

# Beyond Silos

**The Why and How of ICT in  
Integrated Care Service Provision  
A European Conference  
23 November 2011, Evoluon Eindhoven / NL**

Experiences and outcomes  
from other European activities:



The NEXES project

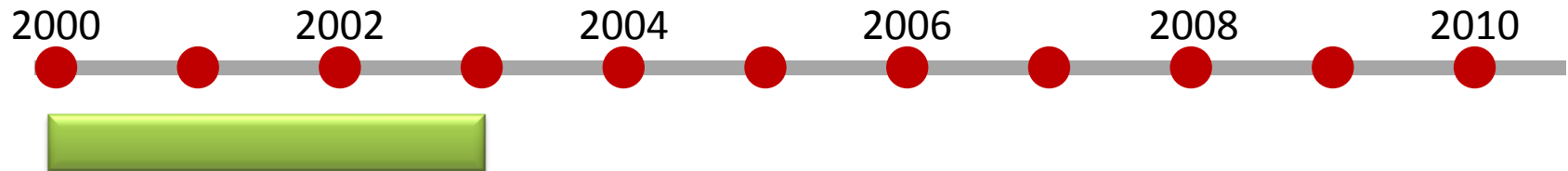
**CLÍNICA**  
**BARCELONA**  
Hospital Universitari

Albert Alonso  
Innovation Directorate

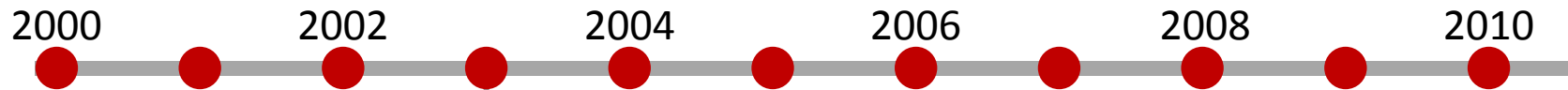
# Agenda

- Background
- Service model and elicitation of requirements
- Pilot studies
- Adoption of services

# Timeline



# Timeline



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European Respiratory Journal  
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## Home hospitalisation of exacerbated chronic obstructive pulmonary disease patients

C. Hernandez\*, A. Casas\*, J. Escarabill<sup>‡</sup>, J. Alonso<sup>§</sup>, J. Puig-Junoy<sup>†</sup>, E. Ferrero<sup>#</sup>, G. Vilagut<sup>¶</sup>, B. Collvent<sup>‡</sup>, R. Rodriguez-Roisin\*, J. Roca\*, and partners of the CHRONIC project

*Home hospitalisation of exacerbated chronic obstructive pulmonary disease patients. C. Hernandez, A. Casas, J. Escarabill, J. Alonso, J. Puig-Junoy, E. Ferrero, G. Vilagut, B. Collvent, R. Rodriguez-Roisin, J. Roca, and partners of the CHRONIC project. ©ERS Journals Ltd 2003.*

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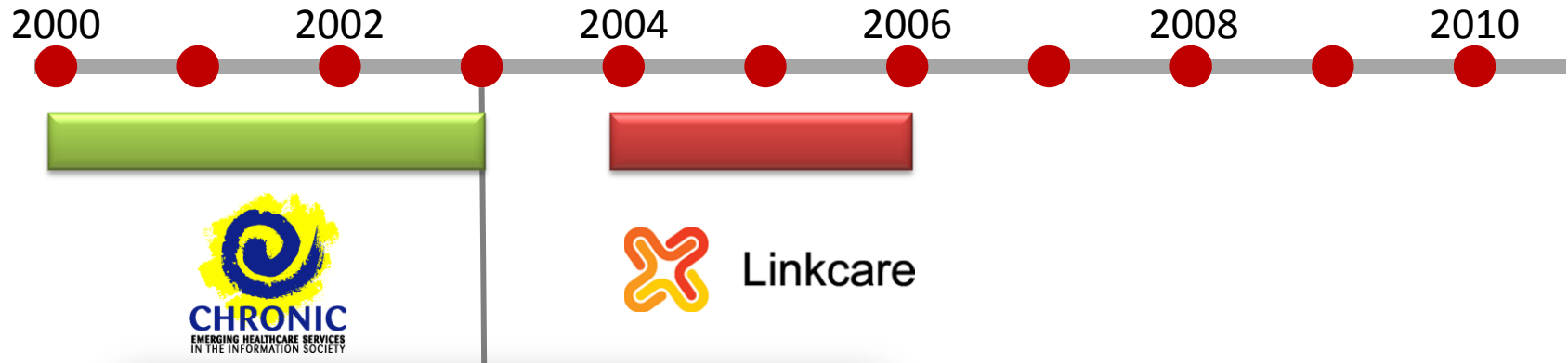
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Mortality (HH: 4.1%; controls: 6.9%) and hospital readmissions (HH: 0.24±0.57; controls: 0.38±0.70) were similar in both groups. However, at the end of the follow-up period, HH patients showed: 1) a lower rate of ER visits (0.13±0.43 versus 0.31±0.62);

