VU University, Amsterdam
Dept. of Clinical Psychology

Trimbos instituut
Netherlands Institute of Mental Health and Addiction

When e-interventions are offered nation wide:

modelling cost-effectiveness

at population level

Filip Smit [1 2]
Heleen Riper [1 2 3] Pim Cuijpers [1 2]

[1] Trimbos Institute [2] VU University
[3] Innovation Centre of Mental Health and Technology

Outline

- Background
- Model
- Results
- Discussion

→ Taking the public health perspective
→ Focus on depressive disorder

Background

Background

- The disease burden of depression is substantial and imposes economic costs on society
- Current health care regimes can only partially alleviate the disease burden
- Low threshold, effective and affordable interventions that are scalable

→ A niche for e-mental health?

VU University, Amsterdam

Dept. of Clinical Psychology

Trimbos instituut

Method (computational model)

VU University, Amsterdam
Dept. of Clinical Psychology

Trimbos instituut

Conceptual outline of the Model

SCENARIO 1	SCENARIO 2
Epidemiology of depression	Epidemiology of depression
Health care system	New health care system
Health care uptake: in units	Health care uptake: in units
Health care costs: in €	Health care costs: in €
Health gains: DALYs	Health gains: DALYs
Expenditures / DALY avoided	Expenditures / DALY avoided
Incremental costs-effectiveness ratio	

Method: epidemiology

COMPARATOR CONDITION

legend: play *w* me | outcome | labels | key-finding | free parm

POPULATION-LEVEL COST-EFFECTIVENESS
OF (MODIFYABLE) CLIN. PATHWAYS FOR DEPRESSION

n=		10.5	source population (in mln)			
n=		269,035	incident cases / yr	costing	€746	mln / yr
access to HC	58%	156,040	new patients / yr			

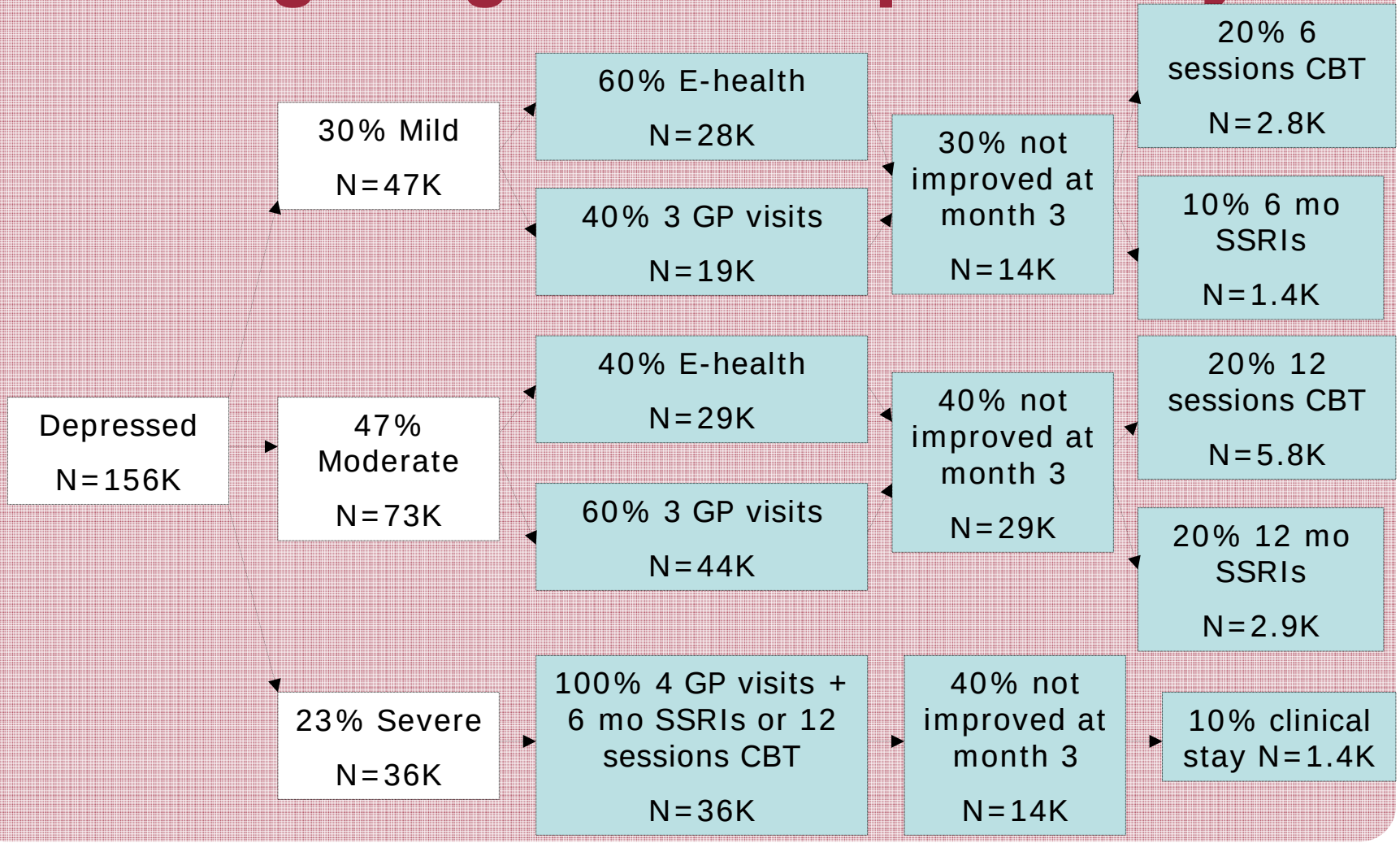
	mild	moderate	severe	all	
%	30%	47%	23%	100%	
n=	46,812	73,339	35,889	156,040	patients
dw=	0.14	0.35	0.76		
t(pyr)=	0.25	0.5	1	84,262	YLDs
DALYs=	1,638	12,834	27,276	41,749	DALYs

