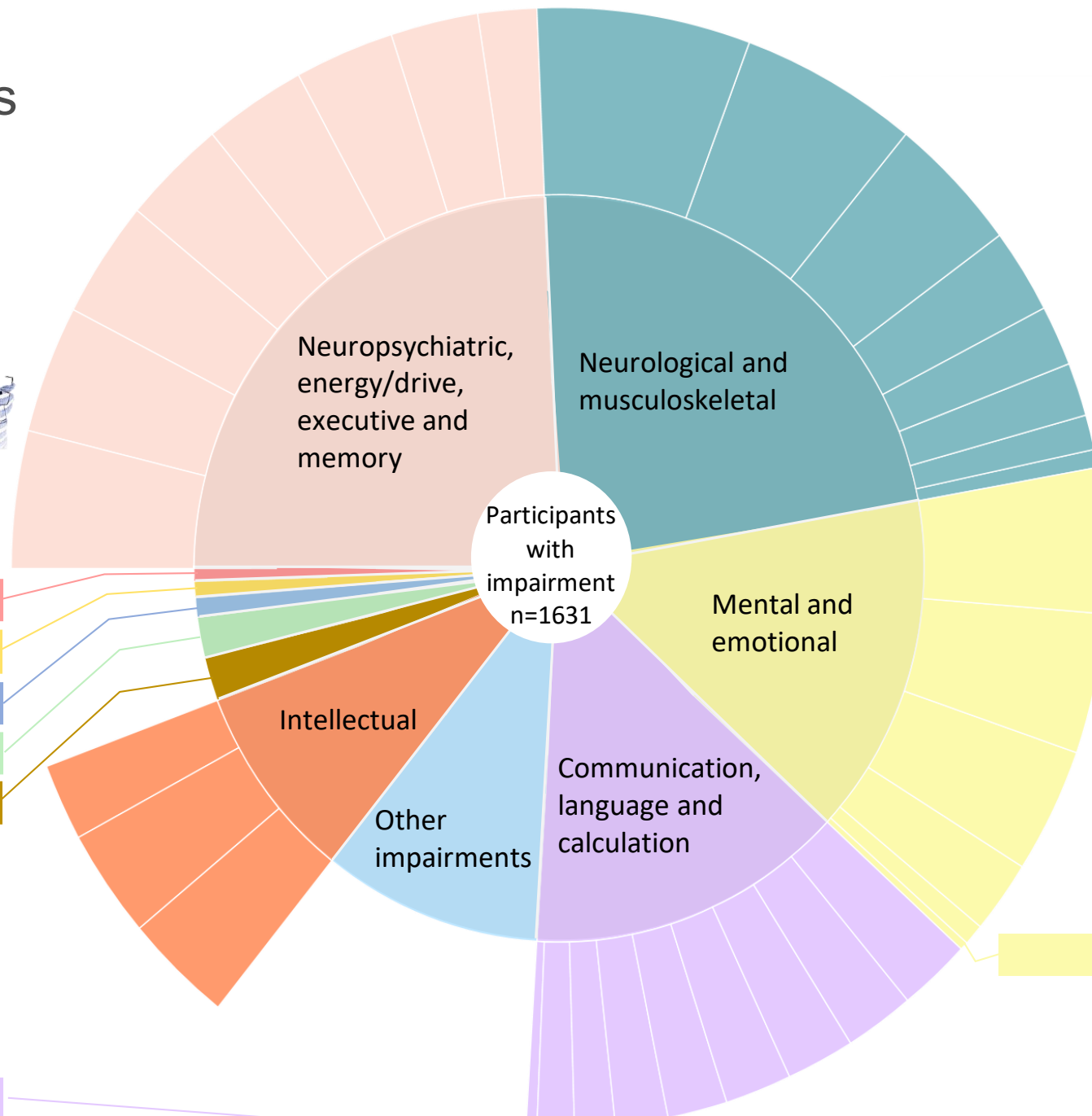
Bekräfta

Avbryta bokningen

Methods



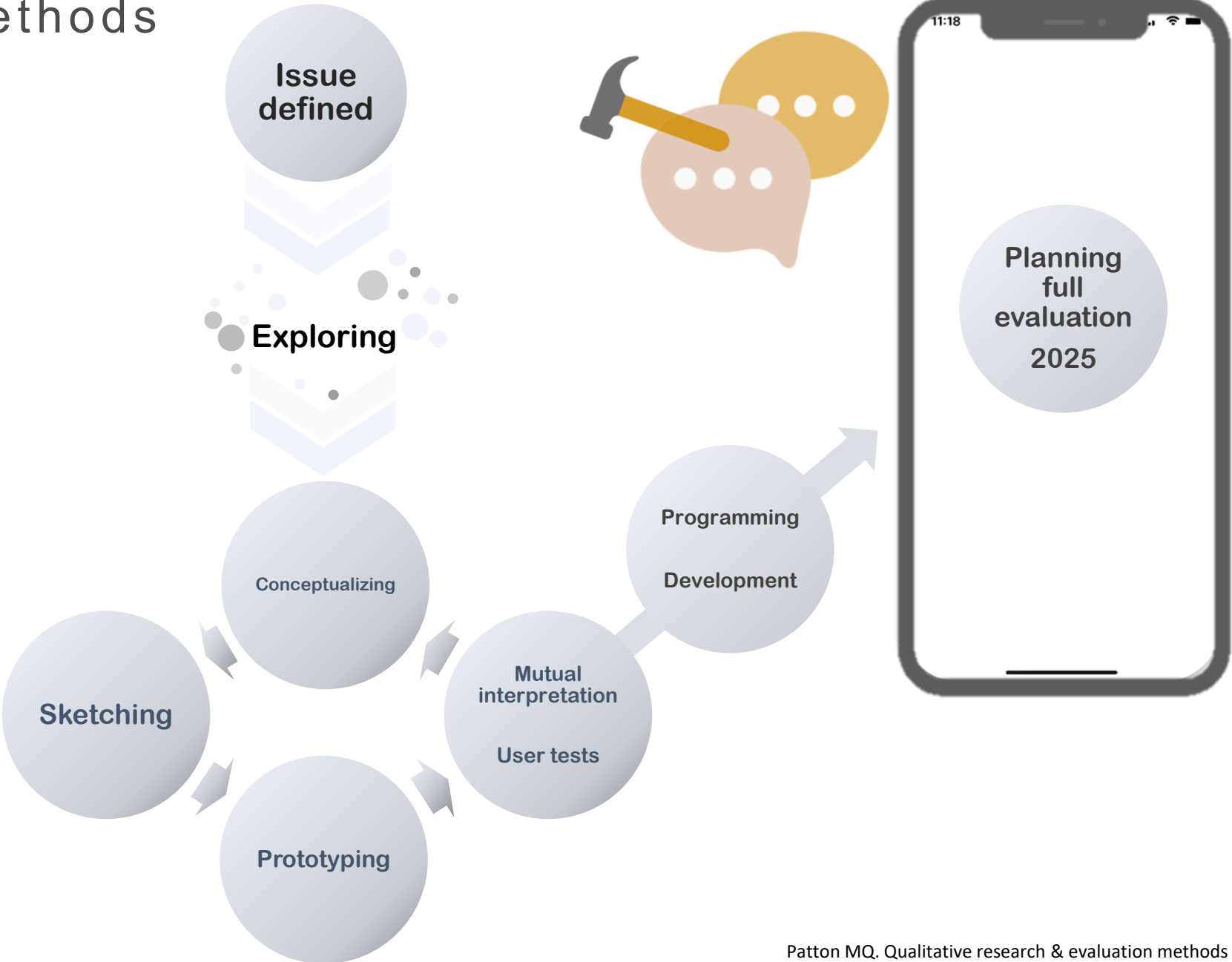
Methods



