

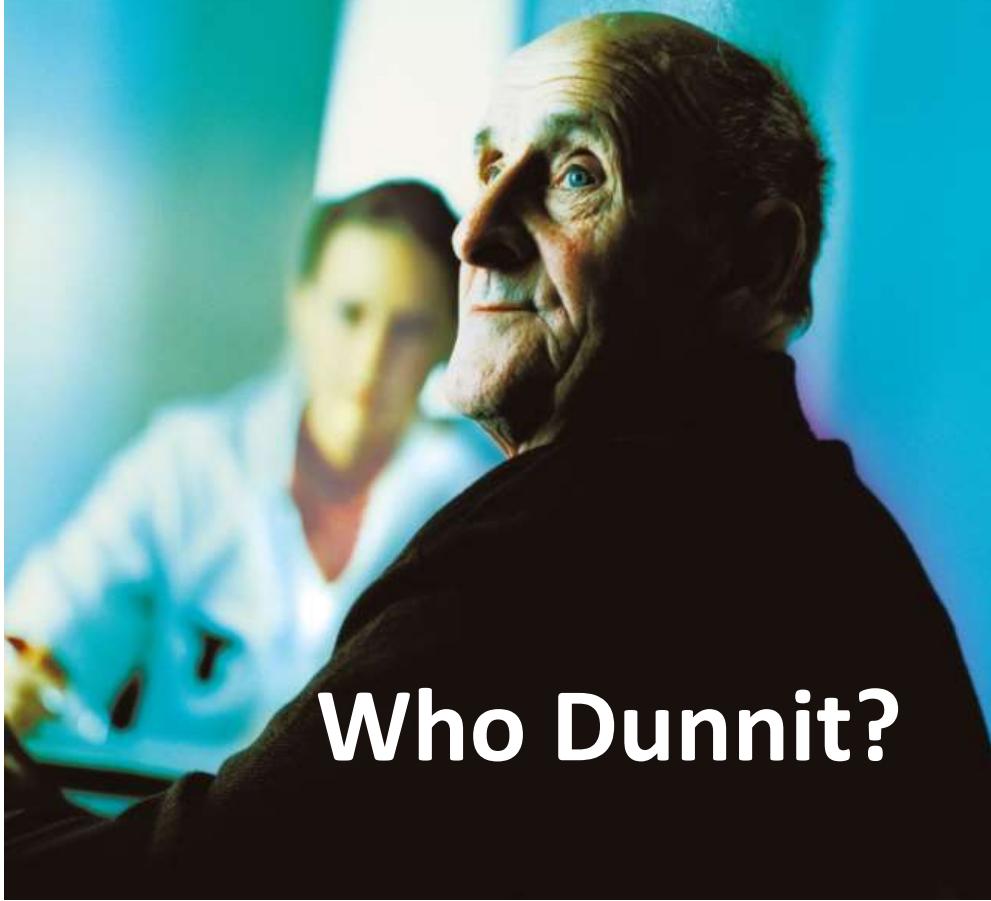
Academic Round

Radboudumc Geriatrics research



Who puts the geriatric patient back together?

**Heart failure, hypertension,
Mild Cognitive Impairment**

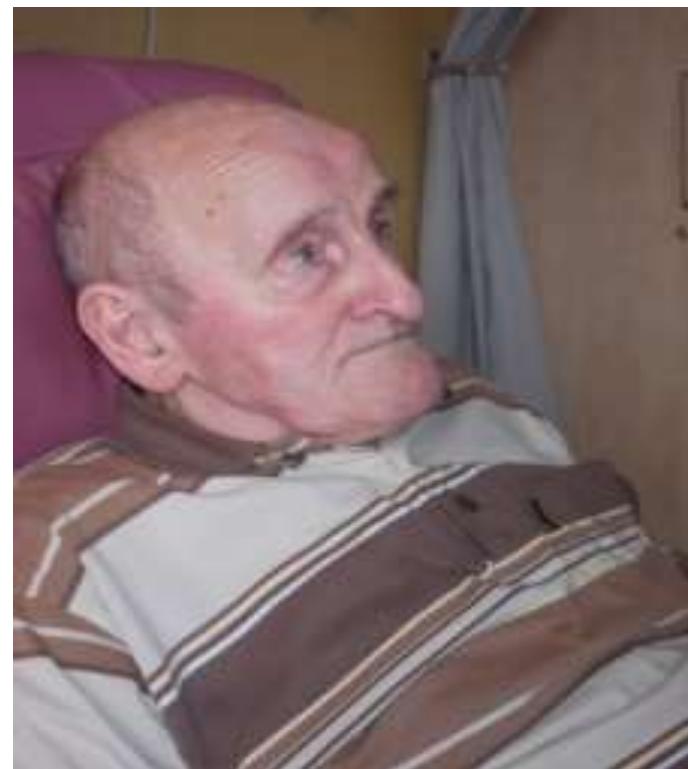
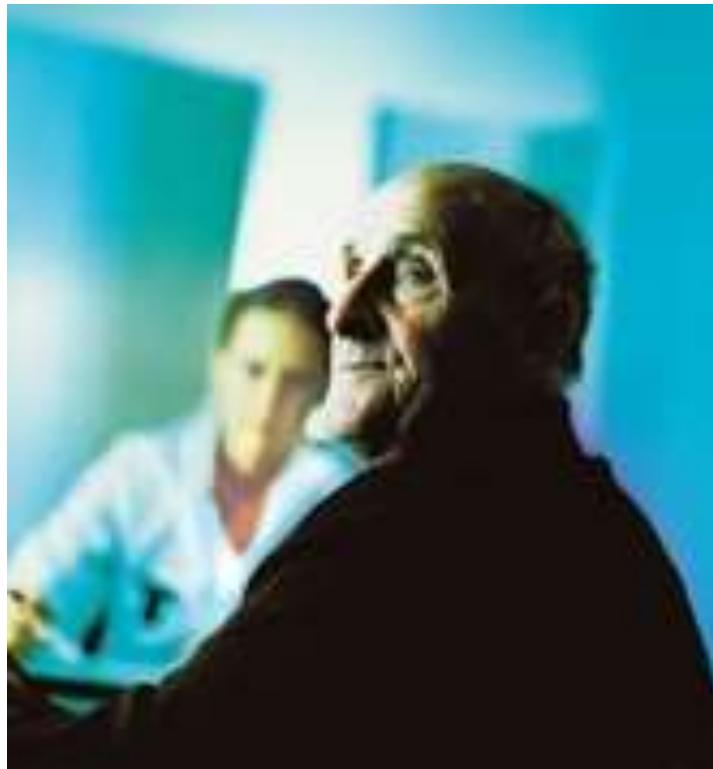


Who Dunnit?

