



Actualització en patologies mèdiques prevalents **eHealth en la Insuficiència cardíaca**



Hospital Universitari
MútuaTerrassa

Sergi Yun Viladomat, MD

Servei de Medicina Interna. Unitat Multidisciplinar d'Atenció a l'Insuficiència Cardíaca Comunitària (UMICO), Hospital Universitari de Bellvitge. Bio-Heart Cardiovascular Diseases Research Group, Bellvitge Biomedical Research Institute (IDIBELL). Programa Territorial d'Atenció Integrada a la Insuficiència Cardíaca de la Gerència Metropolitana Sud, Institut Català de la Salut (ICS).

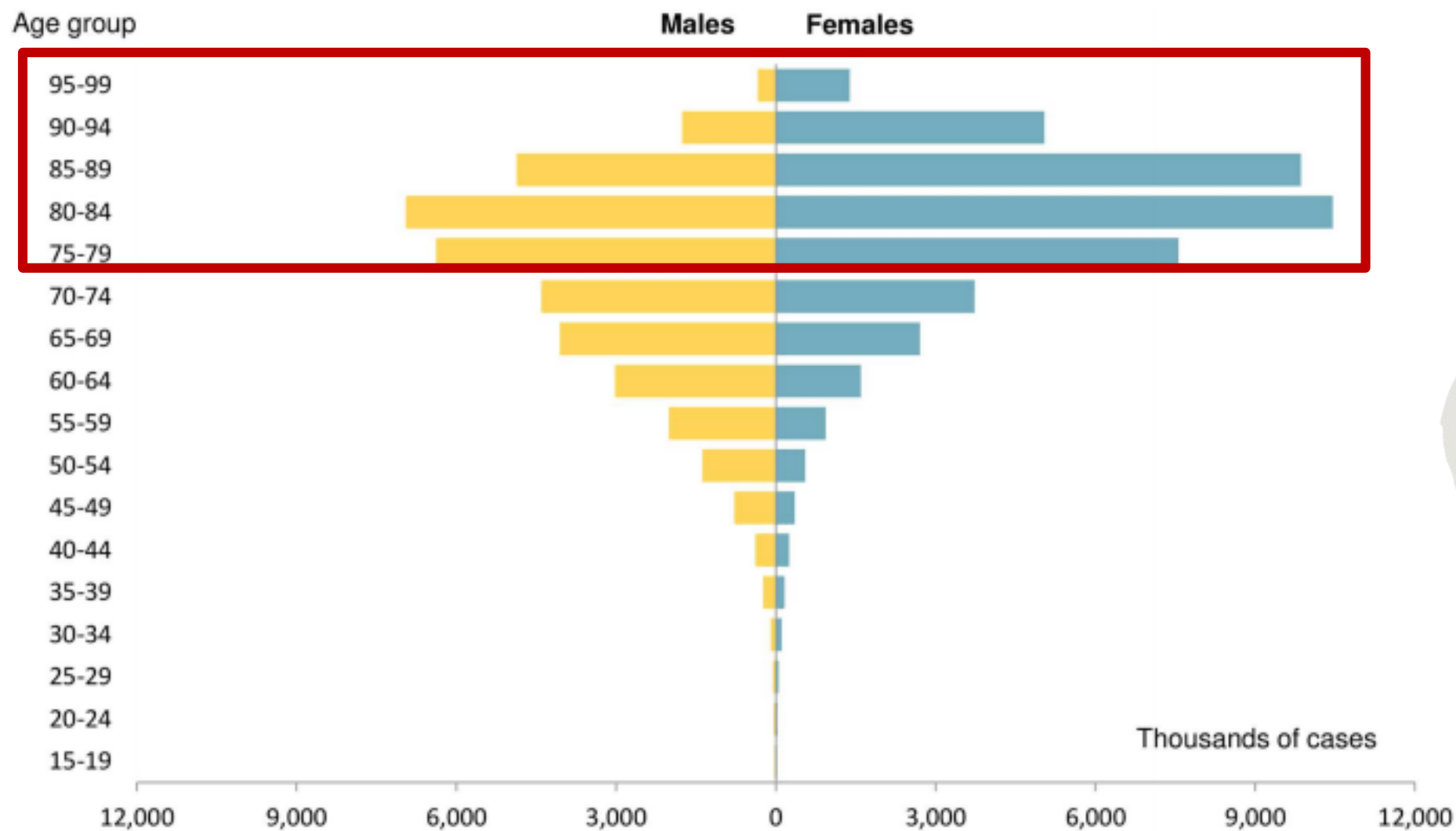
#Conflicts of interest disclosure

Conference and meetings presentations:

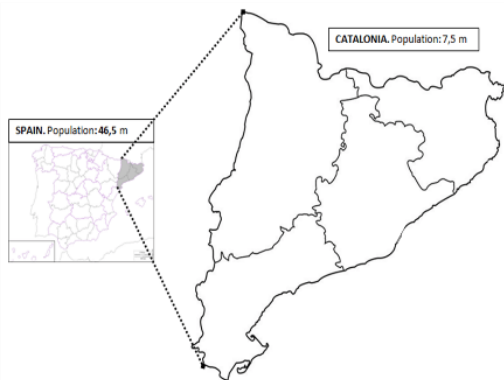
- Bristol – Myers Squibb
- Pfizer
- Rovi

Activities and consulting:

- Pfizer



Farré N, et al. PLoS ONE 12(2): e0172745.



CatSalut. Departament de Salut. 2015

2012

500M€

2015

1,000M€

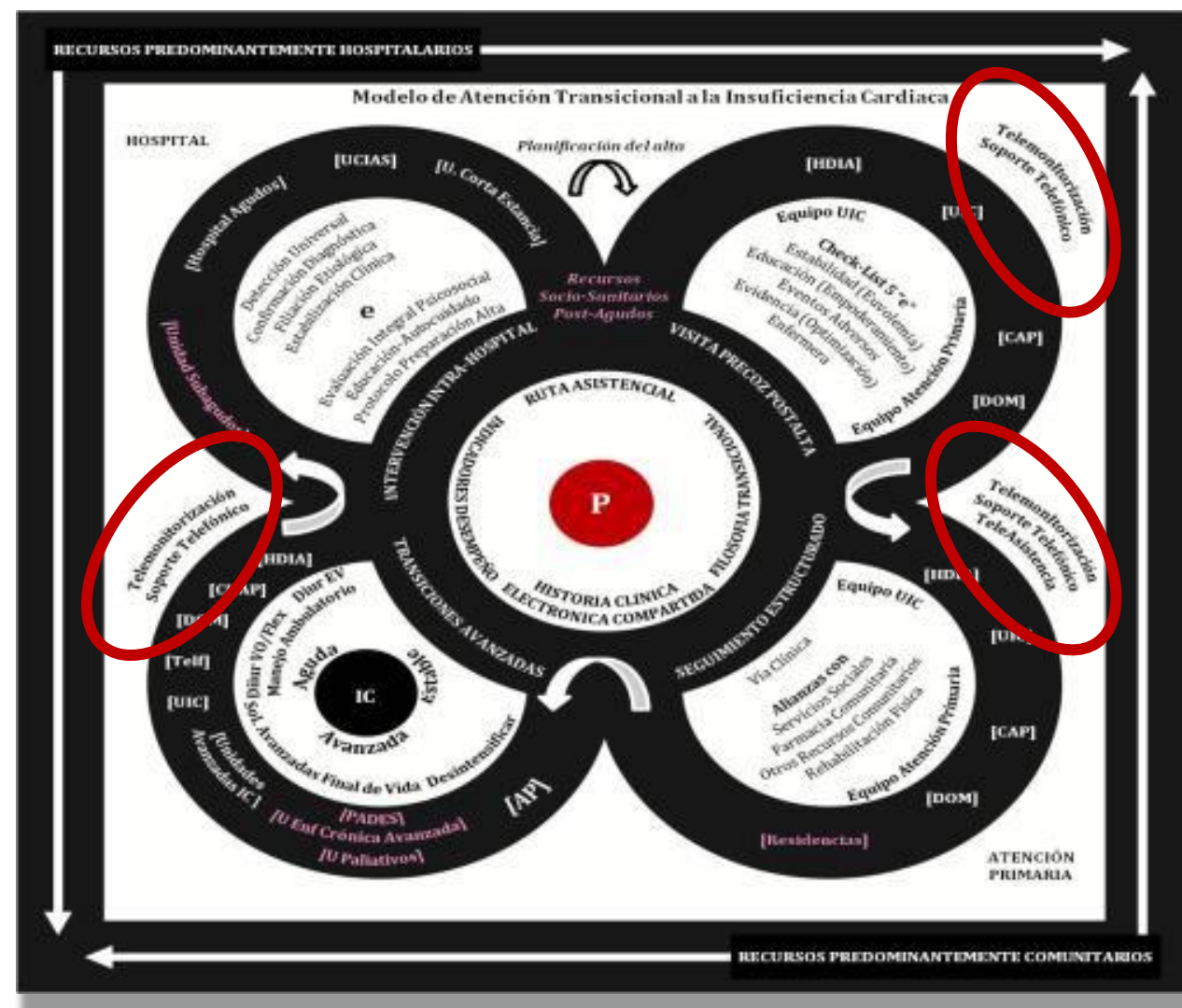
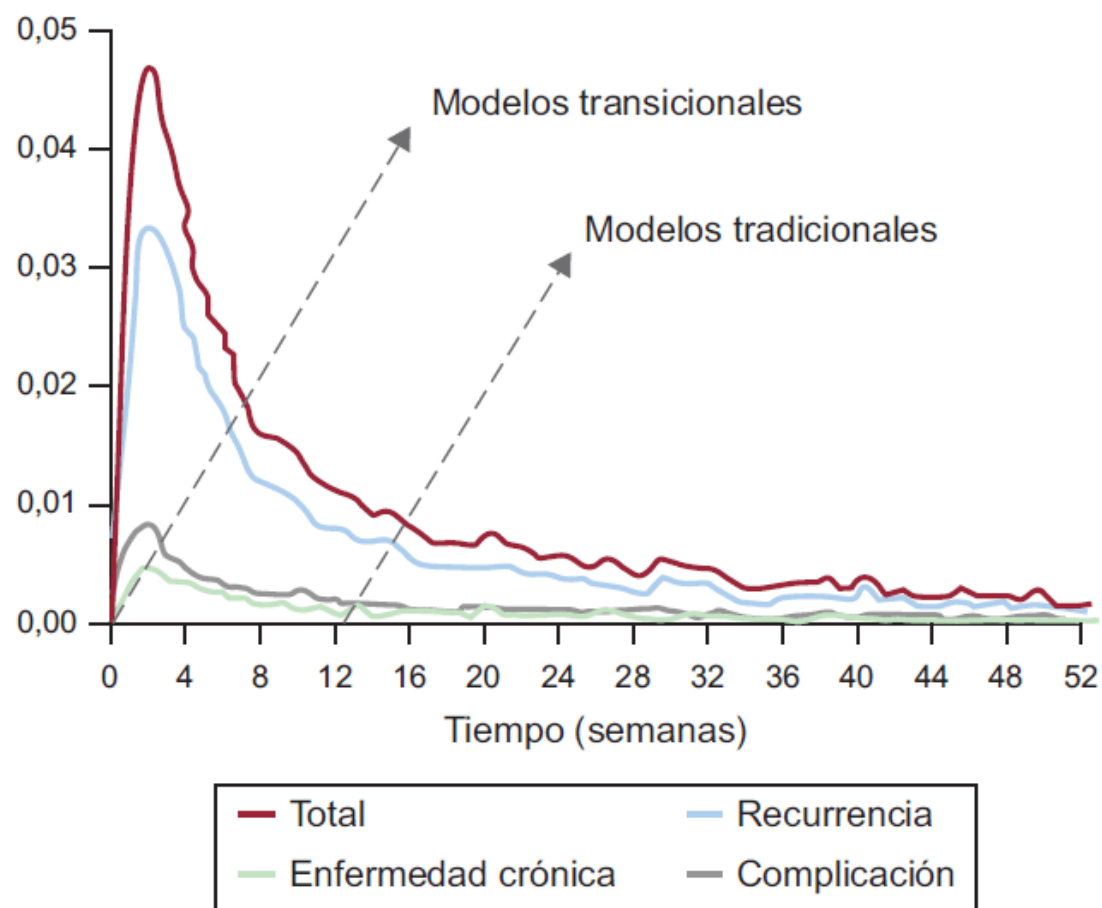
MAGNITUD DEL PROBLEMA...

- ✓ **La medicina reactiva es cara**
- ✓ **No podemos permitirnos la inercia**

~~Reactive~~



Proactive



Comín-Colet J et al. Rev Esp Cardiol. 2016;69(10):951–961.