<sup>\*</sup>Servei de Pneumologia (ICPCT) and <sup>†</sup>Servei d'Urgències, Hospital Clinic, IDIBAPS. <sup>‡</sup>UFISS-Respiratoria (Servei de Pneumologia), Hospital Universitari de Bellvitge Universitat de Barcelona. <sup>§</sup>Health Services Research Unit, Institut Municipal d'Investigació Mèdica (IMIM-IMIAS) and <sup>¶</sup>Research Center for Health and Economics (CRES), Universitat Pompeu Fabra, Barcelona, Spain.

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## Integrated care prevents hospitalisations for exacerbations in COPD patients

A. Casas\*, T. Troosters<sup>†</sup>, J. Garcia-Aymerich<sup>‡</sup>, J. Roca\*, C. Hernández\*, A. Alonso\*, F. del Pozo<sup>§</sup>, P. de Toledo<sup>¶</sup>, J.M. Antó<sup>‡</sup>, R. Rodriguez-Roisin\*, M. Decramer<sup>†</sup> and members of the CHRONIC Project

**ABSTRACT:** Hospital admissions due to chronic obstructive pulmonary disease (COPD) exacerbations have a major impact on the disease evolution and costs. The current authors postulated that a simple and well-standardised, low-intensity integrated care intervention can be effective to prevent such hospitalisations.

Therefore, 155 exacerbated COPD patients (17% females) were recruited after hospital discharge from centres in Barcelona (Spain) and Leuven (Belgium). They were randomly assigned to either integrated care (IC; n=65; age mean ± sd 70 ± 9 yrs; forced expiratory volume in one second (FEV<sub>1</sub>) 1.1 ± 0.5 L, 43% predicted) or usual care (UC; n=90; age 72 ± 9 yrs; FEV<sub>1</sub> 1.1 ± 0.05 L, 41% pred). The IC intervention consisted of an individually tailored care plan upon discharge shared with the primary care team, as well as accessibility to a specialised nurse case manager through a web-based call centre.

After 12 months' follow-up, IC showed a lower hospitalisation rate (1.5 ± 2.6 versus 2.1 ± 3.1) and a higher percentage of patients without re-admissions (49 versus 31%) than UC without differences in mortality (19 versus 16%, respectively).



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# A new standard?

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## EDITORIAL

# Integrated care: a new model for COPD management?

T.A.R. Seemungal\* and J.A. Wedzicha#

**T**otal healthcare expenditure in countries of the Organisation for Economic Co-operation and Development has risen from an average of 5% of gross domestic product in 1970 to ~10% in 2002 [1]. In 2002, pharmaceutical expenditure ranged from 10% of the total healthcare expenditure in Sweden to 21% in France [1], and a major portion of this expenditure arose through hospital care. Chronic obstructive pulmonary disease (COPD) is one of the most common chronic diseases worldwide [2] and a common cause of hospitalisation. An analysis of the economic cost of COPD in the UK shows that 54% accrues from hospitalisation; a further 32% is equally divided between scheduled care and drug treatment [3]. The Study of Risk Factors of COPD Exacerbation (EFRAM Study) showed that among a wide range of potential risk factors, only previous admissions, lower forced expiratory volume in one second, and the under-prescription of oxygen are independently associated with a higher risk of admission for a COPD exacerbation [4]. Under-prescription of home oxygen is easily modifiable once hypoxia has been diagnosed, but hospital admission rates for COPD remain a challenge for pulmonologists and chest therapists