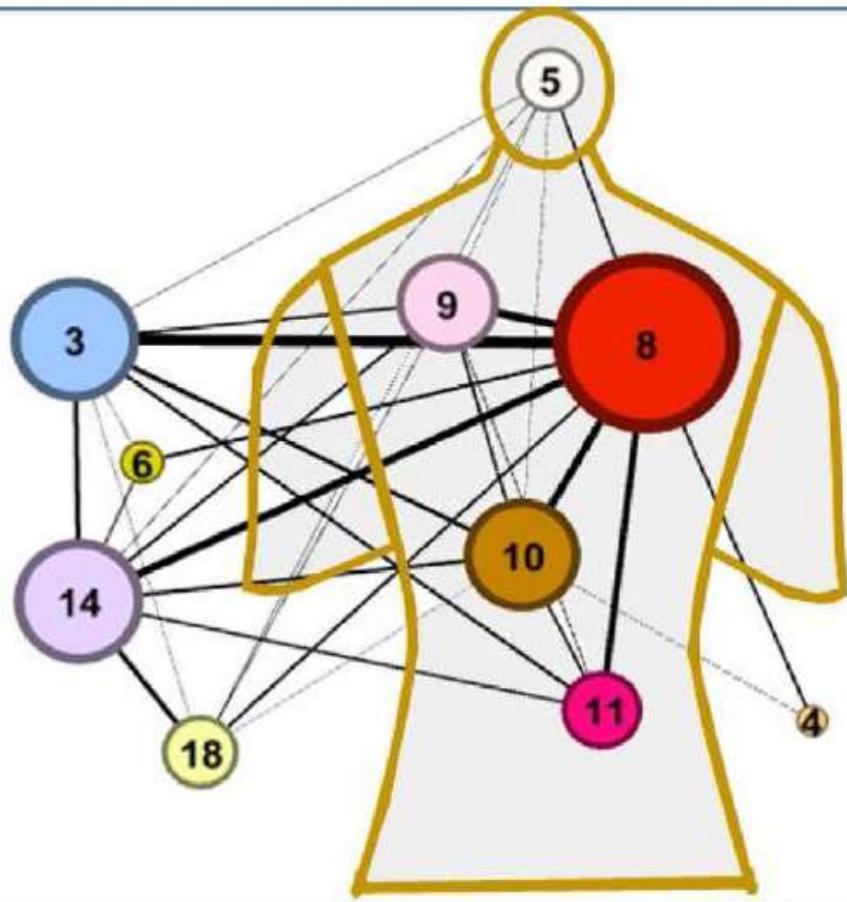
Disease Trajectory Mr B.



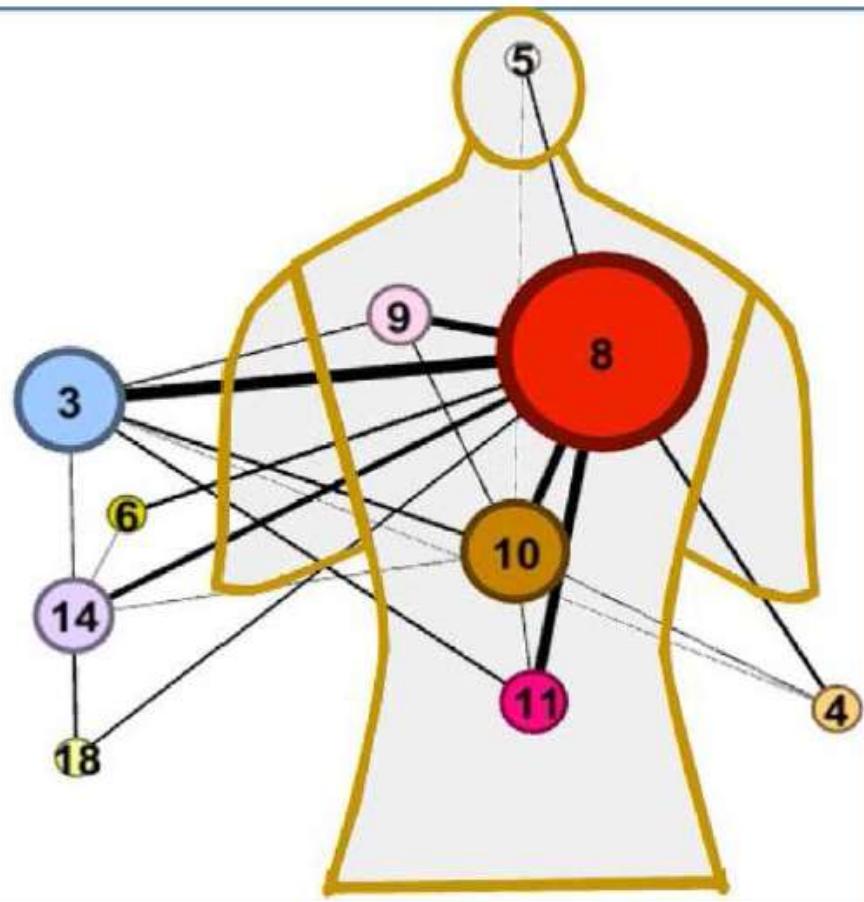
Systemic Resilience?



Who puts mr de Bruin together?



2a. Female Organ Comorbidity Network



2b. Male Organ Comorbidity Network

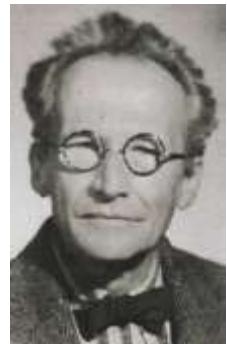
**Kalgrota et al. Multimorbidity network analysis.
Int J Medical Informatics; 2017: 108; 22-8**

Who puts the geriatric patient back together

Frail elderly: complex multimorbidity

- 1) networks: organs, diseases, drugs, context**
- 2) non-linearity: interactions, feedback loops**
- 3) scale diversity: molecule, man, family**
- 4) trajectories**

Criteria complexity, Ilya Prigogine, Nobelprice, 1977



Complexity-science verbindt evidence- en contextbased practice

DELEN

 Plaats een reactie



 Getty Images

De huidige discussie over nut en onnut van evidencebased medicine en contextbased practice verdient nuance. Dit kan door onderscheid te maken tussen eenvoudige medische problemen en complexe problematiek zoals bij comorbiditeit en