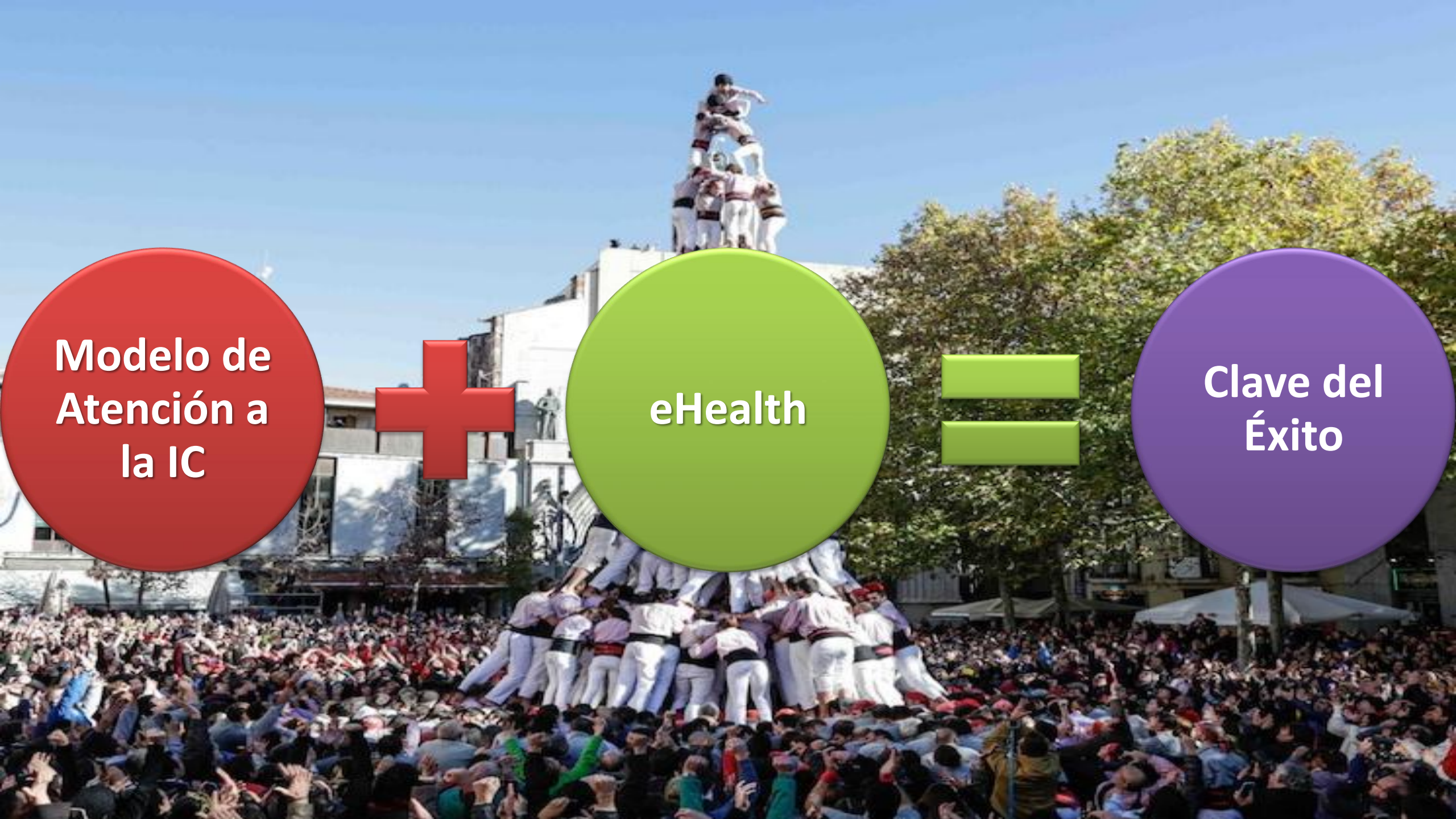
**Modelo de
Atención a
la IC**

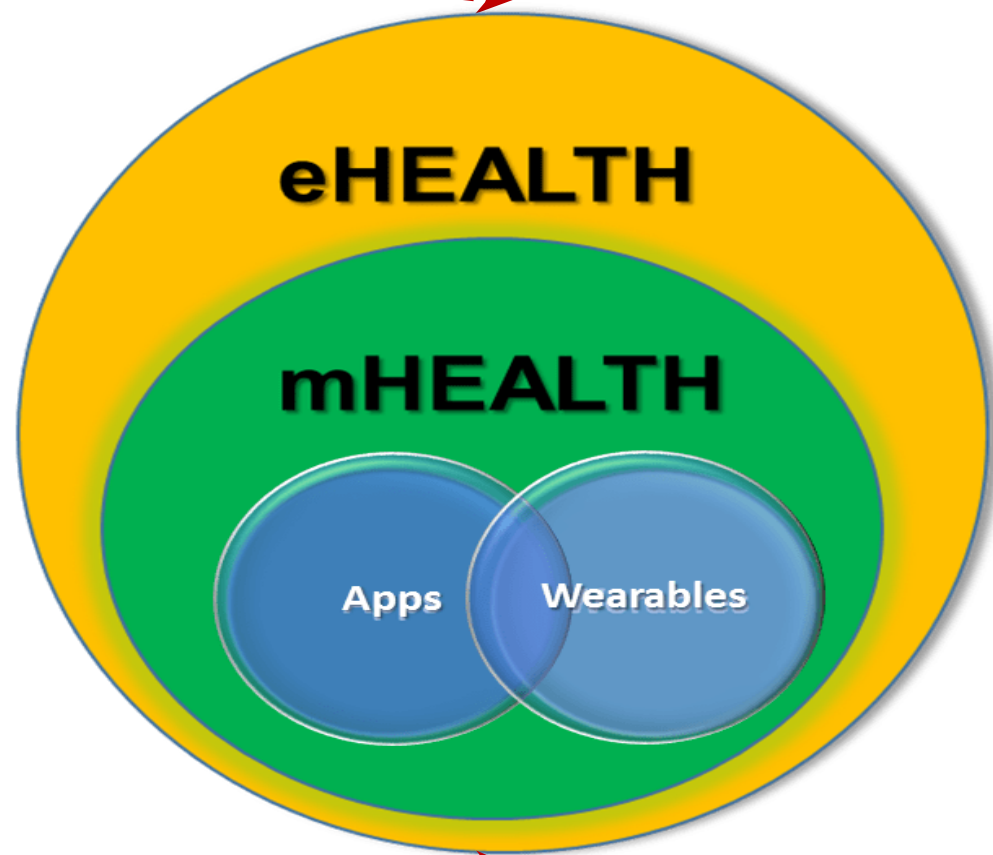
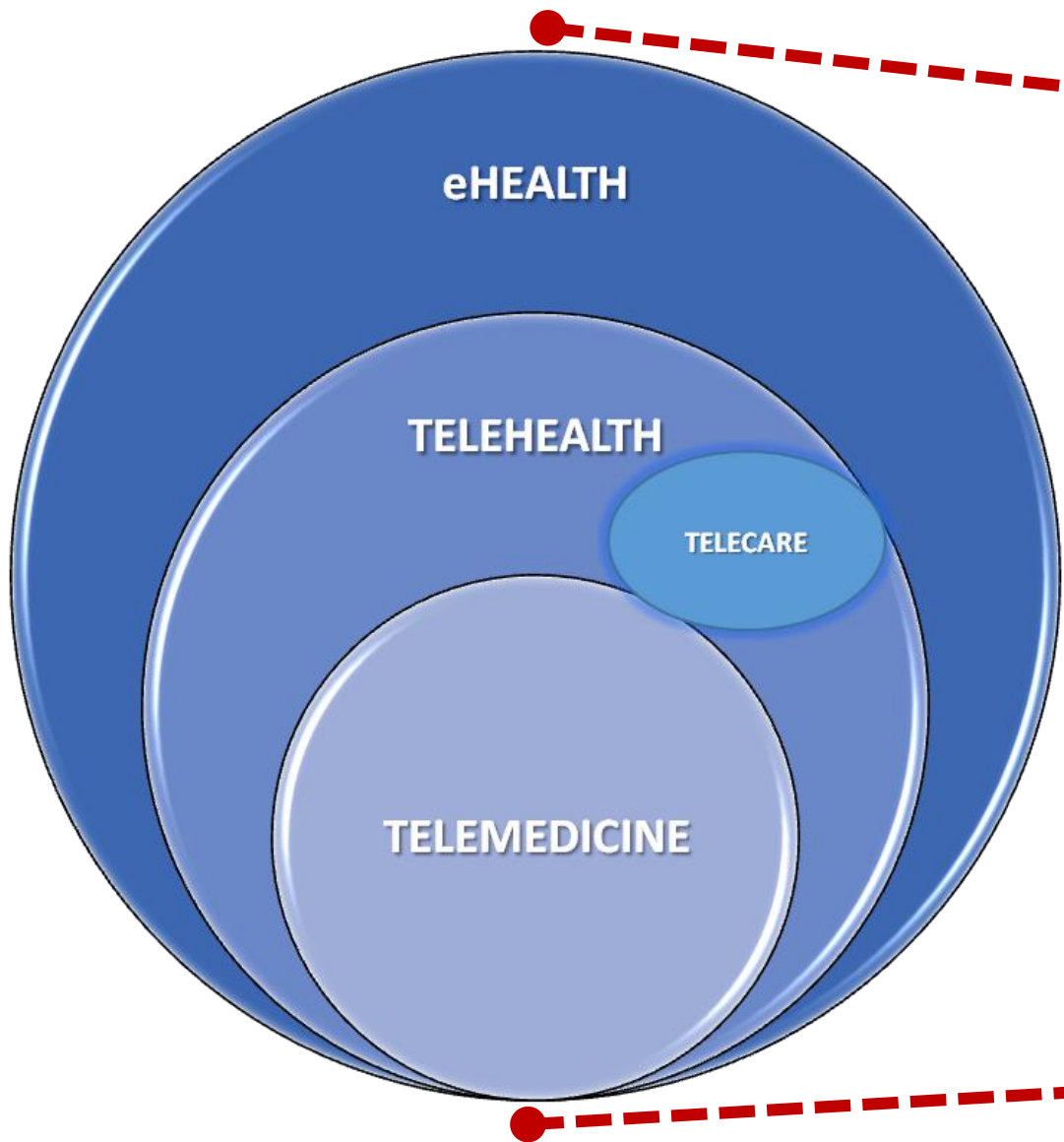


eHealth

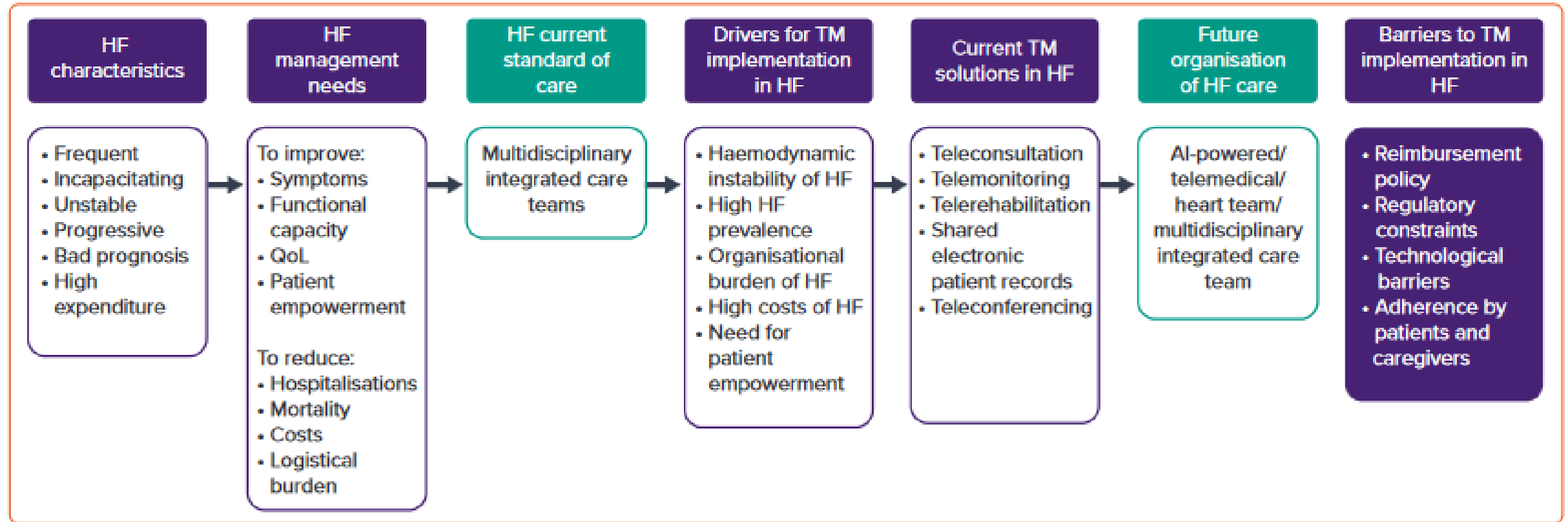


**Clave del
Éxito**



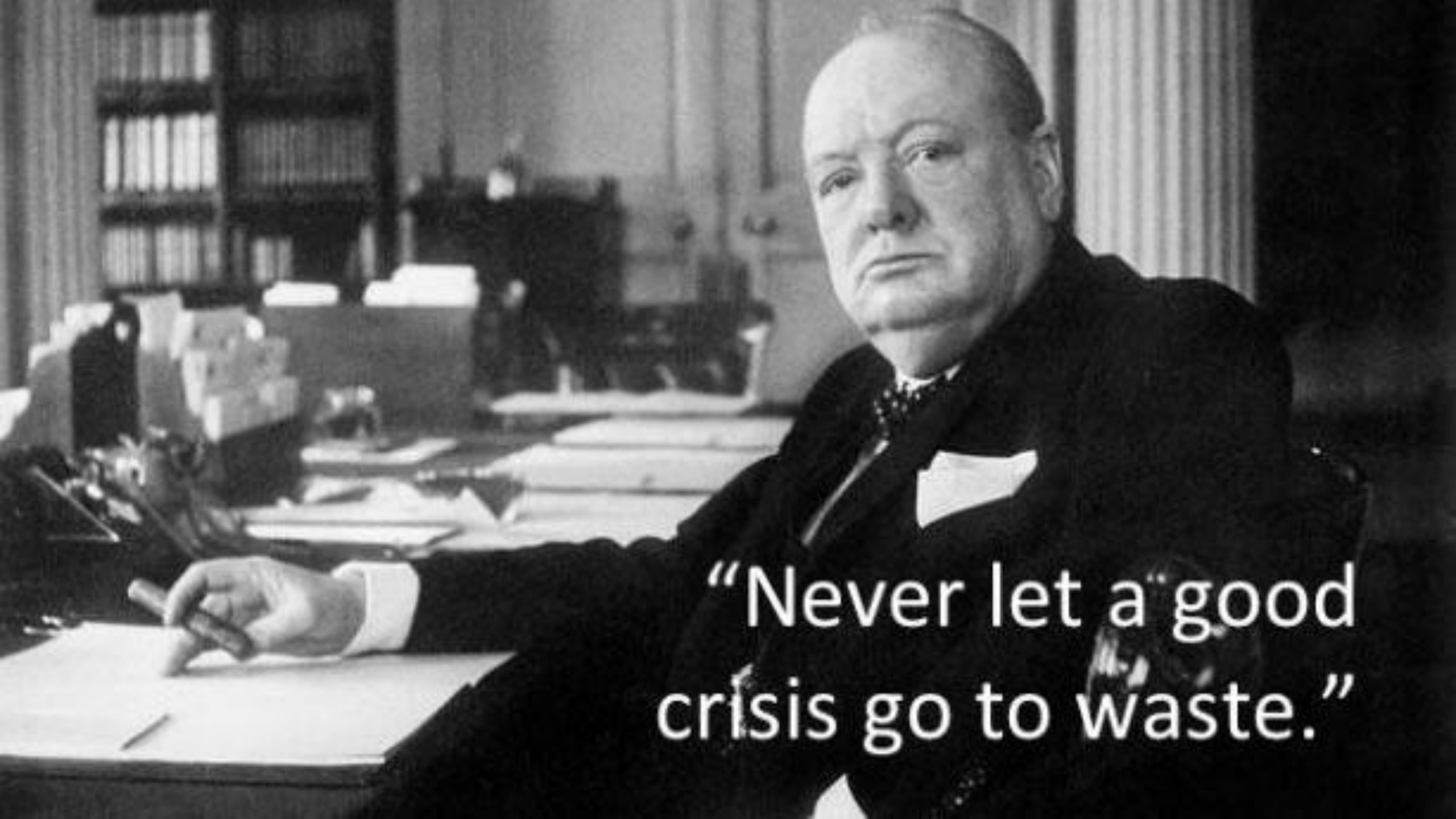


The Future of Telemedicine in the Management of Heart Failure Patients



Silva-Cardoso J, et al. Card Fail Rev. 2021 Mar; 7: e11.



