

What is the future and why do we need to make progress?

Ed de Kluiver



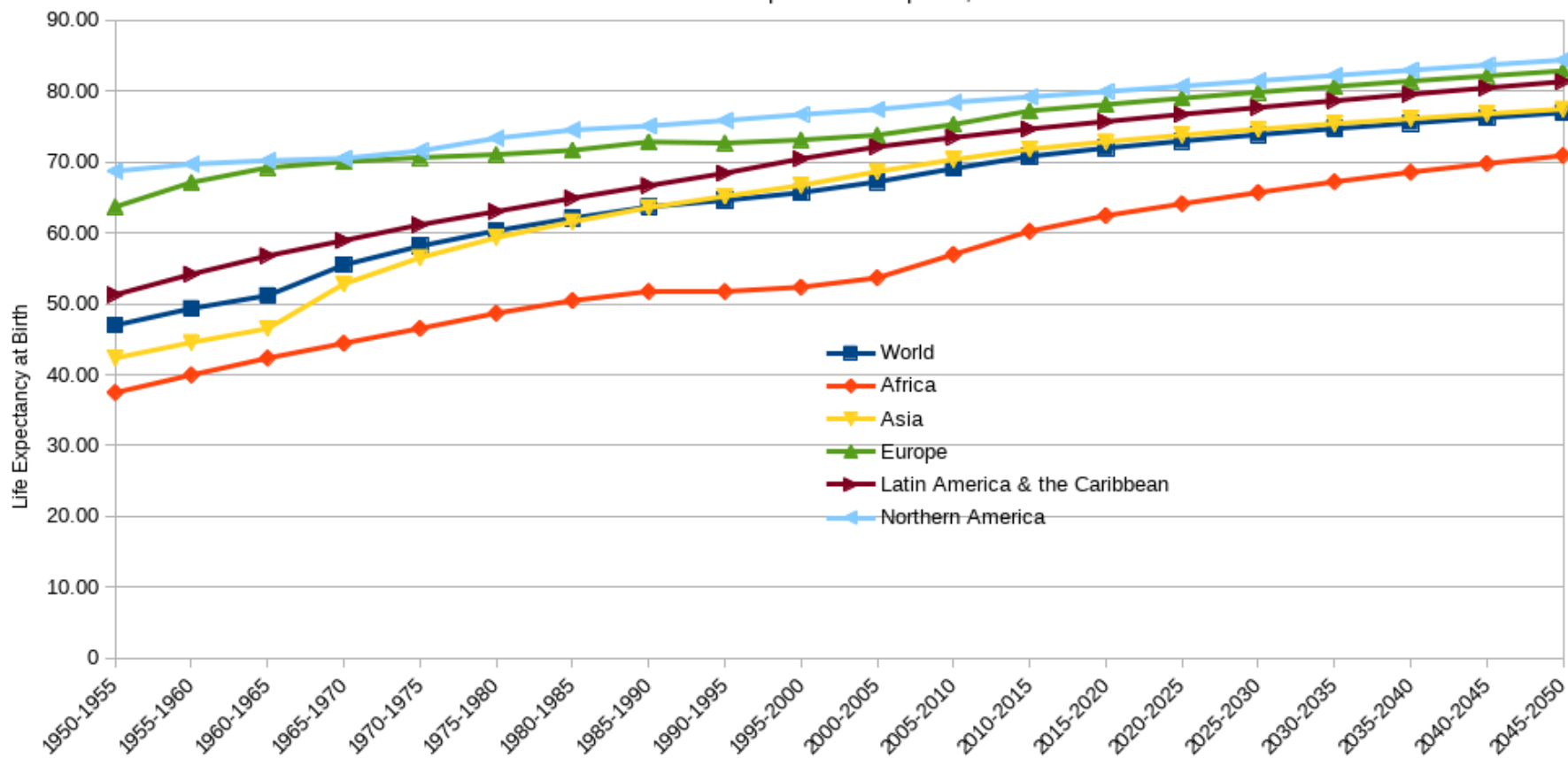
What is the future and why do we need to make progress?

- Aging population
- Chronic diseases and multimorbidity
- Elderly dependency
- Risk of traditional hospitalisation
- The potential of hospital care at home
- Chance@Home; clinical care at home
- Challenges to deal with

