

National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport

Characterization of apps and other e-tools for medication use

Insights into possible benefits and risks

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National Institute for Public Health and the Environment

www.rivm.nl

- Independent knowledge institute
- Research and knowledge integration
- Public health, nutrition, safety and environmental management

RIVM Project e-Medication



Influence of internet on medication use: opportunities and risks

Sub-projects:

1. Purchase of medicinal products via internet
2. Social media as information source on medication use
3. **Self management of medication use with aid of apps**

Introduction

Enormous increase in ‘health apps’ last years

U.S. iTunes Store:

2011: 5800 apps

2013: >23.000 apps

In 2013 and 2014, ‘health apps’ received much attention in media: RISKS?


www.spitsnieuws.nl

Meldpunt voor ’foute apps’

RVZ: Slechte medische apps melden bij IGZ

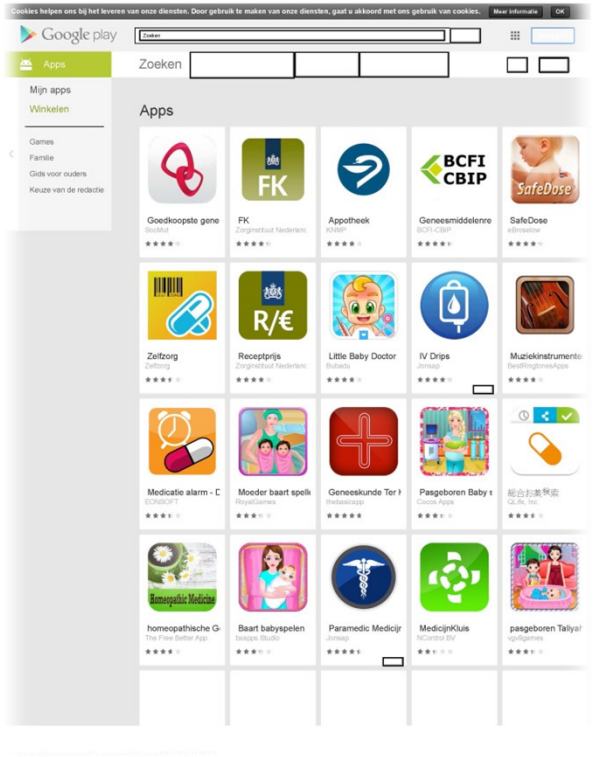
DOOR ANNETTE KARIMI

AMSTERDAM – Er moet een meld-

wel genoemd wordt, richt zich op de mogelijkheden van mobiele technologie, zoals apps voor smartphones en koppeling van online diensten. Andere apps die potentieel gevaarlijk kunnen zijn als ze niet goed werken, zijn apps om de bloeddruk, bloedstolling of bloedwaarden te meten, ziet ook de NPCF, koepel van patiëntenorganisa-

Complaints office for ‘faulty’ apps

Question



Provide more insight into:

- characteristics
- possible benefits
- possible risks

of health apps and e-tools related to medication use.

