Development of smart inpatient rooms using automation and preventing restraints in suicidal patients

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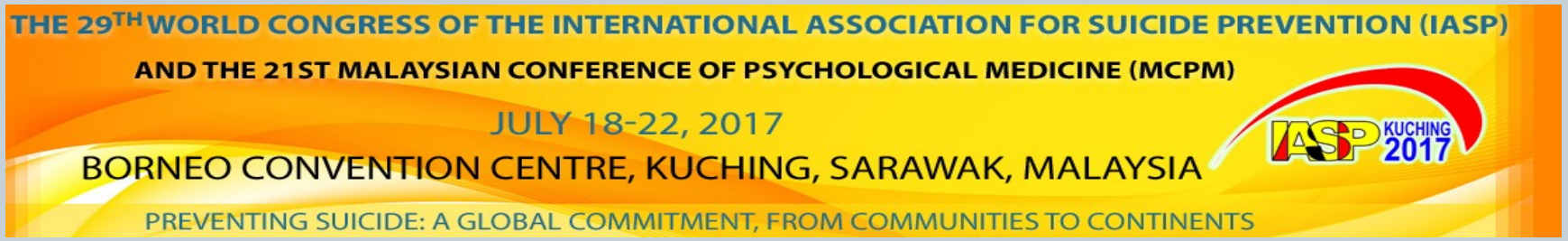


WWW.SUICIDALITEIT.NL

Parnassia Groep

VU UNIVERSITY AMSTERDAM

No Conflict of Interest

Content

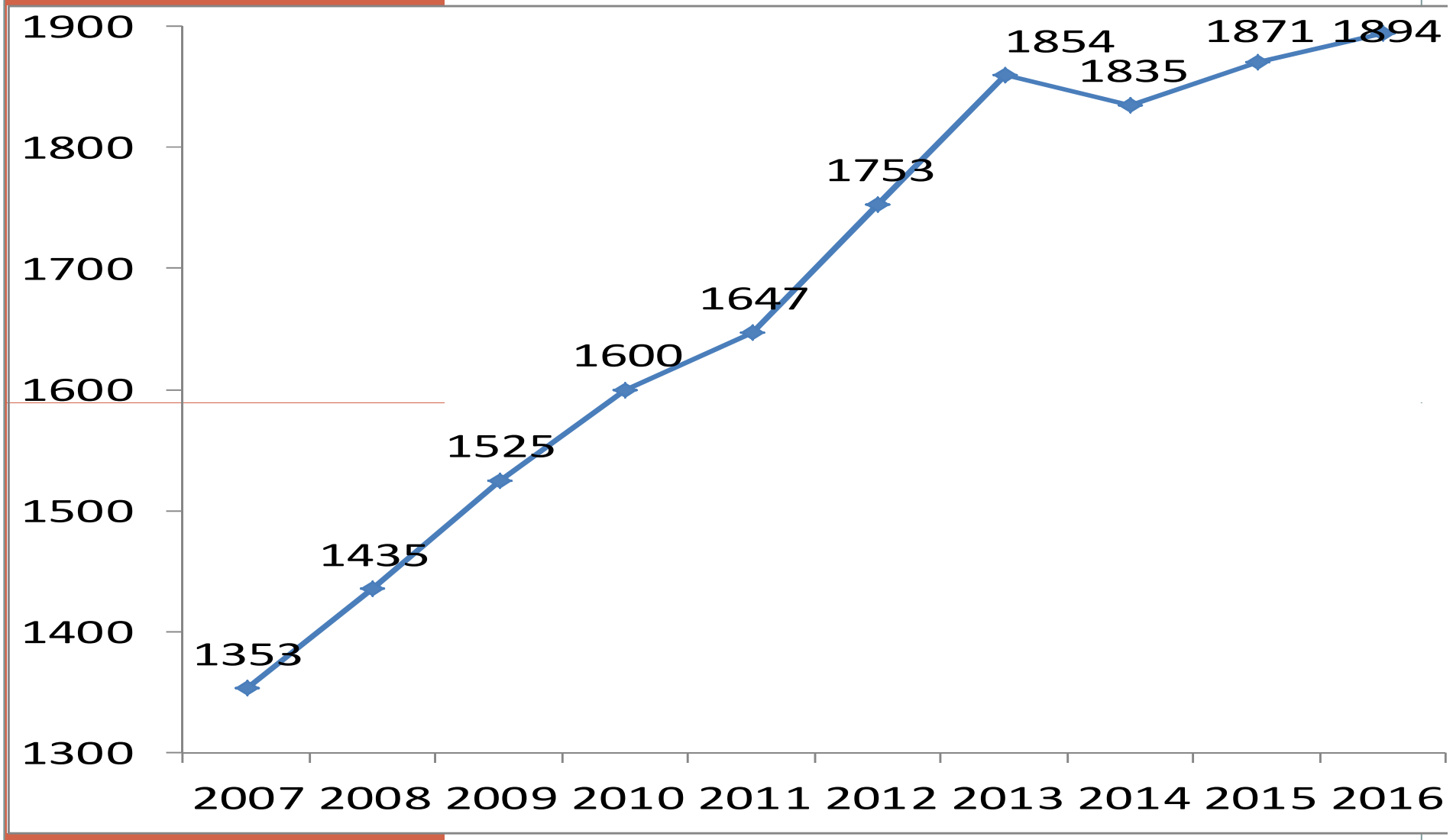
- Netherland suicidal behaviour and figures
- Suicidal behaviour in mental health
- Serious suicidal behaviour, admission and risk taxation
- Seclusion during high risk
- Development of alternatives
- Automation rooms
- Use of automation rooms
- Results
- Conclusions