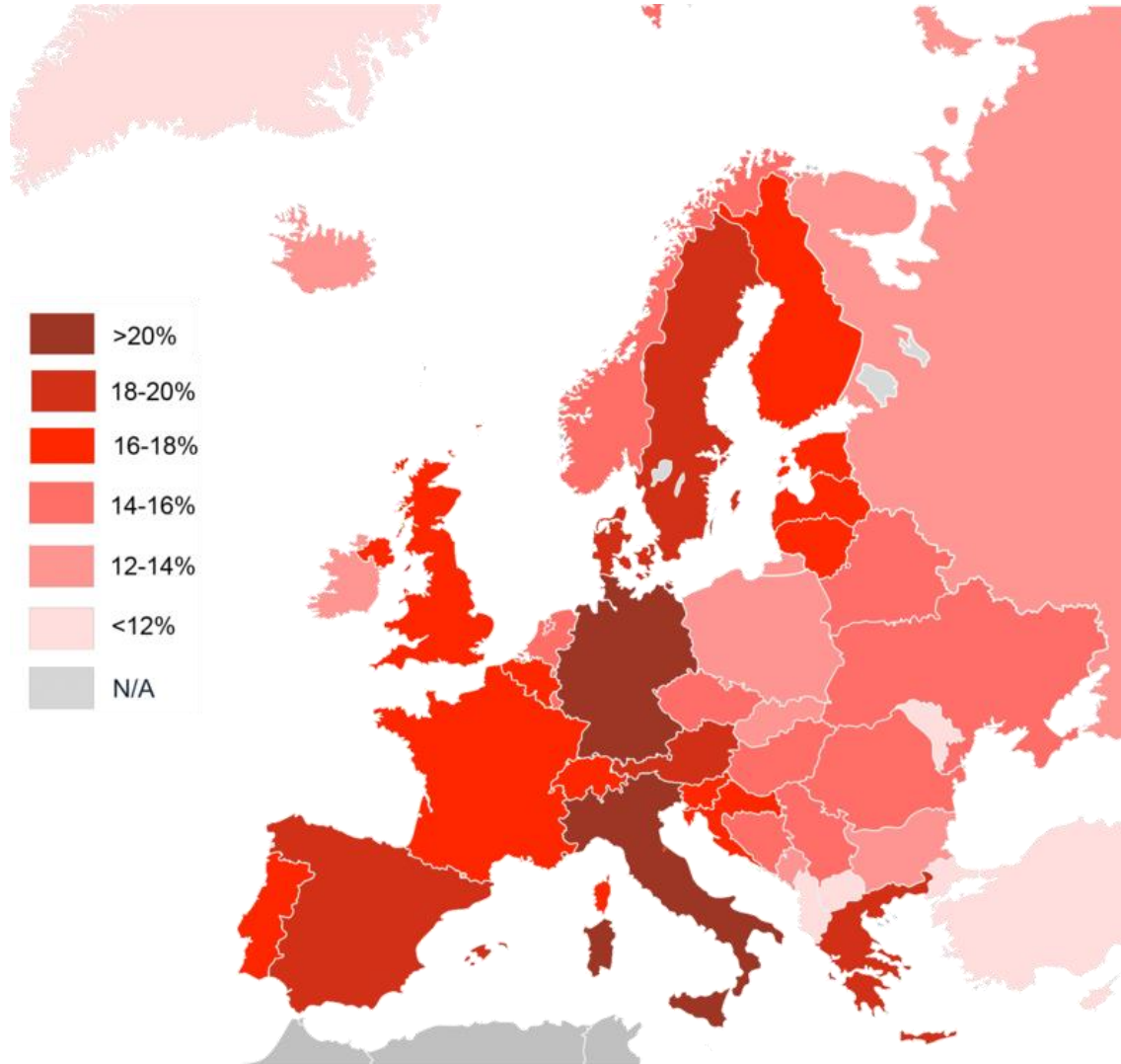
Aging population

Life Expectancy by Region, 1950-2050

Source: UN World Population Prospects, 2017



Aging population



Chronic diseases

NL	Prevalence in % (2002-2008)	
	Chronic disease	Multimorbidity
Female	36.6	15.0
Male	30.7	10.9
Age in years		
65-74	70.0	39.1
≥ 75	83.5	59.2

Sandra H. van Oostrom, ea. Multimorbiditeit en comorbiditeit in de Nederlandse bevolking – gegevens van huisartsenpraktijken. Ned Tijdschr Geneeskd. 2011;155:A3193

Chronic diseases

NL	Mean number of different health care providers per chronic diseased patient in 1 year (95% CI)
Female	4.3 (4.1 - 4.5)
Male	4.2 (4.0 - 4.5)
65-74 yrs	4.3 (4.0 - 4.6)
≥ 75 yrs	4.2 (3.8 - 4.5)
Diabetes	5.8 (5.4 - 6.2)
CVD	4.3 (3.9 - 4.6)
≥ 3 chronic diseases	5.1 (4.8 - 5.5)