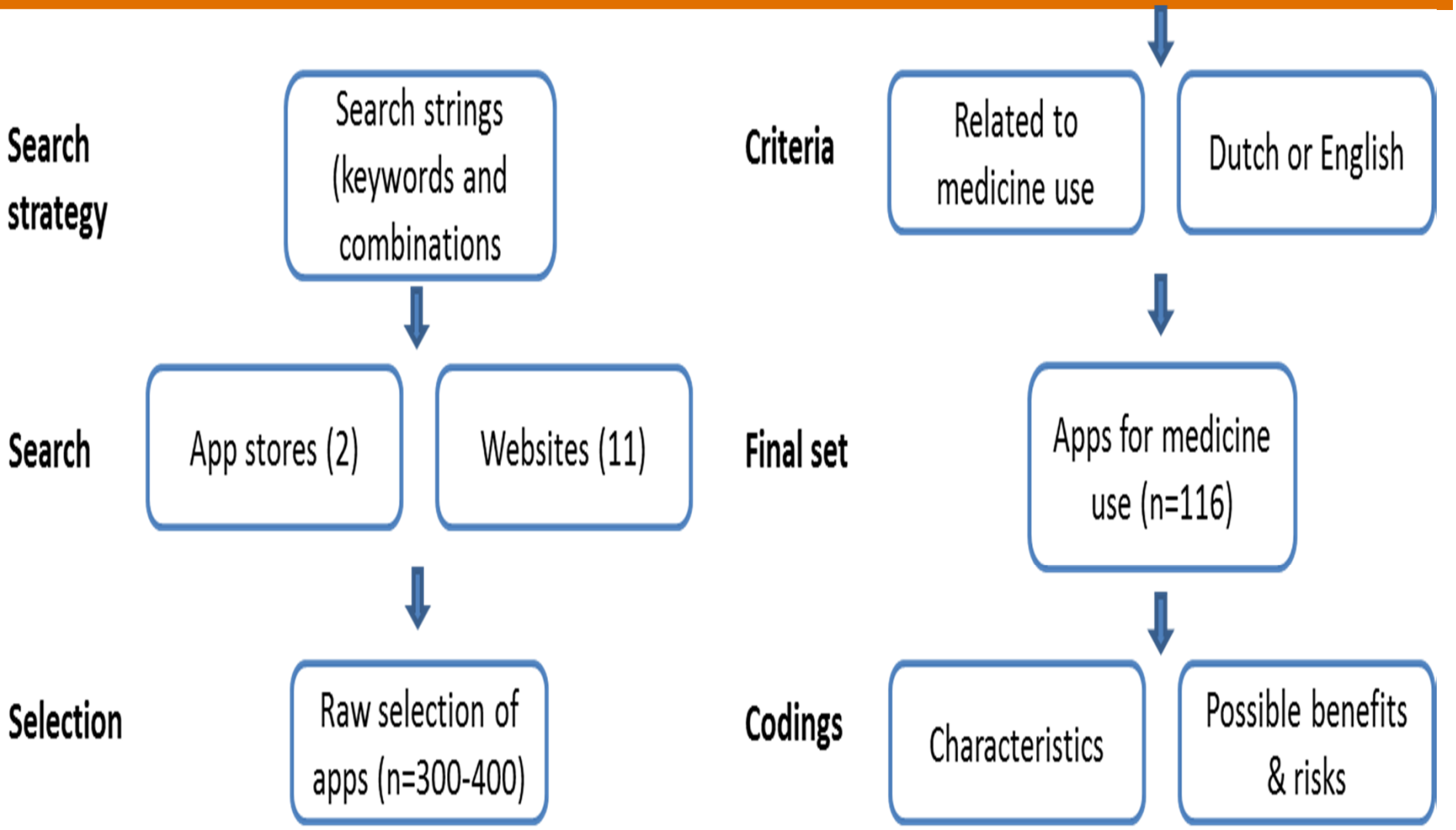
Search strategy

- Search strategy for apps & e-tools: challenge



- Limited search options in app stores
  - Many irrelevant results
  - Need for cut-offs

- Content of app stores changes continuously
  - Overview apps is a snapshot in time


Search strategy
Search strings (keywords and combinations
Search
App stores (2)
Websites (11)
Selection
Raw selection of apps (n=300-400)
Criteria
Related to medicine use
Dutch or English
Final set
Apps for medicine use (n=116)
Codings
Characteristics
Possible benefits & risks

Selection criteria apps and e-tools

- Relates to medicinal products for human use
- Available in Dutch or in English
- Websites were considered a tool if data input is needed
- Available or expected in The Netherlands