A black and white photograph of Winston Churchill sitting at his desk. He is wearing a dark suit and a patterned tie. His right hand is resting on the desk, holding a cigar. The desk is cluttered with papers and a typewriter. In the background, there are bookshelves filled with books. The text "Never let a good crisis go to waste." is overlaid on the bottom right of the image.

“Never let a good
crisis go to waste.”

Virtual Visits for Care of Patients with Heart Failure in the Era of COVID-19: A Statement from the Heart Failure Society of America

EIRAN Z. GORODESKI, MD, MPH, FHFA,^{1,4} PARAG GOYAL, MD, MSc,^{2,†} ZACHARY L. COX, PharmD, FHFA,³
JENNIFER T. THIBODEAU, MD, MSCS, FHFA,⁴ REBECCA E. REAY, ACNP-BC, CHFN,⁵
KISMET RASMUSSEN, DNP, FNP, FHFA,⁶ JOSEPH G. ROGERS, MD,⁷ AND RANDALL C. STARLING, MD, MPH, FHFA⁵

Cleveland, OH; New York, NY; Nashville, TN; Dallas, TX; Salt Lake City, UT; and Durham, NC



Group	Potential benefits
Patient	• Provide access • Receive medical advice • Reduce in-person exposure to SARS-CoV-2 • Reduce distress
Clinician	• Involve caregivers • Serve patients • Reduce in-person exposure to SARS-CoV-2 • Maintain connection between patient and provider
Health care systems	• Reallocate resources • Generate revenue • Support research efforts

IDENTIFICACIÓN



- Mi nombre es
- Soy su médico/enfermera y le llamamos para ver como se encuentra desde su última visita



INFECCIÓN POR COVID19



- ☐ ¿Se ha contagiado por covid19?
- ☐ ¿Ha tenido que ingresar por este motivo?
- En los últimos días:
 - ☐ ¿Ha tenido fiebre o tos seca?
 - ☐ ¿Ha tenido algún contacto con personas infectadas por covid19?

Aplicar protocolo asistencial covid19 del centro/región sanitaria correspondiente

SOCIAL / AUTONOMÍA



- ☐ ¿Necesita ayuda para las tareas cotidianas?
- ☐ ¿Tiene problemas para desplazarse?
- ☐ ¿Ha sufrido alguna caída en los últimos días?
- ☐ ¿Se siente triste?
- ☐ ¿Tiene ayuda de algún familiar o cuidador?
- ☐ ¿Puede ir a recoger la medicación a la farmacia o tiene a alguien que se la traiga?
- ☐ ¿Dispone de tele-asistencia?

AUTOCUIDADO / MEDICACIÓN



- ☐ ¿Conoce los síntomas de alarma?
- ☐ ¿Añade sal a las comidas o alimentos ricos en sal?
- ☐ ¿Bebe más de 1,5 litros de agua al día?
- ☐ ¿Ha perdido el apetito?
- ☐ ¿Es incapaz de salir a la calle?
- ☐ ¿Se olvida de tomar alguna medicación?
- ☐ ¿Le han cambiado el tratamiento recientemente?

SÍNTOMAS Y SIGNOS

¿Cómo se encuentra de su falta de aire en las ultimas semanas?
Peor/Igual/Mejor (clasificación NYHA)



- ☐ ¿Aumento de peso en los últimos días?
- ☐ ¿Piernas/tobillos más hinchados de lo habitual?
- ☐ ¿Tiene que dormir con más almohadas?
- ☐ ¿Por la noche tiene que sentarse en la cama por ahogo?

¿Dispone de instrumentos de medida?

Control constantes
TA : FC : Tª



Planificar seguimiento
Teléfono/presencial



SÍNTOMAS Y SIGNOS DE GRAVEDAD

¿Ha presentado alguno de estos síntomas?



- ☐ Dolor en el pecho
- ☐ Pérdida de conocimiento
- ☐ Ahogo en reposo
- ☐ Taquicardia >120x'
- ☐ Bradicardia <40x'
- ☐ TAS >200 mmHg o < 80 mmHg

Coordinación asistencial con Urgencias

Planificación de soporte de manera coordinada con Trabajo Social

Planificación de cuidados multidisciplinar con Atención Primaria

Planificación de educación sanitaria con enfermería

Proporcionar recomendaciones
Manual del Grupo IC SEMI *

Planificación de cuidados multidisciplinar con Atención Primaria

Aconsejar adquisición de báscula, tensiómetro, termómetro

Si empeoramiento/ descompensación:
Ajuste diuréticos
Optimizar fármacos modificadores de IC según Manual del Grupo IC SEMI *

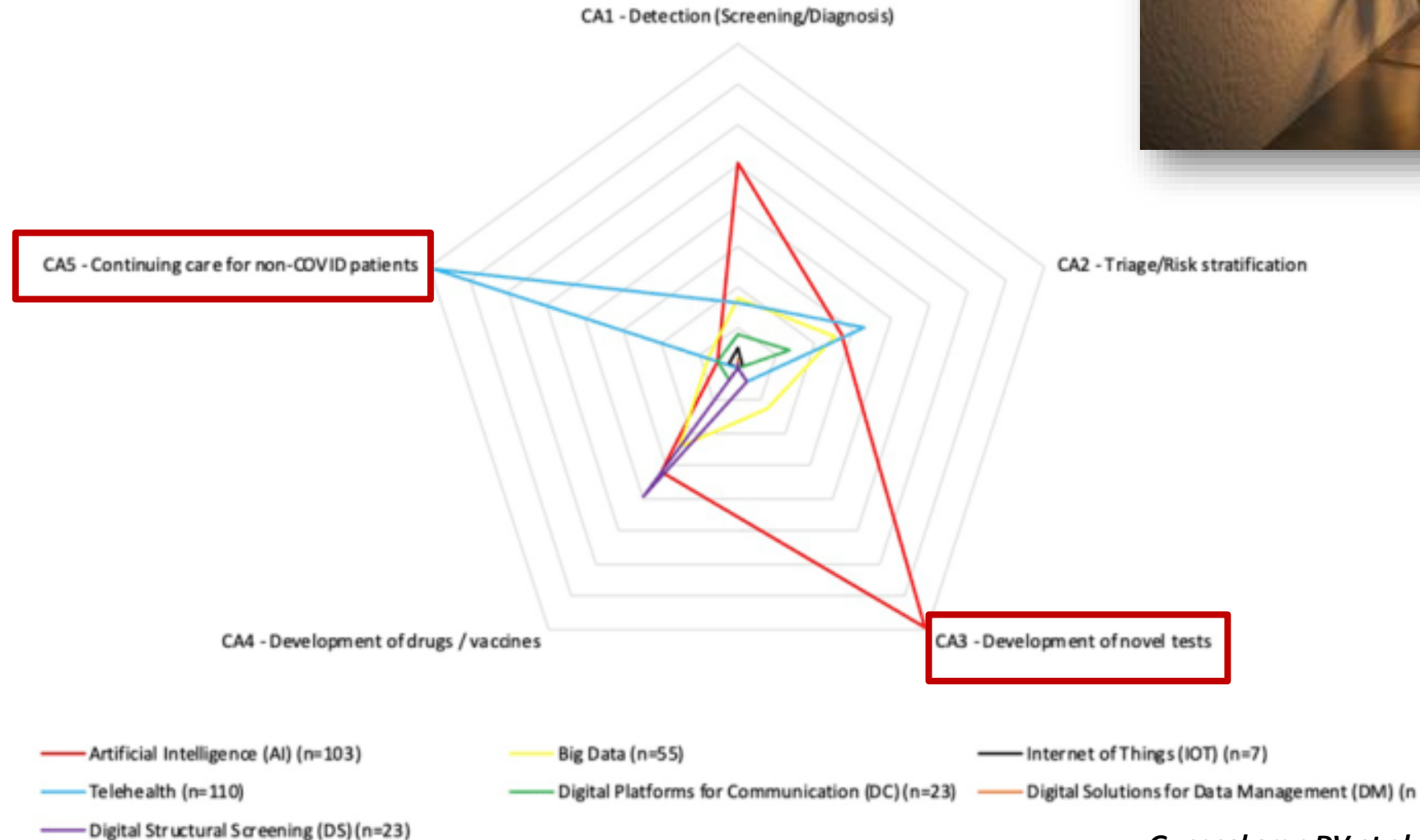
Valorar visita paciente/familiares con Trabajo Social/Enfermería

Valorar visita presencial
(si no respuesta a ajuste diuréticos)

*<https://www.fesemi.org/sites/default/files/documentos/publicaciones/manual-ic-4-edicion-2018.pdf>

Applications of digital health for public health responses to COVID-19: a systematic scoping review of artificial intelligence, telehealth and related technologies

Dinesh Visva Gunasekeran ^{1,2,4}, Rachel Marjorie Wei Wen Tseng^{1,4}, Yih-Chung Tham^{1,3} and Tien Yin Wong ^{1,2,3} 



¿Qué nos aporta la Consulta Virtual?

#1

Proactividad

#4

Menor sobrecarga del sistema

#2

Confort del paciente +/- cuidador/a

#5

Eficiencia: selección de visitas presenciales (“justas y necesarias”)

#3

Minimización de riesgos (p.ej. contagio)

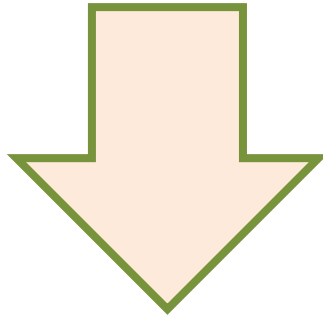
#6

Contacto directo y permanente sistema – paciente (“ubicuidado”)

¿Puede la eHealth cerrar el “Care Gap” en los pacientes crónicos?

#1

Detección precoz
**PREVENCIÓN de INGRESOS
HOSPITALARIOS**



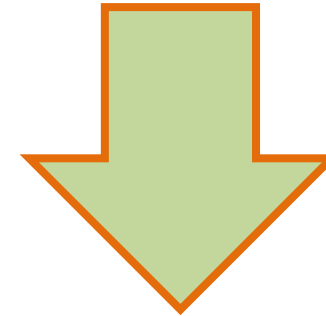
TELEMONITORIZACIÓN



¿Puede la eHealth cerrar el “Care Gap” en los pacientes crónicos?

#2

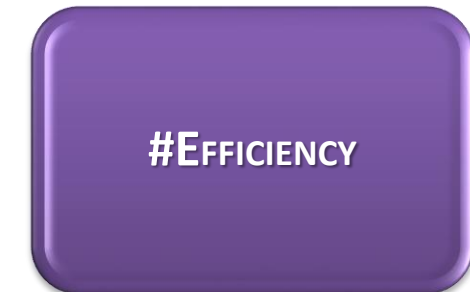
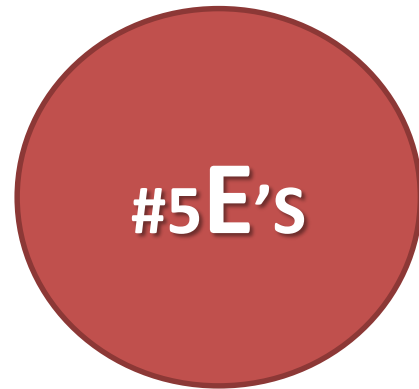
Intervenciones Estructuradas, Planificadas
y Coordinadas
ATENCIÓN BASADA en EVIDENCIA



TELEINTERVENCIÓN



The #5E's of eHealth in HF



Los ensayos que evalúan la eficacia del seguimiento estructurado (teléfono) o la tele-monitorización han mostrado resultados mixtos...



2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

Telemedicine in HF, which is also termed remote patient management, has variable clinical trial results.⁶³⁹ Several meta-analyses suggest clinical benefits, but numerous prospectively initiated clinical trials including >3700 patients have not confirmed this. These clinical trials include Tele-HF,⁶⁴⁰ TIM-HF,⁶⁴¹ INH,⁶⁴² WISH⁶⁴³ and TEHAF.⁶⁴⁴ It is clear that there is not just one type of telemedicine, and each approach needs to be assessed on its individual merit.

Recently, two individual approaches were shown to be successful in improving clinical outcome when used in patients with HFpEF or HFrEF. These approaches include the CardioMems system (tested in 550 patients with both HFrEF and HFpEF)⁶²⁸ and the IN-TIME approach (tested in 664 HFrEF patients)⁶³⁰, which may be considered for use in selected patients with HF (see the recommendations table).

NO recomendaciones específicas sobre el uso de la telemedicina en IC⁸

¹Chaudhry SI, et al. *N Engl J Med*. 2010 Dec 9;363(24):2301-9. ²Ong MK, et al. *JAMA Intern Med*. 2016 March 1; 176(3): 310–318. ³Koehler F, et al. *Circulation*. 2011;123:1873-1880. ⁴Cleland JG, et al. *J Am Coll Cardiol* 2005;45:1654–64. ⁵Comín-Colet J, et al. *Journal of Telemedicine and Telecare* 2016, Vol. 22(5) 282–295. ⁶Koehler F, et al. *Lancet* 2018 Sep 22;392(10152):1047-1057. ⁷Weintraub J, et al. *Cardiac Fail* 2010; 16: 285-92. ⁸Ponikowski P, et al. *Eur Heart J* (2016) 37, 2129–2200.

2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC)



ESC

European Society
of Cardiology

Recommendations for telemonitoring

Recommendations	Class ^a	Level ^b
Non-invasive HTM may be considered for patients with HF in order to reduce the risk of recurrent CV and HF hospitalizations and CV death. ³⁷⁴	IIb	B
Monitoring of pulmonary artery pressure using a wireless haemodynamic monitoring system may be considered in symptomatic patients with HFrEF (LVEF $\leq 35\%$) in order to improve clinical outcomes. ³⁷²	IIb	B

© ESC 2021

9.6 Telemonitoring



McDonagh TA, et al. Eur Heart J (2021) 00, 1-128.