Elderly dependency

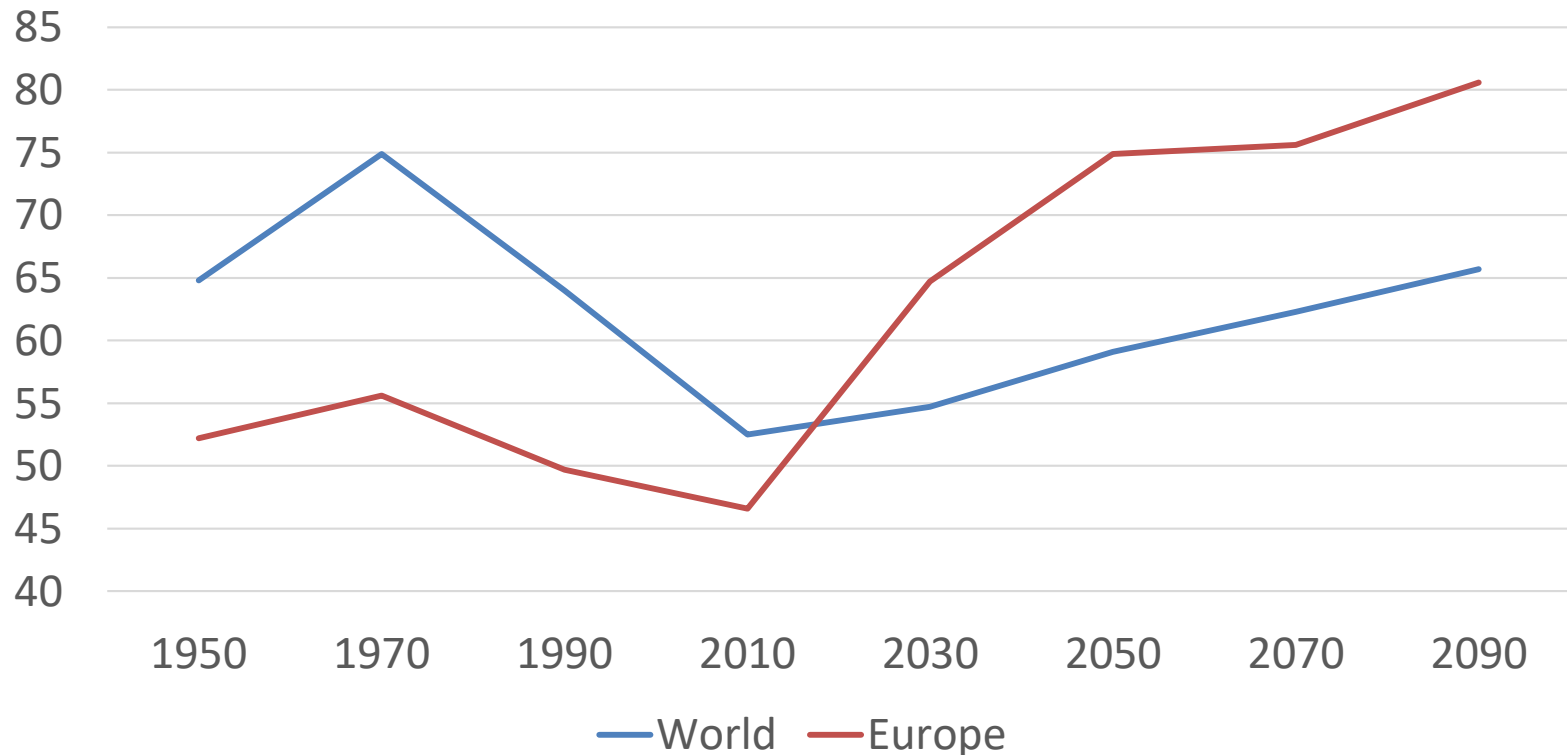
The elderly dependency ratio is the ratio of the elderly population (ages 65+) per 100 people of working age (ages 15-64).

The potential support ratio is the number of working-age people (ages 15-64) per one elderly person (ages 65+).

Country (2015)	elderly dependency ratio	potential support ratio
Italy	35.0	2.9
Germany	32.1	3.1
Finland	32.0	3.1
Portugal	31.8	3.1
Sweden	31.1	3.2
Greece	30.5	3.3
France	30.2	3.3
Denmark	29.7	3.4
United Kingdom	28.2	3.5
Austria	28.1	3.6
Belgium	28.0	3.6
Netherlands	27.4	3.6

Elderly dependency

Total dependency ratio - history and projections



Hospital admissions are harmful, especially for the elderly

- 30-60% of hospital admissions of 70+ patients lead to irreversible **loss of function**
- 15% will develop **delirium** within the first 3 days of admission
 - 8x higher mortality and IC admission rate
- 6% of the elderly will get hospital induced **infectious disease**
 - High chance of Norovirus (7% mortality)
- Admitted patients have higher risk of **falling**

Clinical deterioration in older adults with delirium during early hospitalisation: a prospective cohort Study. Hsieh SJ, et al. BMJ Open 2015;5:e007496. doi:10.1136/bmjopen-2014-007496