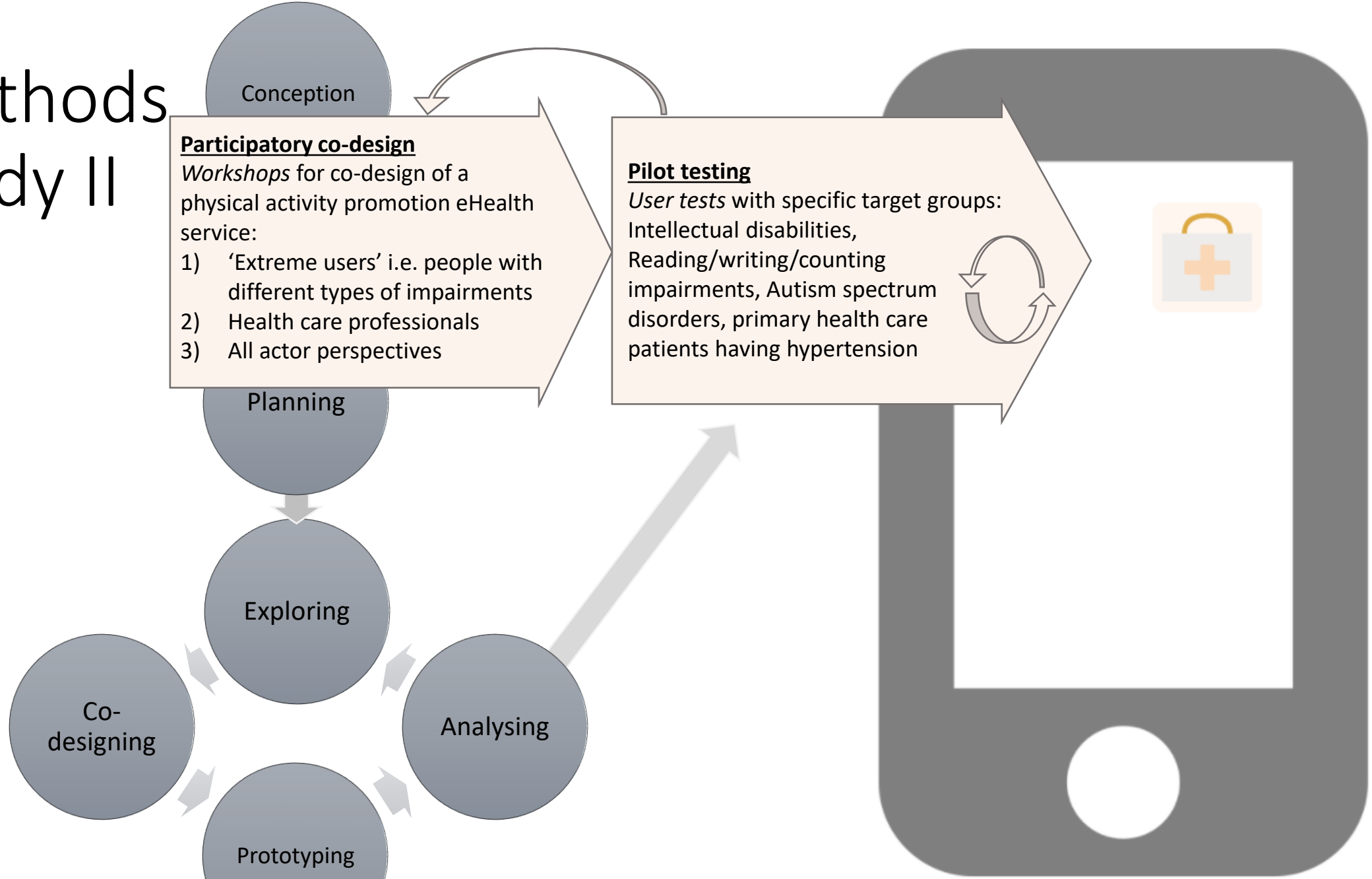
Blindness, n=20(1%)
Deafness, n=24(1%)
Deaf-blindness, n=30(2%)
Visual impairment, n=61(4%)
Hearing impairment, n=66(4%)



