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**CONGRESSO
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**LA MEDICINA
GENERALE
NEL TERZO
MILLENNIO**

**03 / 08
OTTOBRE 2011**
Tanka Village
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“Il progetto inCASA. Reti di sensori a supporto dell’assistenza socio-sanitaria: esperienze europee a confronto”.



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Integrated Network
for Completely Assisted
Senior Citizen’s Autonomy

Welcome to the inCASA project's website.



inCASA Consortium

N°	ORGANISATION	WEB ADDRESS
1	 REPLY - Santer Reply s.p.a (Coordinator)	http://www.reply.eu/
2	 CHC - Chorleywood Health Centre	http://www.chorleywood.org/
3	 CNET - CNet Svenska AB	http://www.cnet.se/
4	 IN-JET - IN-JET APS	www.in-jet.dk
5	 INSERM - INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE	http://www.inserm.fr/
6	 INVENT - INVENT SAS	http://www.invent.fr/
7	 NTUA – National Technical University of Athens	http://www.ntua.gr/
8	 KGHNI - Konstantopouleio General Hospital of Nea Ionia Agia Olga	http://www.agiaolga.gr/
10	 SIG - Steinbeis Innovation gGmbH	http://www.stw.de/
11	 TID - TELEFONICA INVESTIGACION Y DESARROLLO SA	http://www.tid.es/
12	 BU - BRUNEL UNIVERSITY	http://www.brunel.ac.uk/
13	 FHC - FUNDACION HOSPITAL CALAHORRA	http://fhcalahorra.es/
14	 ACT Torino - Agenzia Territoriale per la Casa della Provincia di Torino	http://portale.atc.torino.it/

Project start date: 1st April 2010
 Duration: 30 months
 Coordinating partner: SANTER REPLY Spa
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Objectives



A system developed to improve quality of life and social care for the ageing population and to prolong the time elderly people can live independently at home



- Provide elderly people with means to profile their “in home” habits** by using unobtrusive motion/contact sensors and a Smart Personal Platform with an embedded Habits Analysis Application able to manage alerts
- Provide elderly people with means to monitor their health conditions** at home, by using state of the art personal health systems and integrated telemedicine services
- Provide doctors and health professionals with more comprehensive monitoring data** for understanding remote user’s social/physical conditions and diagnostics
- Enable continuity of care** through a wider interaction between elderly people and caretakers, especially including not just health specialists but also relatives or people who has close social relations with the user
- Integrating home automation in a system permitting remote control** of electronic devices in the immediate surroundings, to cover the special necessities of the elderly and to make active ageing a reality

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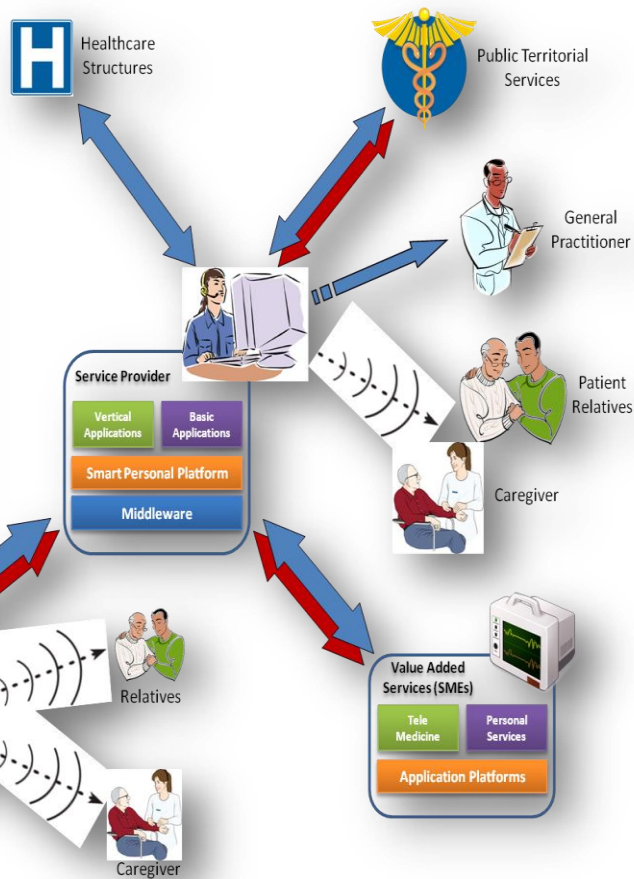
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Model Overview

- Data Interoperability
- Audio-Video Communications
- SMS
- Environment Monitoring
- Human Monitoring
- Reminder
- Touch Screen
- Smart Phone/Base Station