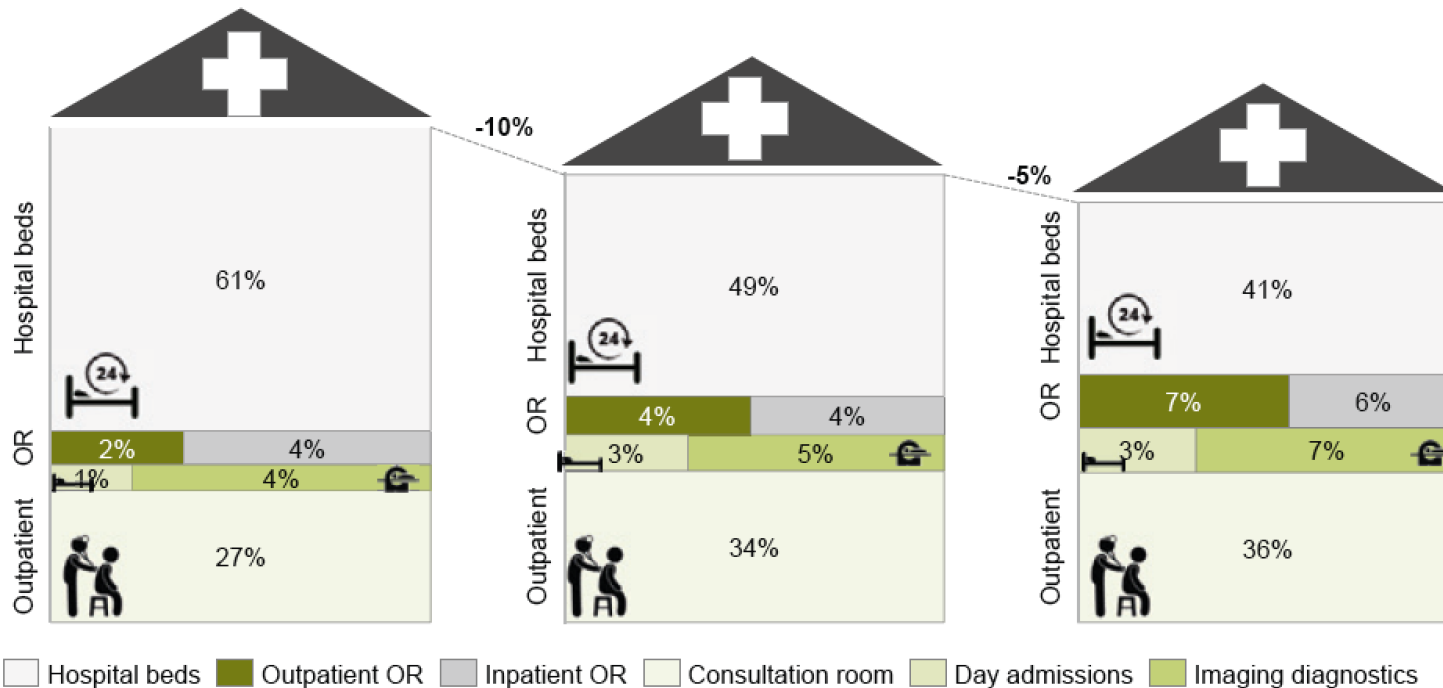
Adverse events and potentially preventable deaths in Dutch hospitals: results of a retrospective patient record review study. M Zegers et al Qual Saf Health Care 2009;18:297–302. doi:10.1136/qshc.2007.025924

The current hospital has a very different use of space than the hospital of 20 years ago