MEEST

1 Weg pr

2 'We wil

3 Jeugdp

4 De dok

5 Check



Complicated

Chaotic

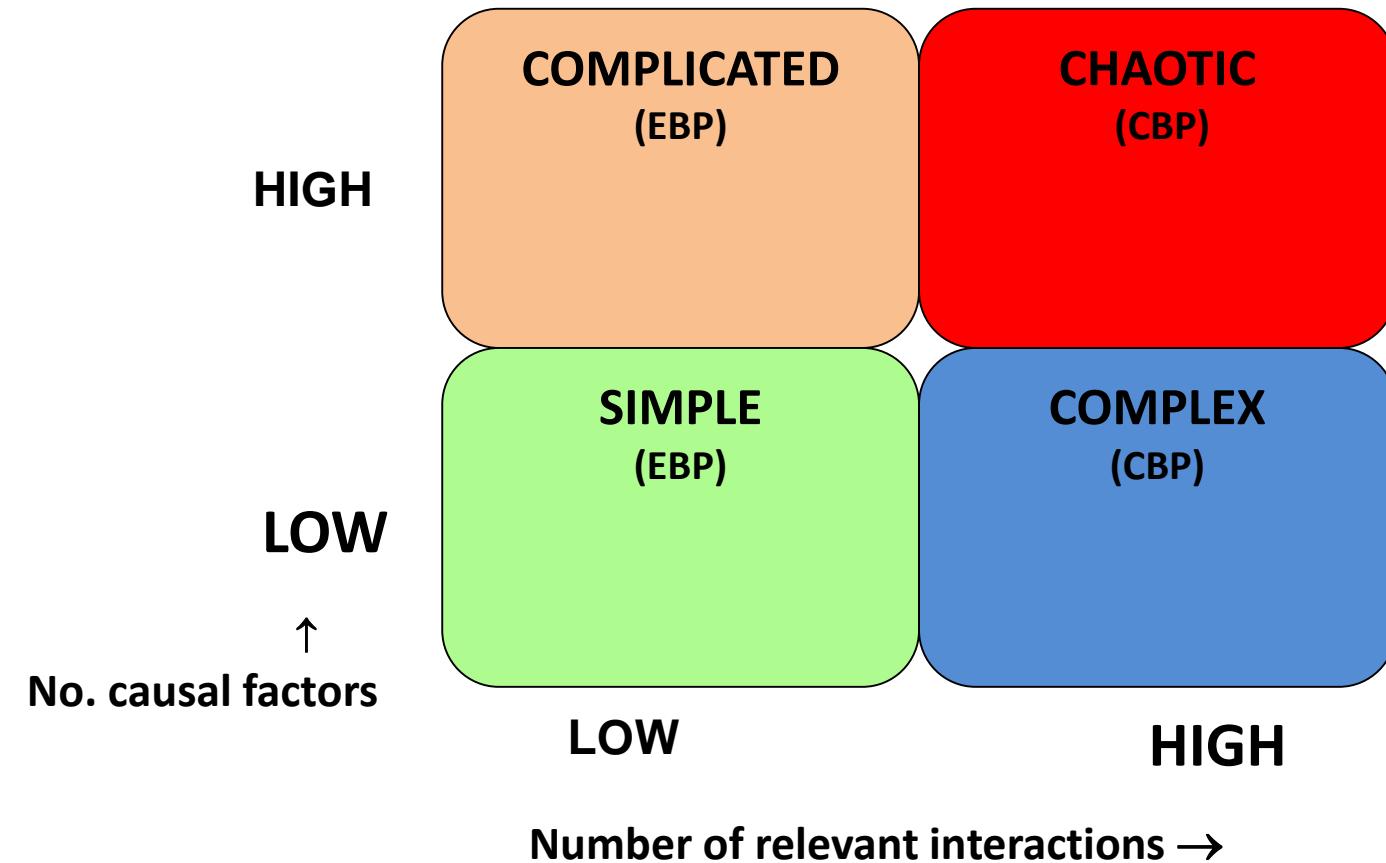


Simple

Complex



Research based on complexity paradigm



Early 19th century

Lesions of organs and tissues
Caseating granulomata

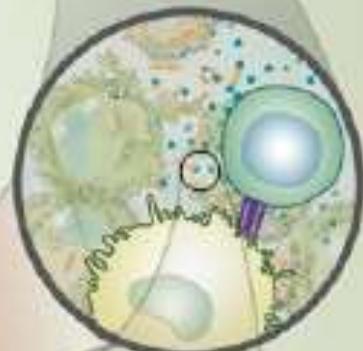
18th century

Sick person
Phthisis



Late 19th century

Lesions of cells
and microbes
M. tuberculosis