Neth ands

- 17.01 million inhabitants
- 7th place happiness population (↓) *(WHR)*
- High density psychiatrists (1:5600)
- Suicide rate 1:11.1 overall (2016)
  - Since 8 years > 40% increase

KCAP The Hague

Suïcide rate in the Netherlands



Centraal Bureau Statistiek (CBS), 2013

Suicidal behaviour in society & MH

- Suicide…… too late for mental health
- 40% suicides treatment in mental health….(Huisman et al 2010)

- **Mental health:**
- Experts diagnosis & treatment of serious suicidal behaviour!
- Very very very serious > admission…
  - Last resort
  - And then….?

Admission

- False sense of security?
- Iatrogenic?
- Last resort?

- Possible rapid treatment
- Observation
- Unburden support system

Risk taxation suicidal behaviour & closed wards

- Concentration of serious suicidal behaviour
- Increased risk suicide (>50-80 x)
- No specific guidelines, just general
- Specific Dutch setting?
- ? Open < >closed (Huber et al 2016)

Serious suicidal behaviour and acting

"study design"

- Acting of mental healthworker changes outcome…….
- Randomised trial > serious lethal suicidal behaviour
  - Group 1 admission
  - Group 2 no admission

- Outcome suicide!

Suicidal behaviour and closed admission

- Suicidal behaviour 28.7% (368/1324) (Miedema ea 2016)

Development Phase plan 2007

- For every patient multidisciplinary risk taxation!
- Daily registration and taxation
- registration monitored on digiboard
- Clarity of taxation for all!

Acute ward,phase plan (de Winter et al 2011)

Phase 5 (Red)	**Continuous observation** (“evt” seclusion during night)	**Serious suicidal**
Phase 4 (Orange)	**Supervision** (differentation)	
Phase 3 (yellow)	**No freedom outside**	
Phase 2 (Green)	**Freedom**	
Phase 1 (Blue)	**discharge**	**Non-suicidal**

High risk? N =1284

(de Winter e.a 2012)

Fase 5 (very high risk)	3.5%
Fase 4 (high risk)	7.1%
Fase 3 (acceptable risk)	“59.5%”
Fase 2 (acceptable risk)	28.0%
Fase 1 (acceptabel risk)	1.9%)