Required space for a hospital for 200,000 inhabitants [%m², 1995]*

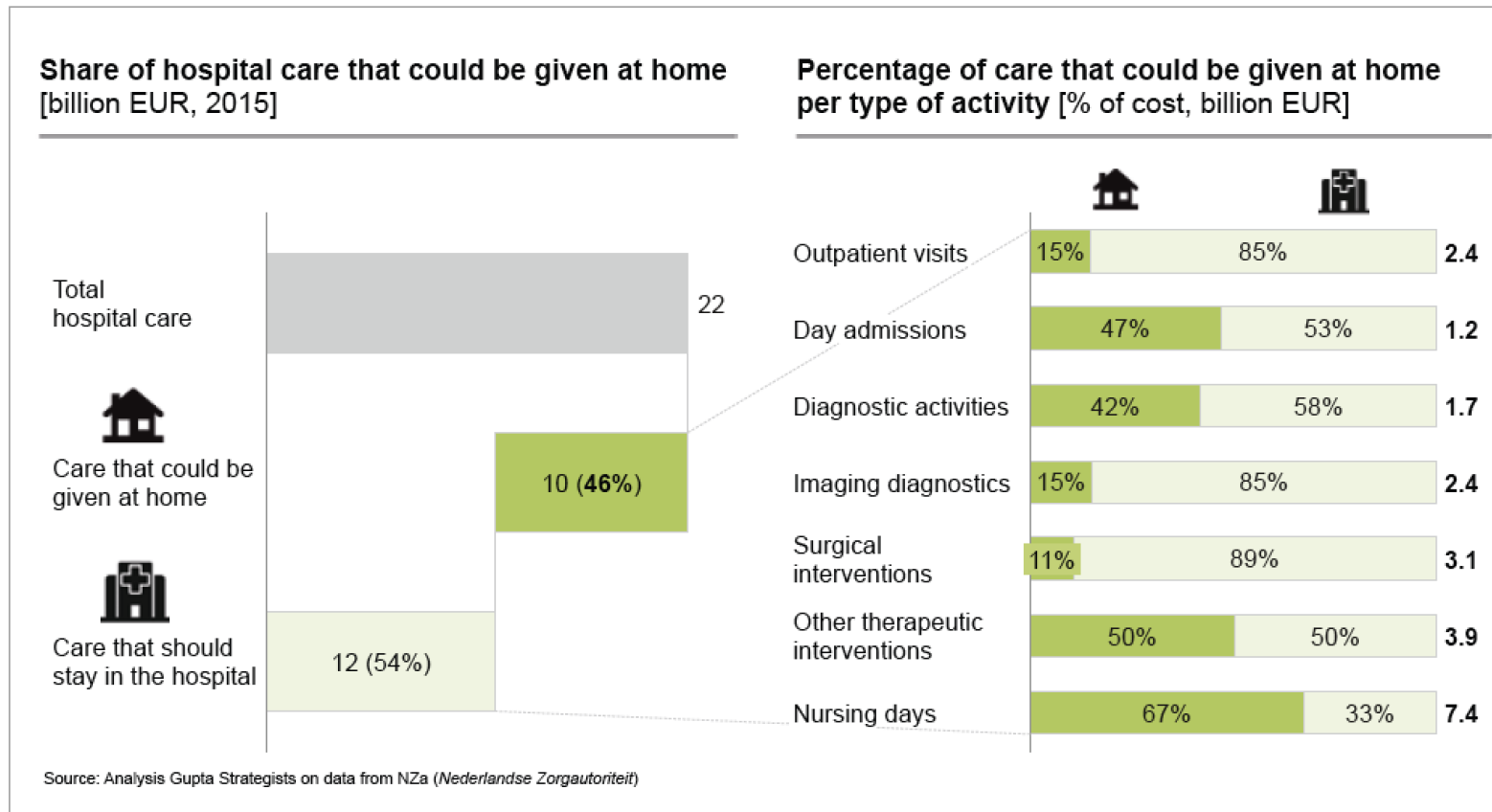
Required space for a hospital for 200,000 inhabitants [%m², 2005]*

Required space for a hospital for 200,000 inhabitants [%m², 2014]*



* Based on building requirements from Bouwcollege for the different activities; demographic developments not taken into account

46% of hospital care can be provided at home, especially nursing days and certain therapeutic interventions



