Strategic Intelligence Monitor on Personal Health Systems (SIMPHS):
Remote Monitoring & Treatment
Market Structure & Innovation Dynamics

SIMPHS Validation Workshop

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IPTS – IS Unit
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**IPTS**: Part of DG JRC of the EC: 7 Research Institutes across Europe

**Mission**: “to provide customer-driven support to the EU policy-making process by researching science-based responses to policy challenges that have both a socio-economic as well as a scientific / technological dimension”

**Modus operandi**: desk research, expert groups, modelling, centres of Expertise, foresight
EC study on business models for eHealth (RAND)

Danish business case for COPD

Case studies identified in SIMPHS

Your Input!

Insights from Projects, pilots & companies analysis

VTT Country studies (F, DE, SE, UK)

IPTS country analysis (presentation of IT & NL)

The Big Picture

Lessons, future steps and policy issues
Contents

Context and objectives

PHS/RMT: The Big Picture/ What is the problem

Evidence from companies, pilots & projects review

Barriers in an ecosystem perspective
Health Care provision in the EU

HC in EU ~9% of EU GDP and ~9.3% of workforce > 15M people
HC is information intensive

BUT:

- Growing importance of health sector (expected to rise to 16% of GDP by 2020, due to demographic and health/sickness developments)
- Predicted shortage of medical professionals (≈ 25% of total workforce)
- Changing Lifestyles influence health and disease patterns

Health trends:

- Paradigm shift towards patient centred and out-of-hospital
- Proactive nurturing of personal wellness (preventive / predictive medicine)

Serious problems in transforming HC delivery

- Resistance to change by public organisations and market parties alike
- Resistance in changing organisational processes
- Different perception among main stakeholders
The role of PHS

eHealth very important: in containing costs and in supporting growth

EHealth/personal health systems (PHS) are key
- patient and consumer driver (driver of the economy → Lead-Market)
- decongestion of secondary care infrastructure (chronic disease segment)

However lack of PHS take-up
- technological, organisational and institutional barriers

Hence the need for additional knowledge to understand market and innovation dynamics

→ Request by DG INFSO (Unit H1: ICT for Health) to develop a monitor that provides an overview of PHS market and innovation dynamics
Definition of PHS is essential (PHS2020)

Personal Health Systems (PHS) assist in the provision of continuous, quality controlled, and personalised health services to empowered individuals regardless of location. They consist of:

a) Ambient and/or body (wearable, portable or implantable) devices, which acquire, monitor and communicate physiological parameters and other health related context of an individual (e.g., vital body signs, biochemical markers, activity, emotional and social state, environment);

b) Intelligent processing of the acquired information and coupling of it with expert biomedical knowledge to derive important new insights about individual’s health status;

c) Active feedback based on such new insights, either from health professionals or directly from the devices to the individuals, assisting in diagnosis, treatment and rehabilitation as well as in disease prevention and lifestyle management.
In the first year of the project SIMPHS, research on RMT:

**Remote Patient Monitoring and Treatment (RMT) systems:**
- monitor vital signs of patients with chronic diseases
- improving quality of care and quality of life of the patient
- enabling prediction of aggravations and exacerbations

RMT help patients keep control over their health condition so they can live independently or with limited care.
**Project planning**

**Phase 1** (2009)
- Remote Patient Monitoring
- Design of SIM

**Phase 2** (2010)
- Personal Health Systems
- Improved SIM

**Phase 3** (2011)
- Monitor supporting EU policy objectives

**Schedule**
- **Area of focus**
  - Remote Patient Monitoring → Personal Health Systems
  - Design of SIM → Improved SIM
  - Improved SIM → Monitor supporting EU policy objectives

- **Conceptual framework**
  - Design of SIM
  - Improved SIM

- **Policy impact**
  - Policy brief

- **Other sources**
  - EU-studies
Main Research Activities

- Inventory of health care system of various EU countries
- RMT country analysis ES, IT, DK, NL + outsourced FR, DE, SE, UK
- Collection and aggregation of relevant literature on PHS/RMT-markets
- Inventory of 200+ firms on PHS market in broad terms and analysis of 50 more RMT focused
- Review and analysis of projects/trials, in Europe (EU/national/regional & industry-led)
- Analysis of specific business cases/networks: Barcelona (Hospital Clinic); Vitaphone (Germany); HTN (Lombardy, IT); ECCH (N. Ireland)
- Description of PHS/RMT market, drivers and barriers; understanding innovations and market dynamics with present day innovation theory; definition of indicators (ongoing).
Contents