Late 20th century
Lesions detected
at molecular level
Interferon testing



21st century

The challenge of reassembly



Greene

NEJM Dec 2017

HIGHLIGHTS RADBOUDUMC GERIATRICS 2016-2017

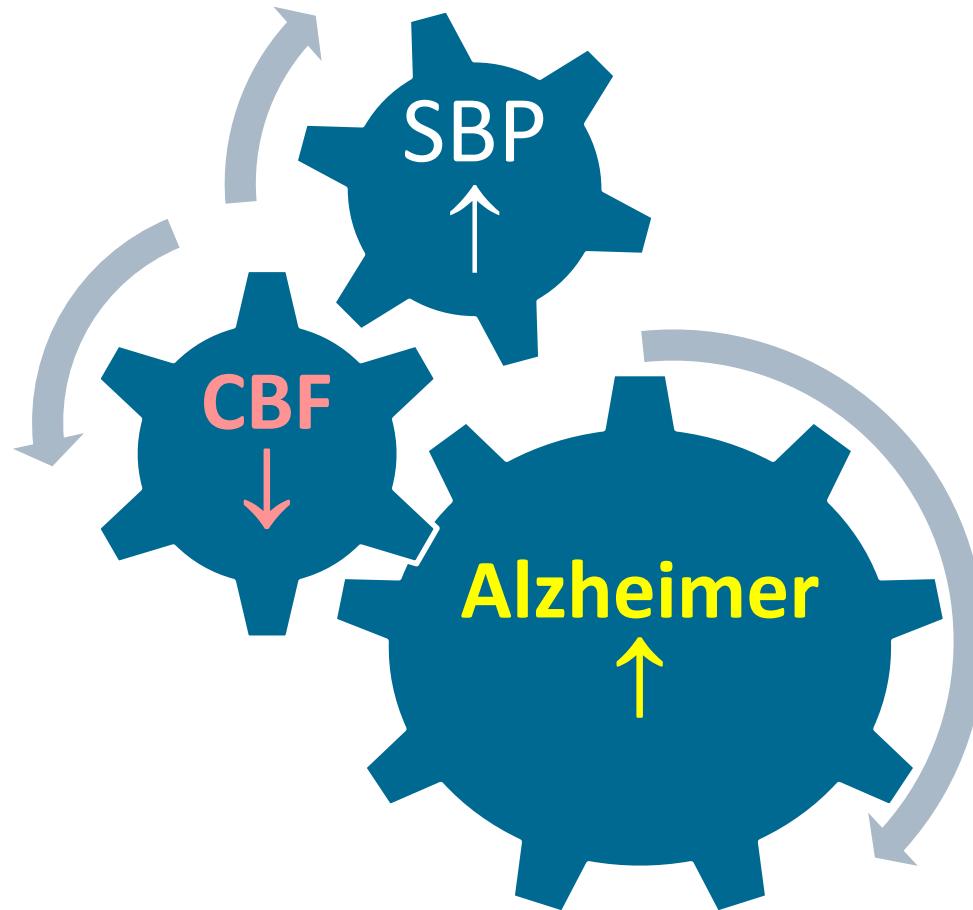


DEMENTIENET



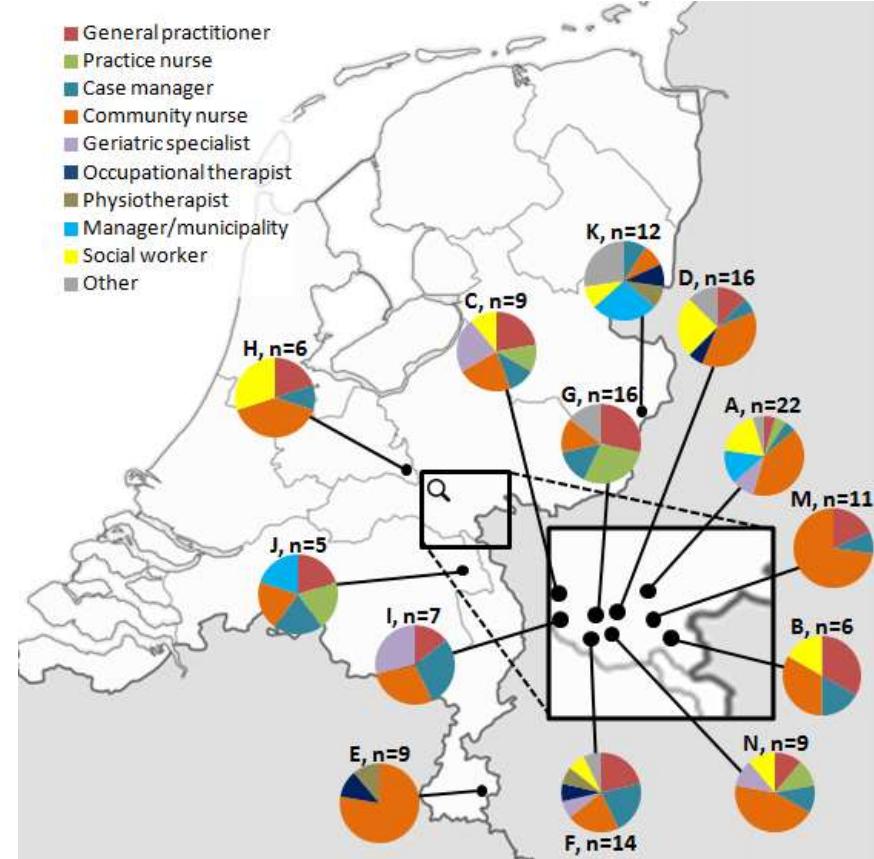
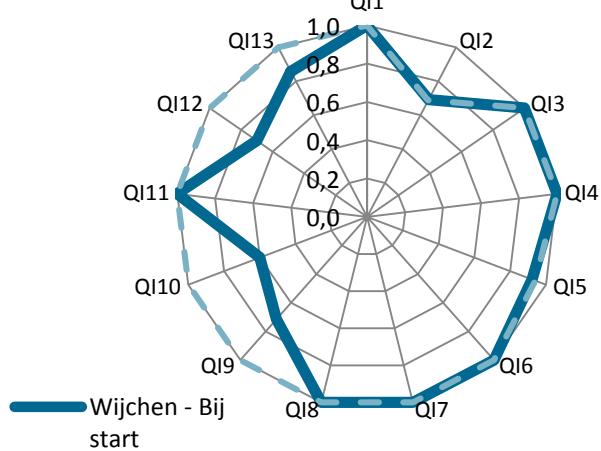
Synergy program for analyzing resilience and critical transitions