adherence to practice guidelines, but because of the diversity of outcome measures and structure, little else could be concluded [8]. In COPD, such studies have recruited patients from the community or hospital. The East London COPD study, a long-term cohort study of moderate-to-severe COPD patients in the community, showed that over a period of 6 yrs hospitalisation rates were higher amongst those COPD patients who tended not to seek treatment for an exacerbation compared with those who sought early treatment from family physicians or the study clinicians [7]. BOURBEAU *et al.* [9] studied 191 COPD patients of similar severity recruited from the outpatient clinics of seven Canadian hospitals, randomised to a self-management plan or usual care (UC), and showed that self-managed subjects were less likely to be hospitalised during the first and also the second year, when there was less contact with the study team [6]. While the East London study looked at unselected patients in the community, the study by BOURBEAU *et al.* [9] required prior hospitalisation in the previous year as a prerequisite [7, 9]. However, a randomised study of self-management *versus* UC involving 248 COPD community-based patients from the Netherlands showed no

# A new standard?

Yes!

*“...An integrated care pathway with flexible shared-care arrangements between primary care and hospital, facilitated by information technologies, has an enormous potential to decrease hospital admissions in chronic obstructive pulmonary disease patients.”*

# A new standard?

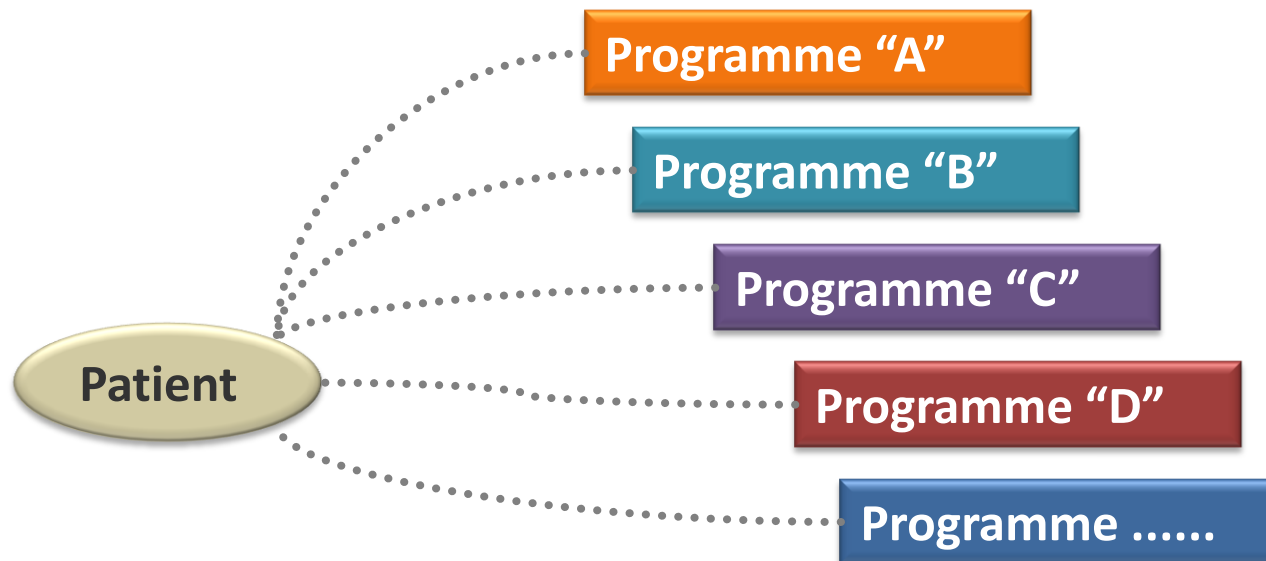
**But..!**

***“... In the integrated care approach, several models are available and we now require comparative studies.”***

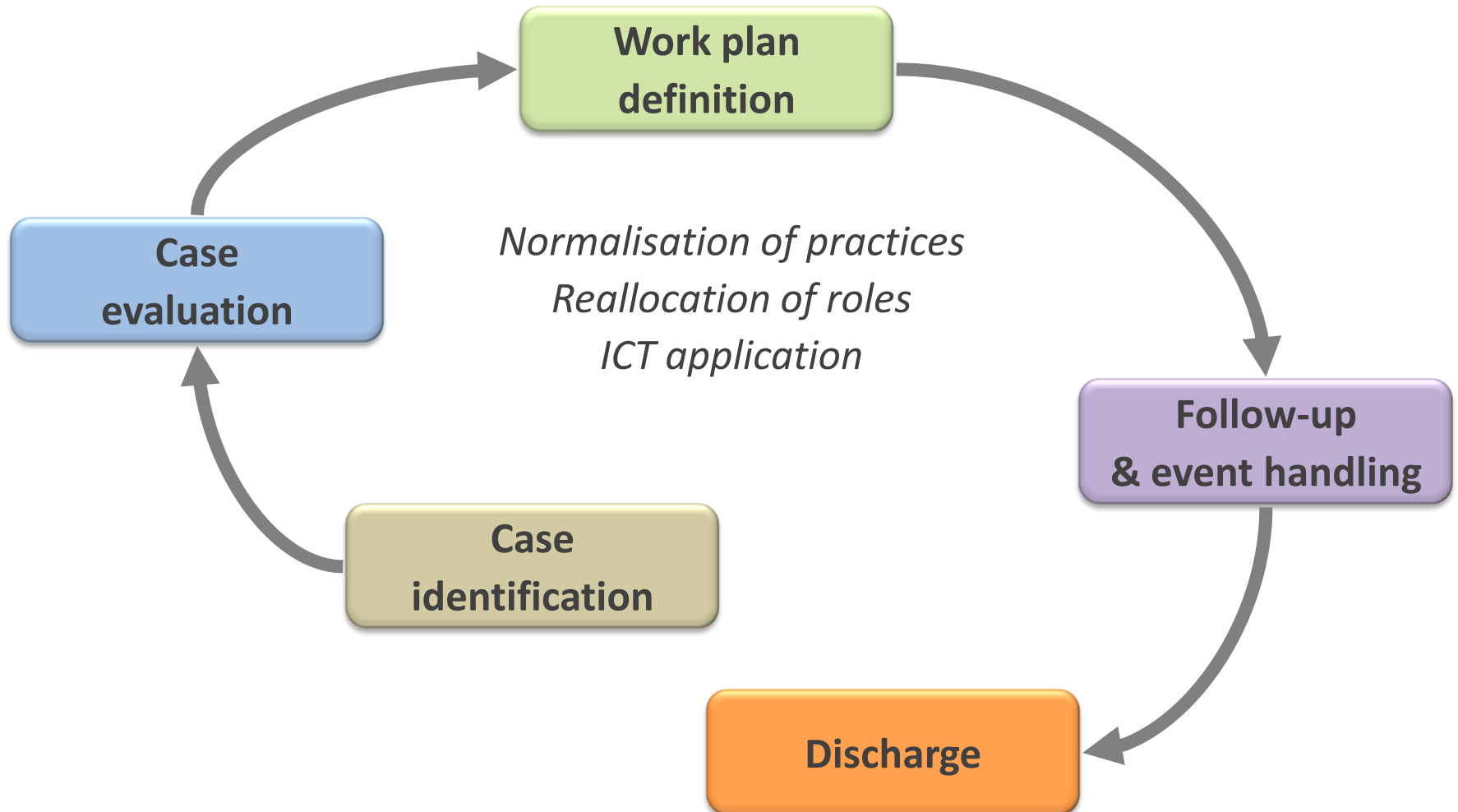
***“We must also be aware that from a healthcare provider perspective, further studies of this model must include cost-effectiveness as well as effectiveness in older disabled patients with chronic obstructive pulmonary disease”***

# Integrated care model

- Approach by programmes:
  - Set of normalised actions as well as evaluation tools that target precise service objectives.
  - The programme is based on a process model but it is not the (entire) process.



# Integrated care model



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# Nexes services / studies



Wellness and rehabilitation



Frail care, transitional care



Home hospitalisation / early discharge



Support

# Wellness and rehabilitation

- Empower patients active role (physical activity, self-management)
- Clinically stable COPD/CHF/coronary disease
- Based in the community
- Outcomes: reduce conventional interactions with the health system, improve life-style
- ICT : Mobile technology, Personal Health Folder



# Frailty, transitional / palliative care

- Prevention of hospitalizations in frail patients with history of high rate of admissions
- Transitional Care after discharge /Palliative care
- Frail patients in the community (low & high complexity)
- ICT: Call centre, Linkcare (patients' management application, mobile technology)