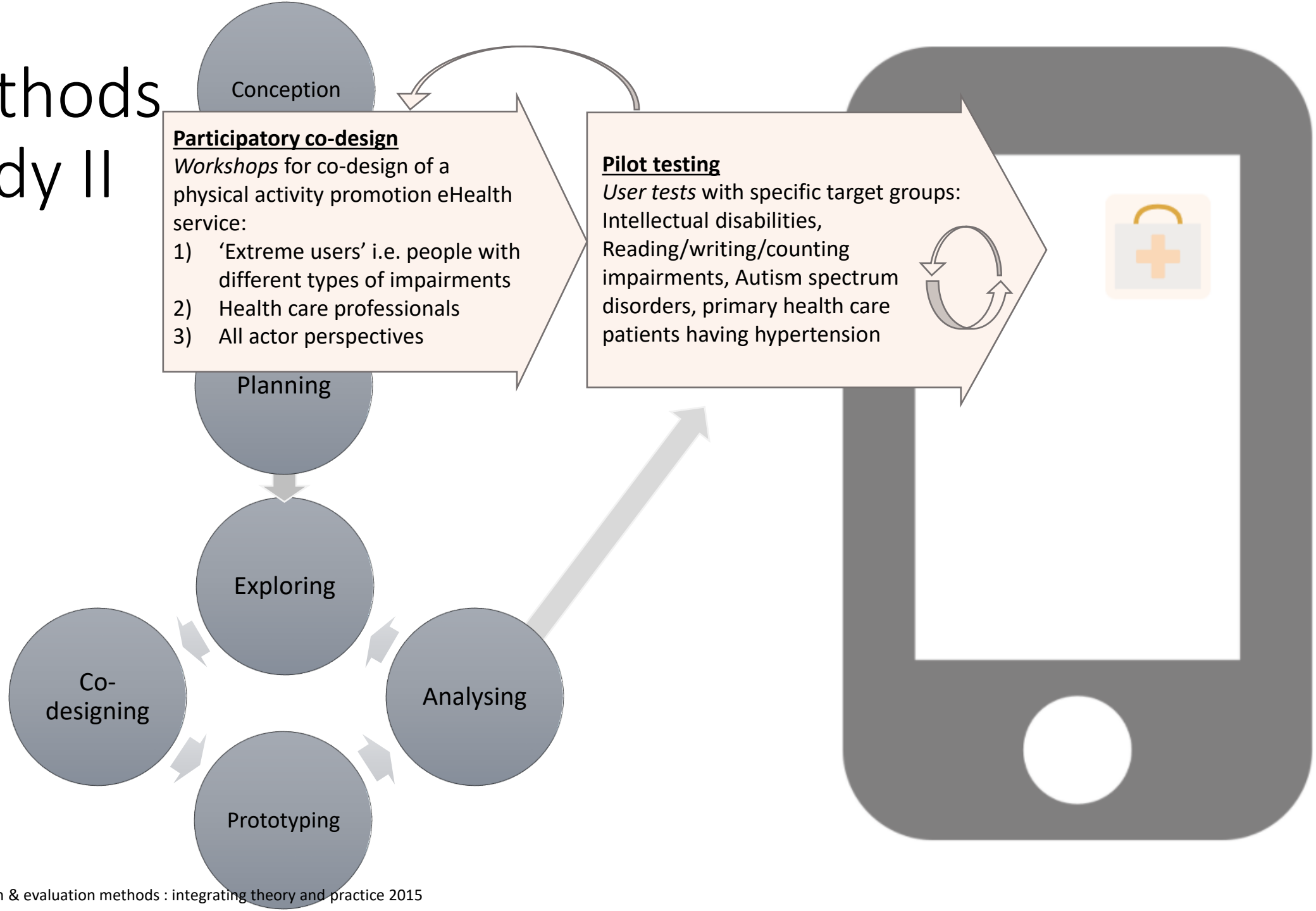
Methods



Methods Study II



Methods Study II



Methods

Study IV

- Hypertension: Intervention (n=88) vs. Care as usual (n=32) –
 - Accessibility and usability
 - use / intention to use
 - engagement
 - difficulty of use
 - functionality
 - relevance
 - trustworthiness
 - intention to recommend
 - blood pressure
 - physical activity
 - 2 items Physical Activity questionnaire
 - questions on sedentary behaviour
 - the Exercise Self-efficacy Scale
 - activity logs