(Midlife) Hypertension, cerebral perfusion and Alzheimer

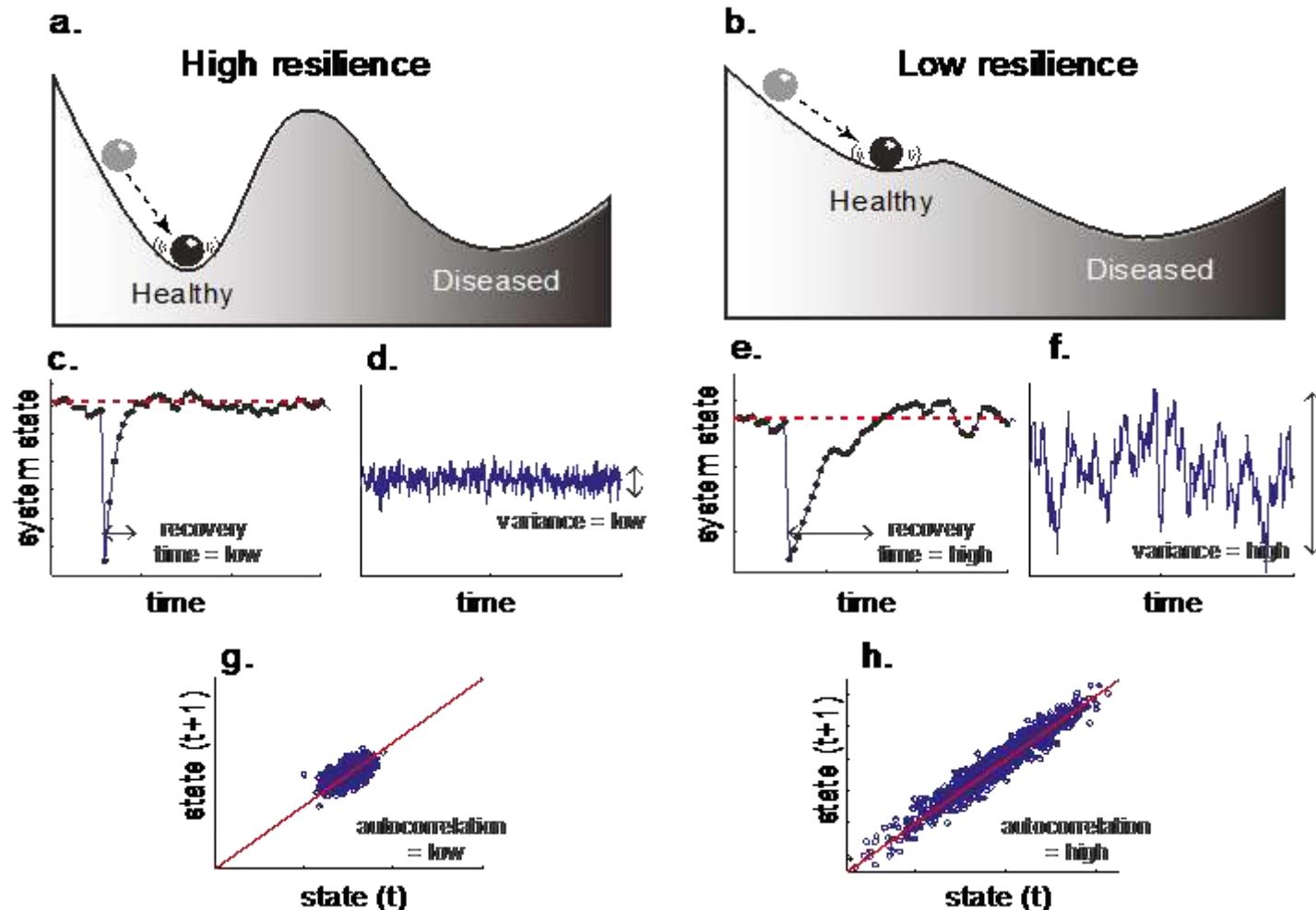


DementiaNet Networks

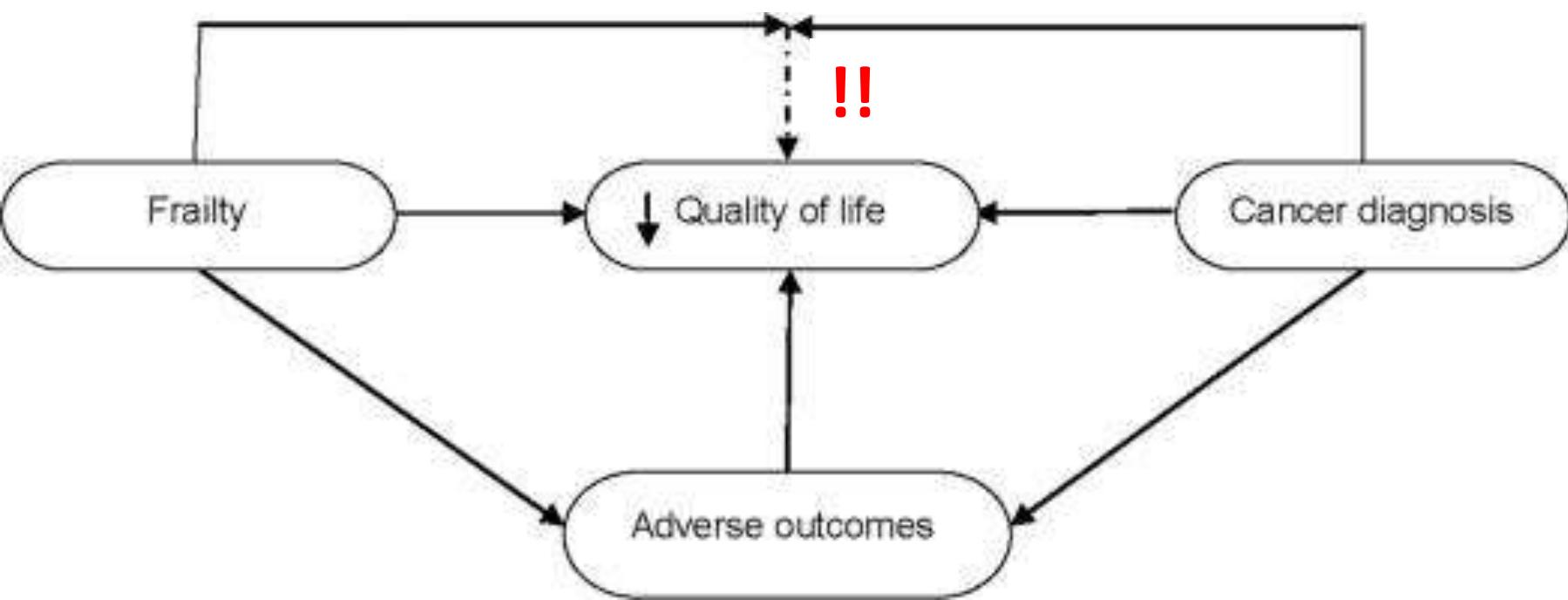
- **25+ networks recruited**
 - 2 years follow up
 - 18+ disciplines
 - 300++ professional
 - >1250 patients and carers