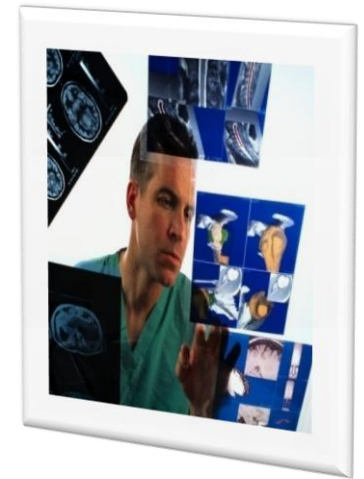
# Home hospitalisation

- Provide complete substitution of an acute hospital stay in the patient's home.
- Broad spectrum of patients (20% respiratory)
- Hospital-based integrated care unit
- ICT: Call centre, Linkcare (patients' management application, mobile technology)

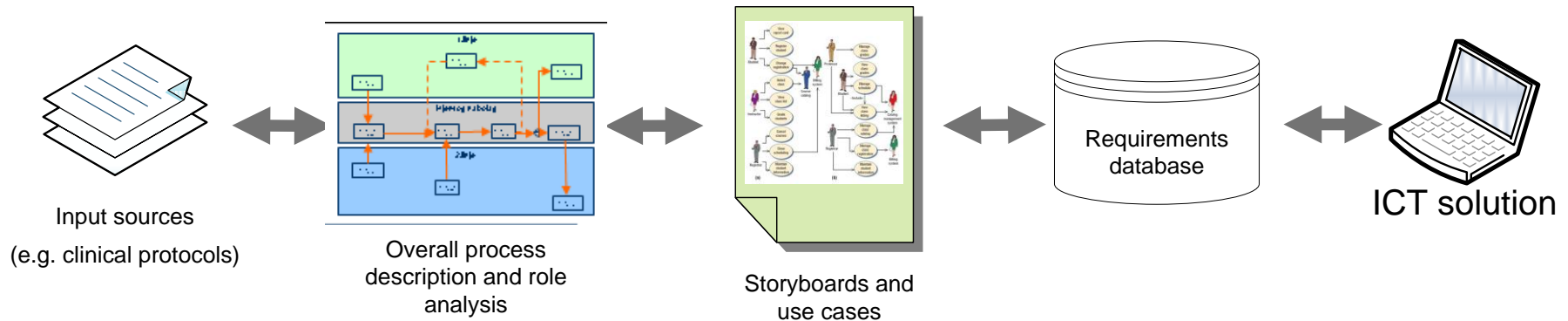


# Support

- Reinforcing Primary Care potential for diagnosis and follow-up of complex therapies; and,
- Supporting tertiary care interventions at home
- Case studies: High quality spirometries at primary care, portable ecocardiography
- General practitioner and non specialised nurses
- Outcome: Set-up added value of new services enabled by an ICT collaborative platform.

