



University of Twente

Self-management via digital triage in Primary Care

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Self-management via web-based communication systems, eConsult

- Communication through computer-based applications to *receive guidance and support on a health related issue*
 - Free text e-mail consult: communication with GP in your own vocabulary
 - **Triage consult: communication via a symptom driven system**, without involvement of GP (Questionnaire; computer generated self-care advice)

Nijland, Van Gemert-Pijnen et al, Evaluation of Internet-Based Technology for Supporting Self-Care: Problems Encountered by Patients and Caregivers When Using Self-Care Applications, JMIR, May 2008

Online patient interviewing; triage ecuity

- “Classification of patient acuity that characterizes the degree to which the patient’s condition is life or limb threatening, and whether immediate treatment is needed” (Gilboy et al, 2005)



Table 1. Benefits of Computer-Based Patient Interviewing

- More complete medical history (computers do not forget any questions).
- Patient can complete the computer interview at leisure.
- Patient can access medications and records not otherwise readily available in the clinical setting.
- It has been proven repeatedly that patients are more likely to disclose sensitive issues and concerns to a computer than to a human interviewer.
- Patients are better prepared for the medical interview after being interviewed by a computer.
- Computers provide legible summaries.
- Computer-based history can be entered into an electronic medical record and the information used to direct future care.
- Computers can calculate and analyze to produce scores, audits and other reports.
- Computers can provide questions in different languages and allow patients who are deaf to read or enter information in alternative ways.
- As the computer obtains the history, it can at the same time offer tailored education and instruction.



Digital triage in Primary Care

- to assist patients and persons in self-management skills and healthy behaviors through fully automated diagnosis and advice (decision framework)
- to empower patients and to reduce unnecessary doctors' visits (self-limiting diseases)
 - “when to contact a doctor”;
 - “what a doctor can do,
 - “ what you can do”.



The “digital (fully automated) triage consult”

- ISO 9001-2000 standards; certified TNO-QMIC (quality standards) and NHG (national standards primary care)
- encrypted software for secure exchange of information
- free service from insurance companies
- 25 entry complaints (self-limiting diseases, based on ICPC)
- each complaint leads to specific triage modules
 - high frequency complaints
 - possibility to rule out emergencies
 - covers 35% of primary care visits (Verlinden, 2005)

Focus of our study

The contribution of digital triage to self-management

- what kind of complaints were submitted?
- what kind of advice was generated by the digital triage system?
(*retrospective analysis* from one year, yielding 13116 inquiries)

The compliance with a “fully automated” advice

- which factors influence the intention to comply with computer generated advice?
- which factors influence actual compliance; non-compliance?
(*online surveys among current users*)

Consultation process, a) Identifying the complaint

log-on with a user-ID password
identify your complaint on the
virtual body
(a click on the body)

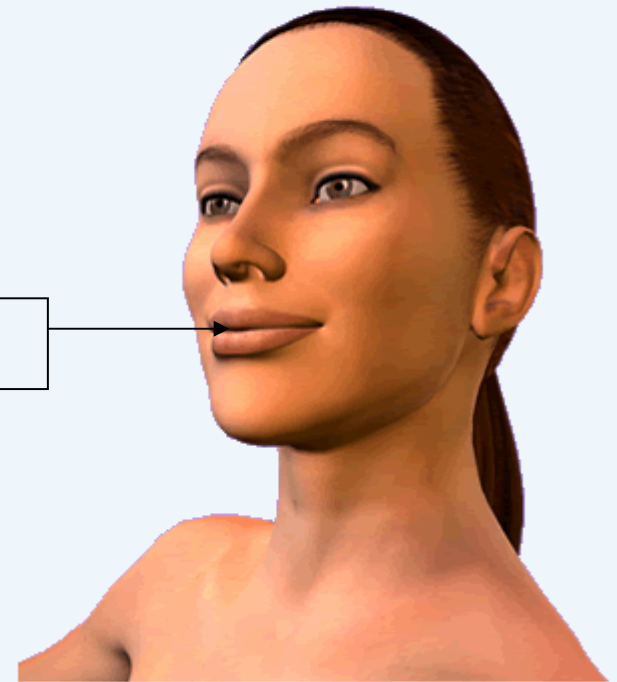
Uw vragen voor het Digitaal consult

vooraanzicht

achteraanzicht

hoofd

cough





Uw vragen voor het Digitaal consult

Hoe verloopt het hoesten?