(Results)

Study I

published

Pettersson L, Johansson S, Demmelmaier I, Gustavsson C. Disability digital divide: survey of accessibility of eHealth among people with and without impairment. BMC Public Health. 2023

Study II

in writing

Pettersson L, Johansson S, Demmelmaier I, von Koch L, Gulliksen J, Hedvall P-O, Gummesson K, Gustavsson C. Disability digital divide: comparing accessibility of eHealth from before to during the COVID19 pandemic. ...

Extra study?

ethical application drafted

Pettersson L, Johansson S, Demmelmaier I, Gustavsson C. Digging deep into the eHealth Disability digital divide - Survey of use and perceived difficulty in the use of twenty-one eHealth services among people with various types of impairments. ...

Study III

ongoing co-design

Pettersson L, Johansson S, Jonsson M, Gustavsson C. Co-design of an eHealth service for physical activity promotion together with users of the services. ...

Study IV

ethical application in writing

Pettersson L, Johansson S, Jonsson M, Gustavsson C. ProMotion: a co-designed eHealth service for promotion of physical activity in primary healthcare – a randomised controlled feasibility study. ...



Significance (Results)

Study I

published

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- Acceptance & cost-effectiveness analyses of eHealth improve over time
- Patient outcomes are generally at least as effective as traditional care
- Patients already use eHealth from non-reliable sources

(Bashshur RL *et al.* 2016)

- Often low adherence, can lead to underestimation of the effects

(Eland-de Kok *et al.* 2011)



- Users are younger, richer, more educated, cohabitant, living in cities

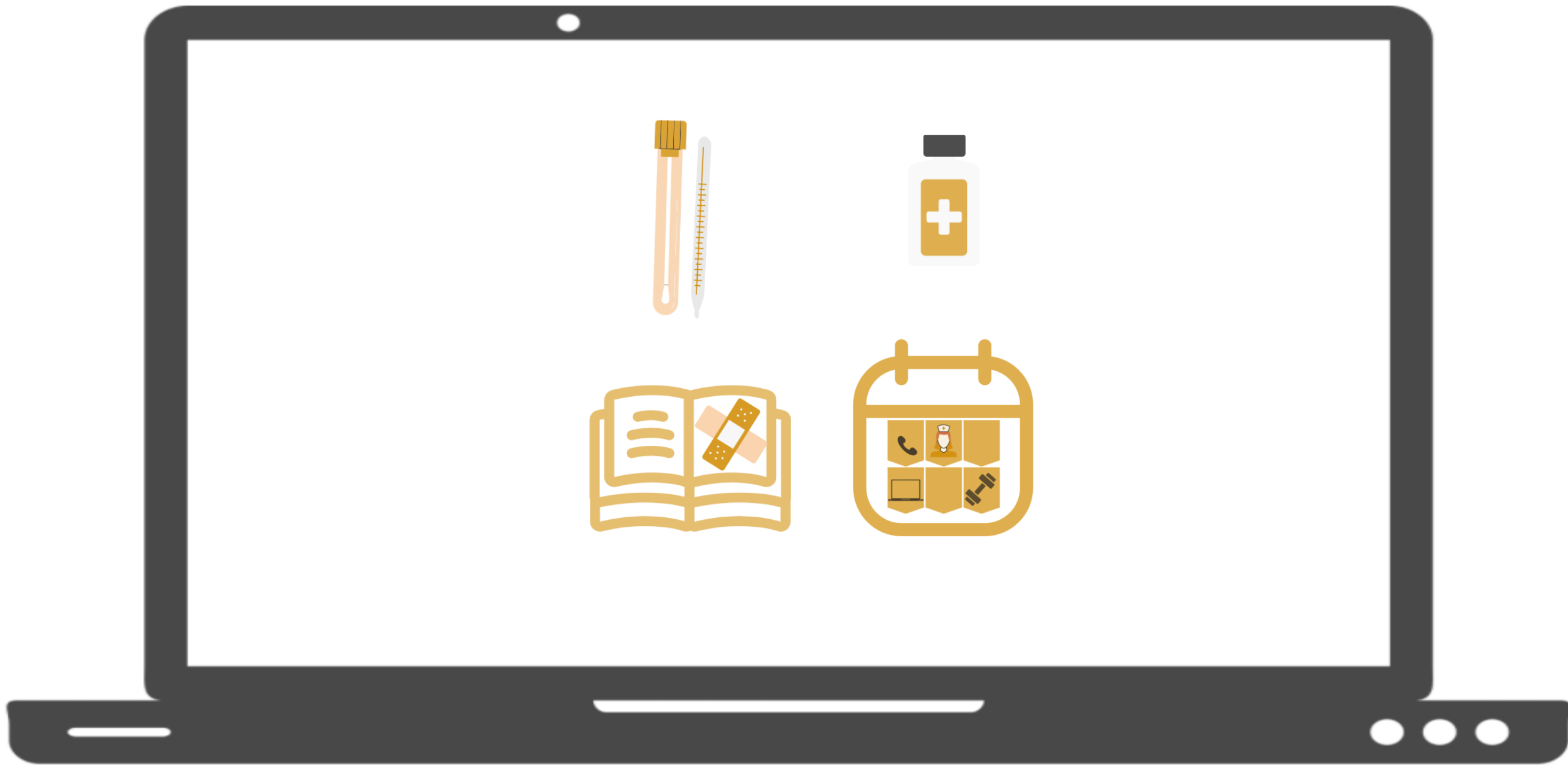
(Reiners F *et al.* 2019)