Context and objectives

PHS/RMT: The Big Picture/ What is the problem

Evidence from companies, pilots & projects review

Barriers in an ecosystem perspective
1 Introduction

2+3 Problem and evidence

• Urgent drivers
• Clear potential
• Infant market

3 Why: Theory

• S-Shaped thinking
• Disruptive innovation
• Socio-institutionalism
• Healthcare ecosystem

4 Why: Theory

5 Why: views from the field

• Views on barriers:
  • Restructuring
  • Incentives
  • Reimbursement
  • Inter-operability
  • Etc..

6 Scenarios and policy

• Scenarios
• Impact simulation
• Unlocking the potential
HC Challenges

Pressures

More demand

Resource constraints

Ageing

Consumerism & access

Income / education

Shrinking tax base

Scarcity of carers

Little funds for innovation

System inefficiency

Untapped information

Fragmented care process

Overshooting

Little optimisation c. service delivery models

Difficulty to meet increasing and changing demands

Vicious circle

Resource constraints on reform and innovation

Financial resources barely meet ordinary delivery
Increase quantity and quality of care, while ensuring financial sustainability and coping with decreasing pool of carers. 

PHS/RMT help produce more and better output with almost the same cost.

Optimisation of delivery models through increasing patient centricity.

Increased capacity to meet more and new demands.

ICT driven Innovation to leverage information.

Cost partially contained and more resources freed for innovation.

Virtuous circle

ESLA “ICT for sustainable health”
PHS2020 Vision

User interfaces
Decision-making Support
Probabilistic Expert Reasoning
Technology Assessment and Validation
Standard, Terminologies, Vocabularies

Medical Informatics in support of Functional Genomics
- Computational Grid
- Security
- Processing of 3D Images
- Large Data Acquisition Systems
- Noise detection & error handling
- Controlled Vocabularies
- Knowledge representation & ontologies
- Text mining & information retrieval
- Knowledge data mining & discovery
- Modeling & Simulation

Clinical Practice & Research

Bioinformatics in support of Personalised Healthcare
- Comparison and Prediction algorithms
- Database integration
- Automatic annotation

Source: PHS2020 Book, p. 103
### Chronic diseases driver

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Prevalence</th>
<th>Costs</th>
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| Diabetes | • 53 m in 2007 (64 m in 2025)  
• 2.2 million DALYs yearly | • EU 27 ID 82m in 2007 (98m in 2025)  
• Study on 8 countries: € 29 bln per year (Type II) |
| COPD     | • Range from 4% to 11%  
• 2 million DALY lost yearly | • No aggregate data found  
• cost per patient per year: from € 400 up to € 2.100 |
| CVD in general | • Difficult to calculate,  
• 12 million DALYs lost yearly | • In 2006 EU27 € 106 bln direct costs= 10% of expenditure  
• 54% of it for hospitalisation  
• Indirect costs: € 83 bln |
| CHF      | • Difficult to calculate,  
• No decline since the 1980s  
• Up to 1/3 of death attributed CHD may be related to CHF | • Up to 20 billion per year  
• On average 50% re-hospitalisation after six months |
• **RMT proven outcomes**
  • Clinical outcomes: robust evidence
  • Cost-effectiveness: inconclusive?
  • CHF:
    - Re-hospitalisation due to CHF reduced
    - All cause re-hospitalisation not?

• **US VHA study:**
  • Diabetes: 20.4% utilisation decrease;
  • CHF: 25.9% utilisation decrease
  • COPD: 20.7% utilisation decrease

• **Other Studies:**
  • RCT for HBT in Italy (↓ hospitalisation readmission, ↓mortality)
  • Similar outcomes with diabetes/ COPD in other studies

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**Reducing diabetic death**

11,000 deaths caused by complication ensuing from diabetes could be reduced in the six Member States through the combined applications of EMR and disease management

*Source*: EU Swedish Presidency, (2009) *eHealth for a Healthier Europe!* , p. 34

**Reduce hospitalisation**

Application of telemedicine and home health monitoring could avoid 5.6 million admissions to hospitals for chronically ill patients in the six Member States

- Drivers and evidence would justify expectation of RMT having took off
- Diffusion remain limited
- RMT comparatively a laggard
- Turf wars, training needs, technology fragmentation as some of the reasons