We found 116 apps and e-tools

in Google Playstore and iTunes App store

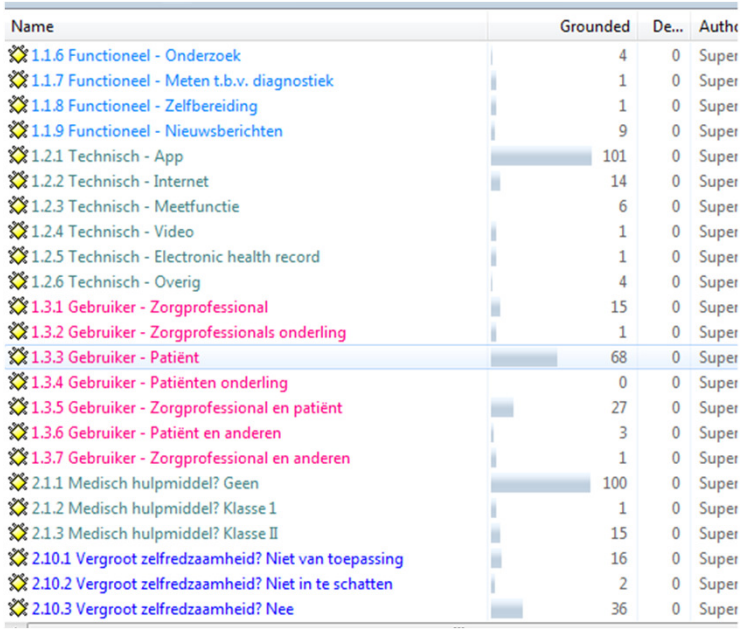
(86% of downloads in NL)