User House:

- Monitoring of user habits to build a personal profile
- Monitoring of user health conditions
- Alerts management

Service Provider:

- Call Center/Help Desk to manage incoming alerts
- Social and Healthcare specific services involvement and coordination
- IT management

Additional Services:

- Tele medicine
- Home monitoring Services

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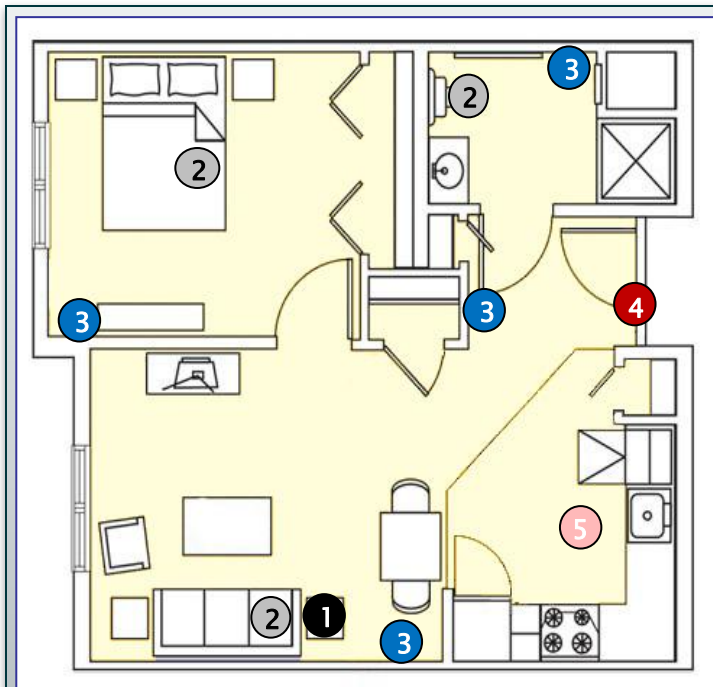
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inCASA Monitoring (1/2)



inCASA – Basic Set

- 1 Base Station
- 2 Habits Sensors
- 3 Motion Sensors
- 4 Contact Sensor
- 5 Alert

Status	
Activity	Flag
Morning Wake up	Green
Meal Preparation	Green
Activity Index	Red
Bathroom Visits (Night Time)	Yellow
Medication (If medicale place)	No Data
Outside	
Inside	

Activity Details	
Date	Event Occurrences
Monday April 12th, 2010	3
Tuesday April 13th, 2010	1
Wednesday April 14th, 2010	6

Event Details		
Date	Start Time	Duration
Monday April 12th, 2010	1.02	1 Min
Monday April 12th, 2010	3.05	1 Min
Monday April 12th, 2010	5.55	9 Min

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inCASA Monitoring (2/2)

Area	Variable	Needs
Human Monitoring	Body temperature (°C/°F)	Msrs 2-3 times / day
	Skin Moisture (%)	Msrs 1-2 times / day
	Respiratory Acts (freq.)	24h profiling or 3-4 representative times /day
	Heart beat (O/I)	Wearing/not wearing dispositive control – 24/7
	Heart frequency (bpm)	Cardiac 24h profiling
	Blood Pressure (mmHg)	Msrs 3-6 times /day, depending on patient
	Blood Glucose (mg/dl – mmol/L)	Msrs 3 times/day, before and after meals Occasionally, in presence of hyperglycemia or hypoglycemia symptoms
	Weight (Kg)	Msrs 1 time / 2-3 days
	Wrist moving (Acceleration)	Circadian Cycle/Sleep-wake Rhythm
	Oximetry (saturation of O ₂ in the blood)	Ordinary msrs throughout the day or Occasional measurement in case of <u>dyspnea</u>
	Cardiac Enzymes (esp. Troponin)	Ordinary msrs throughout the day or Occasional msrs in presence of cardiac symptoms
	Prothromvine time/INR	Occasional msrs when needed

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Sensor Network

Sensor	Illustration	Source
S1.2.1 Position Sensor Door / Window		http://www.alertme.com/
S1.2.2 Energy sensor (per device) plus switchable outlet		http://www.pikkerton.de/zigbee/ZigBeeEnergyMeter.html
S1.2.3 Occupancy sensor		http://www.alertme.com/
S1.2.4 Temperature/humidity sensor		http://www.zigbeesensors.co.uk/index.php?cat=Overview
S1.2.5 Light switch / dimmer		http://www.centralite.com/
S1.2.6 Door lock		http://www.bdihhi.com/accesscontrol/