Telemedicine in heart failure: new insights from the Cochrane meta-analyses

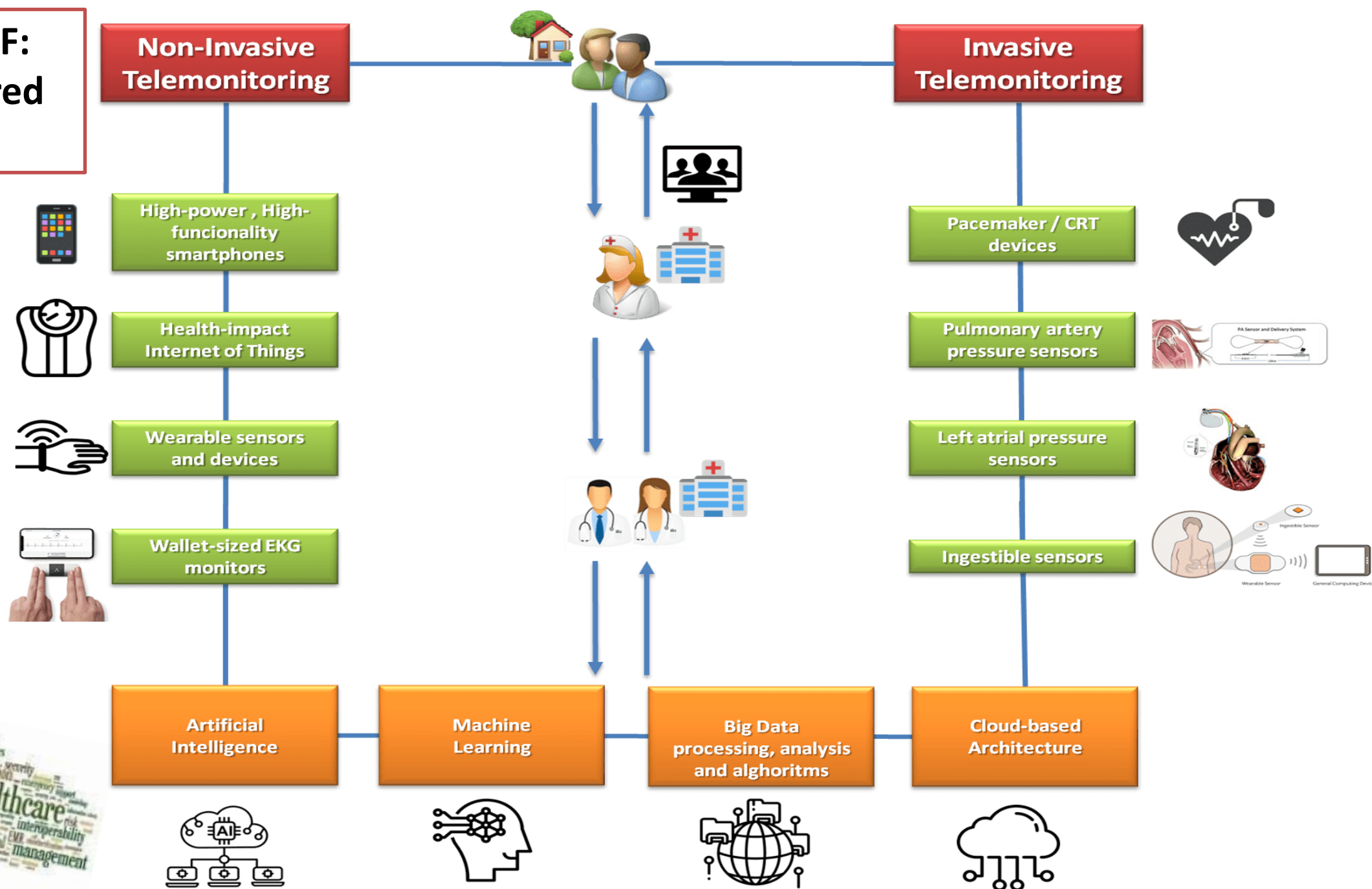


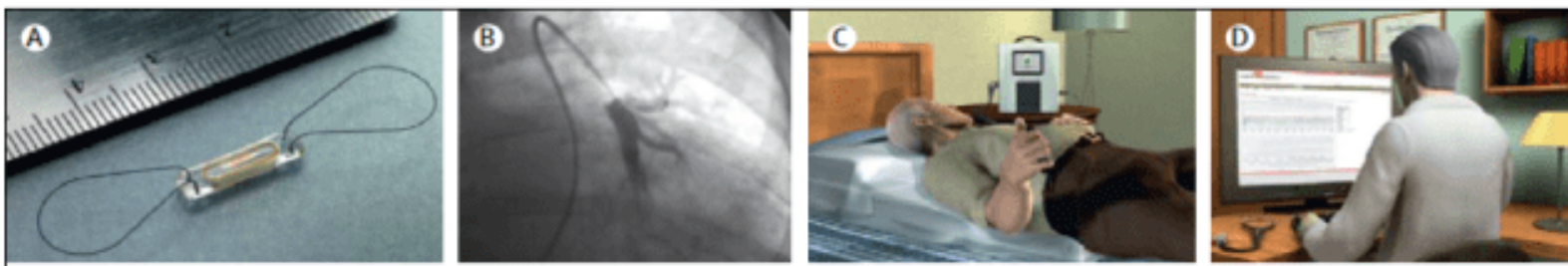
Table 1 Summary of main characteristics of the Cochrane reviews of 2007, 2010, and 2015 on structured telephone support or non-invasive telemonitoring for patients with heart failure

Cochrane review	Era	Trials included (n)	Mortality	HF-related hospitalizations
2007	1966–2006	14		
TM			RR 0.62 (0.45–0.85)	RR 0.86 (0.57–1.28)
STS			RR 0.85 (0.72–1.01)	RR 0.78 (0.68–0.89)
2010	1966–2008	30		
TM			RR 0.66 (0.54–0.81)	RR 0.79 (0.67–0.94)
STS			RR 0.88 (0.76–1.01)	RR 0.77 (0.68–0.87)
2015	1966–2015	41		
TM			RR 0.80 (0.68–0.94)	RR 0.71 (0.60–0.83)
STS			RR 0.87 (0.77–0.98)	RR 0.85 (0.77–0.93)

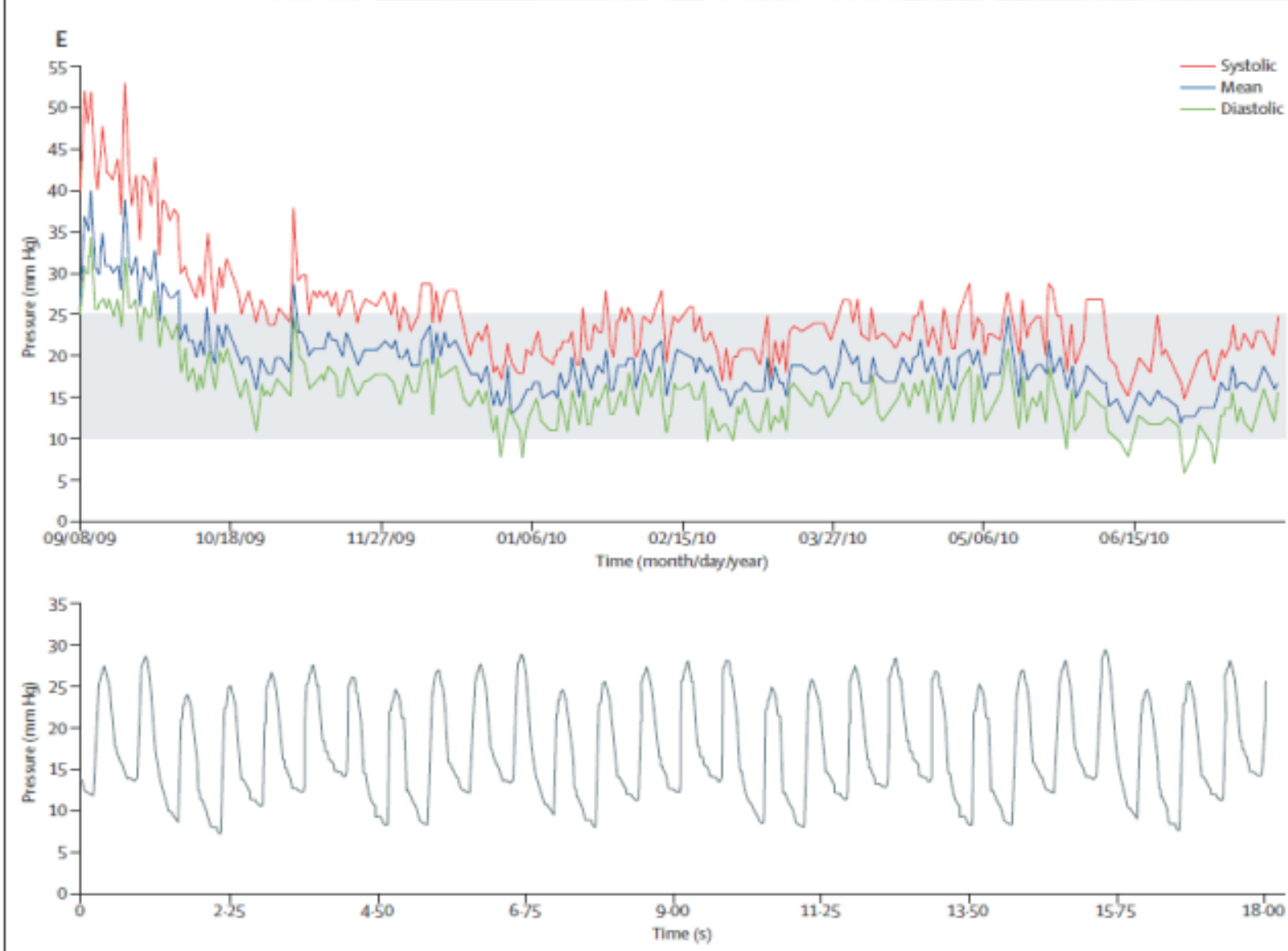
Dierckx R, et al. *Eur J Heart Fail* 2017;19:304-306.

eHealth in HF: Patient-Centred Solutions

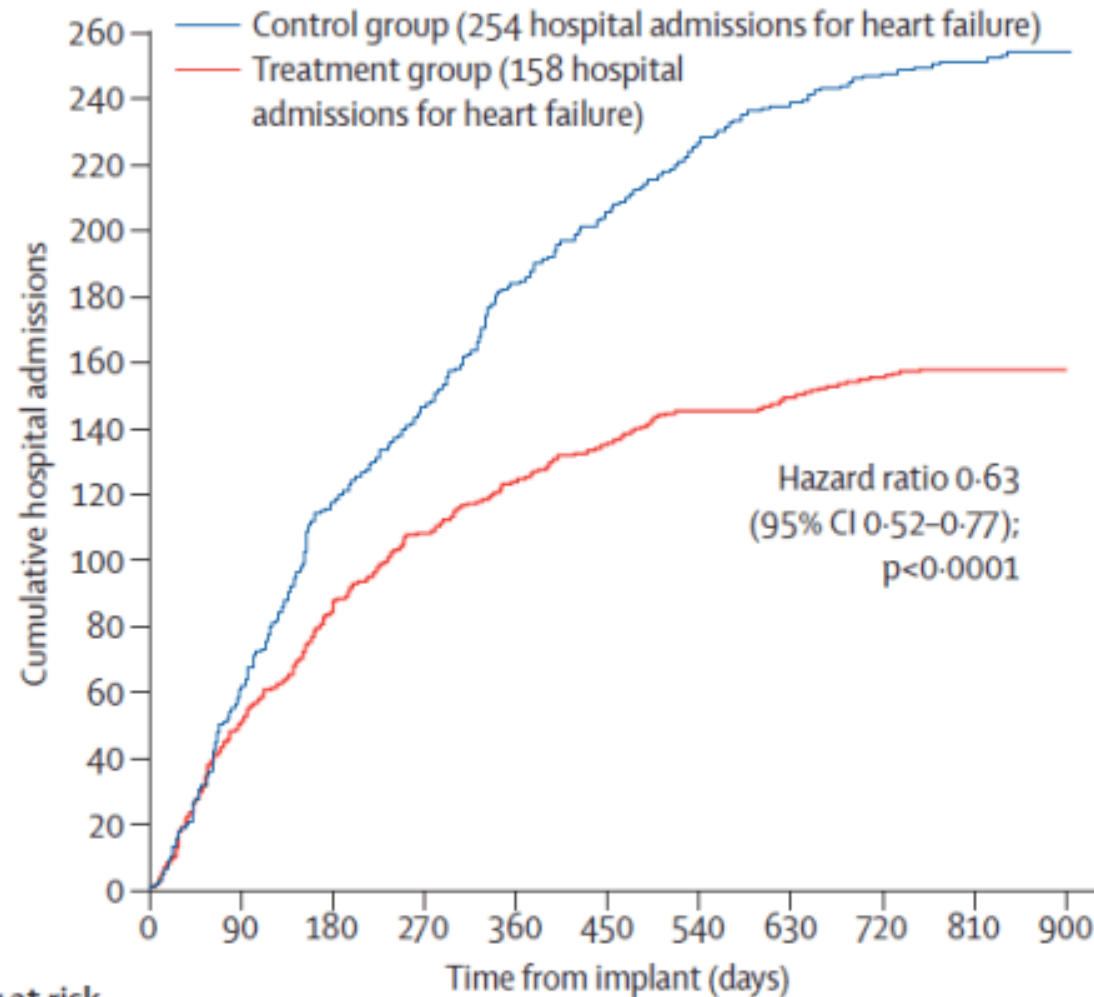




#INVASIVE TELEMONITORING



#CHAMPION TRIAL



Population

- N = 550
- NYHA functional class III
- ≥ 1 HF admissions in the last 12 months

Primary Endpoint

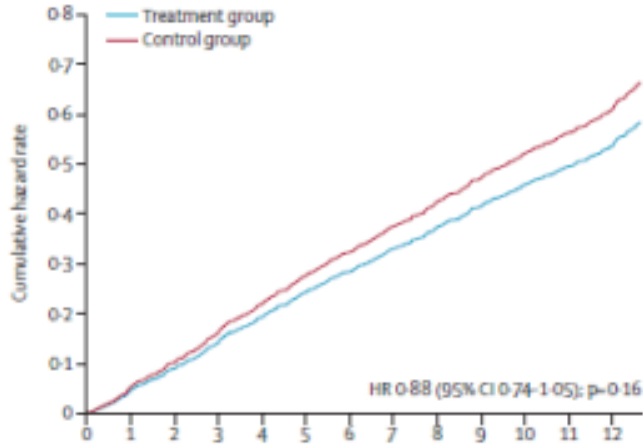
- HF admissions at 6 months post-implantation