- Minor conditions
(Gabrielsson-Järhult F, Kjellström S, Josefsson KA. 2021)

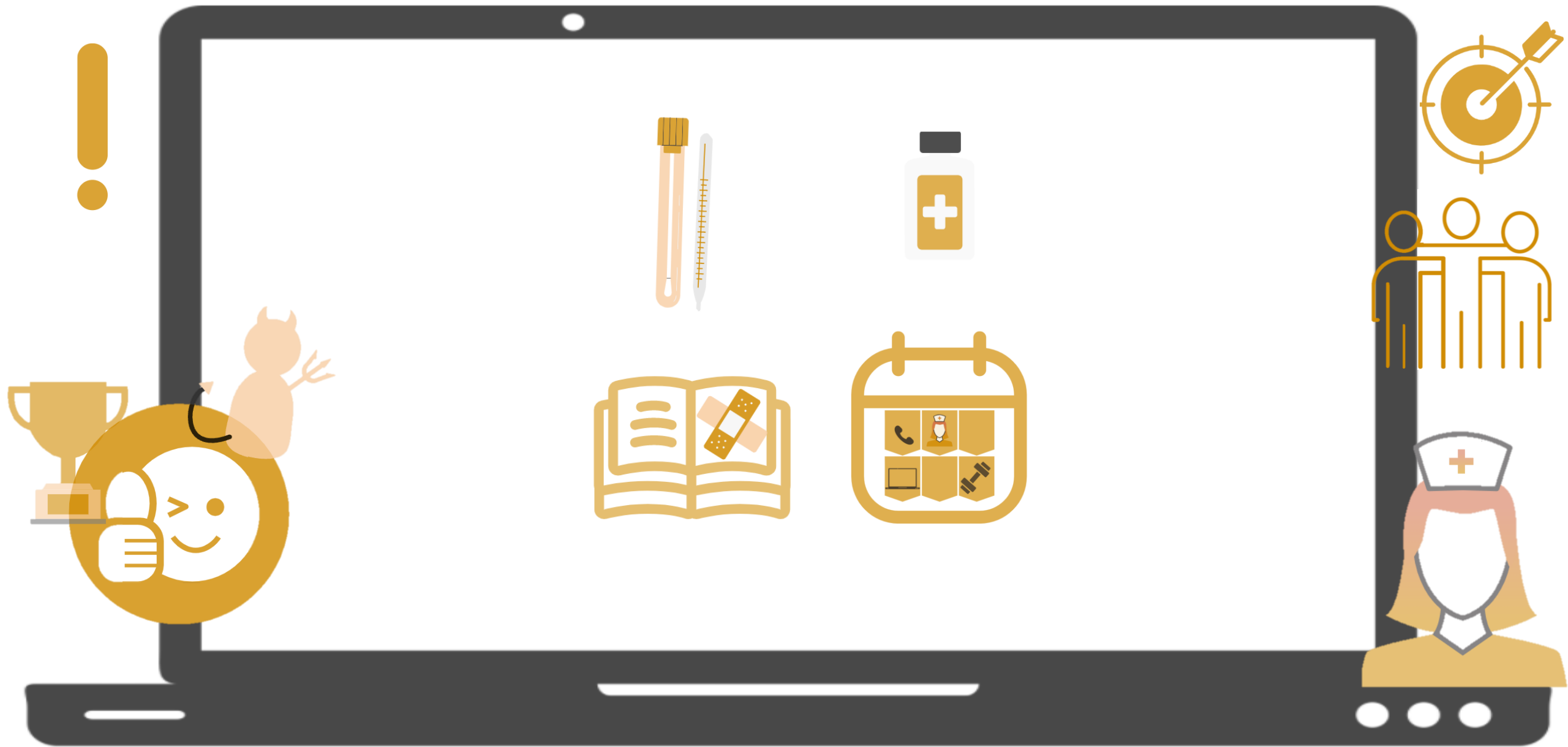
- Users have less chronic diagnoses and less diagnoses are handled online

(The Swedish Agency for Health and Care Services Analysis 2022)