Sensor	Illustration	Source
S5.2.1 Light switch		http://www.cooperiringdevices.com/
S5.2.2 Lamp dimming control		http://www.cooperlighting.com/
S5.2.3 Door lock		http://consumer.schlage.com/products/ProductDetail.asp?styleID=136&functionID=79&finishID=5
S5.2.4 Motion sensor		http://www.act-solutions.com/HomePro/HomeProProductGrid.htm
S5.2.5 Door/window contact		http://www.everspring.com/Products/Home_Automation_Detail.asp?parentUID=83&UID=355&CategoryUIDList=0,83
S5.2.6 Shade control		http://www.rsceneautomation.com/prod_list.php?cat_ID=6

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Services for Pilots

Partner	Country	Setting	Size	Aim
ATC	Italy	Social	20	Integrate social housing and social services by employing telecare services enabled by inCASA.
CHC	UK	Primary Care	25	To compare variations in the activity template and the variations in the physiological parameters to identify patterns and to understand if and how environmental monitoring can aid or even predict clinical events
INSERM	France	Hospital	30	To evaluate the effects of the cancer treatment through the detection of movements (cronoteraphia), and to make rapid decisions to improve safety of home delivery of cancer chemotherapy in elderly patients
KGHNI	Greece	Hospital	25	Ensure best medical compliance for patients after discharge while staying at home, by monitoring their medical compliance and normal habits, trying to precociously identify any incoming risk related to the patient socio-health conditions
FHC	Spain	Hospital	30	To promote and monitor rehabilitation exercise at home in order to improve patients' quality of life.

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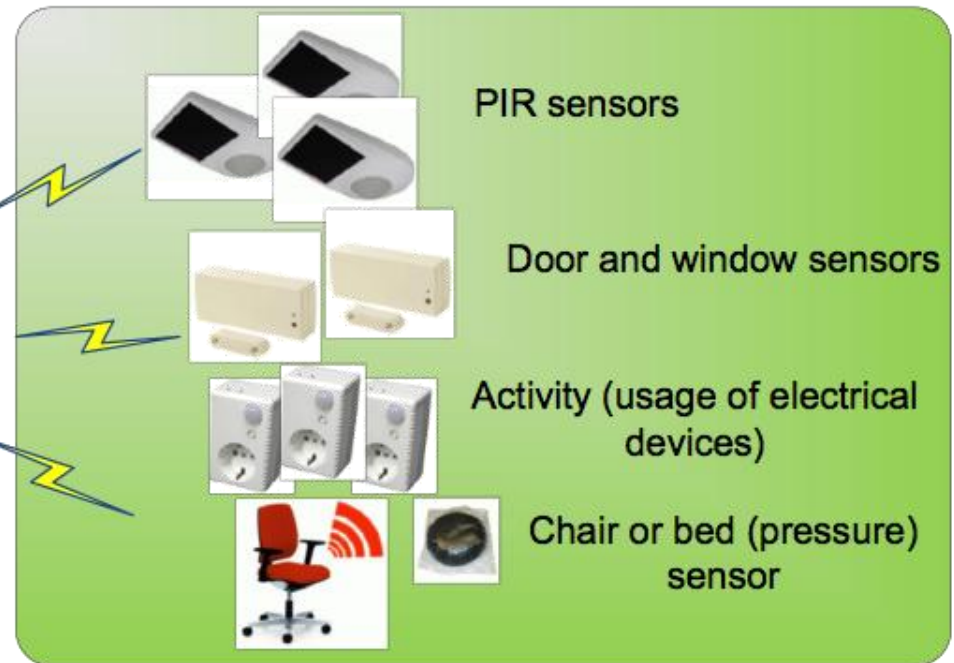
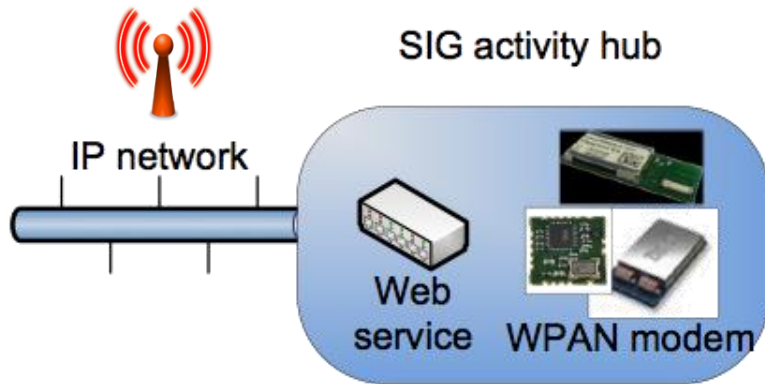
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ATC Ex: technical infrastructure