Method: health care system

CLINICAL PATHWAYS		mild	moderate	severe
Self-help	modules	0	0	0
GP	consultation	3	5	6
SSRIs	monthly	0	3	12
out-pat	session	0	2	6
in-patient	days	0	0	2

NUMBER OF UNITS		mild	moderate	severe
Self-help	modules	0	0	0
GP	consultation	140,436	366,695	215,336
SSRIs	monthly	0	220,017	430,672
out-pat	session	0	146,678	215,336
in-patient	days	0	0	71,779

Designing clinical pathways



Method: health care system

CLINICAL PATHWAYS		mild	moderate	severe
Self-help	modules	0	0	0
GP	consultation	3	5	6
SSRIs	monthly	0	3	12
out-pat	session	0	2	6
in-patient	days	0	0	2

NUMBER OF UNITS		mild	moderate	severe
Self-help	modules	0	0	0
GP	consultation	140,436	366,695	215,336
SSRIs	monthly	0	220,017	430,672
out-pat	session	0	146,678	215,336
in-patient	days	0	0	71,779

Calculating expenditures (in €)

COSTS (IN €)			mild, in mln €		moderate mln €		severe mln €	
Self-help	module	€5.00	€0.00		€0.00		€0.00	
GP	consult.	€20.20	€2.84		€7.41		€4.35	
SSRIs	monthly	€19.18	€0.00		€4.22		€8.26	
out-pat	session	€124.00	€0.00		€18.19		€26.70	
in-patient	days	€250.00	€0.00	+	€0.00	+	€17.94	+
Sum of expenditures (in mln €)			€2.84	mln	€29.82	mln	€57.26	mln

Estimating health gains (DALYs)

		mild	moderate	severe
Self-help	0.50	0.00	0.00	0
GP	0.22	0.28	0.36	0.39
SSRIs	0.55	0.00	0.31	0.57
out-pat	0.77	0.00	0.31	0.54
in-patient	0.02	0.00	0.00	0.04
total d of clinical path		0.18	0.65	1.04
dw change	0.172	0.032	0.111	0.179
DALYs averted		253	3,432	5,905
as % of total		15%	27%	22%
Expenditures / DALY averted		€11,212	€8,688	€9,696

VU University, Amsterdam
Dept. of Clinical Psychology

Trimbos instituut

Method

SCENARIO 1	SCENARIO 2
Epidemiology of depression	Epidemiology of depression
Health care system	New health care system
Health care uptake: in units	Health care uptake: in units
Health care costs: in €	Health care costs: in €
Health gains: DALYs	Health gains: DALYs
Expenditures / DALY avoided	Expenditures / DALY avoided
Incremental costs-effectiveness ratio	

Getting the ICER (€ / DALY) (CAU *versus* CAU + eHealth)

POPULATION LEVEL COST-EFFECTIVENESS (€/DALY avoided)		
Incremental costs	-€23.04	mln
Incremental effects	2,948	DALYs avoided
Incremental C/E ratio	-€7,816	€/DALY avoided

Results

Results

- Several scenarios can be compared, e.g. usual care *v* usual care augmented with e-health
- Adding e-health to existing health care systems helps to alleviate the disease burden of depressive disorder
- And reduces costs at the same time

Discussion

Discussion

- Basically, the model combines and synthesises existing research findings (from epidemiological studies, cost-of-illness studies, RCTs, meta-analyses)
- I was amazed to see that very few assumptions had to be made
- The model can reproduce Dutch statistics on disease burden and health care costs, which lends some (criterion) validity to the model

Discussion

Limitations:

- There are some problems with estimating health gains, especially the cumulative effects of several consecutive interventions (requires more research)
- Most parameters are surrounded by (stochastic) uncertainty, but fully automated sensitivity analyses for parameters can be implemented easily

Conclusion

- Self-help e-interventions for depressive disorder deserve a firm place in the Dutch health care system
- E-interventions are likely to further reduce the disease burden attributable to depressive disorder
- … and are also likely to produce cost offsets, making e-interventions attractive from a health economical point of view

VU University, Amsterdam

Dept. of Clinical Psychology

Trimbos instituut

Netherlands Institute of Mental Health and Addiction

Contact

Filip Smit

fsmit@trimbos.nl