*eHealth adoption in six Member States*

Market data (1/2)

• **F&S 2008 European RMT Report:**
  - RMT market estimated worth €127.9 million in 2007, to increase to €292.3 million in 2014
  - 40% market share to RMT vendors (€ 52m) / 60% to service providers (€ 76m)
  - Service quantification does not include medical activities
  - UK is EU leader, followed by Germany, Italy & France

• **GMD 2009 Report**
  - Focus on RMT devices only, valued €28.1 million in 2008, with 2.9% growth rate per year until 2015 to reach €34.5 million
  - Drivers for growth are CVD prevalence increase, use of RMT in homecare settings
  - Leading market is France

• **In comparative perspective:**
  - RMT is 0.6% of total estimated value of eHealth market
  - blood glucose segment: RMT 0.7% vs. 99.3% blood glucose strips
• Can market data be considered representative when:
  - Boundaries for RMT are very fuzzy
  - There is no consensus on what activities should be in/out
  - There is a myriad of small scale activities going unnoticed

• Are medical activities RMT market or expenditure?
  - Business model exemplification
  - Data do not allow granular quantification to include medical part when it is indeed a market transaction
  - We may want to talk about “RMT total expenditure” to reflect medical activities
(1) Not a market transaction, it cannot enter the estimation of market size;
(2) This is the only market transaction that should be reflected into the estimation of market size;
(3) and (4) pertain the funding side and in principle should cover (2) and the opportunity cost value of (4)
BM2

Customers

Suppliers (broadly defined ICT industry)

HC players (local health units, hospitals, etc)

3rd party payers (NHS, social or private insurances)

(1a) + (1b) = market transaction whose value should enter the estimation of market size

(2) and (3) same as previous model

= Core medical service

= Money flows

= Supporting equipment and services (Devices, call centre, software services, etc)
Does it matter?

- **Emergence**
- **Acceleration**
- **Full market potential**
- **Maturity**

**Time**

**Diffusion: users / market**

- Early adopters
- Early majority
- Late majority
- Laggards
Disruptive innovations

Disruption of healthcare Professions

Disruption of healthcare institution

• Innovation goes from micro-organisational change to macro level institutionalisation

• Institutional factors: inertia or change

• Mimetic processes where network and hubs of innovation spread the word

• But also strategic and tactic behaviour influenced by incentives structure
Context and objectives

PHS/RMT: The Big Picture/ What is the problem

Evidence from companies, pilots & projects review

Barriers in an ecosystem perspective
Market Overview

- First impression: many companies (over 200) in the PHS market… However:
  - Many companies operate in eHealth or Health IT markets, not PHS itself
  - Limited signs of the market functioning as an integrated whole
  - Many companies only have one product/service related to PHS
  - Many are ‘generic’ service providers (e.g. imaging solutions/data management/videoconference), not PHS service providers

- Plenty of activity in product/device market
  - High activity on remote monitoring segment especially for CHF, diabetes & COPD
  - Other sectors apparently underserved

- Large players: low priority on PHS
  - Relatively low state of development → difficult to gain revenues on PHS market
  - As PHS market develops, large players likely to become much more active

- SMEs: rather large playing field ...
  - A source of novel products and services
  - A source of innovative business models
  - SMEs help drive the market and prepare the ground for further developments

- New entrants: ICT companies & telcos
  - Many provide "traditional" ICT services (e.g. network infrastructure, connectivity)
  - Several telcos expand their portfolio by entering PHS market
Company type

- Majority of companies in operation for at least 5 years

- Primarily small and large companies, less medium-sized ones in sample

- Majority of medium and large companies in business for more than 5 years, small companies more evenly spread

- Only ca. 10% of studied companies are recent market entrants: very recent start-ups may have limited visibility
Technology perspective

- Cardiac, diabetes and COPD targeted by more than 50% of companies

- Monitoring, medical platform and communication devices offered by many, intervention devices by less than 40% of companies

- Less than 30% of companies provide telecom services

- Data processing and diagnostics offered by more than 80% of companies, personalised feedback by more than half

- Some form of systems integration provided by almost all companies
Services perspective

- Vital signs by far focus of most services / implants more of a niche market

- Services for hospitals or homecare lead even though services to GPs and call centres are also common

- In “Guidance” area, feedback more commonly offered than education

- As to ICT connection, PHS services connected mostly to Hospital Information Systems, followed by EHR; connection to PACS and billing system more seldom
Size vs. solution offered

- SMEs tend to offer partial solutions, large companies full ones (i.e. encompassing all parts of the value chain): difference likely due to larger resources and product portfolios of the latter.