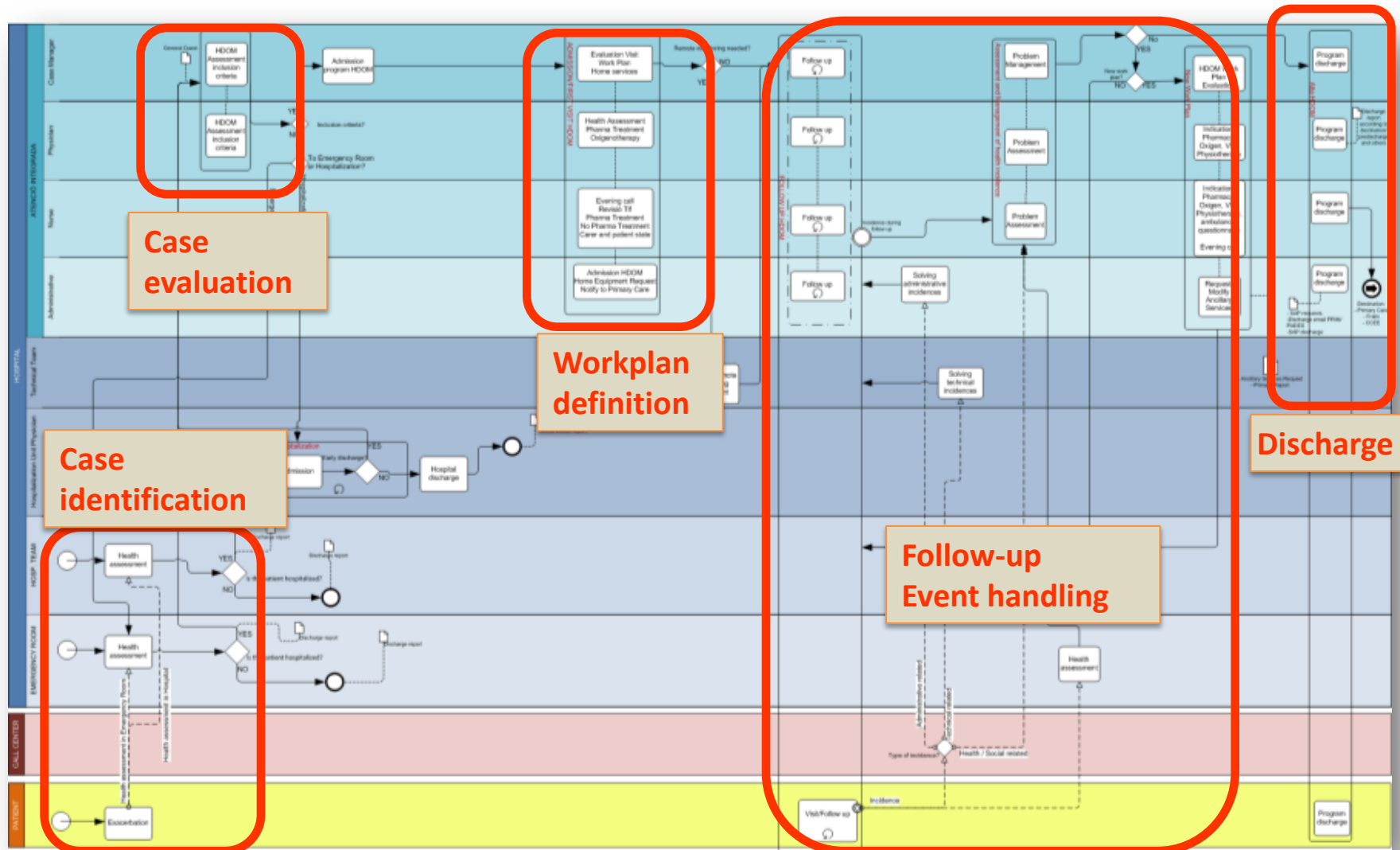


# Elicitation of requirements



- Collect requirements from the three trial locations (Barcelona, Athens, and Trondheim).
- Identify the need for customization of existing platforms in each site.
- Provide an analysis of the similarities and the differences among the trial sites, and present Nexes service provision model and framework.

# Elicitation of requirements



# Pilot studies

<b>Wellness &amp; rehab</b>	<b>Barcelona</b>	<b>Trondheim</b>	<b>Sotiria</b>	<b>Santair</b>
Type of study design	RCT	RCT	N/A	RCT
ICT platform used	Linkcare®	ELIN®	N/A	Linkcare®
# subjects to be included (DoW)	500	128	N/A	100
# subjects included (at project end)	240	54	N/A	159

<b>Frail patients</b>	<b>BCN_1</b>	<b>BCN_2</b>	<b>Trondheim</b>	<b>Sotiria</b>	<b>Santair</b>
Type of study design	Observation	RCT	RCT	RCT	N/A
ICT platform used	Linkcare	Linkcare	ELIN	Linkcare	N/A
# subjects to be included (DoW)		1200	303	100	N/A
# subjects included (at project end)	900	800	303	200	N/A

# Pilot studies

<b>Home Hospitalisation</b>	<b>Barcelona</b>	<b>Trondheim</b>	<b>Sotiria</b>	<b>Santair</b>
Type of study design	Observational	RCT	RCT	N/A
ICT platform used	Linkcare	ELIN	Linkcare	N/A
# subjects to be included (DoW)	2200	303	100	N/A
# subjects included (at project end)	2900	303	100	N/A

<b>Support</b>	<b>Barcelona</b>	<b>Trondheim</b>	<b>Sotiria</b>	<b>Santair*</b>
Type of study design	RCT	Observational	--	N/A
ICT platform used	Linkcare	Vscan, GE	Linkcare	N/A
# subjects to be included (DoW)	500	90	100	N/A
# subjects included (at project end)	7000	92	100?	N/A