Coding of apps and e-tools

Coding scheme based on Nictiz, 2013

Coding by 2 researchers in Atlas.ti

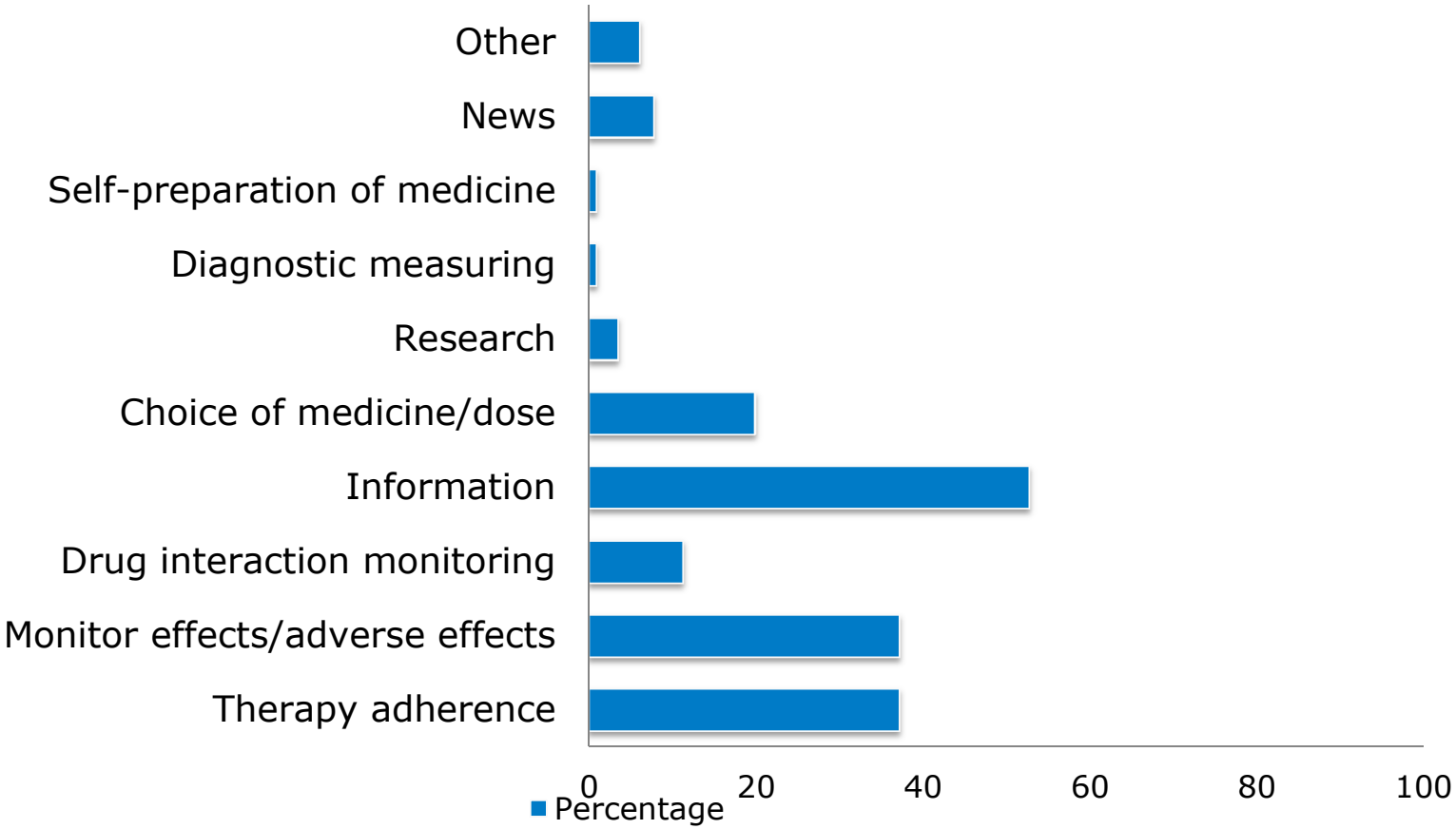


Name	Grounded	De...	Auth
1.1.6 Functioneel - Onderzoek	4	0	Super
1.1.7 Functioneel - Meten t.b.v. diagnostiek	1	0	Super
1.1.8 Functioneel - Zelfbereiding	1	0	Super
1.1.9 Functioneel - Nieuwsberichten	9	0	Super
1.2.1 Technisch - App	101	0	Super
1.2.2 Technisch - Internet	14	0	Super
1.2.3 Technisch - Meetfunctie	6	0	Super
1.2.4 Technisch - Video	1	0	Super
1.2.5 Technisch - Electronic health record	1	0	Super
1.2.6 Technisch - Overig	4	0	Super
1.3.1 Gebruiker - Zorgprofessional	15	0	Super
1.3.2 Gebruiker - Zorgprofessionals onderling	1	0	Super
1.3.3 Gebruiker - Patiënt	68	0	Super
1.3.4 Gebruiker - Patiënten onderling	0	0	Super
1.3.5 Gebruiker - Zorgprofessional en patiënt	27	0	Super
1.3.6 Gebruiker - Patiënt en anderen	3	0	Super
1.3.7 Gebruiker - Zorgprofessional en anderen	1	0	Super
2.1.1 Medisch hulpmiddel? Geen	100	0	Super
2.1.2 Medisch hulpmiddel? Klasse 1	1	0	Super
2.1.3 Medisch hulpmiddel? Klasse II	15	0	Super
2.10.1 Vergroot zelfredzaamheid? Niet van toepassing	16	0	Super
2.10.2 Vergroot zelfredzaamheid? Niet in te schatten	2	0	Super
2.10.3 Vergroot zelfredzaamheid? Nee	36	0	Super

Codes:

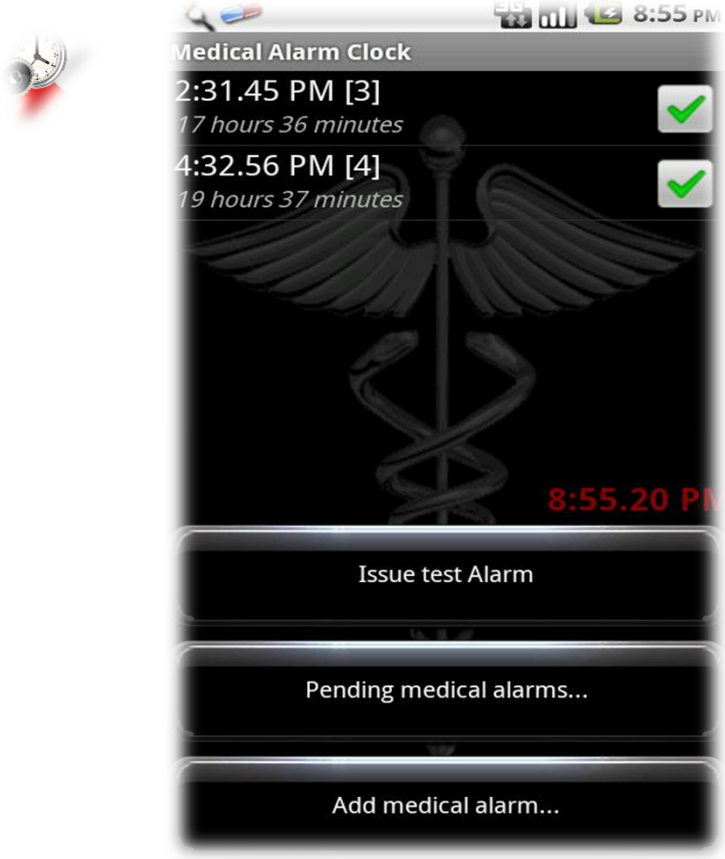
- Characteristics: 4 codes (e.g. user, downloads)
- Possible benefits: 4 codes (e.g. health profits, self-reliance)
- Possible risks: 8 codes (e.g. medical device, faulty design, privacy)