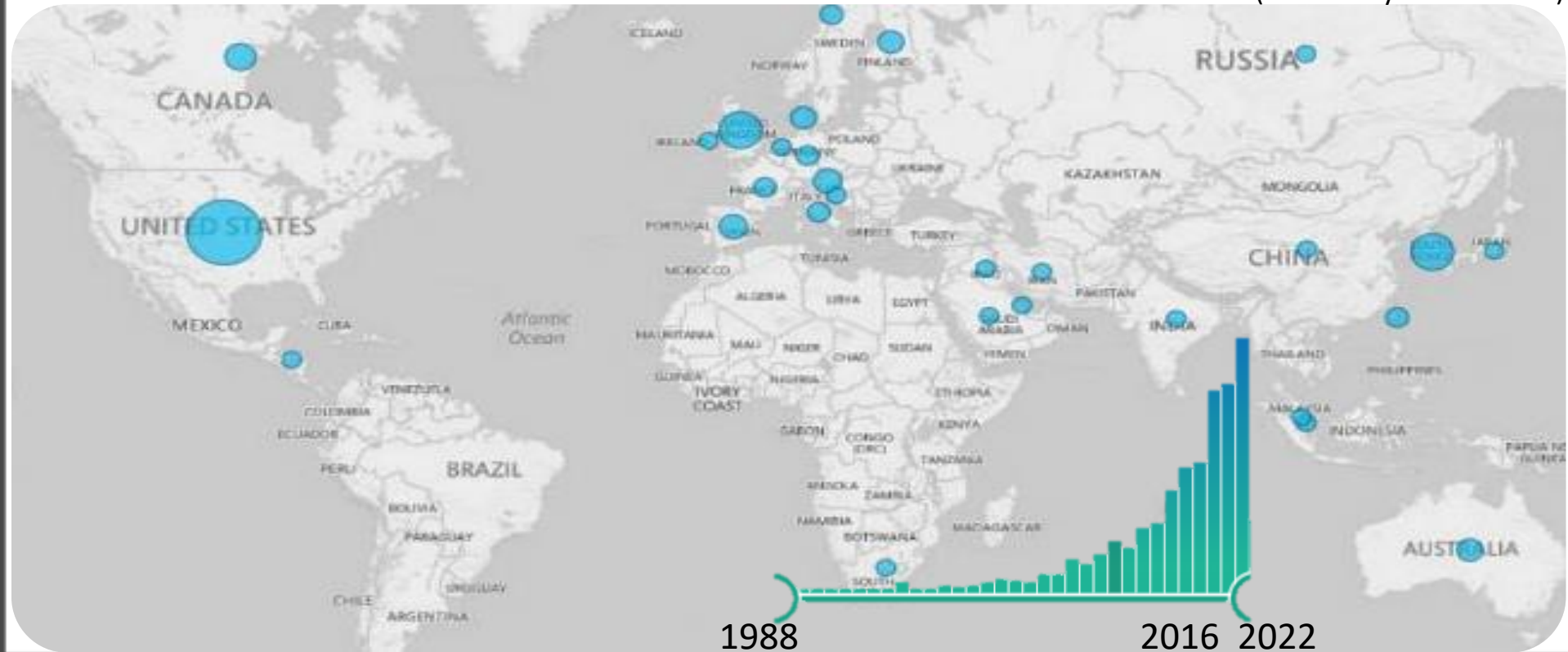




Disability Digital Divide Why? (3/3)

- No studies on digital use with sufficient number with impairments

(Dobransky K et al. 2016)