- Large companies are visible in all the segments, while SMEs offer intervention devices only to very limited extent: may be due to more resource-intensive nature and higher risks (health, legal) involved.

- Company size and health condition addressed do not correlate [no graph].
Companies and value chain

- Rough mapping placing companies on the value chain according to the segment they are most active in.
- Most companies active in several segments, except for cardiac implant manufacturers.
- Difficult to draw typical PHS provider profile, but mapping helps visualise type of activity.

Company positions in the value chain:

**Implantable devices (mainly heart)**
- Medtronic
- Biotronik
- St. Jude
- Boston Scientific

**Measuring and Monitoring (Vital signs)**
- HeartLink
- Amra
- GEM
- MED
- IEM
- Kievko
- Vitalogy
- Allermuir
- Aerotel
- MeTeDa

**Omron**
**SHL**
**Philips**
**GE Health**
**Schiller**
**Roche**
**CardGuard**

**Communication device**
- Medtronic
- Biotronik
- SPic
- Vodafone
- Tunstall
- Cisco
- Nokia
- Telefonica
- Sorin

**Medical platform**
- Ericsson
- Tesan

- GPH
- CC
- Hospital
- WAN

'In-patient' BAN
'Patient Home' PAN
• Revenues streams, pricing & business models
  - Little information available on pricing and revenues generation, possibly because of sensitiveness of such data and small size of operation
  - Funding is a major issue to sustain business, since long time to reach positive ROI
  - Main difference in funding approaches linked to company size
    - Some SMEs were able to secure financing from investors, while others have struggled
    - Large companies base investment decisions on market growth perspectives and may see them as diversification opportunities (e.g. Telcos)
  - Revenues from providing/installing devices, developing software, processing/storing data, and carrying out clinical triage
  - Business Models include reimbursement by insurance, out of pocket & direct contract with HC provider
  - RMT for chronic diseases often focusing on three main conditions
  - Wellness part as promising market but little activity on the ground
  - Business models develop in pragmatic way, and often have to adapt to circumstances
• **Market focus & market size**
  - Healthcare and social care set-up play a key role in determining business strategy
  - Some companies focus on one condition only, others cater for a wider spectrum
    - When a company offers a full solution incl. medical services, it limits focus on one medical condition
  - In terms of market size, it is very difficult to get access to any comparable data

• **Research and innovation activities**
  - Larger companies draw on own R&D resources and facilities
  - Smaller companies more dependent on public projects to sustain innovation & operation

• **Partnerships**
  - Telcos and mobile operators partner with technology providers to enter the market
  - For companies providing full solutions, or with established services, insurance companies are interesting partners, giving access to large bases of patients
  - On a scientific level, companies also seek cooperation with research organisations (e.g. for validation of PHS solution impact etc.)
The Evidence

- Looking for PHS market players - *results from a company review*

- Learning from R&D projects, pilots and programmes
- International activities (EU funded): e.g. Nexes, CommonWell
- National whole system demonstrator telecare trials: e.g. UK trials (WSD programme), NL (HealthBuddy)
- Regional initiatives - Scotland’s Telecare Development Programme (TDP programme), Connected Health & Care Northern Ireland Experience (ECCH), Veneto region, Italy (HTN Lombardy), OUH South Denmark
- Industry-led initiatives: e.g. Spain (Cataluña, Andalucía), Hungary

USA - Veterans Administration with 40,000 veterans, and 202 home care agencies offering telehealth (NAHCH study)
Pilots & programmes: content

• **Health condition perspective**
  - Most commonly addressed conditions are **COPD, CHF, diabetes**, and combinations of these (including for co-morbidity);
  - **Broader spectrum of conditions covered in the US**, e.g. VHA US- nationwide initiative targets chronic Spinal Cord Injury (SCI), depression, mild dementia, multiple sclerosis (MS), or Parkinson's disease, besides COPD, CHF & diabetes
  - In addition patients with at least one or more unplanned events in the last 12 months in relation to their long term condition - such as unplanned hospital admission, intermediate care/ rapid response service use, treatment following call out of ambulance services or accident and emergency visit - also focus of some programmes (e.g. WSD programme in the UK)