CHANCE@HOME

24/7
service

Clinical care at home

eHealth
facilitated

Specialised nurses





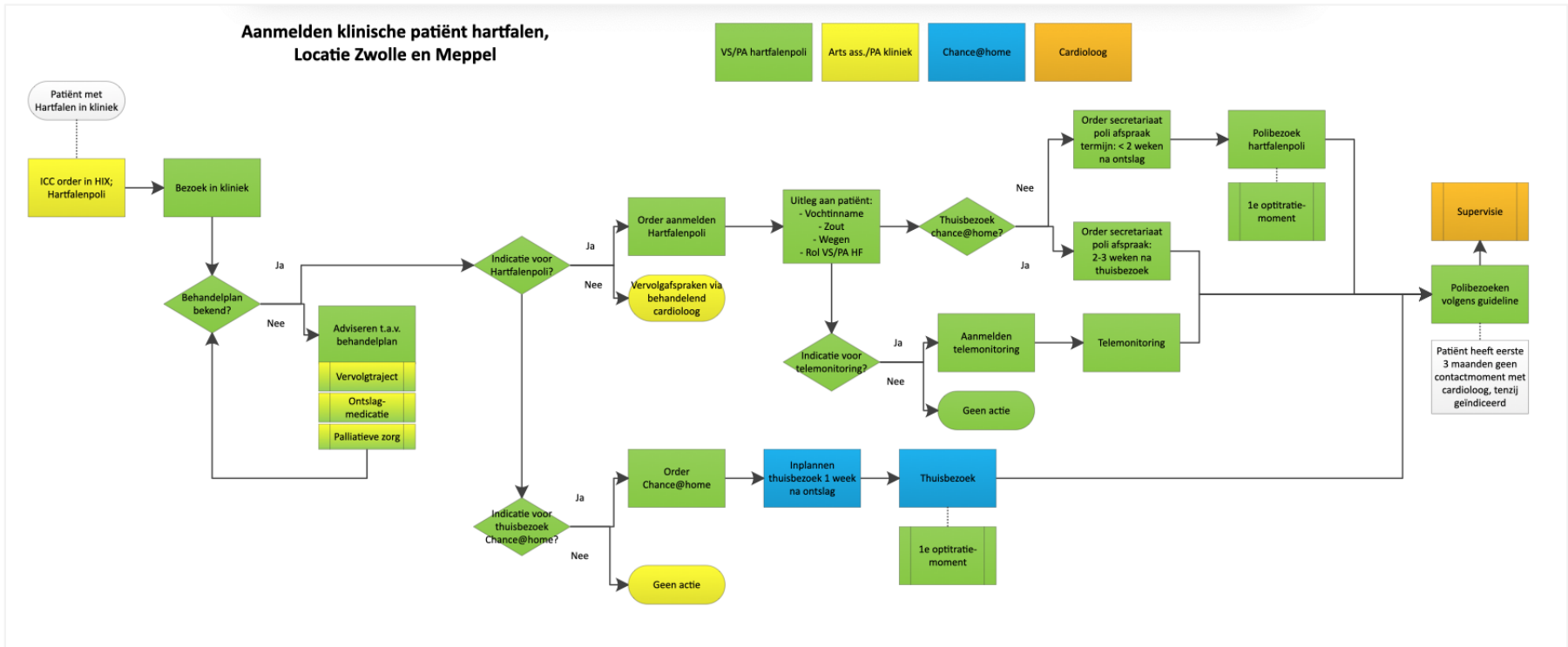
- ❑ Acute exacerbation of known and well assesses chronic heart failure
- ❑ ADL self supporting / sufficient support
- ❑ Living < 30 kilometres from heart centre
- ❑ 17 IC/CC nurses
- ❑ 2 Coordinators

CHANCE@HOME

- ✓ Home visit(s)
- ✓ Interview
- ✓ Physical examination
- ✓ Intravenous medication
- ✓ Monitoring (sO₂, BP, ECG)
- ✓ Lab testing