Function of apps



Adherence

Alarm clock



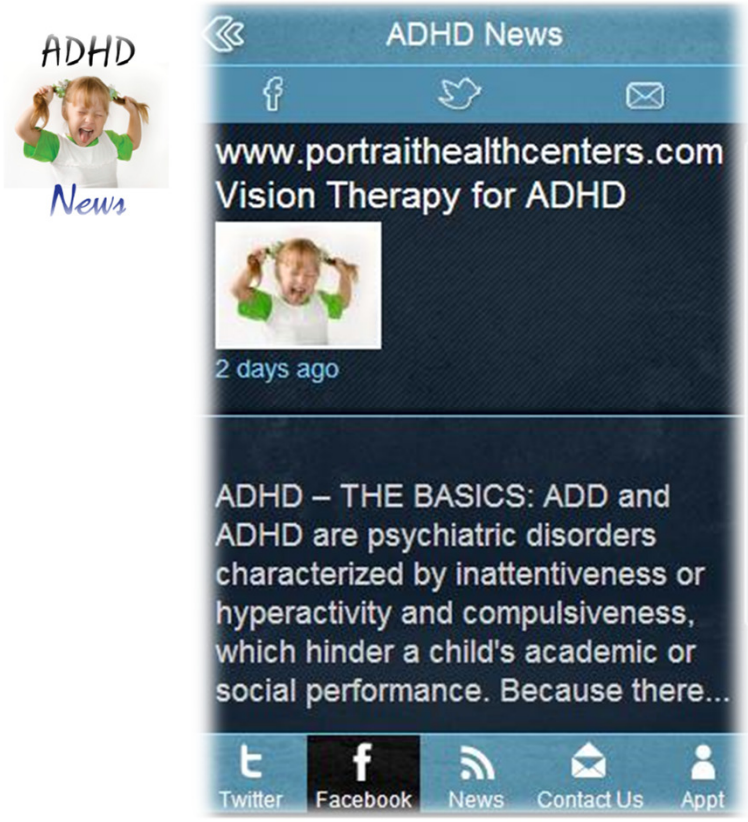
Monitoring

Asthma Tracker & Log



Information

ADHD News



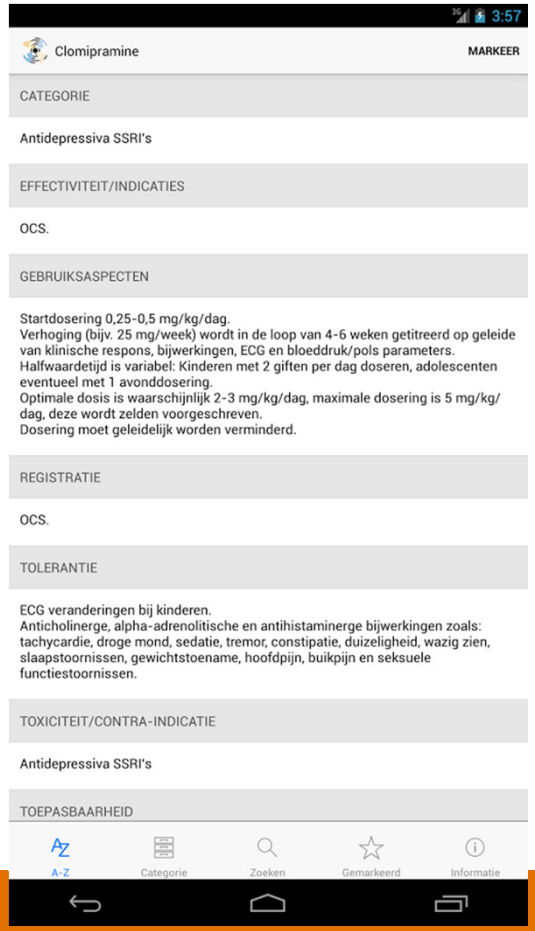
Diagnostic measurements

Philips Motiva chronic heart failure



Choice medication/dose

Formulary KJP

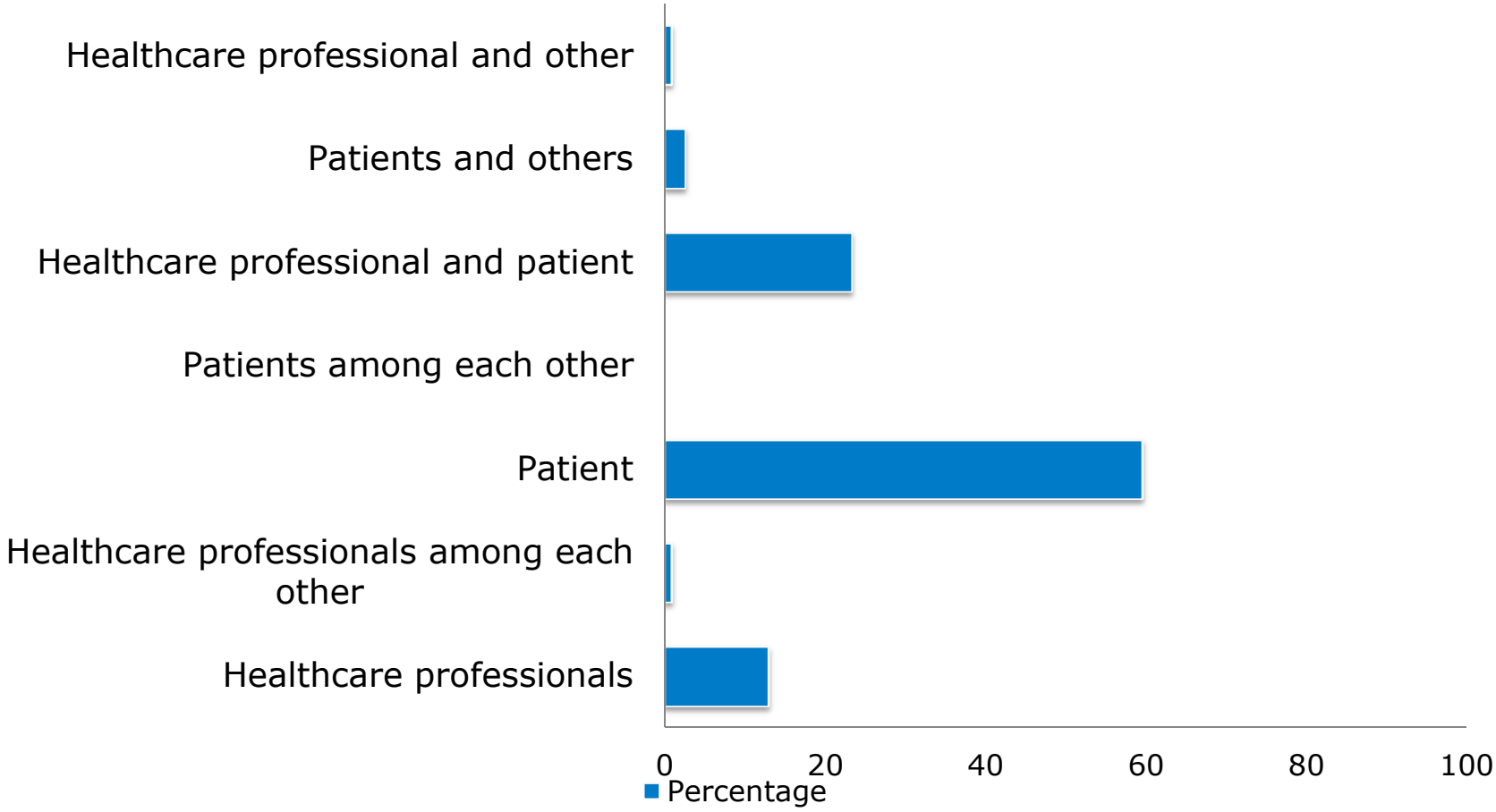


Research

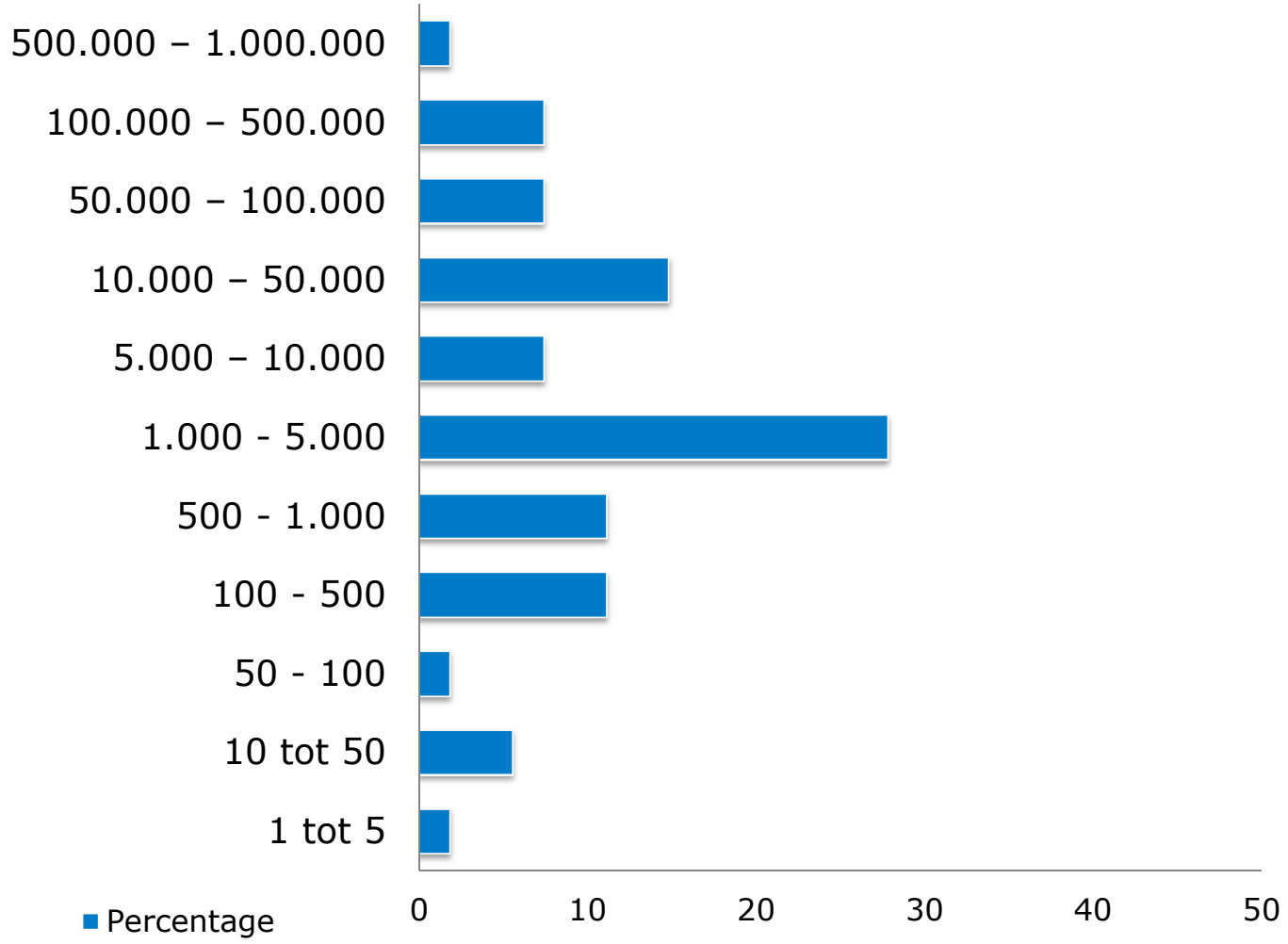
Owise breast cancer



Intended users apps



Downloads Google Playstore



Possible benefits (%)				
CODE	Yes	No	Not assessable	Not applicable
Improves health	65.5	34.6	0.9	0
Enhances self-reliance	52.6	31.9	1.7	13.8
Lowers healthcare costs	55.2	40.5	4.3	0
Contributes to self-management	35.3	48.3	2.6	13.8
Data upload	25.9	10.3	63.8	0

Possible risks (%)				
CODE	Yes	No	Not assessable	Not applicable