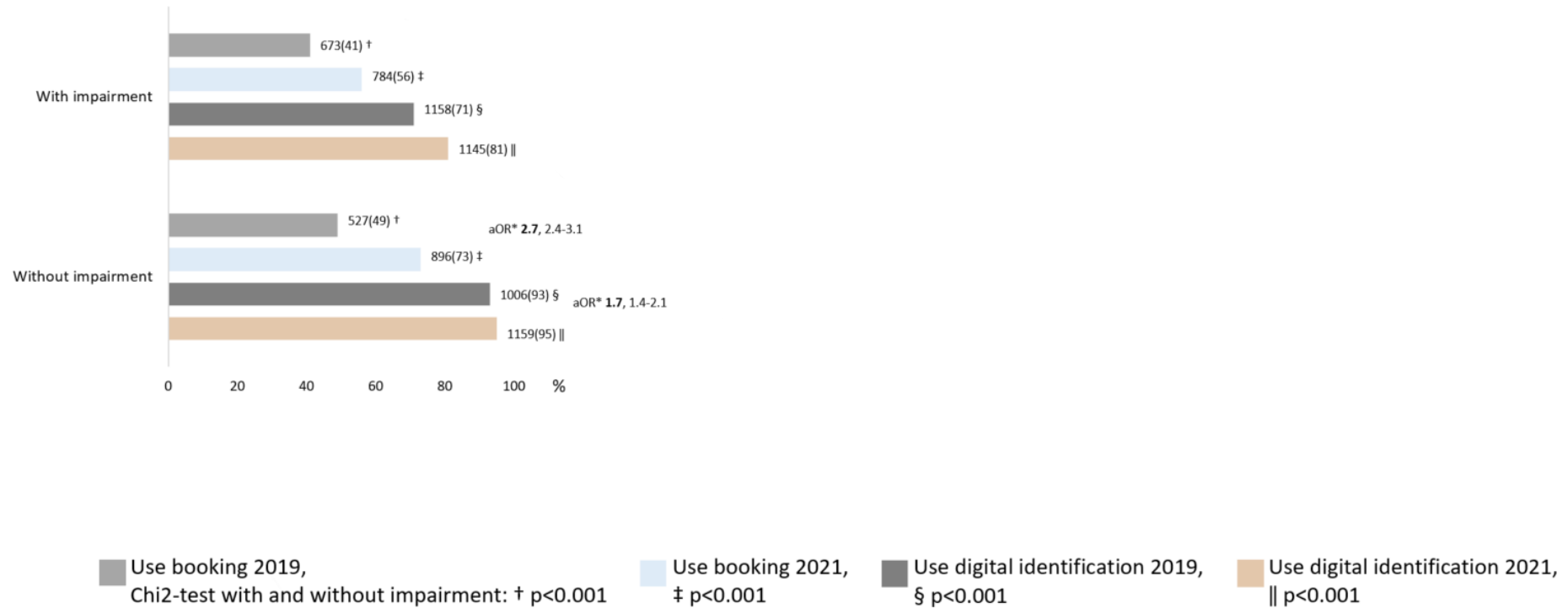


From: Hamine S et al. Impact of mHealth chronic disease management on treatment adherence and patient outcomes: a systematic review. Journal of medical Internet research. 2015

Henni SH *et al.* The experiences, needs and barriers of people with impairments related to usability and accessibility of digital health solutions, levels of involvement in the design process and strategies for participatory and universal design: a scoping review. BMC Public Health 2022

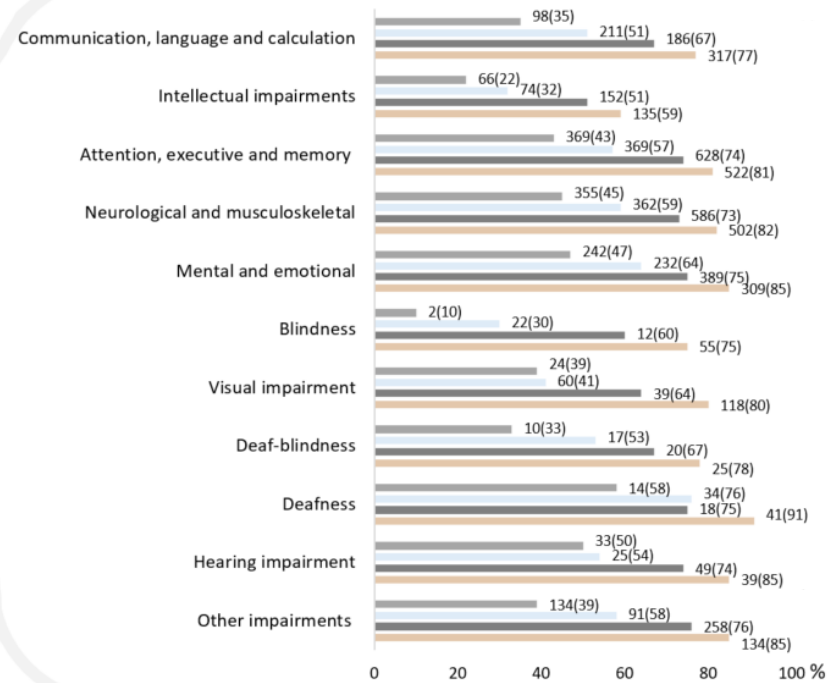
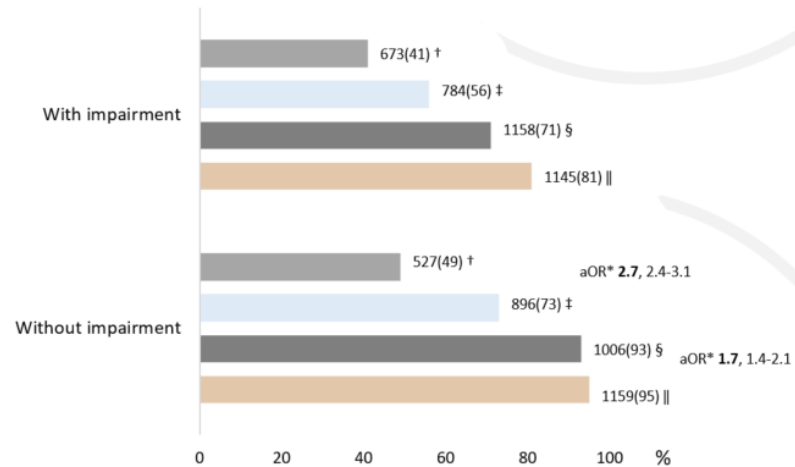
Jones M *et al.* Mobile Healthcare and People with Disabilities: Current State and Future Needs. International journal of environmental research and public health 2018

Results



* Logistic regression models of change in use of eHealth across the pandemic. Reference group is 2019 results, adjusted for type of impairment (reference is participants without impairment), gender (reference female) and age (reference <30 years old); aOR = adjusted odds ratio (significant values in bold), followed by 95% confidence interval.