A study of the connection between coercive measures used in a closed acute psychiatric ward and the socio-demographic and clinical characteristics of the patients involved

TIJDSCHRIFT VOOR PSYCHIATRIE 58(2016)6, 434-445

N. MIEDEMA, M.C. HAZEWINKEL, D. VAN HOEKEN, A.S VAN AMERONGEN, R.F.P. DE WINTER

TABEL 2 Klinische kenmerken in relatie tot dwangmaatregelen

Klinisch kenmerk	Totaal		Dwangmaatregel					
			Separatie			Noodmedicatie		
	N	%	Ja	% Ja	χ^2-toets**	Ja	% Ja	χ^2-toets**
Alle opnames	1283	100,0%	260	20,3%		182	14,2%	
Opnamereden*								
Psychotische decompensatie	472	36,8%	127	48,8%	χ^2 = 20,385; df = 1; p < 0,001	94	51,6%	χ^2 = 20,404; df = 1; p < 0,001
Suïcidaliteit	370	28,8%	45	17,3%	χ^2 = 21,127; df = 1; p < 0,001	23	12,6%	χ^2 = 27,003; df = 1; p < 0,001
Agressie	216	16,8%	78	30,0%	χ^2 = 40,681; df = 1; p < 0,001	68	37,4%	χ^2 = 62,697; df = 1; p < 0,001

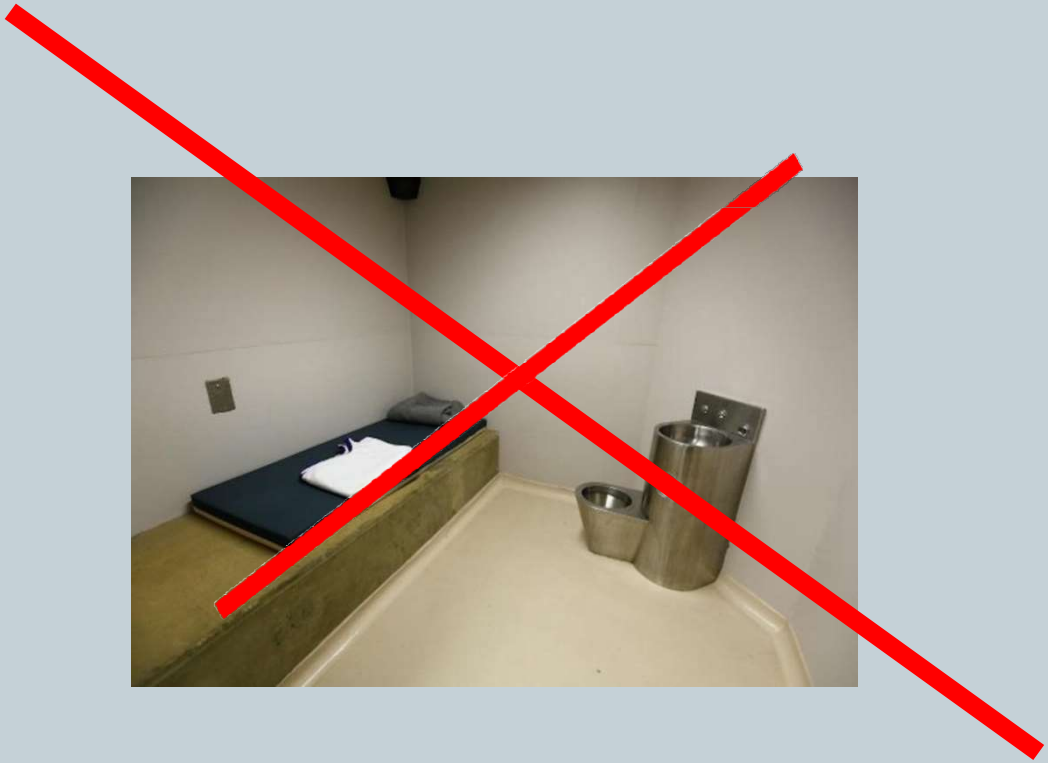
OPNAMEAFDELING

Alternatives

- Phase 5 permanent observation
  - For 52 patiens 4 nurses (23.00 - 7.30)
  - During nights seclusion.....
- Seclusion and suicidal behaviour!
- Seclusion = detrimental (de Winter et al 2011)

Mission!