Results

- Primary endpoint $\rightarrow$ HR 0.72 (0.60-0.85)
- Secondary endpoints:
 - Improved QoL
 - Greater PAP reduction
- Safety:
 - 98.6% without complications
 - 0% sensor failures

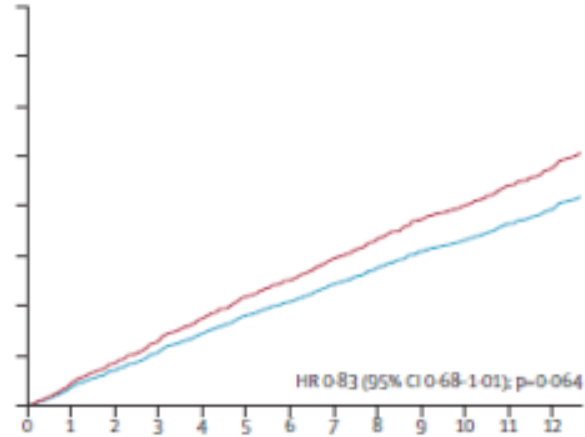
#GUIDE-HF TRIAL

A Primary outcome: all-cause mortality, heart failure hospitalisations, urgent heart failure visits

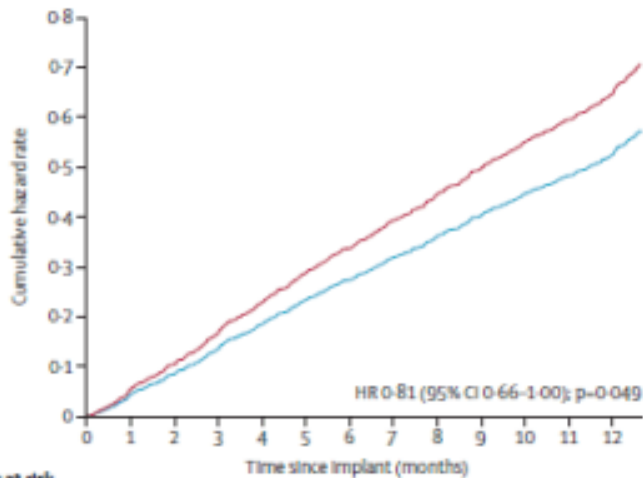


Number at risk
Treatment group 497 496 491 486 480 473 468 465 456 447 441 422 193
Control group 503 500 494 488 482 476 468 463 459 456 442 434 180

B Heart failure hospitalisations

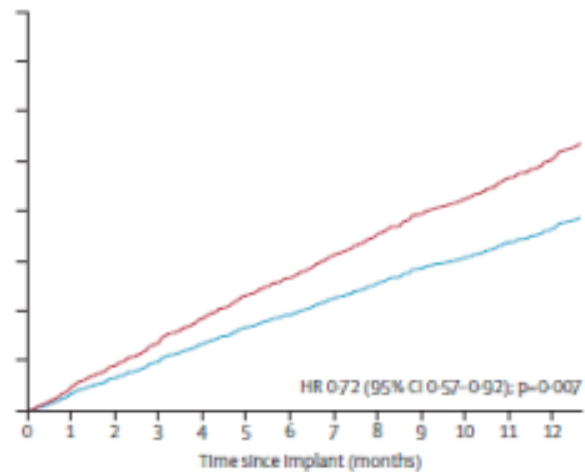


C Primary outcome: all-cause mortality, heart failure hospitalisations, urgent heart failure visits



Number at risk
Treatment group 497 496 491 459 404 360 328 290 251 216 182 155 58
Control group 503 500 494 459 405 365 335 303 272 237 200 172 59

D Heart failure hospitalisations



Overall analysis

Pre-COVID-19 impact analysis

Population

- N = 1000
- NYHA functional class II-IV
- Either a recent HF hospitalisation or elevated natriuretic peptides

Primary Endpoint

- A composite of all-cause mortality and total HF events at 12 months.

NON-INVASIVE vs INVASIVE TELEMONTITORING



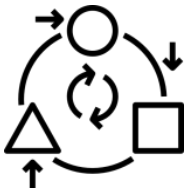
Cheaper



Global



Safe



Adaptable



Democratic

**NON-INVASIVE
TELEMONTITORING**

**INVASIVE
TELEMONTITORING**



Resistencia de las partes interesadas

Stakeholder resistance to adopt digital health based care:

- Lack of patient motivation and digital health literacy skills
- Lack of healthcare provider belief in digital health care

Legal, ethical & technical barriers:

- Mobile data privacy, security & liability concerns
- Lack of interoperability

Other barriers:

- Lack of health economical evaluations
- Lack of reimbursement

Barreras Legales, Éticas y Técnicas

How to deploy digital health based care in Europe?

Otras Barreras: económicas...

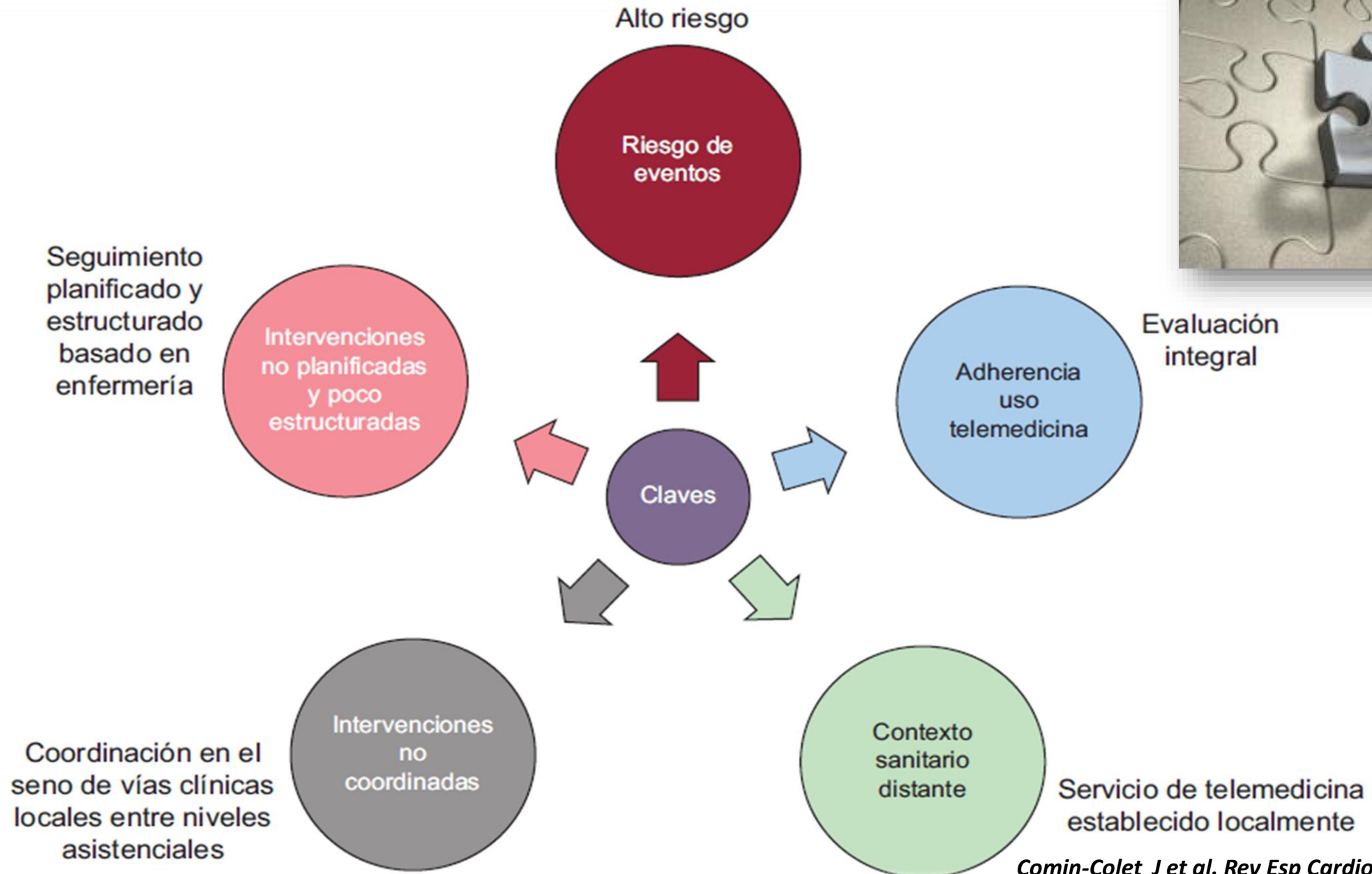




TIPS & TRICKS



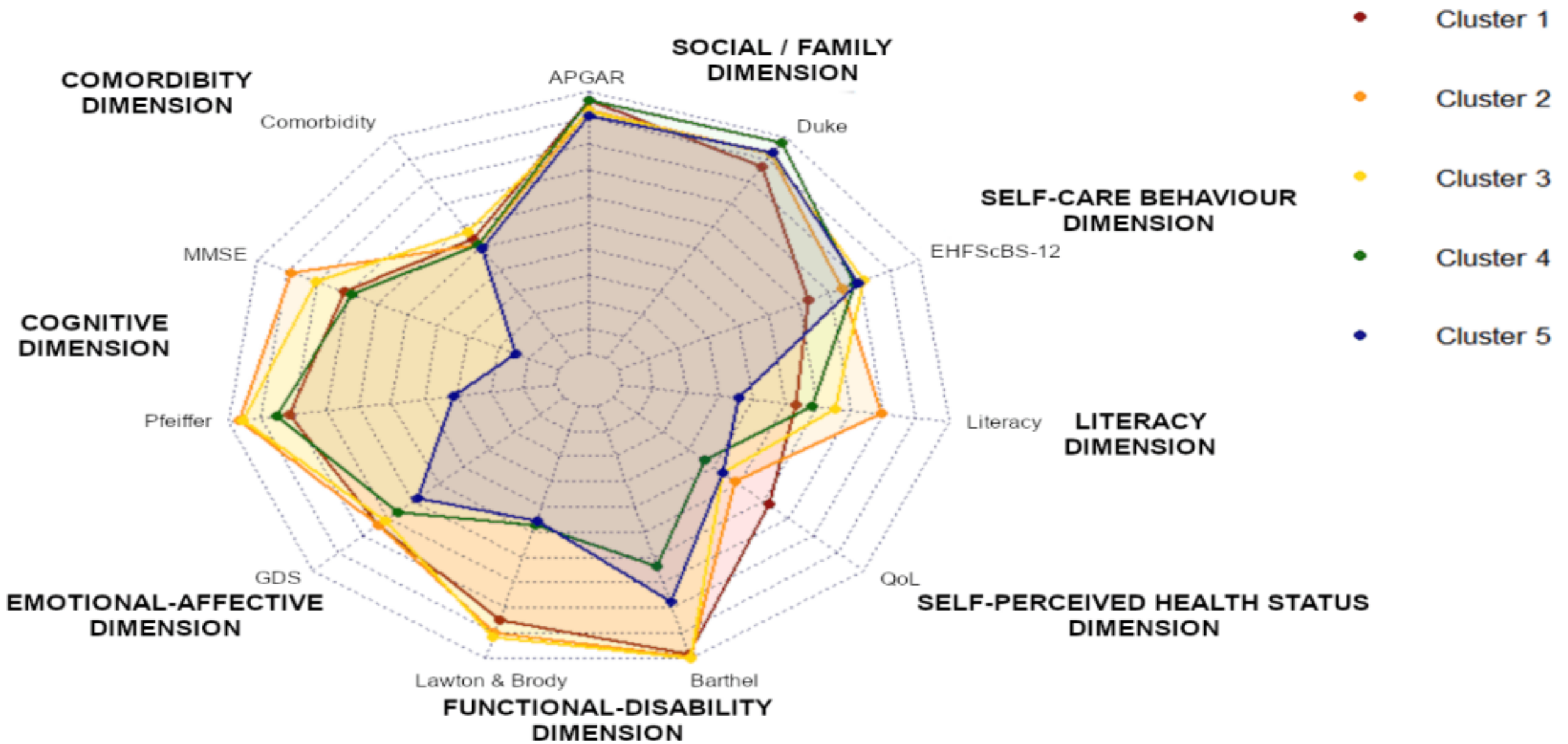
Integración de la *eHealth* en un programa de atención integrada : ingredientes para el éxito

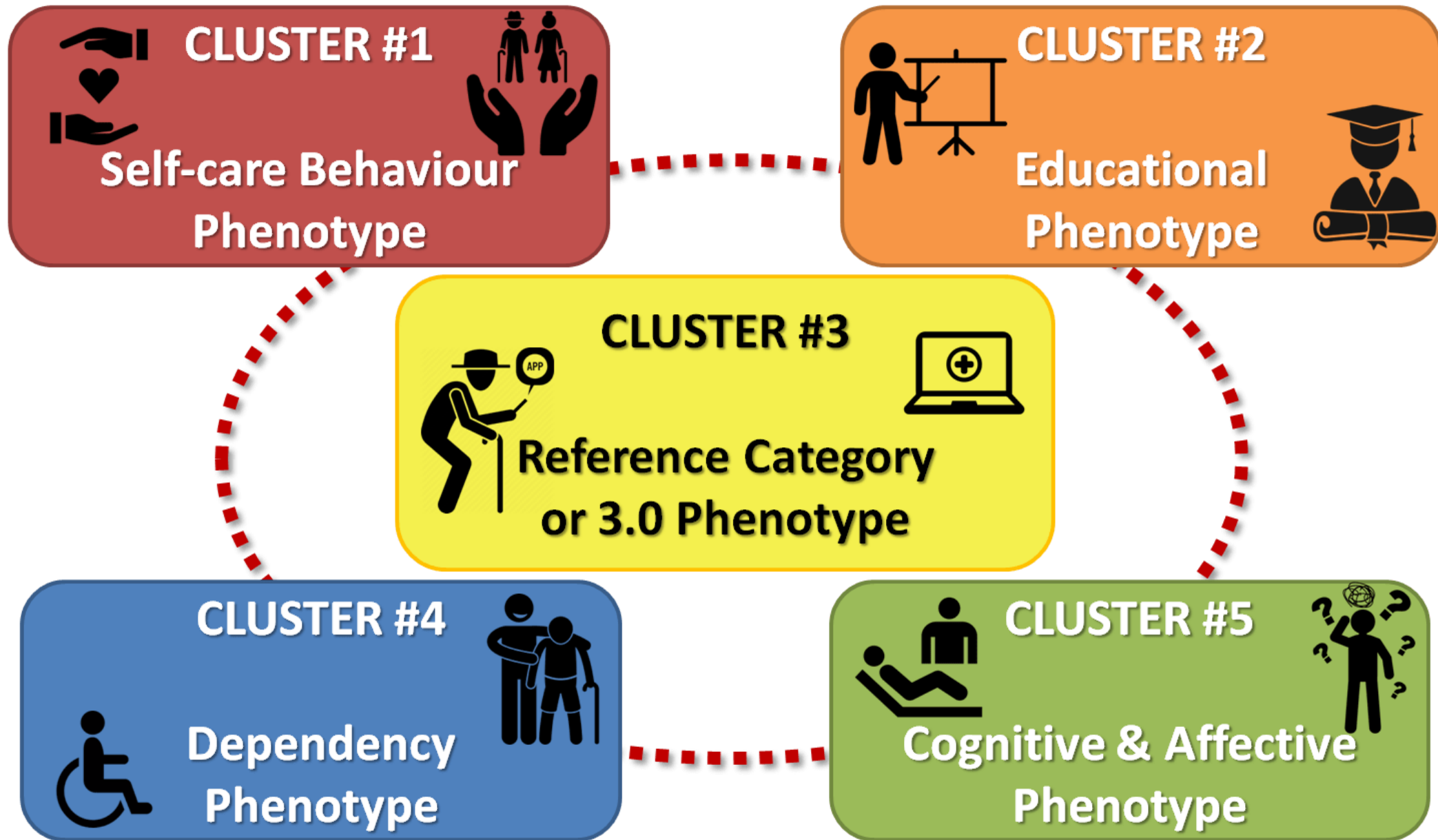


A close-up photograph showing two hands holding a small, rectangular piece of white paper. The paper is held between the thumb and index finger of each hand, with the thumbs positioned at the top edge. The word "frailty" is written in the center of the paper in a black, cursive-style font. The background is a blurred wooden surface with vertical grain lines.