u moet af en toe hoesten

u moet regelmatig hoesten

het hoesten gaat in aanvallen

U STAAT INGESCHEVEN ALS:

N Nijland

uw verzekeraar:



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Consultation process:

b) gathering personal information via a symptom driven question-answer system;
varying according to gender, age, answers to previous questions

How goes your coughing?

- I cough sometimes
- I cough often
- I cough in fits



Content of advice

- contact a doctor
 - contact a doctor in case of emergency (as soon as possible, in short time, in 24 hours)
- tailored self-care advice
 - diagnose and advice tailored to a complaint
 - the cause of your complaint
 - what a doctor can do; what you can do
 - the source of the medical advice (evidence)

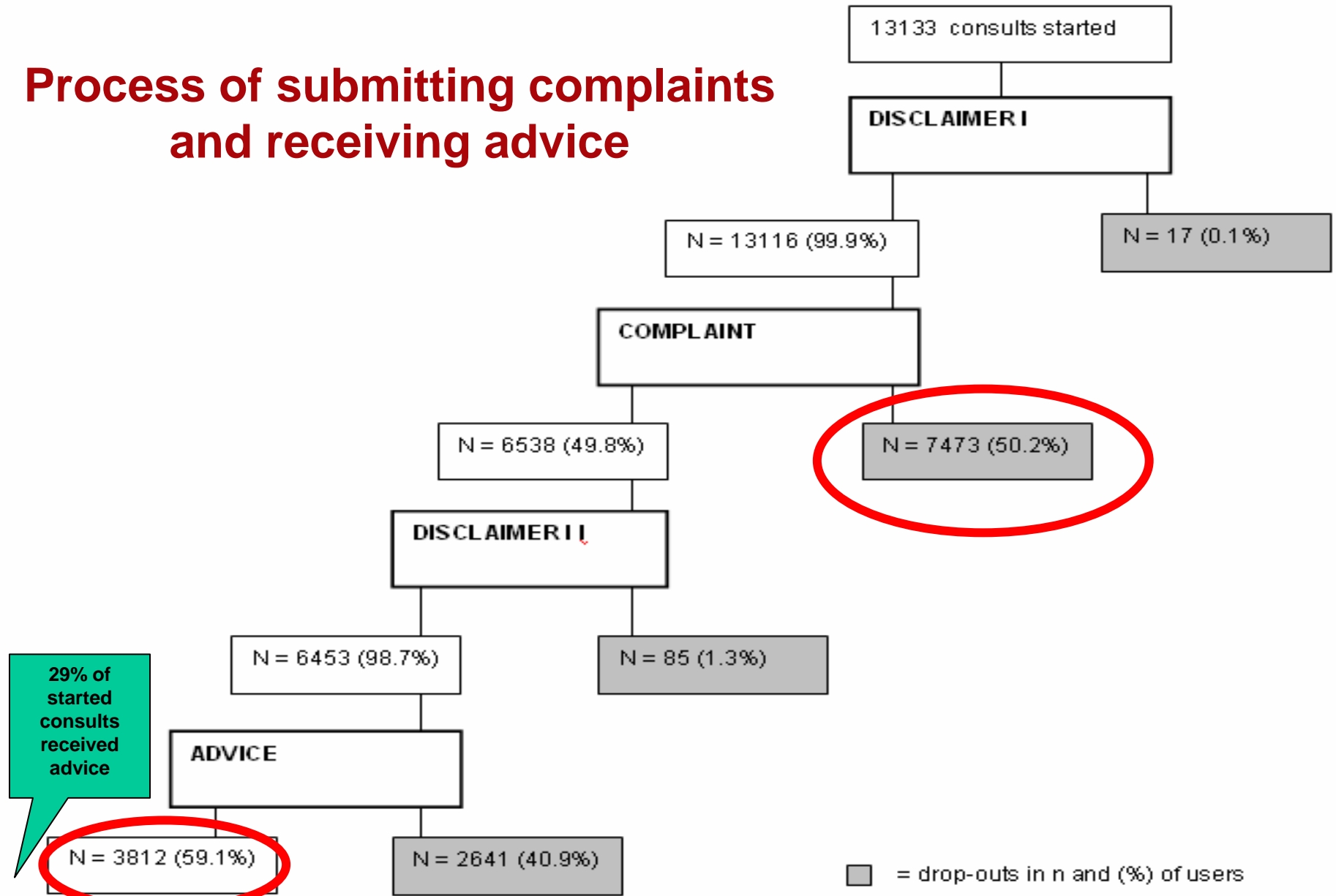


Example of self-care advice

- although your complaints can be (very) irritating, there are no reasons to worry
- you have a common disease, *you do not need to visit your GP*
- your complaints indicate an upper airway disease, caused by a virus or a bacteria
- this is a non-severe disease, which recovers spontaneously within 1 to 2 weeks
- *what a doctor can do, what you can do*