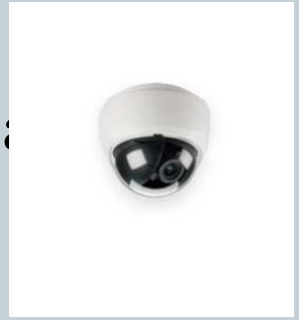
- **No more use of seclusion rooms for suicidal patients!**



Finding alternatives

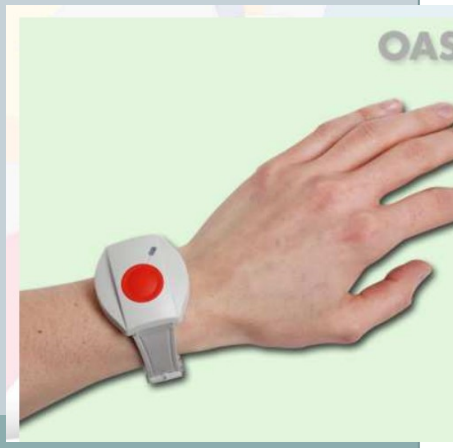
- Since 2010, development of alternatives!

- Patients and staff prefer modern detection systems a
  separation (Hazewinkel et al 2014).



- Searching for alternatives with detection?

- Learning detection systems/smart wrist application/smartphone application/ rooming in etc..



Alternative for seclusion during nights

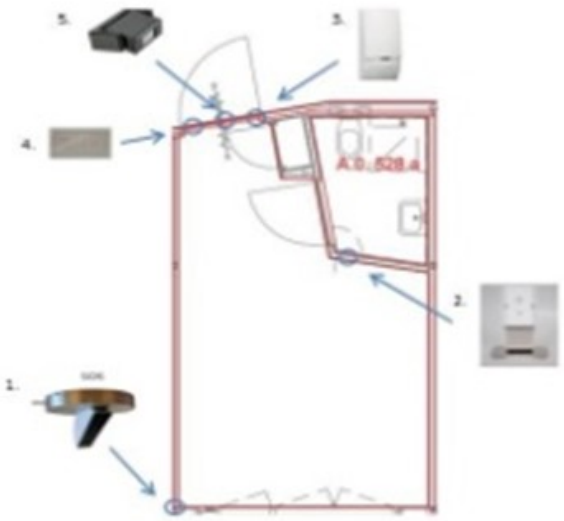
- finally
- Development of **Automation rooms!**