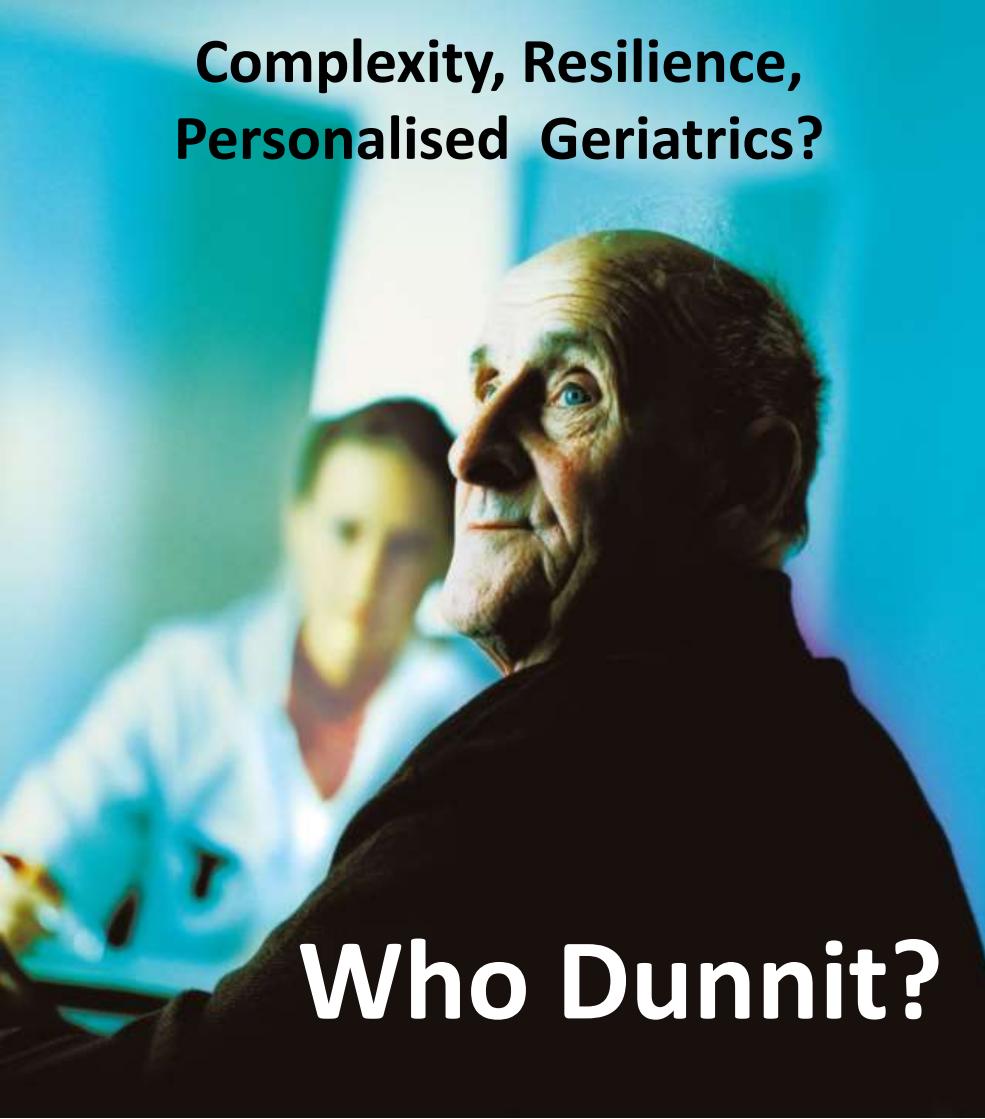
Dynamical Indicators of Resilience



The Older Patients and Informal Caregivers Survey & TOPICS-PROM



Geessink N, Schoon Y, et al. Melis R . Plos One Dec.2017



**Complexity, Resilience,
Personalised Geriatrics?**

Who Dunnit?

Who dunit?

Principal investigators



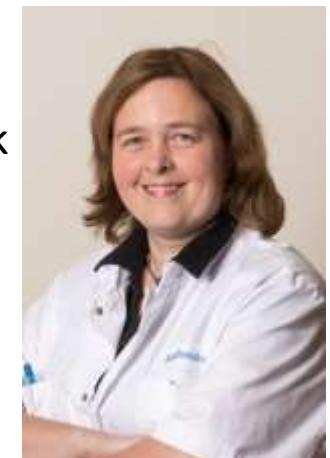
Jurgen Claassen
CARNET



René Melis
TOPICS-MDS



Marjolein vd Marck
DEMENTIENET



Yvonne Schoon
Principal Clinician

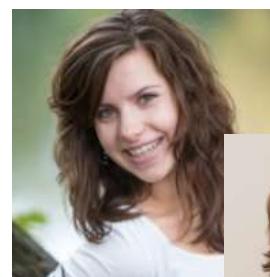
Whodunit!



Whodunit!!



Whodunit!!



Radboudumc

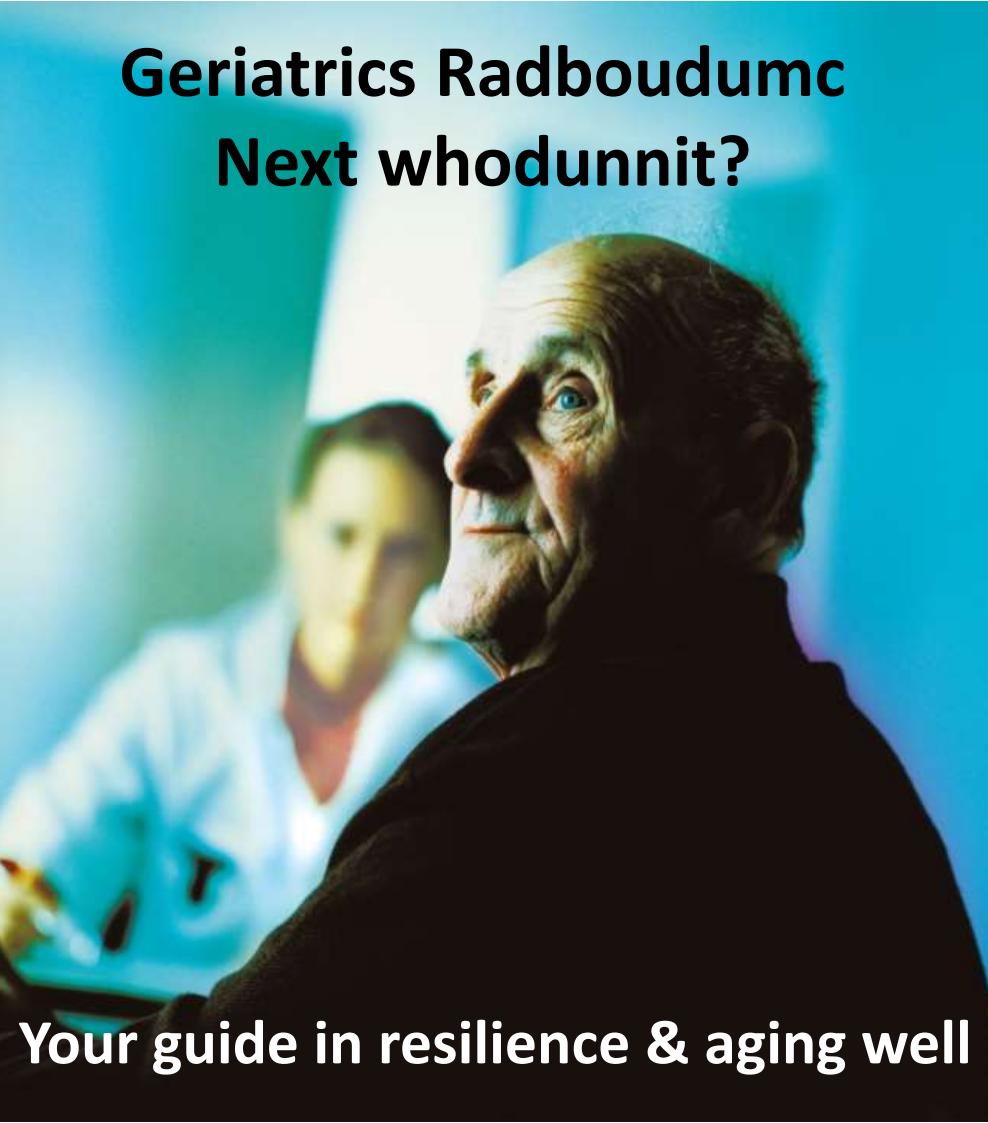
Whodunit!!