• **Innovative developments**
  - Most promising developments under so–called "integrated care" services (combination of social care and health care) can be seen in:
    - Veterans Health Administration's programme in the US (nationwide)
    - Scotland's Telecare Development Programme (TDP programme) and Telescot
    - Connected Health & Care Northern Ireland strategy (ECCH)
    - HTN Lombardy in Italy
  - Some pilots and trials also involve a combination of telecare and home telehealth applications, such as the KOALA study in the Netherlands.
Pilots & programmes: key features

- Large variety in pilot design
- Typically launched by (public) HC providers
- Some company-driven localised initiatives
- Only few large scale pilots both in US and Europe
- Usually regional/local focus

Telemonitoring and teleconsulting services for "Care en Cure" for about 1000 patients in NL.

Care and monitoring of 600 patients with chronic diseases in Ontario region (CAN, expanding into the thousands of patients in 200) currently served (future >50,000 patients)

>30,000 elderly patients (elderly veterans with chronic care needs)

978 Home care associations across USA

The largest RCT of Telecare and Telehealth in the world to date. 6000 patients at three sites (Cornwall, Kent and Newham).

Scotland NHS Lothian Telehealth programme (Telescot) is considered one of the largest of its kind in the UK (started with 200 COPD patients and will later include those with other chronic conditions including cardiac diseases and diabetes across Edinburgh and the Lothian regions).

Connected Health & Care Northern Ireland strategy (ECCH) represents a major investment in chronic disease management and public procurement of a remote telemonitoring service for 5000 people (heart disease, COPD, diabetes) by 2011 in Northern Ireland (NI).
Cross-cutting issues

Robust evidence on Effectiveness of PHS/RMT

Care coordination  VHA

North America

Public procurement

Integrated Care Scaling-up

Integrated Care

WSD

ECCH

Large scale

FP6/FP7/eTEN/CIP
...e.g. Better Breathing (eTEN)
CommonWell (CIP)
NEXES (CIP)

Integrated care
Market validation
Cross border

VITAPHONE
Integrating reimbursement

Company driven, local mobile solution

Public-private local initiative

Healthier Scotland

VHA

HTN

Integrating reimbursement
Validation with “real” patients

• Approach to validation
  – Huge differences in terms of number of patients served - typically beginning with tens of patients, then scaling up to hundreds and in some cases thousands of patients (large scale)
  – Equally large diversity in terms of geographical coverage (local, regional or national)

• Validation outcomes
  – Most projects have foreseen clinical trials with real patients
  – Often outcomes are still to be assessed
  – Examples of reported benefits found in Heartfaid (FP6), Better Breathing (eTEN), Health-eLife (eTEN), HealthService24 (eTEN) or the HHH study

Box 1 - Multi-site trials and validations (examples)

MyHeart (FP6) - 200 patients in 6 sites

In October 2008 a clinical study was launched as part of the MyHeart Heart Failure Management project. The aim of the study is to determine if daily measurement of vital signs obtained by the MyHeart system can help predict worsening heart failure. Up to 200 patients at 6 clinical sites (Athens, Madrid, Heidelberg, Malaga, Munich and Bad Oeynhausen) are included in the study, which is jointly organised by Medtronic and Philips.

Heartfaid (FP6)

The HEARTFAID platform prototype has been tested by the clinical partners participating in the consortium: University “Magna Graecia” of Catanzaro (Italy), Jagiellonian University Medical College (Cracow, Poland), University of Milan-Bicocca (Italy), Istituto Auxologico Italiano (Milan, Italy) in two settings: i.e. hospital and home settings. In home care settings, the system prototype has been tested to transmit by means of various sensors most commonly monitored home data in heart failure patients (about 20 patients).

Clinical stabilisation at home of the HF patients and lower incidence of acute exacerbations at home were some of the benefits observed together with costs reduction. Improvement of patient care through an easier and better management of the disease. In addition the HEARTFAID platform increased interest towards a better care and awareness of the disease among HF patients improving self-care.

Metabo (FP7)

The validation foreseen in the Metabo project will involve patients with diagnosed diabetes in Italy, Spain and Czech Republic.