Medical device	13.8	86.2	0.0	0.0
Healthcare professional involved in obtaining	13.8	69.0	3.4	13.8
Healthcare professional involved in using	14.7	68.1	3.4	13.8
Accessible to non-healthcare professional if MD type II	6.0	0.0	0.9	93.0
Replaces health care professional	5.2	93.1	1.7	0.0

Ongoing research: survey of users

- Frequently downloaded apps relating to medication use
  - Apps for anesthesiologists
  - Apps for diabetes patients





- Aim to gain insight into:
  - Actual use
  - Pros and cons according to users
  - Reliability
  - Policy

- Survey conducted in collaboration with
  - Dutch Association for Anesthesiologists (NVA)
  - Diabetes Association Netherlands (DVN)

Preliminary results

For both anesthesiologists and diabetes patients, we found:

Users select apps themselves, but are unaware of:

- Quality and designer of the app
- Status as medical device
- Reliability
- Data upload and privacy

Both users and non-users would appreciate practical and reliable apps provided by reliable organizations (such as their association)

Conclusions

Most apps related to medicine use have little health risk

However,

- Users select apps based on very limited information
- Large supply and dynamic content of apps
- Erroneous information or poor functionality difficult to track
- Almost impossible to regulate and supervise apps
- Some apps meet MD definition; no CE mark in app store

Recommendations:

1. Create good awareness of both benefits and risks among users
2. Develop and certify reliable apps for critical use