Radboudumc

Geriatrics Radboudumc

Next whodunnit?

A photograph of an elderly man with blue eyes and receding hairline, looking over his right shoulder with a slight smile. In the blurred background, a younger woman in a white coat is visible, suggesting a medical setting.

Your guide in resilience & aging well

What is 'evidence-based medicine'?

Evidence-based medicine is the integration of

- best research evidence
- with clinical expertise
- and patient values.



David Sackett
(2000)

Juni
2017



Zonder context
geen bewijs

Over de illusie van
evidence-based
practice in de zorg

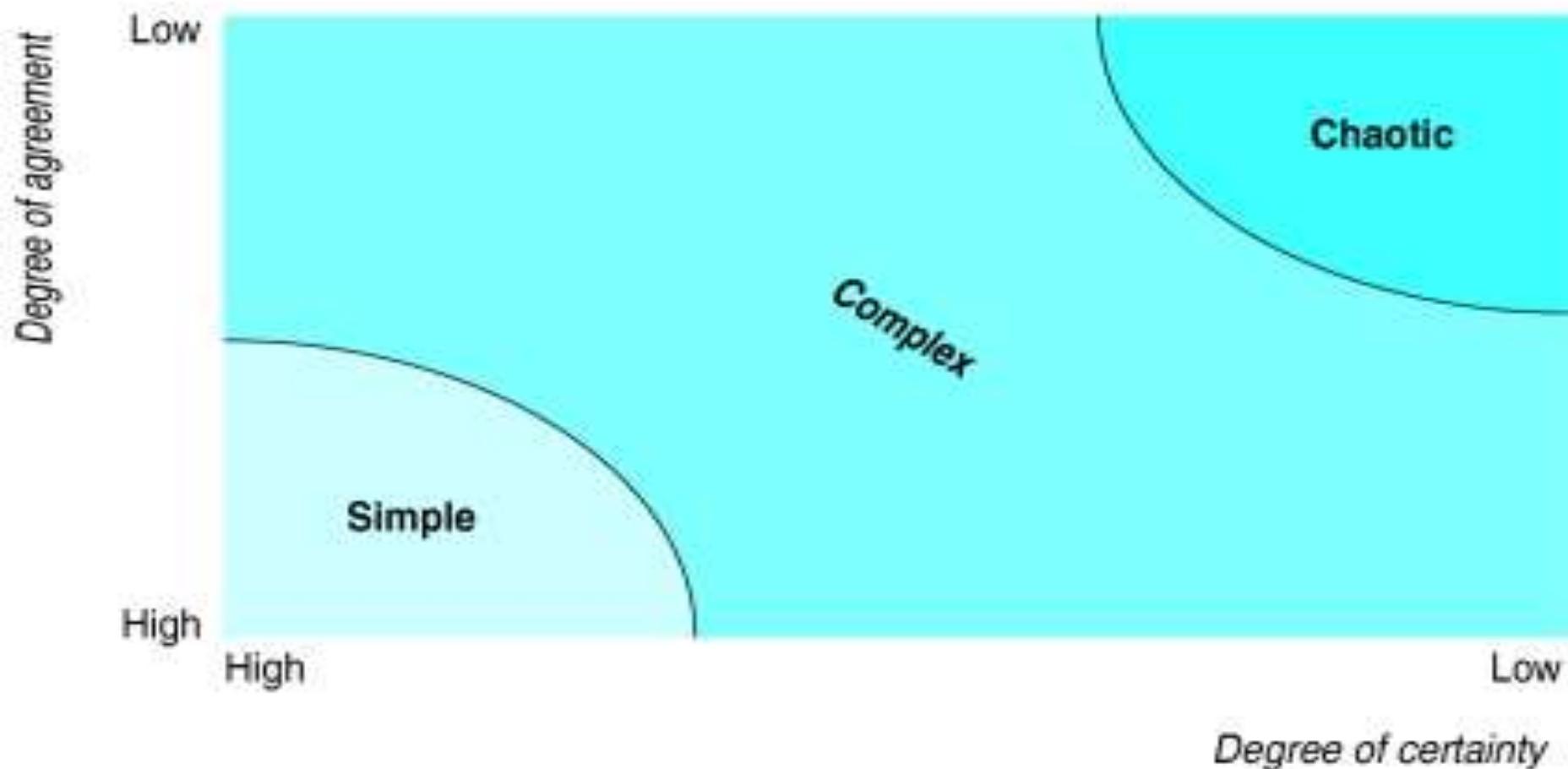


Vlaams Instituut voor
Medische Wetenschappen en
Samenleving

Geriatrics: how to embracing complexity?

Evidence ↔ Uncertainty

(Trisha Greenhalgh; BMJ 2001; Iona Heath BMJ 2016)



From EBM to E↔U Medicine-Research

EBM	E↔U Medicine
Linearity	Non-linearity
Monocausal	Multicausal
Simple intervention	Complex intervention
RCT	Mixed methods

Resilience/complexity in our research

Dementia Research

- Cerebro-Cardiovascular interactions
- DementiaNet; linking fragmented care
 - Formal & informal care; Health & Welfare
- Studying heterogeneity in old age epidemiology

Resilience/complexity in our research

Complex multimorbidity in old age

- Acute & chronic: triage and improving resilience
 - Shared decision making
 - Uncertainty + EBM



Stellingen

-Het EBM paradigma, past niet goed op de complexiteit van de geriatrische patiënt en de klinische geriatrie.