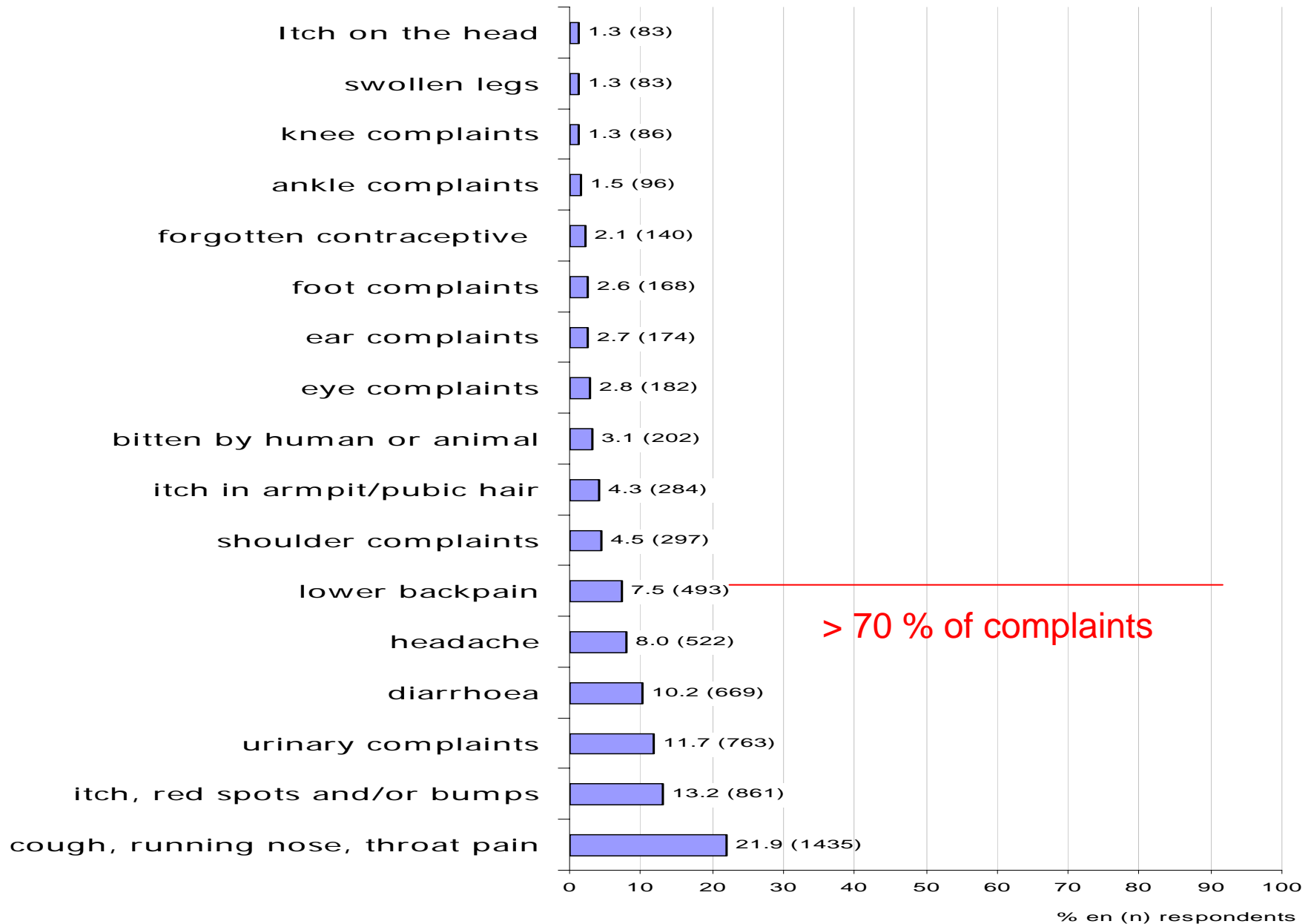


Process of submitting complaints and receiving advice

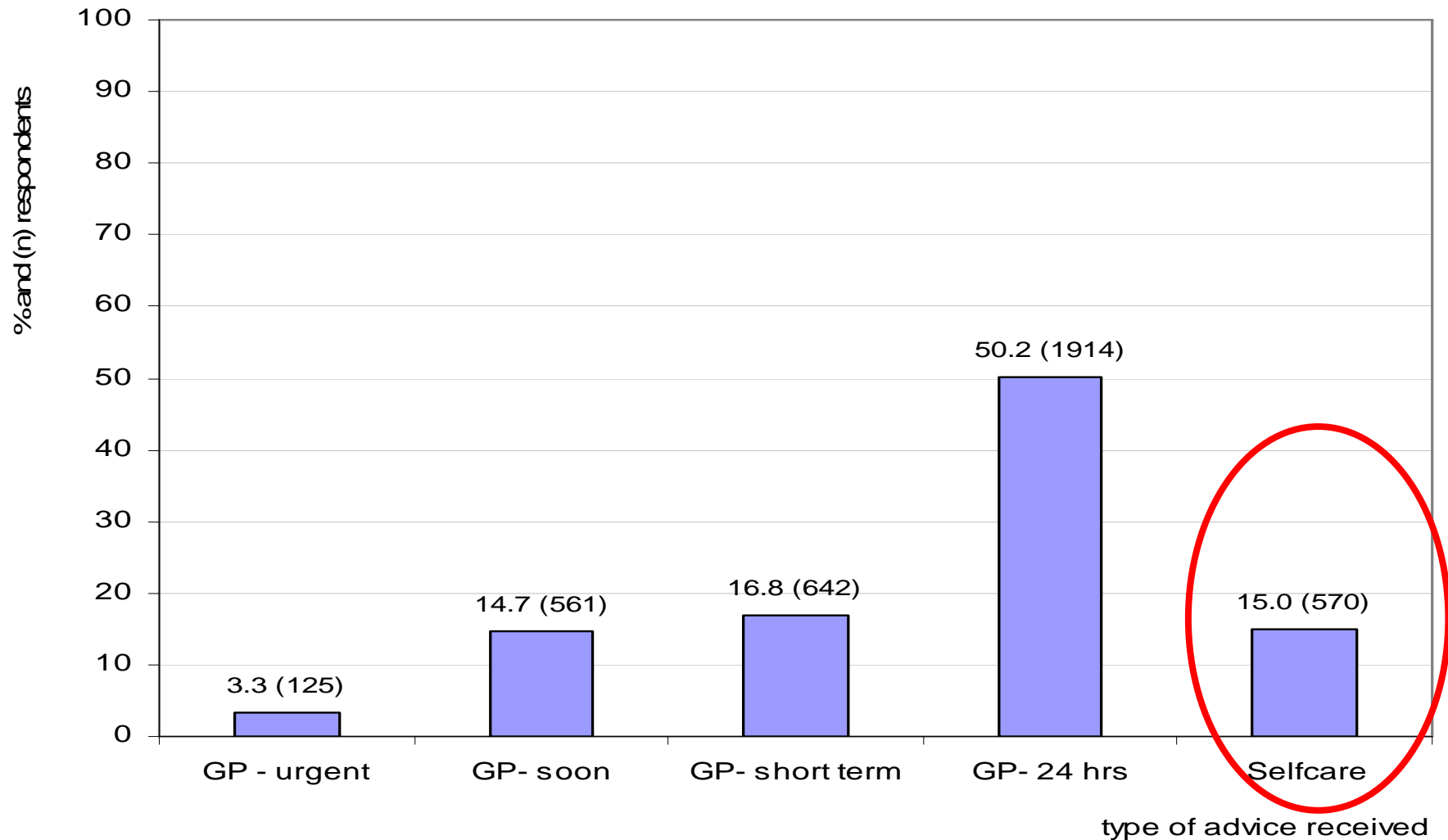


Frequency of complaints (n=6538)

Complaints



Frequency of advice (n=3812)



Generated advice related to frequent/infrequent complaints

complaints	Contact a doctor in %				tailored self-care in %
	urgent (112)	soon	short-term	24hrs	advice (and diagnose)
cough n=877	14.3	28.8	10.5	32.2	14.3 =100%
itch, red spots and/or bumps n=462	0	20.3	0	52.4	27.3
urinary complaints n=417	0	0	22.1	76	1.9
diarrhoea n=435	0	0	55.4	19.5	25.1
headache n=305	0	25.7	6.3	63.2	4.9
eye complaints n=138	0	2.2	11.6	60.9	25.4
ear complaints n=114	0	19.3	16.7	43	21.1
foot complaints n=102	0	0	0	77.5	22.5
forgotten contraceptive n=80	0	0	0	51.3	48.8

Reasons for encounter: top-20 of ICPC-codes,2005 (www.LINH.nl)

Reasons for encounter per 1000 patients per year, classified according to ICPC-chapter and gender, 2005)

	number of reasons for encounter		
	male	female	all
ICPC unknown	1817	2646	2232