End User's House

Client place/room



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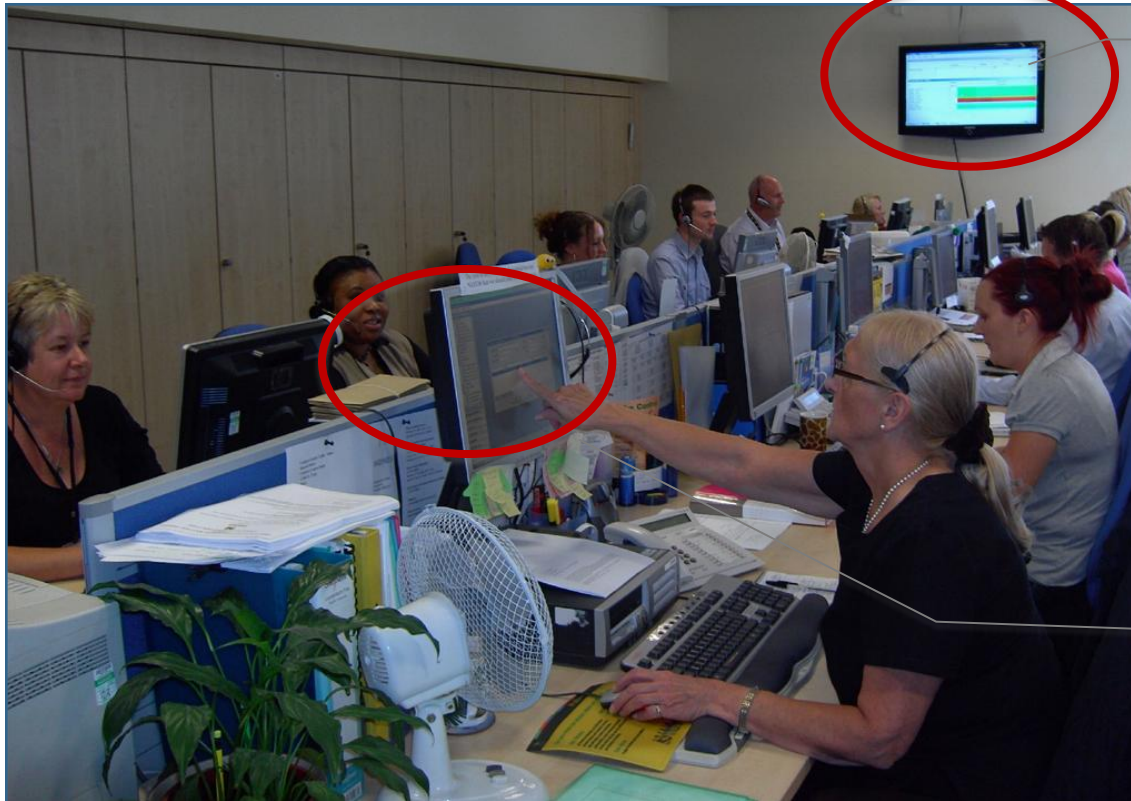
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ATC Ex: contact center



Technical Alerts (i.e. Flooding alert) are immediately visualized on a wall screen

Alerts are sent via sms to User/Relative/Operator



Personal Data are displayed on operator's workstation

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ATC ex: Services for Pilots

Senso rs	Door	Movement	Water	Temperatur e ¹	Bed	Chair	Activit y
Time							
00:00-3:00	●	●	●	●	●	●	●
3:00-6:00	●	●	●	●	●	●	●
6:00-9:00	●	●	●	●	●	●	●
9:00-12:00	●	●	●	●	●	●	●
12:00-15:00	●	▼	●	▲	●	●	●
15:00-18:00	!	●	●	▲	●	●	●
18:00-21:00	●	●	●	●	●	●	●
21:00-00:00	●	▲	●	●	▼	●	●

**Variations from usual habits /
normal values**

- Less than 50 % / normal
- Between 50% and 70% /mild over threshold
- Over 70% /much over threshold