Universiteit Leiden

Avics

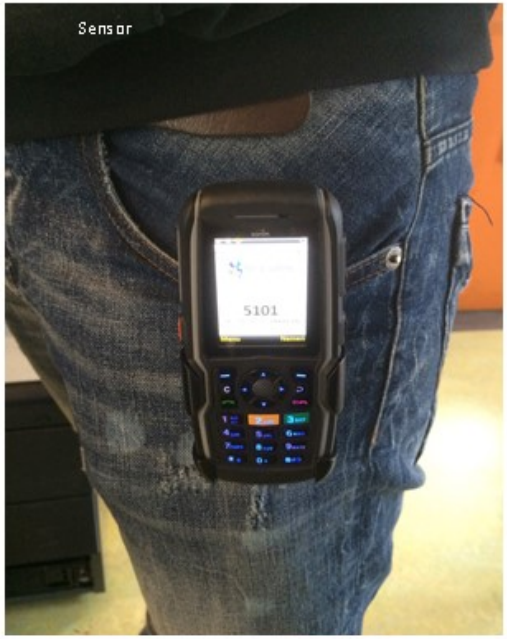
TU Delft

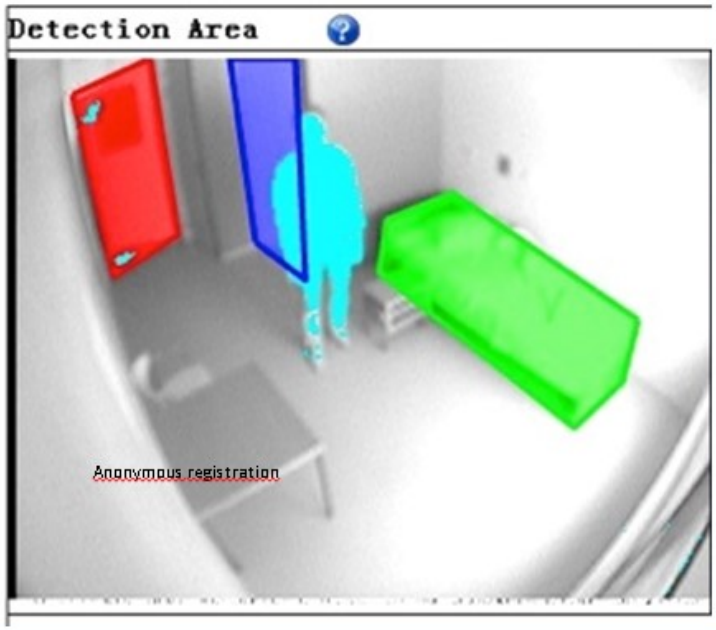
Collaberation AVICS



Automati

1. Smart sensor
2. Movement sensor
3. Movement sensor
4. Acoustic sensor
5. Door sensor
6. Smartglass





Acting after signal

- Signal:
- 1. Sensor detection movement or otherwise in room.
- 2. Signal notification on handsensor
- 3. Watching Video fragment on pc
- 4. Face to face contact patient

Results Automation room

- Experience almost 3 years (end 2014-2017) 3 “rooms”
- All suicidal patients high risk > automation room > (*night and hours with less obeservation*)
- Depressive disorder most common
- 124 times usage automation room (96 individuals)
  - 7 patients 3 admissions, 14 patients 2 admission
- Total 1071 nights usage automation room
  - 255 nights > finally seclusion
- 1 suicide
- Several times bugs in system (no figures)

Light in the darkness

Decrease in seclusions

- **76.2 %** ↓
  - in using seclusion rooms for suicidal patients.

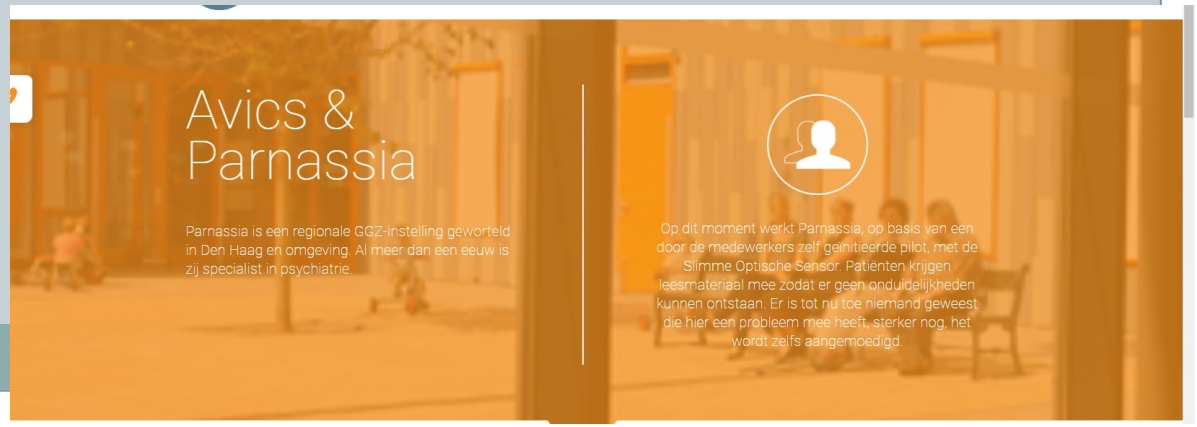
- All seclusions < 4 % primary suicidal behaviour (was 17.3%!)