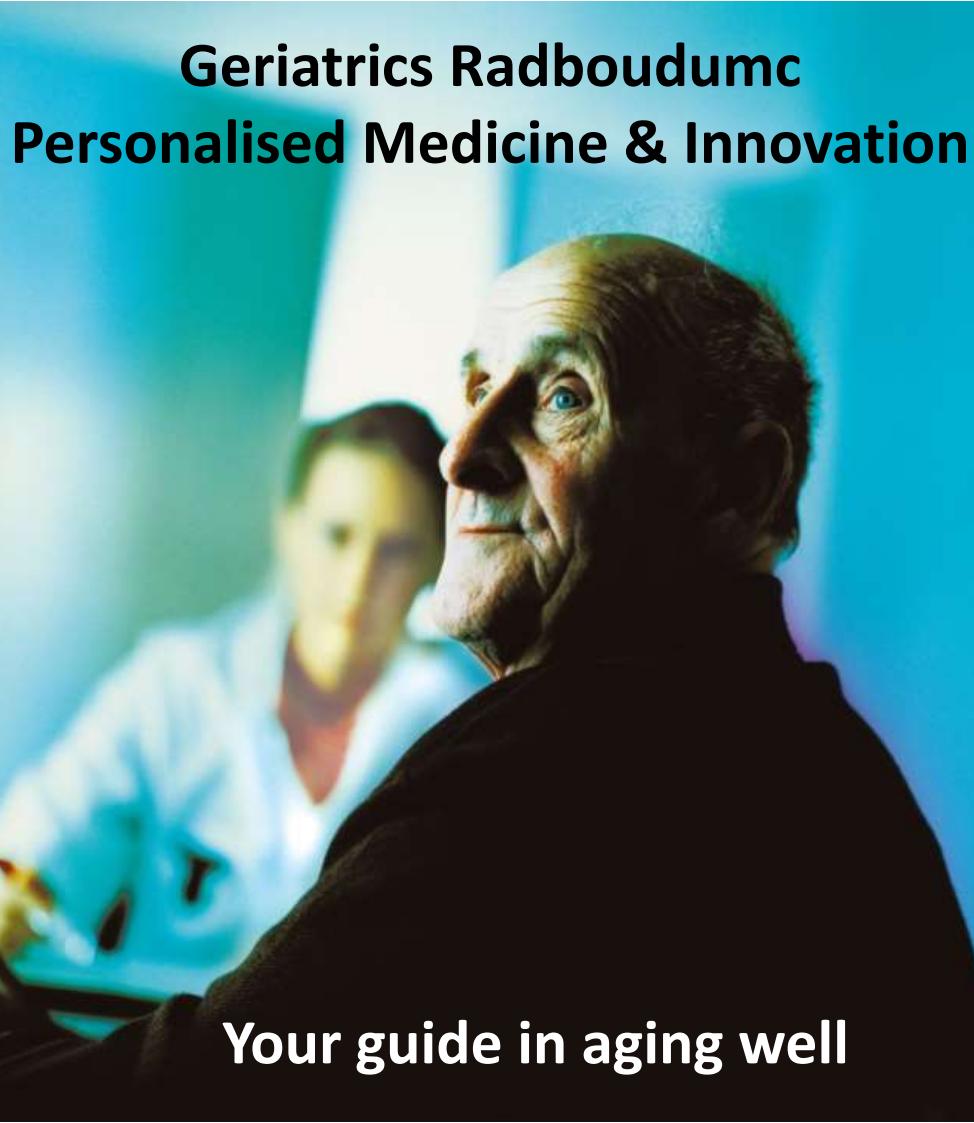
Dat vraagt nieuwe wegen van onderzoek, richtlijnvorming en patiëntenzorg.

Stellingen

**-Het erkennen en leren werken met
onzekerheid in kliniek en onderzoek,
is noodzakelijk om de geriatrie verder
te verbeteren.**

Geriatrics Radboudumc

Personalised Medicine & Innovation



Your guide in aging well

Slowing Down of Recovery as Generic Risk Marker for Acute Severity Transitions in Chronic Diseases

Marcel G. M. Olde Rikkert, MD, PhD¹; Vasilis Dakos, PhD²; Timothy G. Buchman, PhD, MD³;
Rob de Boer, PhD⁴; Leon Glass, PhD⁵; Angélique O. J. Cramer, PhD⁶; Simon Levin, PhD⁷;
Egbert van Nes, PhD⁸; George Sugihara, PhD⁹; Michel D. Ferrari, MD, PhD¹⁰; Else A. Tolner, PhD¹⁰;
Ingrid van de Leemput, MSc⁸; Joep Lagro, MD, PhD¹¹; René Melis, MD, PhD¹; Marten Scheffer, PhD⁸

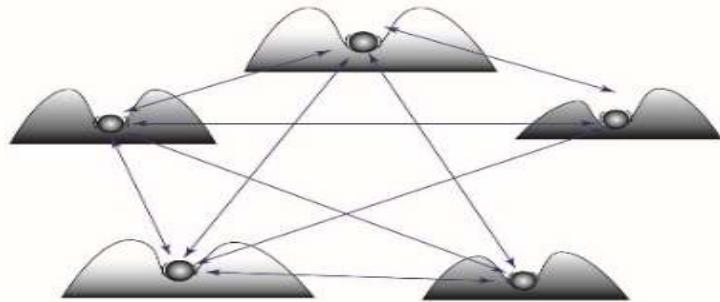
Dynamical Indicators of Resilience

- Increased auto correlation**
- Increased variance**
- slowing down of recovery**

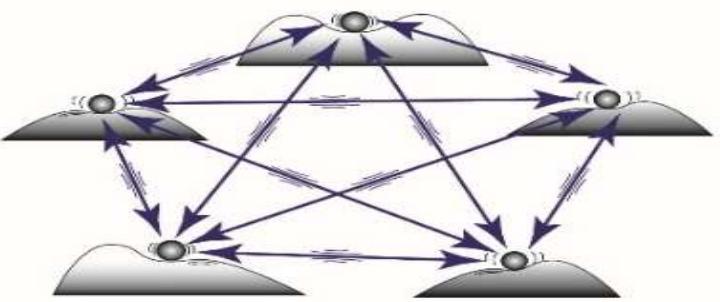
Resilience Indicators in time series:

- Slowing down of recovery
- Increased variance and autocorrelation
- Increased cross correlations

G Low Cross-Correlation between subsystems



H High Cross-Correlation between subsystems



*Cross correlation in Multi Organ Failure:
Asada et al. Crit Care Med 2016; 44:83–90*