A General & Unspecified	389	589	489
B Blood	35	73	54
D Digestive	308	462	385
F Eye	101	140	121
H Ear	168	181	174
K Circulatory	662	877	770
L Musculoskeletal	566	879	723
N Neurological	111	216	164
P Psychological	326	604	465
R Respiratory	566	726	646
S Skin	510	664	587
T Endocrine & Metabolic	371	444	407
U Urology	80	246	163
P Pregnancy & Family Planning	1	261	131
X Female Genital System	1	309	156
Y Male Genital System	117	1	59
Z Social Problems	33	63	48
total number of reasons for encounter per 1000 patients	6163	9382	7774

Digital triage, limited benefits

- **limited decision support, medico-technology driven system rather than user-centered**
 - too defensive (medico-legal concerns); the greater part of advice referred to contact a doctor
 - minority of complaints resulted in self-care advice
- **limited “consumerist” empowerment**
 - high rate of drop-outs
 - 50% by entering complaint
 - 40% secondary drop-outs before getting advice
 - used to prove assumptions (professional empowerment) rather than to make decisions when to contact a doctor

Digital triage, opportunities

- gatekeeper
 - complaints similar to encounters for which a GP was contacted most according the top 20 encounters in the Netherlands
 - complaints for which self-care advice could be given
 - most complaints referred to non-urgent situations

Online surveys *current users*

Survey (n=190) **Intention to comply with self-care-advice**

- demographics, reasons digital consult; use of digital consult
- expected and received advice
- factors that may influence intention to comply
 - attitude advice ($\alpha=0.84$)
 - subjective norm ($\alpha=0.61$)
 - self-efficacy ($\alpha=0.88$)
 - severity of complaint ($\alpha=0.84$) before and after submitting complaint)

Follow-up survey (n=36) **Actual compliance**

- compliance with advice (yes, no)
- reasons non-compliance

Results survey

Demographics		<i>n</i>	%
gender	male	60	32
	female	127	68
age in years mean 36.4/SD 13.72	16-35	107	57
	30-50	48	25
	51-75	33	18
education level	low	31	17
	middle	101	54
	high	55	29