	Total (n = 67)	♀ (n = 37)	♂ (n = 30)	p
Age (SD)	39.5 (15.05)	36.4(14.6)	43.4 (14.9)	ns
Major diagnoses				
Comorbidity (%)	20 (29.9%)	13 (35.1%)	7 (23.3%)	ns
Depressive disorder	24 (35.8%)	14 (37.8%)	10 (33.3%)	ns
(psychotic depression)	(9(13.4%)	4 (10.8%)	5 (16.7%)	ns
Primary psychotic	18 (26.9%)	6 (16.2%)	12 (33.3%)	0.029
Personality disorder	18 (26.8%)	10 (27%)	8 (26.7%)	ns
Substance/alcohol	8 (11.9%)	4 (10.1%)	4 (13.3%)	ns
PTSD	7 (10.4%)	5 (13.5%)	2 (6.7%)	ns
Anxious disorder	5 (7.5)%)	3 (8.1%)	2 (6.7%)	ns
Autism	1 (1.5%)	2 (5.4%)	0 (0%)	ns
rest	3 (4.5%)	2 (5.4%)	1 (3.3%	ns
Unknown	4 (6.0%)	3 (8.1%)	1 (3.3%)	ns
Automation usage				
repeated	15	13	2	0.024
average nights (range)	8.7 (1-138)	10.2 (1-138)	6.4 (1-29)	ns

Experiences of staff

Survey nursing staff N = 24

- Revealed that automation was used mainly at night.
- Automation is seen as an alternative for restraint methods during admission.
- Patients and staff trust the new technology. There is a strong desire for continuing the supplementary method.



limitations

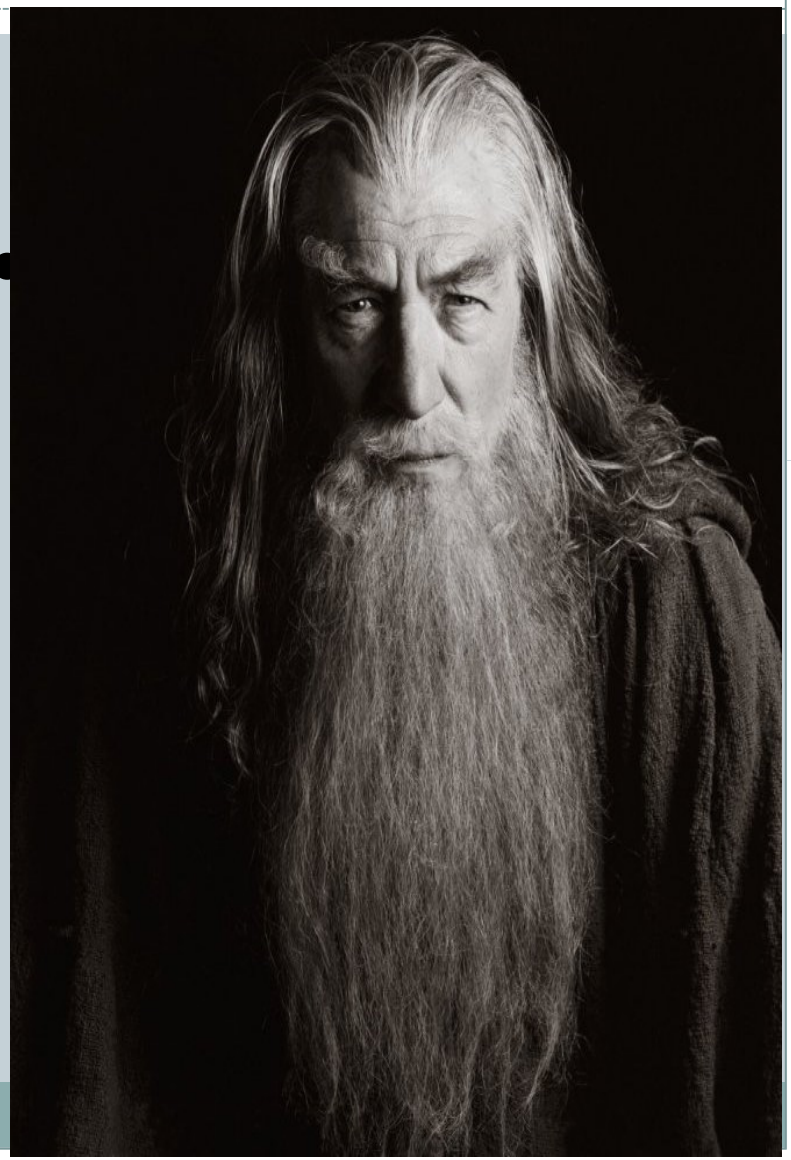
- Naturalistic design
- No control
- Unknown missing data
- Etc……