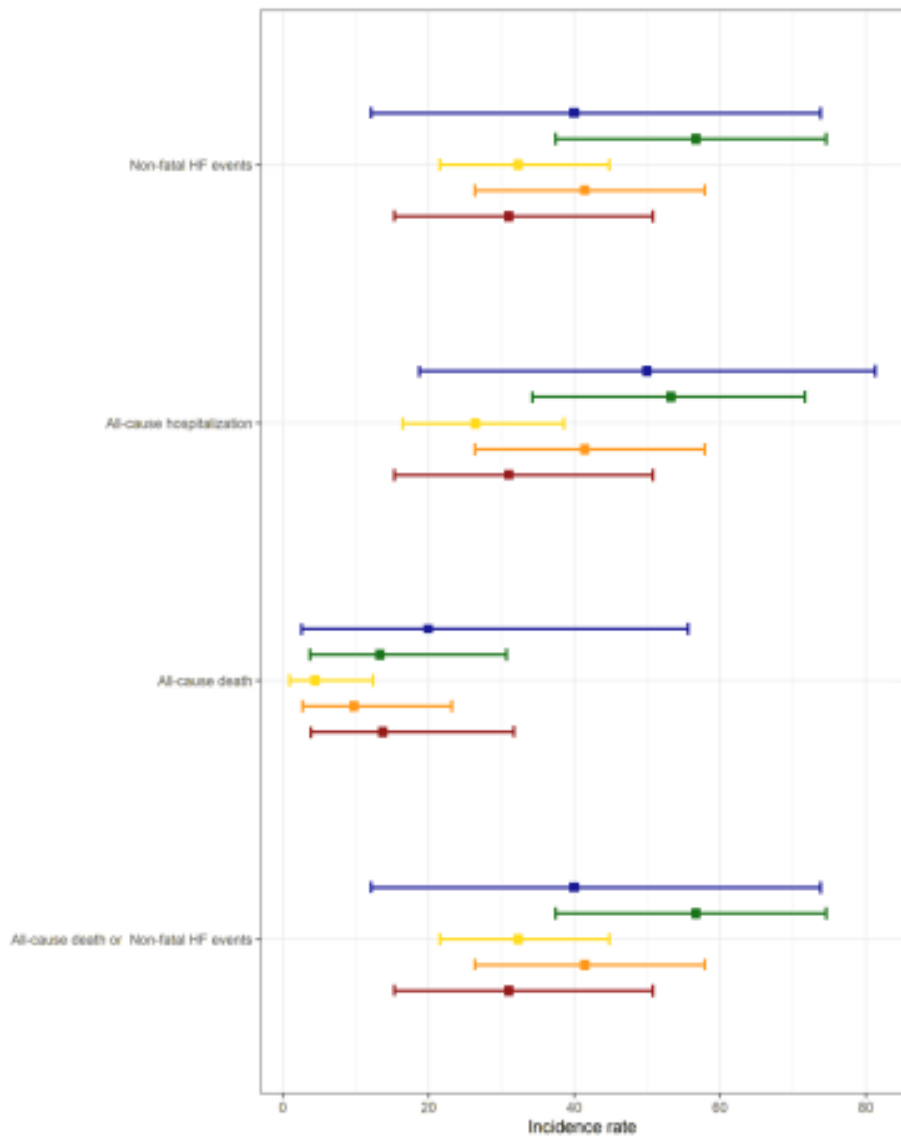
frailty

iCOR (*insuficiència Cardíaca Optimització Remota*) sub-analysis

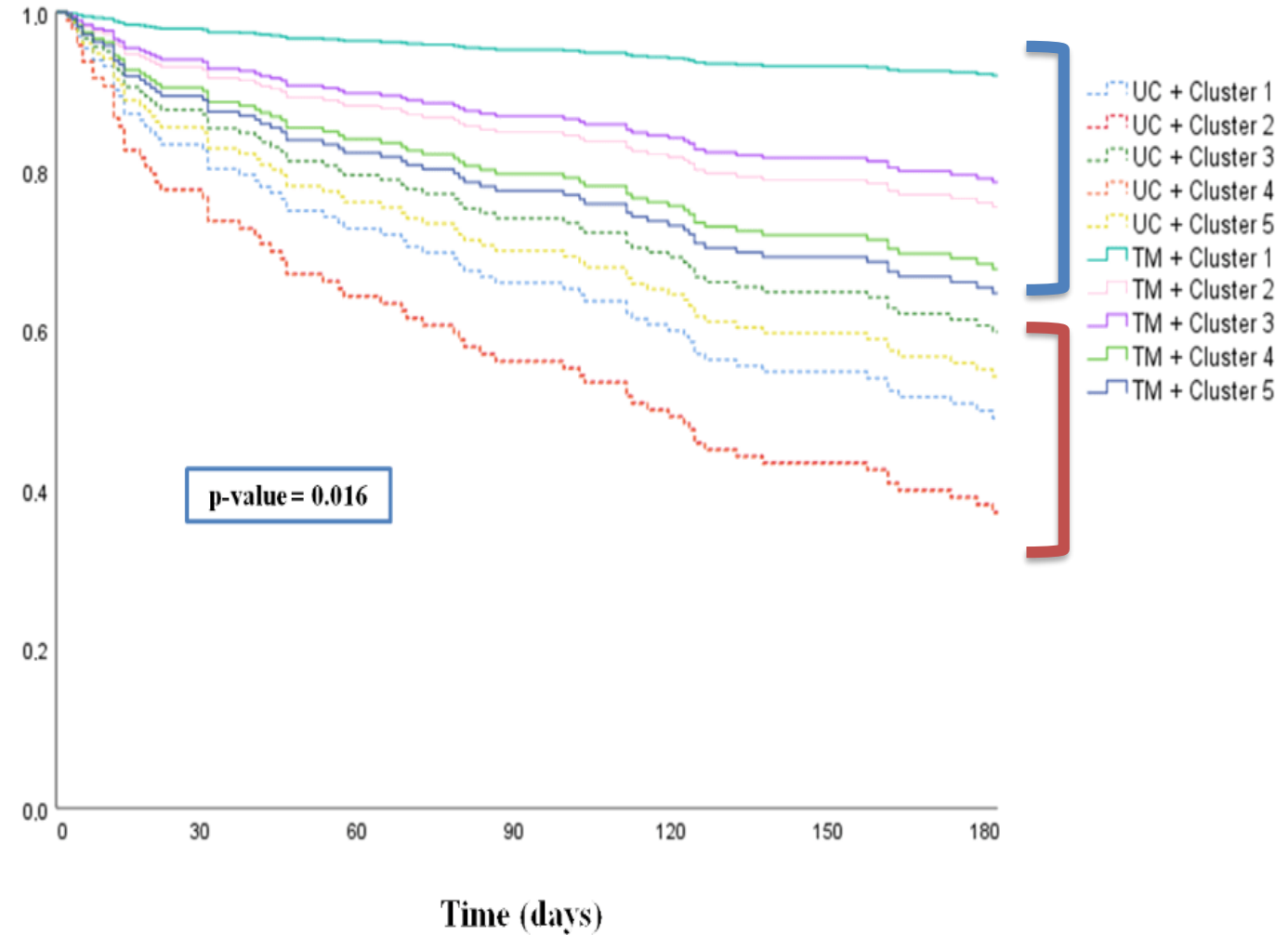




iCOR (*insuficiència Cardíaca Optimització Remota*) sub-analysis



Cumulative Probability of Non-Fatal HF Events



TM no invasiva → eficaz en la prevención de nuevos eventos clínicos en los 5 estratos de vulnerabilidad descritos.

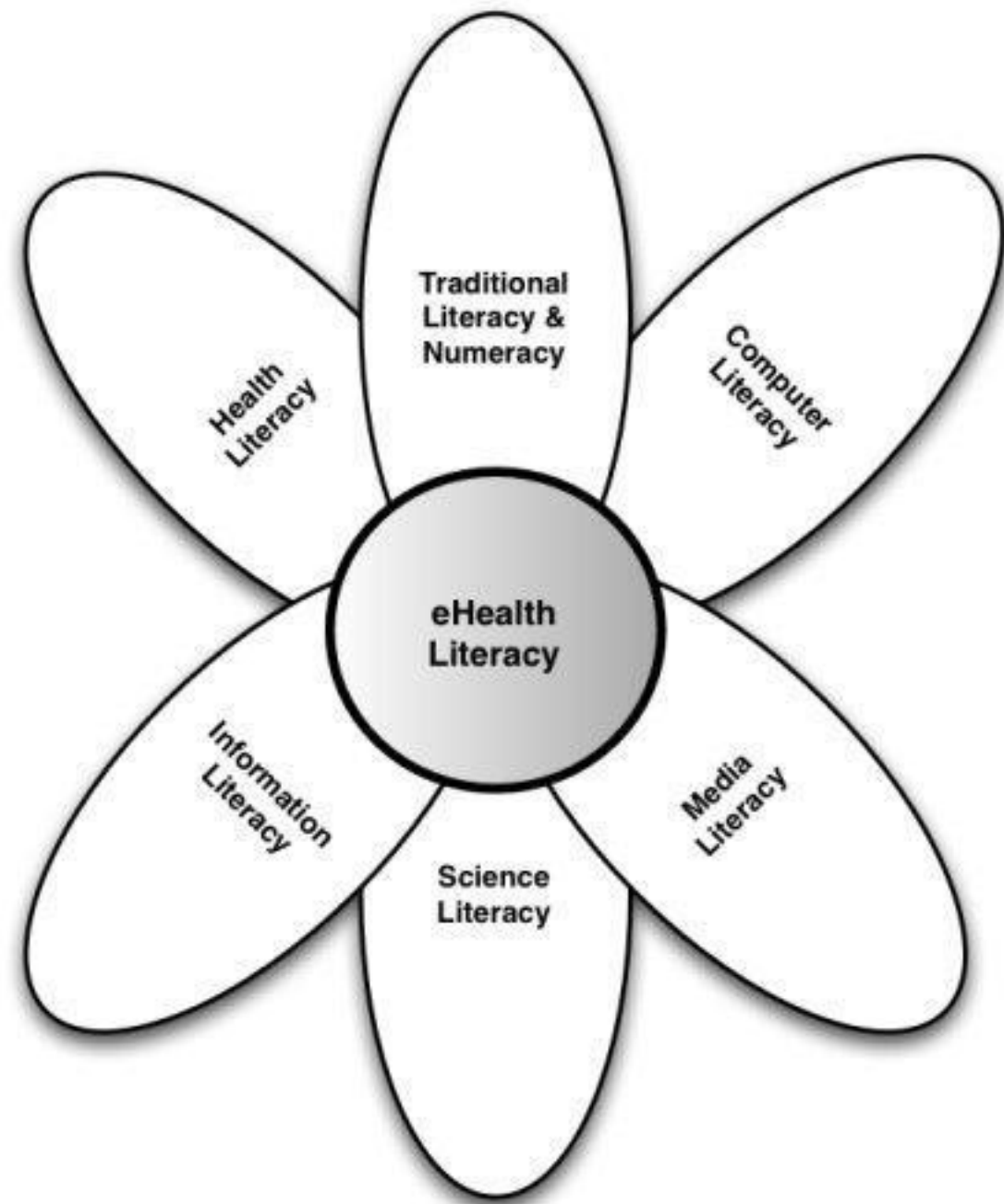
A close-up photograph of a thick, old wooden book with a dark cover. The book is lying flat on a light-colored wooden surface. On the spine of the book, eight small, light-colored wooden blocks are arranged in a row, each bearing a black letter. The letters, from left to right, are L, I, T, E, R, A, C, and Y, spelling out the word "LITERACY". The background is a blurred view of a library or bookstore with rows of books on shelves.