Main reason digital consult (n=147)	<i>n</i>	%
information about complaint	72	49
advice if a GP should be contacted	38	26
second opinion	11	8
curiosity	10	7
taboo-complaint	8	5
information about medication	6	4
other	2	1

Results survey; evaluation advice, intention to comply

- no clear expectations about advice
 - (n=93, expected: **29% GP-advice**, 38% tailored self-care, 19% no expectations)
- majority received a contact-a-doctor advice
 - (n=72, **76% GP-advice**, 24% self-care advice)
- neutral to positive attitude towards advice
 - mean attitude 0.42 (scale -2 to +2)
- positive about self-efficacy
 - mean self efficacy 1.0 (scale -2 to +2)
- neutral influence (family, parents etc) on intention to comply
 - mean social norm 1.3 (scale -10 to +10)
- slightly severe perceived complaints
 - mean perception of severity -0.24 (scale -2 to +2 (-2= non severe))
- neutral to positive intention to comply
 - mean intention to comply 0.49 (scale -2 to + 2)

The compliance with a “fully automated” advice

- Determinants of intention to comply with advice (beta):

- Attitude	.69***	
- Subjective norm	.05	
- Self-efficacy	.08	
- Severity of complaint	.07	R ² = .53

- Determinants of actual compliance with advice (beta)

- Attitude	.21	
- Subjective norm	.26	
- Self-efficacy	.15	
- Severity of complaint	.08	
- Intention to comply	.72**	R ² = .47

** p <.01; *** P <.001



Aspects that determine a positive *attitude* towards automated advice

- Expected usefulness
 - understandable advice
 - reliable
 - applicable advice
- Effective
 - reduced uncertainty, tailored to complaint



Opportunities digital triage

- **Online patient-interviewing;**
 - diagnose, early detection of risks, preoperative screening
 - matching QA-systems and users' mental models
- **Division of labor**
 - mid-level professionals (nurse practitioner's)
 - e-triage centers
- **E-service package chronic diseases**
 - digital triage, combined with online education, lifestyle interventions
 - taboo complaints (urine-incontinency; Drs Kelders)



To foster empowerment via e-triage

- Organize e-care systems around patients/consumers
 - How they think and frame their problems
 - What they expect to be responsible for their own care and decisions
 - What they need to support self-management of care
- Remove barriers and create enablers
 - 50% referral to a doctor (24hrs) provides opportunity for self-care via online consultation
 - enhance confidence in online consultation via easy to use and useful systems
 - interoperable with Electronic Health Records

freeMD symptom evaluations have been used in hundreds of hospitals for more than a decade.



Tell Me More

Do you have moderate to severe throat pain?