# Evaluation methodology

MAST

Preceding considerations

Multidisciplinary assessment of outcomes

*Safety*

*Clinical effectiveness*

*Patients' perspectives*

*Professionals' perspectives*

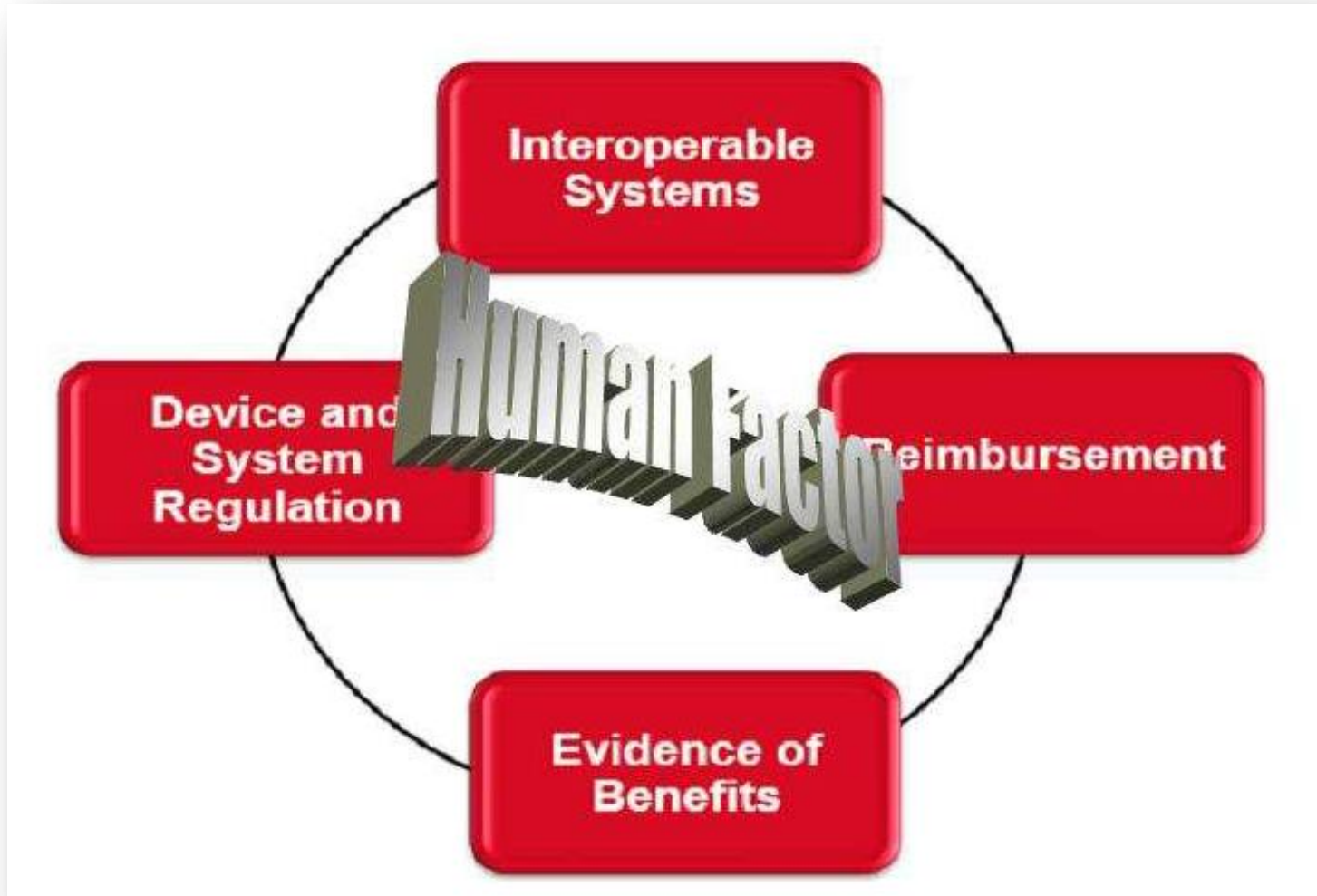
*Economic aspects*

*Organisational aspects*

*Social aspects*

Transferability assessment

# Adoption of services



Thank you for your attention