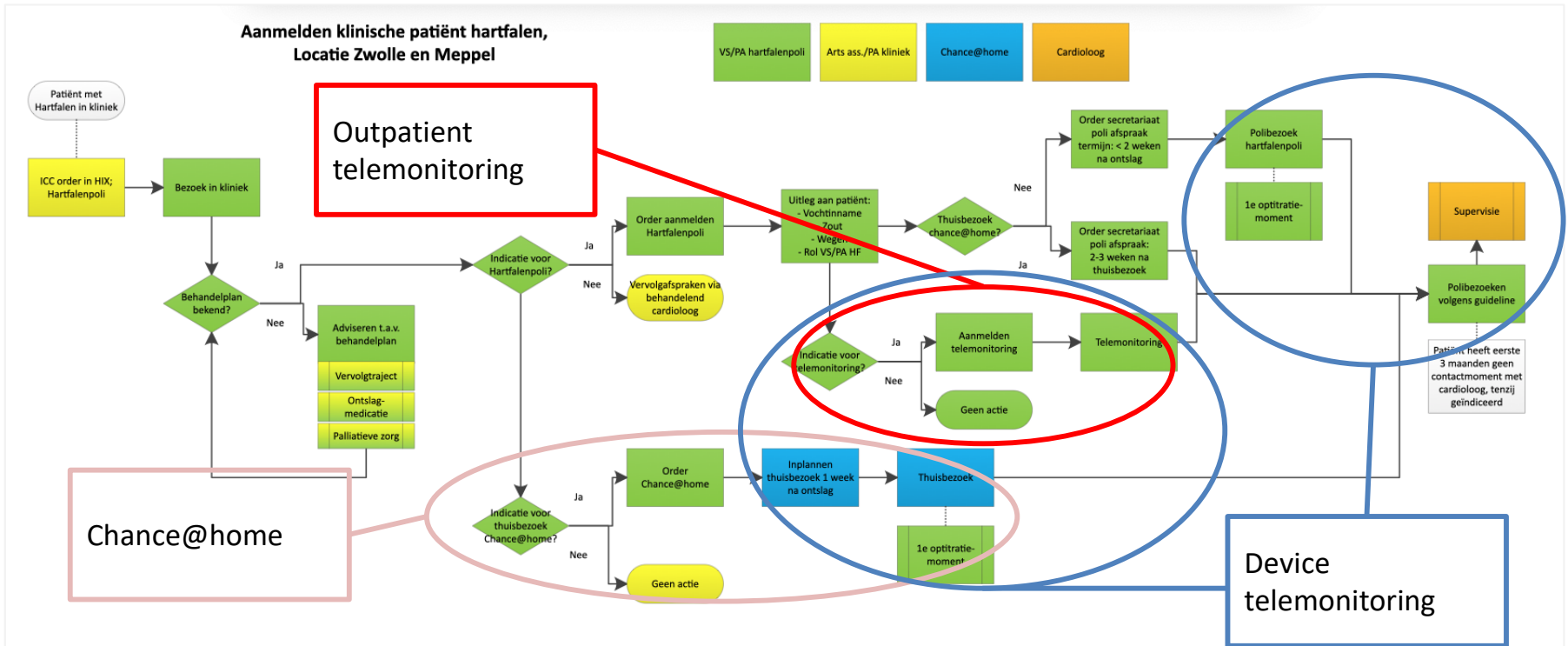
Challenges

Example: pathway heart failure



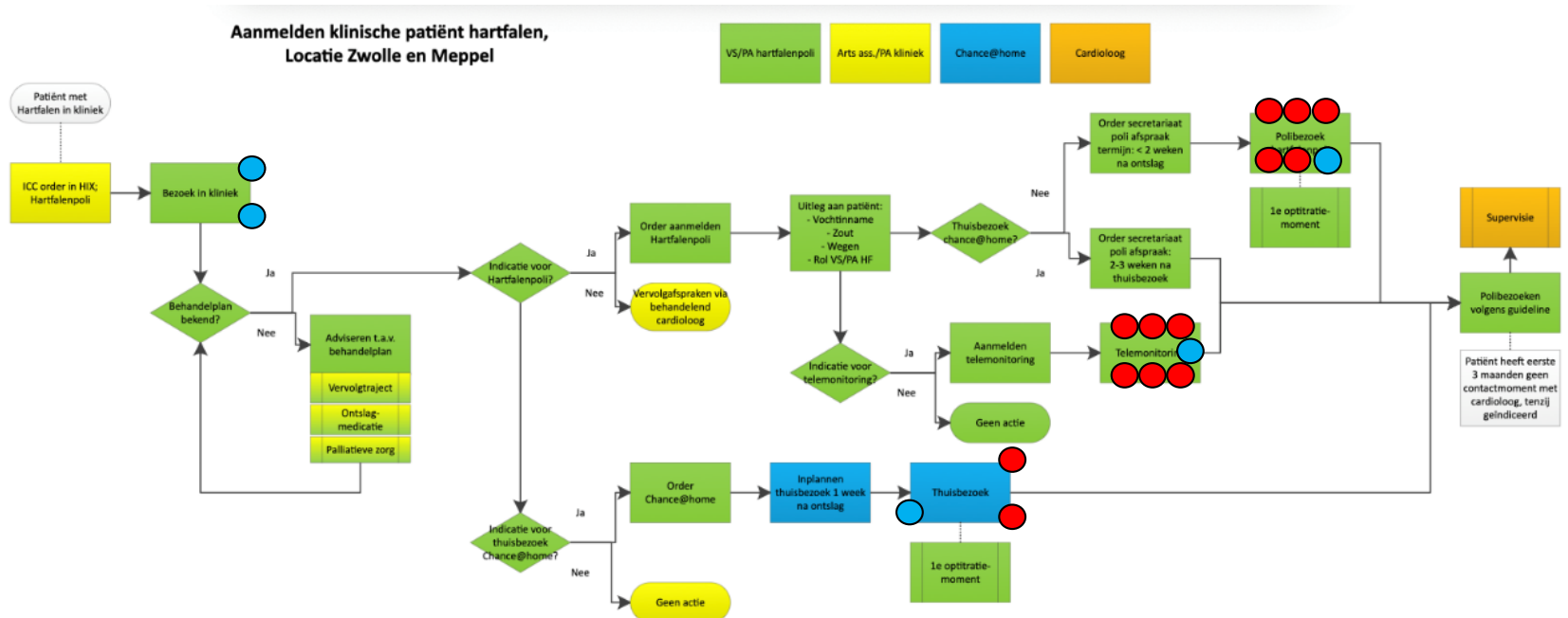
Challenges

Pathway heart failure - fitting in e-Health components



Challenges

Many technology suppliers

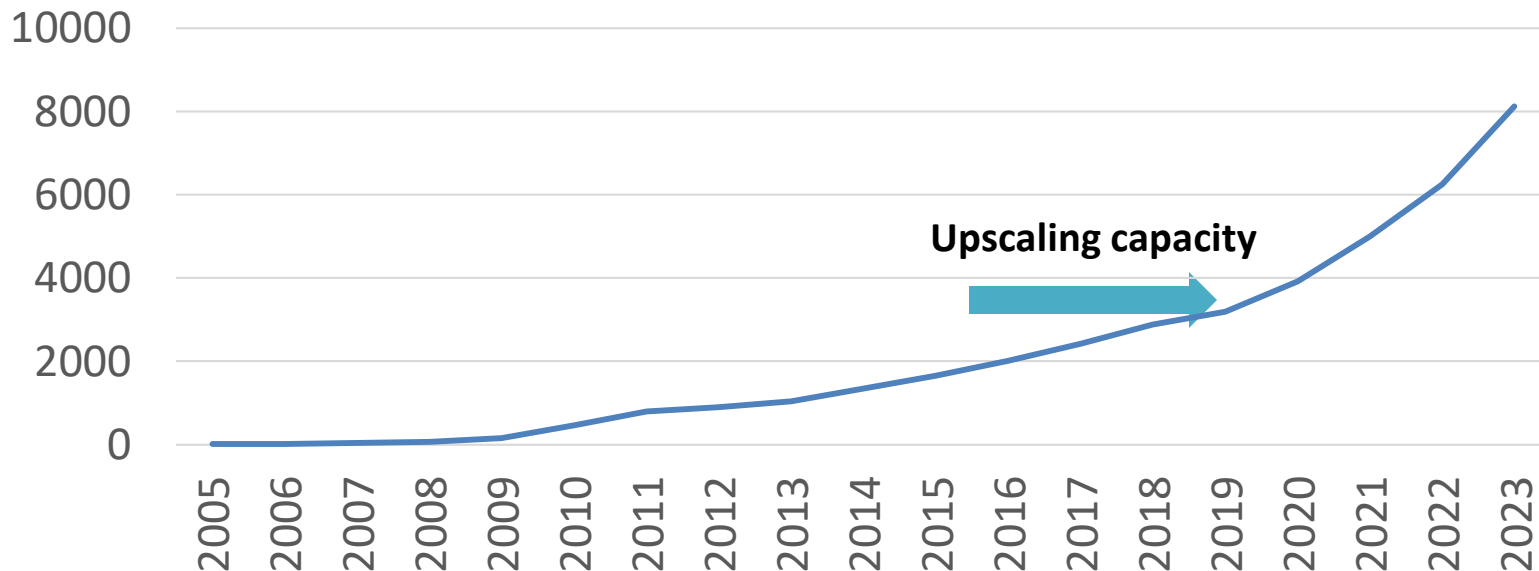


- 8 contracted suppliers
- 4 in process of contracting

Challenges

Expansion

Total number of patients using e-Health modalities
Isala Heart Centre



The challenge of integrating mHealth applications

Applying mHealth is part of a strategy, it is not about using gadgets

1. Develop and describe the patient journey (care path)
2. Build a solid organisation/infrastructure
3. Choose the appropriate technology

The challenge of integrating mHealth applications

- 1 Develop and describe current and future patient journey
 - Choose a relevant patient population
 - volume
 - homogeneity
 - incidence (disease/exacerbation) in chosen population
 - episode of disease
 - Assessing evidence and patient value (expected impact; compared to usual care)
 - Describe
 - desired outcomes/effects (e.g. BP values, weight reduction, reduction hospital visits)
 - required consultations, diagnostic and therapeutic interventions
 - Determine the appropriate health care partners

The challenge of integrating mHealth applications

You might be able to handle 50 patients, but can you handle 500 patients?

2 Build a solid organisation/infrastructure (virtual heart centre)