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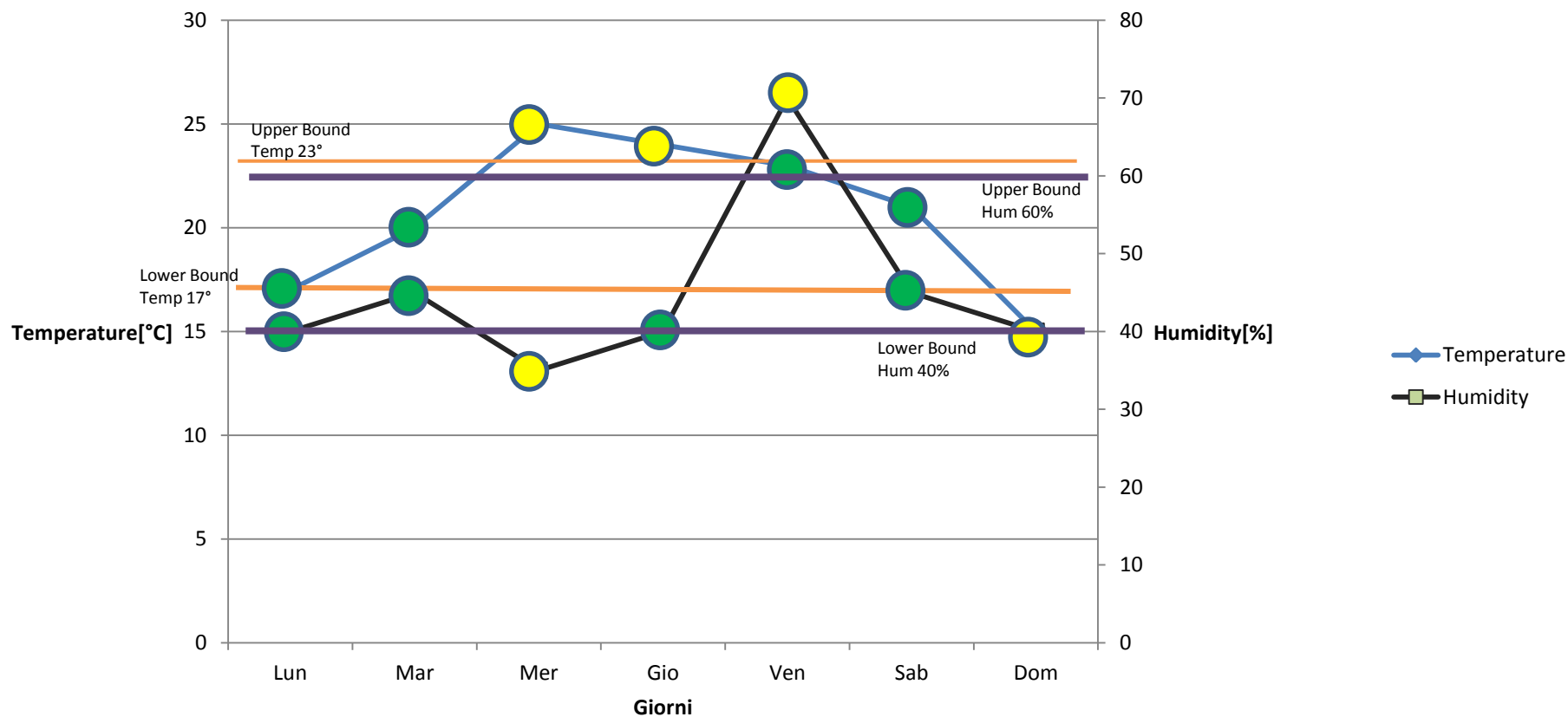
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ATC ex: weekly report



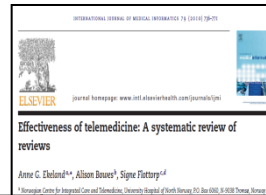
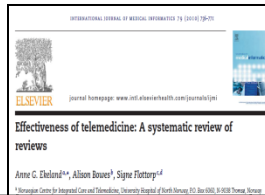
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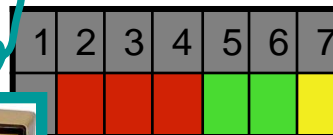
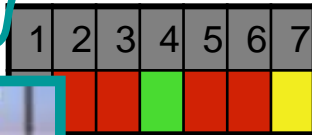
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Methodology evaluation (MAST)



1. Problem, Application	2. Safety	3. Clinical	4. Patient	5. Economic	6. Organi- zational	7. Socio- cultural
Describe	Evidence? Outcome?	Evidence? Outcome?	Evidence? Outcome?	Evidence? Outcome?	Evidence? Outcome?	Evidence? Outcome?



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Open Points

- ❖ Telecare v/s telehealth ie. integration
- ❖ GP involvement
- ❖ Ethics
- ❖ Open standards and inclusive platforms

Massimo caprino

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<http://www.incasa-project.eu>



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