L I T E R A C Y



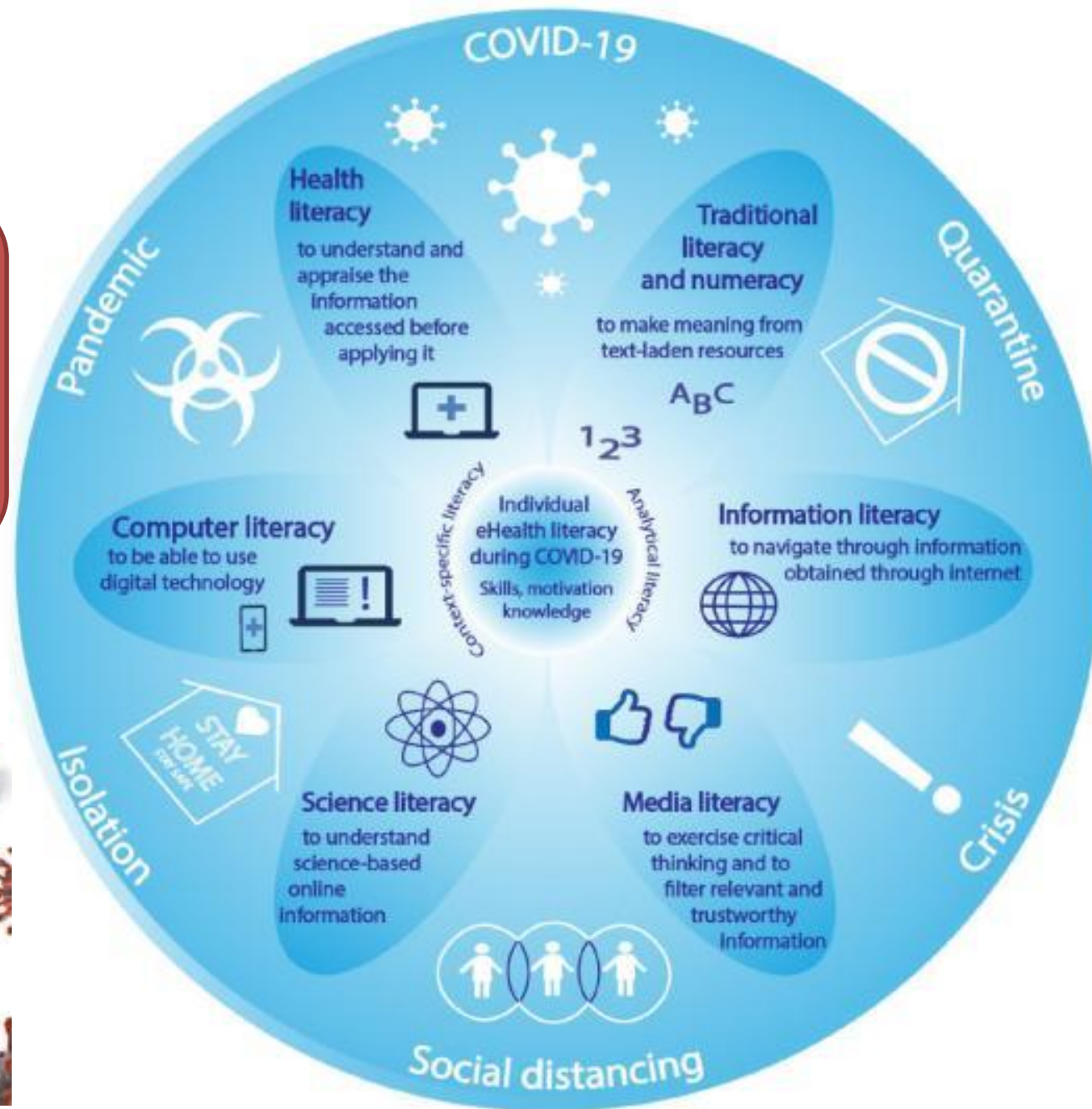
eHEALTH LITERACY

“Capacidad de buscar, encontrar, comprender y valorar la información sanitaria procedente de fuentes electrónicas y aplicar los conocimientos adquiridos para abordar o resolver un problema de salud”.





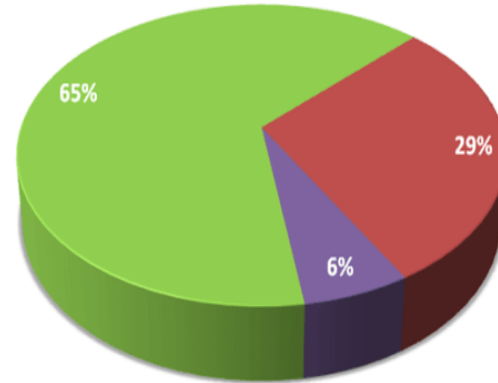
eHEALTH LITERACY



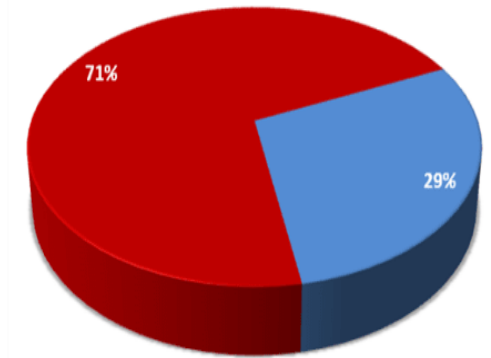


iCOR (*insuficiència Cardíaca Optimització Remota*) sub-analysis

“Traditional Literacy”

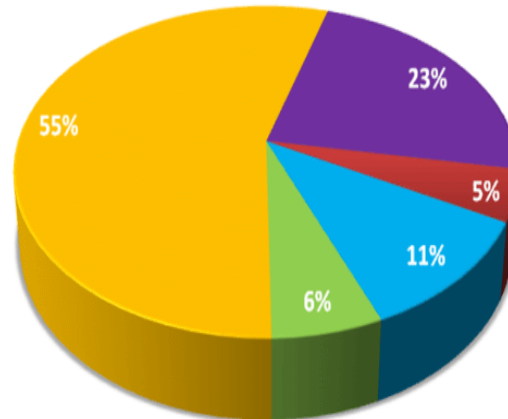


■ Illiterate ■ Elementary education ■ Middle school or higher education

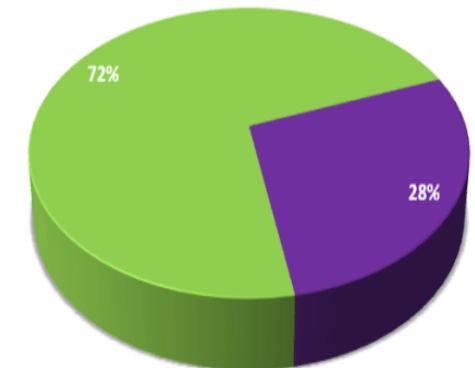


■ Lower Literacy ■ Middle or Higher Literacy

“Computer Literacy”



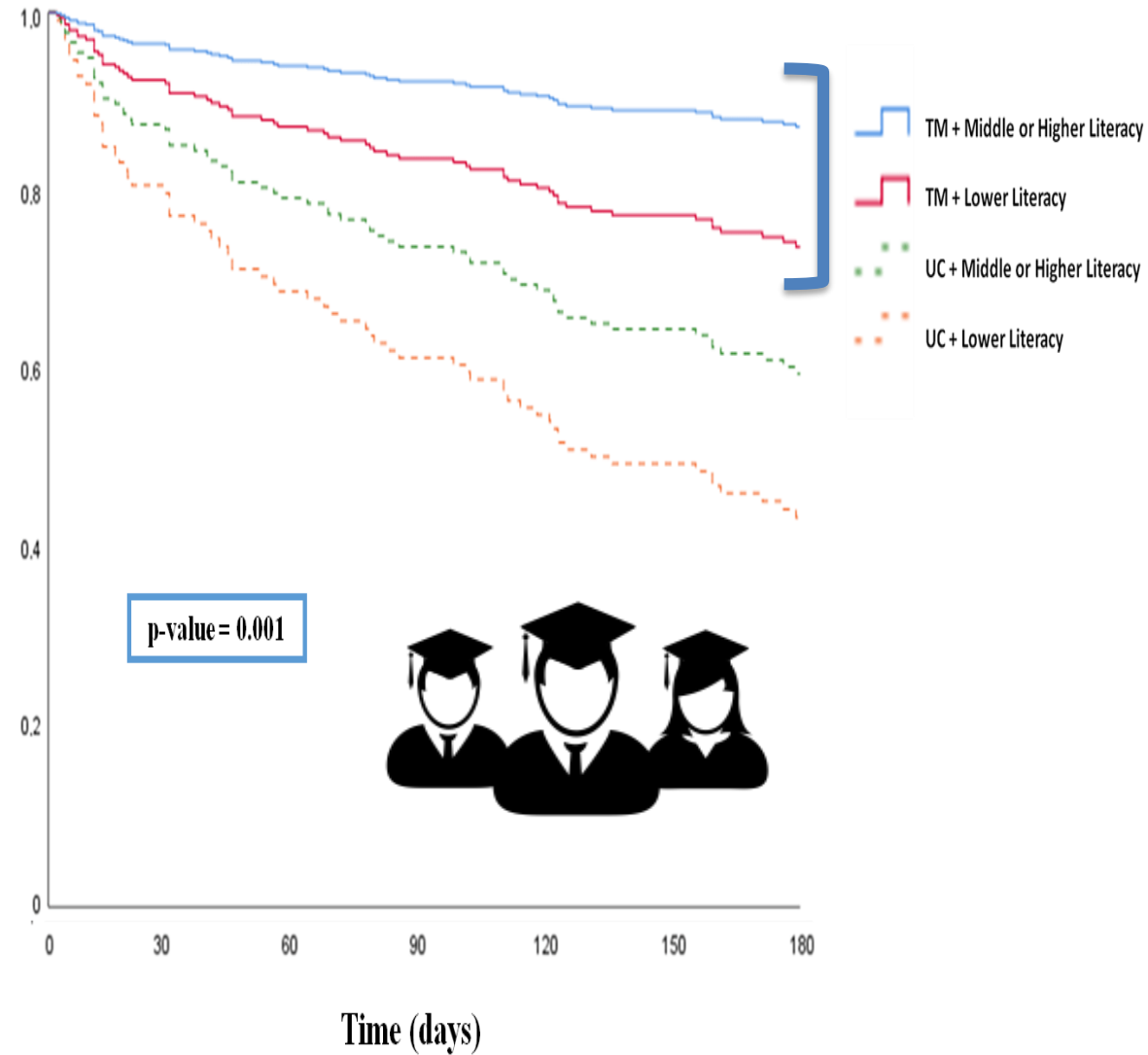
■ 1 ■ 2 ■ 3 ■ 4 ■ 5



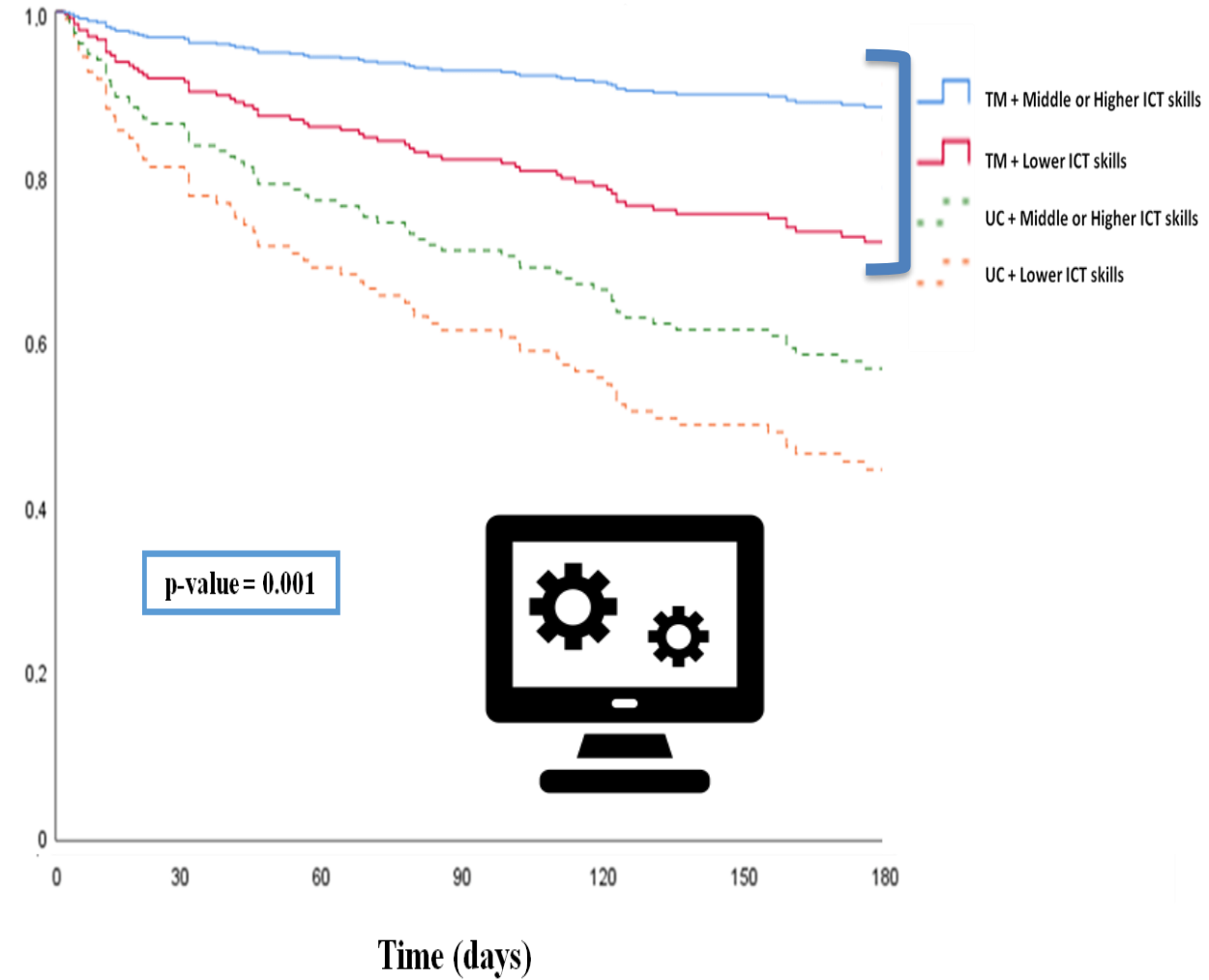
■ High Difficulties in New Technologies ■ No or Few Difficulties in New Technologies