Yes

No

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*Reasons for encounter: top-20 of ICPG
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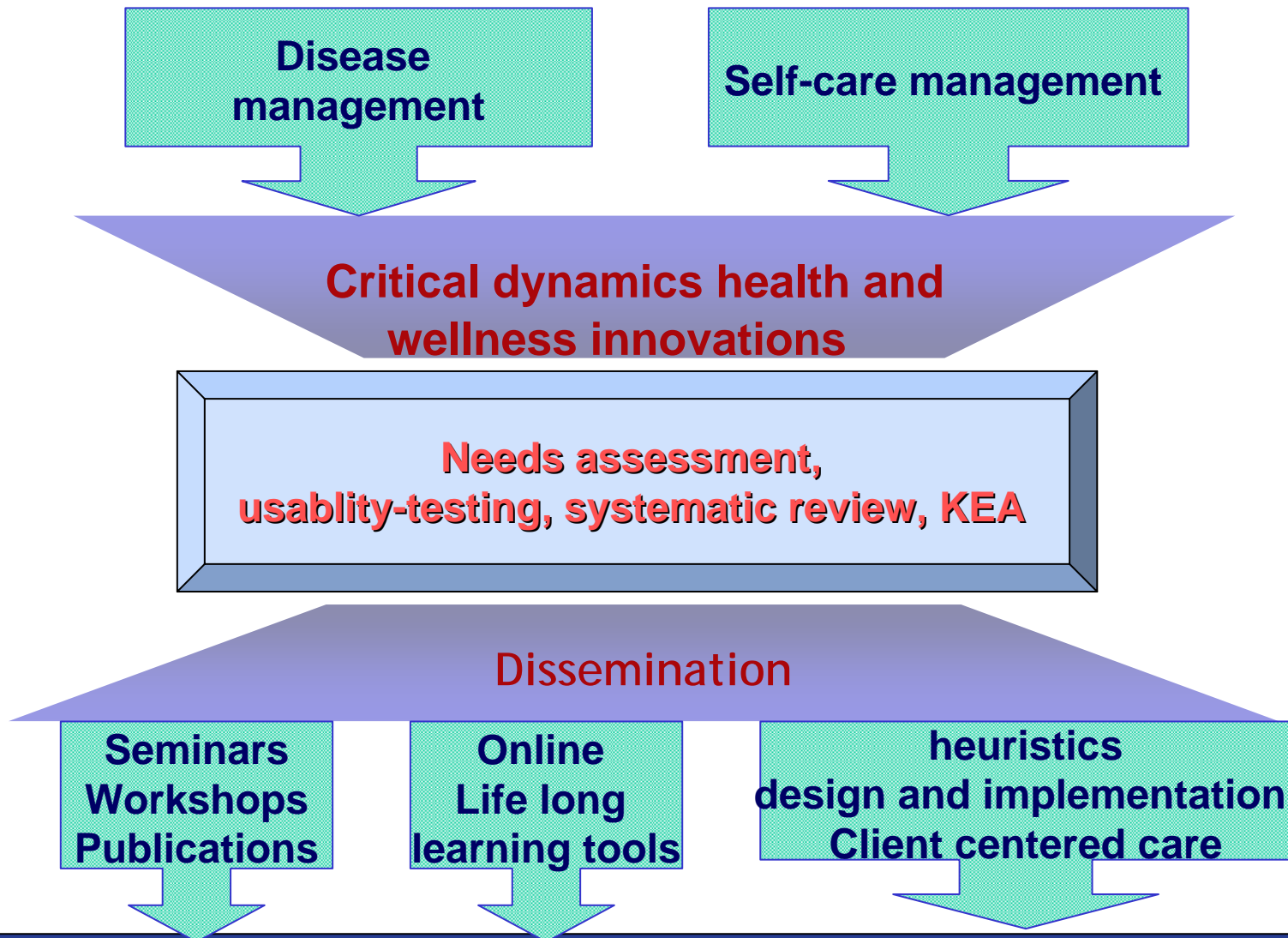


Top 20 encounters primary care	%
K86 Uncomplicated hypertension	4,70
A99 Other general/unspec diseases	3,27
T90 Diabetes mellitus	2,80
P06 Disturbances of sleep/insomnia	1,35
P76 Depressive disorder	1,26
U71 Cystitis/other urin infect NOS	1,25
T93 Lipid metabolism disorder	1,19
R96 Asthma	1,17
R05 Cough	1,13
S88 Contact dermatitis/other eczema	1,01
R74 URI (common cold)	0,90
W11 Family plan/oral contraceptive	0,88
R97 Hayfever/allergic rhinitis	0,85
L03 Low back complt excl radiation	0,81
S74 Dermatophytosis	0,78
R78 Acute bronchitis/bronchiolitis	0,76
A97 No disease	0,75
R95 Emphysema/COPD	0,74
P01 Feeling anxious/nervous/tense	0,73
D12 Constipation	0,61
Other	44,28
Unknown	28,78
Total	100,00



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Center eHealth Research (IBR)



Projecten eHealthgw.nl

- **Care coordination**

- web-based information services (health care consumers, patients, health professionals, caregivers)
- cross-border eHealth