Conclusions

- Seclusion not anymore last resort for serious suicidality
- Automation rooms are save, staff is satisfied & hopefull
- Depressive disorder most common
- Male using automation > ↑psychotic disorder
- Female more often readmitted and using automation
- Automation rooms > 76.2% decrease of seclusion!!

Time.....

- 9 years.....



Personal involvement: development automation rooms (suicidaliteit.nl)

- **2007:** development phasing plan for suicide risk (*intern publication 2007, national paper 2011, book chapter 2016, several oral national/international presentations)*
- **2010-2014:** adoptation phasing plan different Dutch mental health institutes (*different national oral presentations*)
- **2009-2010:** cohort of 1314 admissions on a closed ward and phasing plan (*publication 2016, 2 international poster presentations (ESSSB14 IASP), 1 national poster presentation, several oral national/international presentations, publication in preparation*)
- **2010-** starting finding alternatives for seclusion during high suicide risk (*Leonardo grant, several oral presentations, collaboration Technical university Delft/ University Leiden/IPT telemedicine/AVICS*)
- **2011-2013** study: opinion staff and patients for alternatives for seclusion (*several oral national presentations, manuscript in review*)
- **2015** pilot automation rooms n = 13 (*national poster NVvP 2015*)
- **2016-2017** extension pilot n = 67 (*presentation ESSSB 2016, manuscript….? Dutch Psychiatric association*)

Thank you audience……

- **Always welcome to visit the clinic!**
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- Thanks:
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Questions

- https://youtu.be/05HrZ6YnM10


CAT

Suicidal behaviour 2009-2010

	All (n = 1284)	High risk (n =137)
Suicide	n = 4 (0,3%)	*n = 1 (0.7%)*
Suicide attempt (lethal intent)	n = 41 (3.2%)	*n = 25 (18.2%)* [a]
Suicide attempt (non-lethal intent)	n = 78(6,1%)	*n = 33 (24.1%)* [a]
Suicidal tendencies	n= 82 (6,4%)	*n = 21 (15.3%)* [a]
Suicidal thoughts	n= 213 (16.6%)	*n = 28 (20.4%)*

	Acceptable N =1147	High risk N =137	**Sign.**
CGI	5.2	5.7	p <.001
GAF (categorised)	23.4	30.2	p <.001
Female	42.6%	60.6%	p <.001
Age	39.8	34.8	p <.001
Married/living together	30%	39%	ns
Having children	34.6%	36.5%	ns
Voluntary	63.2%	49.6%	P = .007
First admission (<5 yrs)	42%	68%	p < .001
Seclusion	25.3%	17.3%	p < .001
jobless	70.5%	56%	p < .001
ECT treatment	0.7%	8.7%	p < .001