(the bridge between expertise and technology)

- Health care
- Help desk / call centre
- Logistics

The challenge of integrating mHealth applications

2 Build a solid organisation/infrastructure

- Health care (**professionals/health care institute**)
- patient safety
- quality management
 - standard operating procedures (SOP)
 - work instructions
- responsibilities
- medical stock maintenance
- medical technology
- 24/7 service / monitoring / backup
- training and education
- informing home care and GP's

The challenge of integrating mHealth applications

2 Build a solid organisation/infrastructure

- Help desk / call centre
 - medical
 - technical

Health care institute or contract third party



The challenge of integrating mHealth applications

2 Build a solid organisation/infrastructure

Logistics (**contract third party; responsibilities!!**)

- Registering
- Certifying
- Sending
- Instructing
- Installing
- Servicing
- Monitoring
- Returning
- Cleaning
- Repairing
- Data handling/archiving
- Data safety
- Patient safety

The challenge of integrating mHealth applications

Choose the appropriate technology

(**professionals/institution/third party**)

- sensors
- smartphones / tablets
- applications
- regarding
 - compliance official regulations (GDPR)
 - hospital IT requirements
 - interfacing electronic medical dossier
 - integration in 1 web-based platform
 - interfacing sensors and applications

NWE-Chance will provide answers