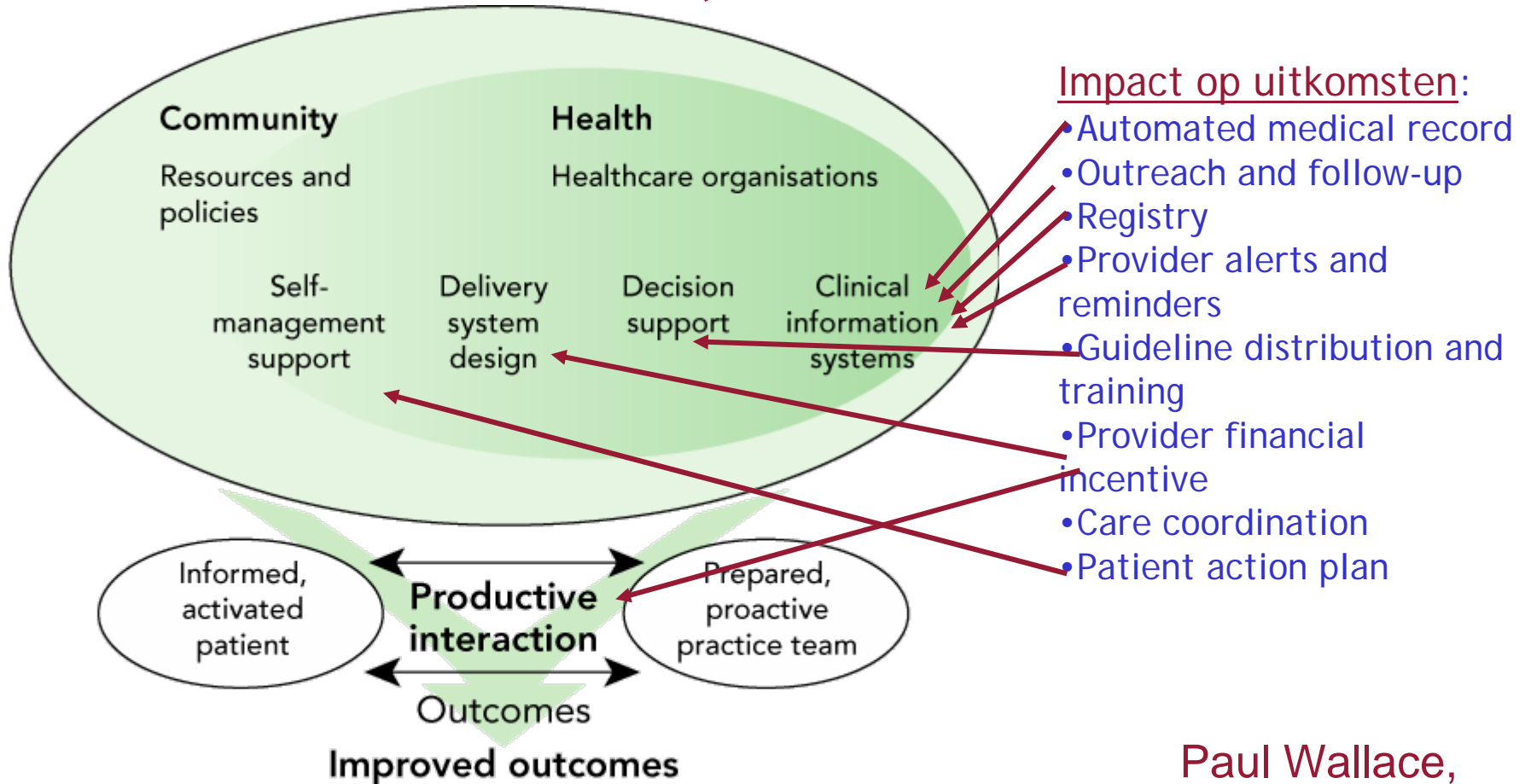
- **Patient Care**

- e-coach chronic complaints; monitoring, feedback, reminders, reinforcement programs
- e-triage (QA-systems for self-care support)
- e-consult (online communication and education)
- home health monitoring for continuity of care
- online discussion forums (self-help-groups)

- **Promotion of Public Health**

- internet for youth , portals

Chronic care model; kader voor interventies



Paul Wallace,
Kaiser Permanente