iCOR (*insuficiència Cardíaca Optimització Remota*) sub-analysis

Cumulative Probability of Non-Fatal HF Events

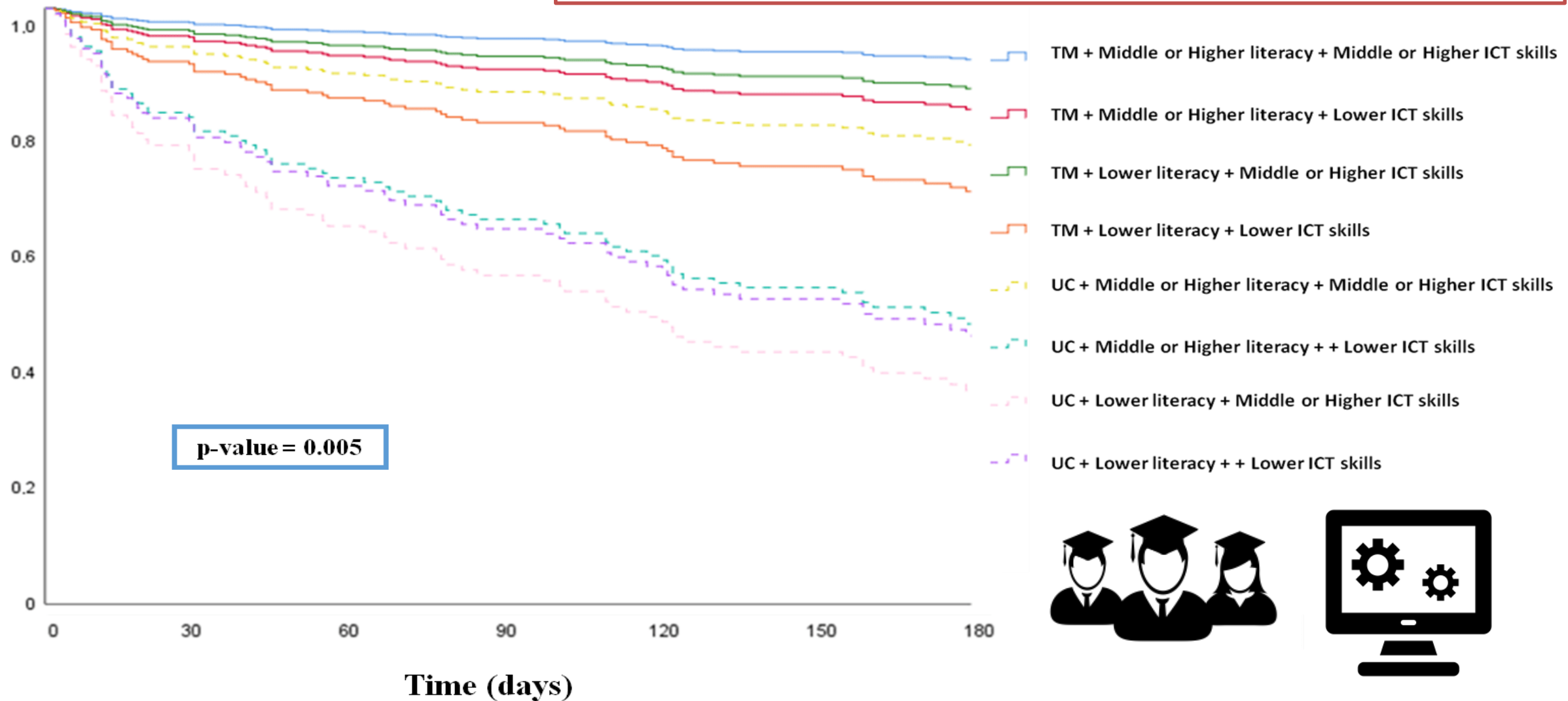


Cumulative Probability of Non-Fatal HF Events



iCOR (*insuficiència Cardíaca Optimització Remota*) sub-analysis

Cumulative Probability of Non-Fatal HF Events

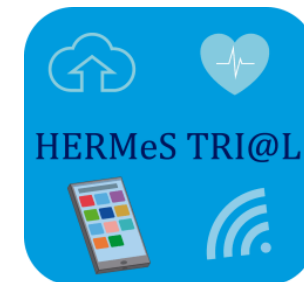


TM no invasiva → eficaz en la prevención de nuevos eventos clínicos independientemente al nivel de estudios y a la habilidad tecnológica.

What's

NEXT

Study design of Heart failure Events reduction with Remote Monitoring and eHealth Support (HERMeS)



Sergi Yun^{1,2,3} , Cristina Enjuanes^{1,2,4}, Esther Calero^{1,2,4}, Encarnación Hidalgo^{1,2,4}, Marta Cobo^{5,6}, Pau Llàcer⁷, José Manuel García-Pinilla^{6,8}, Álvaro González-Franco⁹, Julio Núñez^{6,10}, José Luis Morales-Rull¹¹, Paola Beltrán^{2,12}, Cristina Delso¹³, Román Freixa-Pamias^{2,14}, Pedro Moliner^{1,2,4}, Xavier Corbella^{2,3,15}, Josep Comín-Colet^{1,2,4,16*}  and the HERMeS trial investigators group

¹Community Heart Failure Program, Departments of Cardiology and Internal Medicine, Bellvitge University Hospital, L'Hospitalet de Llobregat, Barcelona, Spain; ²Bellvitge Biomedical Research Institute (IDIBELL), L'Hospitalet de Llobregat, Barcelona, Spain; ³Department of Internal Medicine, Bellvitge University Hospital, L'Hospitalet de Llobregat, Barcelona, Spain; ⁴Department of Cardiology, Bellvitge University Hospital, L'Hospitalet de Llobregat, Barcelona, Spain; ⁵Department of Cardiology, Puerta de Hierro Majadahonda University Hospital, Puerta de Hierro-Segovia de Arana Health Research Institute (IDIPHS), Madrid, Spain; ⁶Biomedical Research Networking Center on Cardiovascular Diseases (CIBERCV), Carlos III Health Institute (ISCIII), Madrid, Spain; ⁷Department of Internal Medicine, Manises Hospital, Medical Research Institute of Hospital La Fe (IIS La Fe), València, Spain; ⁸Department of Cardiology, Heart Failure and Familial Cardiomyopathy Unit, Virgen de la Victoria University Hospital (HUVV), Institute of Biomedical Research in Málaga (IBIMA), Málaga, Spain; ⁹Department of Internal Medicine, Central de Asturias University Hospital (HUCA), Foundation for Health and Biomedicine Research and Innovation of Asturias (FINBA), Oviedo, Spain; ¹⁰Department of Cardiology, Clinic of València University Hospital, Biomedical Research Institute of València (INCLIVA), School of Medicine, University of València, València, Spain; ¹¹Department of Internal Medicine, Heart Failure Unit, Arnau de Vilanova University Hospital, Lleida Biomedical Research Institute's Dr. Pífarre Foundation (IRBLleida), Lleida, Spain; ¹²Department of Cardiology, Viladecans Hospital, Institut Català de la Salut (ICS), Viladecans, Barcelona, Spain; ¹³Chronic Care Teams, Primary Care Service (SAP) Delta Llobregat, Foundation University Institute for Research in Primary Health Care Jordi Gol i Gurina (IDIAPJGol), L'Hospitalet de Llobregat, Barcelona, Spain; ¹⁴Department of Cardiology, Sant Joan Despi Moisès Broggi Hospital, Consorci Sanitari Integral (CSI), Department of Clinical Sciences, School of Medicine, Autonomous University of Barcelona (UAB), Barcelona, Spain; ¹⁵Hestia Chair in Integrated Health and Social Care, School of Medicine, Universitat Internacional de Catalunya, Barcelona, Spain; ¹⁶Department of Clinical Sciences, School of Medicine, University of Barcelona (UB), Barcelona, Spain

Recruitment is close to being completed...

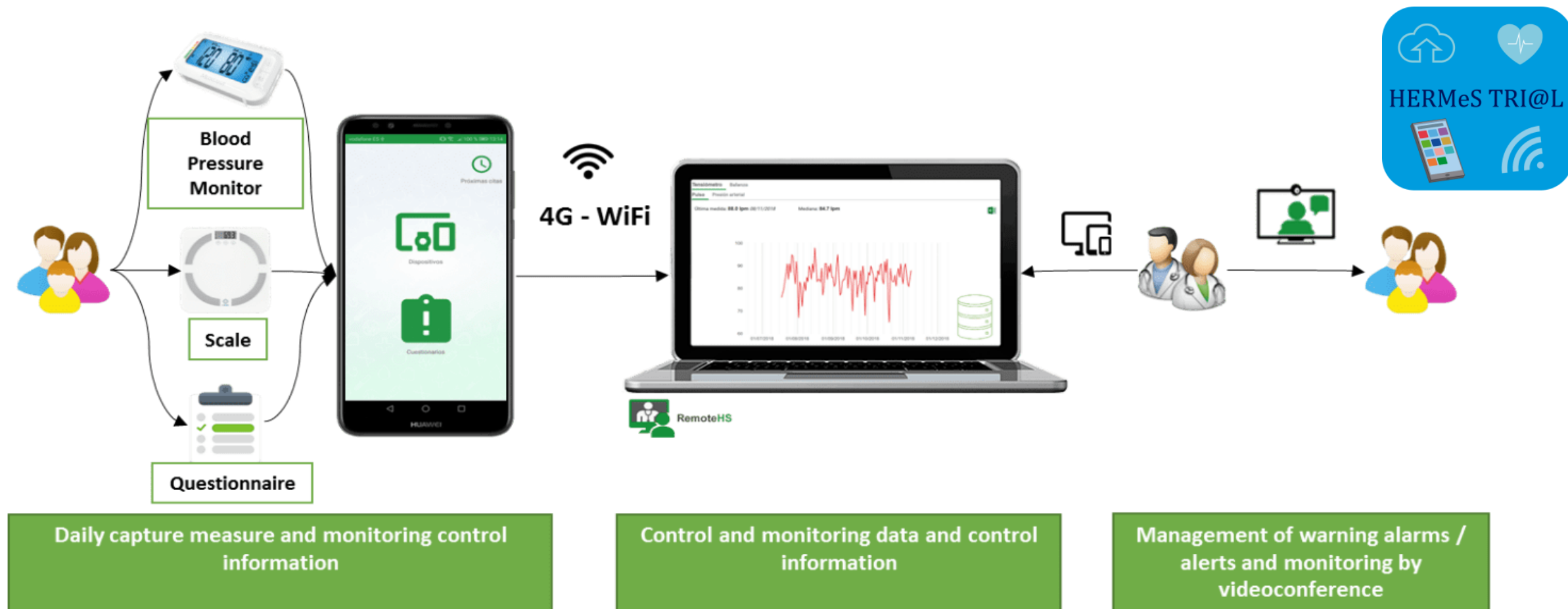
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PLEASE WAIT

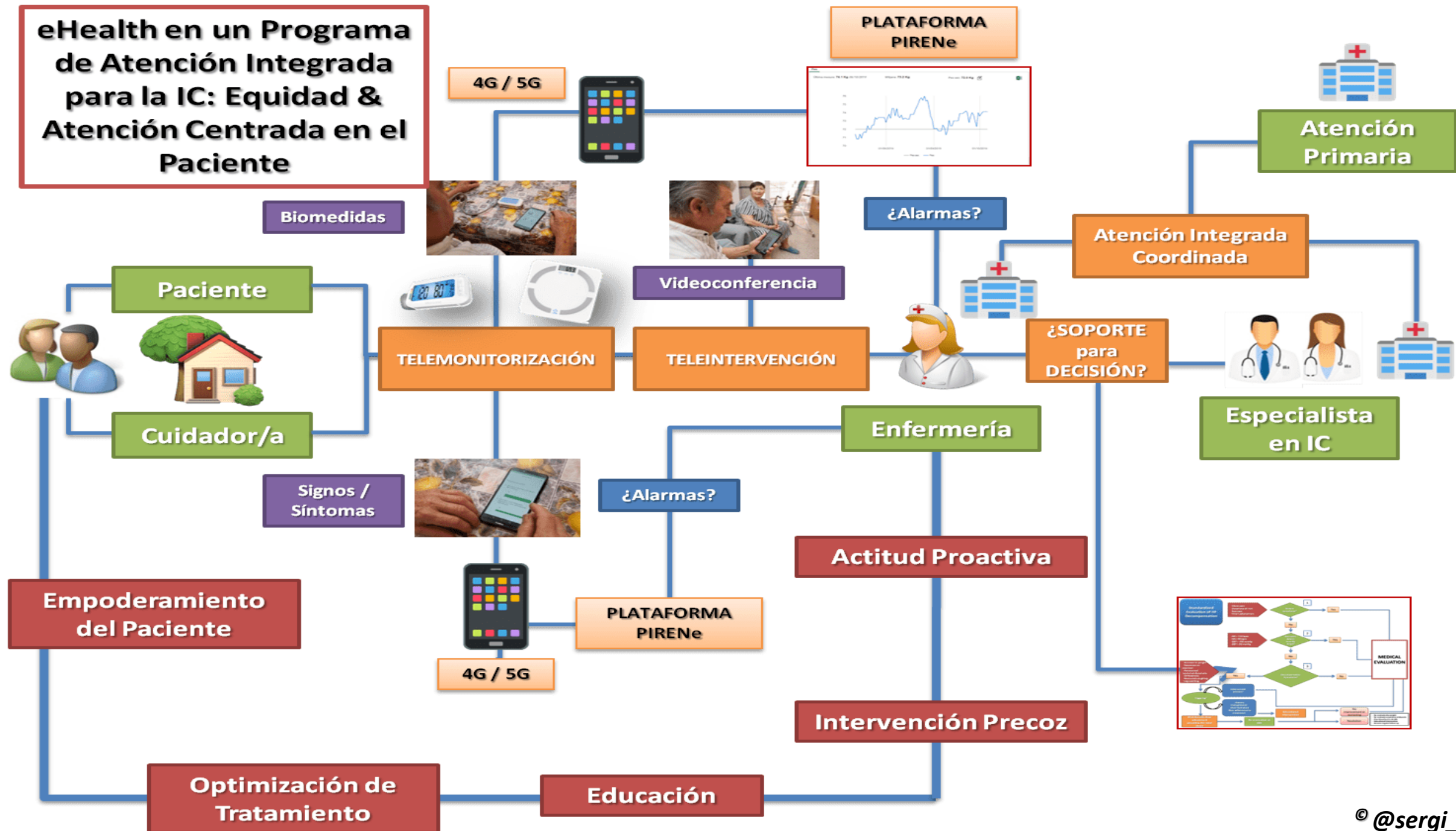
PIRENe Platform

(Platform for the provision of tele-Intervention, Remote monitoring and Empowerment to people with chroNic disease based on eHealth)



Yun S, et al. ESC Heart Fail. 2020 Sep 17;7(6):4448–57.

eHealth en un Programa de Atención Integrada para la IC: Equidad & Atención Centrada en el Paciente





#TAKE HOME MESSAGES

- ✓ La **eHealth** debe ser una **herramienta fundamental** en esta “**nueva realidad**”.
- ✓ El uso de la **eHealth** es **factible** en pacientes con **IC** en el “**mundo real**”.
- ✓ Soluciones **no invasivas** de **eHealth** pueden y deberían ser claves en el **seguimiento actual y futuro** de la **IC**.
- ✓ Una buena herramienta de **eHealth** es óptima si se **encaja** en un **proceso de atención integrado, estructurado, coordinado, bien definido** y dirigido a pacientes en “**fase vulnerable**”.



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Moltes gràcies!



sergi.yun@bellvitgehospital.cat



[@sergi_yun](https://twitter.com/sergi_yun)



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