Results



■ Use booking 2019,
Chi2-test with and without impairment: † p<0.001

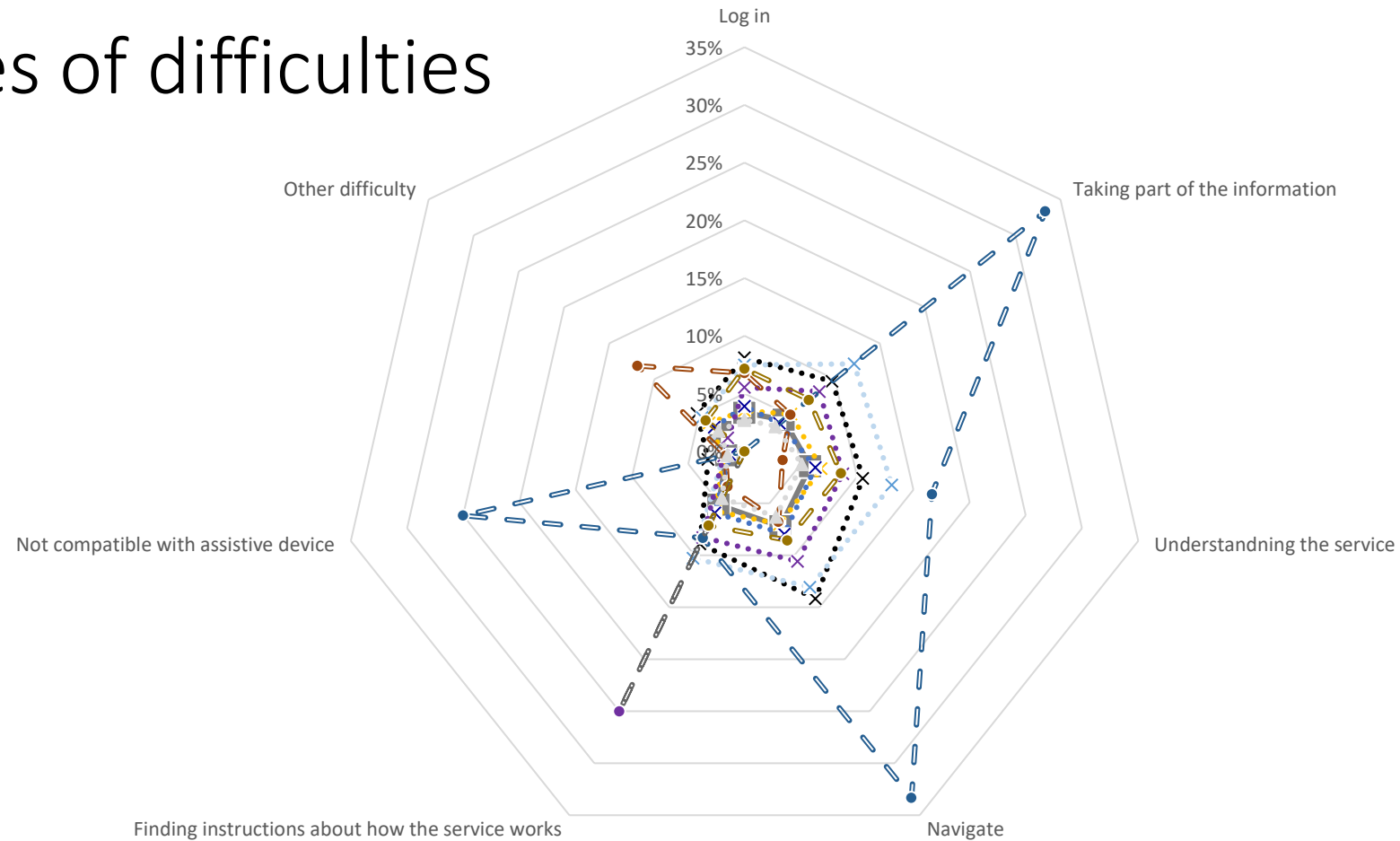
■ Use booking 2021,
‡ p<0.001

■ Use digital identification 2019,
§ p<0.001

■ Use digital identification 2021,
|| p<0.001

* Logistic regression models of change in use of eHealth across the pandemic. Reference group is 2019 results, adjusted for type of impairment (reference is participants without impairment), gender (reference female) and age (reference <30 years old); aOR = adjusted odds ratio (significant values in bold), followed by 95% confidence interval.

Types of difficulties



—■— All, n = 872

...x... Neuropsychiatric, energy/drive, executive and memory conditions, n = 484

- - - ● - - - Blindness, n = 12

—●— Hearing impairment, n = 70

...x... Communication, language and calculation conditions, n = 247

...x... Neurological and musculoskeletal conditions, n = 540

- - - ● - - - Visual impairment, n = 59

...▲... Other conditions, n = 666

...x... Intellectual conditions, n = 107

...x... Mental and emotional conditions, n = 217

- - - ● - - - Deafness, childhood onset or acquired in adulthood, n = 4

Methodological considerations

- Sufficient sample size in a hard-to-reach population
 - <-> selection bias in the recruitment
 - Self-assessed



Conclusions

- Divide in eHealth accessibility
- Impairments can be aggregated into relevant groups
- Heterogeneities of use and difficulty to use eHealth