Dreaming (eTEN) - 300 patients in 6 sites

The DREAMING solution is being piloted in Denmark, Estonia, Germany, Italy, Spain and Sweden (multi-centre) randomised trials with 50 users per site, in total over 300 users, both elderly as well as chronic patients. The aim of the pilot is to assess the impact of the service on the quality of life of elderly people, their health and informal caregivers and their relatives as well as on economic and clinical indicators, verify its financial sustainability and check user satisfaction.

NEXES (CIP) - 3000 patients in 3 sites

Large scale randomised clinical trials (up to 5000 patients) are foreseen for deploying four integrated care programs for chronic patients in three sites (Catalonia, Norway, Greece). In Catalonia, all of the Nexes services will be deployed in several local health areas, namely three districts of Barcelona and one medium size city in the suburbs of Barcelona. In each area, deployment will be coordinated by the Hospital Clinic of Barcelona. In Norway, all of the Nexes services will be deployed in the area of the city of Tromsø (St Olav hospital) while in Greece, the Nexes services will be deployed in the metropolitan area of Athens by several partners (Sotiria hospital, Sanitar and ISPM).

Better Breathing (eTEN) - 4 sites

Four pilot sites in Better Breathing carry out market validation of the eServices for the care of chronic patients in Catalonia, Denmark, Norway and Wales. In Catalonia, the field trials are conducted with patients from the Hospital Cliní Procésional Barceló in Barcelona. In Denmark, the market validation take place at the Furens Hospital (validating eCare and eLearning). In Norway in the University Hospital of North Norway (eCare, eRehabilitation, eLearning) and ePatient Community services. The patient group consists of COPD patients. In Wales, the market validation take place in co-operation between the Prince Philip hospital in Ullswater, Carmarthenshire, Carmarthenshire Trust and HNC validation of eCare, eRehabilitation and eLearning.

Evaluation of impacts on medical staff showed increased workload, but "measuring for them to be able to monitor vulnerable patients remotely".
Lessons from Pilots & Projects

• Leader countries
  – Most advanced countries in relation to RMT, in terms of scale as well as degree of integration or 'mainstreaming', seems to be the US, United Kingdom and Germany.

• Lack of operational service provision
  – Pilots, pilots…and more pilots! – yet no sustained long-term services.
  – Some cases of services supported by reimbursement models can be seen in Germany (Vitaphone) or Italy (HTN)

• Need for more, comparable evidence
  – There is a need to strengthen further evidence related to RMT clinical effects, cost effectiveness, impacts on services utilisation, and acceptance by healthcare providers.
  – Some evidence is available, but difficult to access and compare

• Identification of patient cohorts
  – Identifying the risk population (i.e. which patients will be a high cost in 6-12 months time as well as those patients that will have an avoidable event) is one of the main challenges for PHS implementation.
Lessons from Pilots & Projects (continued)

• Focus of innovative activities
  – From a health condition perspective, chronic heart failure (CHF), diabetes and pulmonary conditions like COPD are the most important chronic diseases addressed by both EU-funded projects, pilots and programmes, together with co-morbidities (somewhat larger set of diseases in USA)
  – Most EU-funded projects address the whole value chain of the personal health systems and remote patient monitoring markets, from development of monitoring & measurement devices (sensors) including protocols & analysis tools to patient platforms & patient management systems (patient and medical loops).
  – In some cases the platform connects to electronic health records (EHR, PHR).

• Funding of innovative activities
  – Funding is needed at the start of the service procurement as well as for the transition period towards full deployment, which is not always foreseen
  – Most of successful implementations seem to happen when funding is made available by public authorities.
  – ECCH in Northern Ireland is so far the only large scale, system-wide initiative with pre-procurement
Contribution of projects and pilots to innovation dynamics

- Many projects address product innovation (e.g. textile sensing platforms, biosensors…) / incremental innovation

- Shift of focus towards process innovations (e.g. intelligent closed-loop approaches for chronic disease management)

- Little market innovation – not yet in pilots…but emergin in the market (e.g. Bayer Didget)

- User-centric service innovation in RMT in Living Labs

- Successful implementations of RMT for chronic disease management with reimbursement (e.g. HTN, BKK Taunus)

- Move towards "Integrated Care" models (EU-funded activities like CommonWell project and NEXES (CIP) as well as national or regional initiatives like VHA in USA or WSD in UK or Scotland's telehealth/telecare programmes).
Context and objectives

PHS/RMT: The Big Picture/ What is the problem

Evidence from companies, pilots & projects review

Barriers in an ecosystem perspective
Market players views

- Lack of reimbursement
  - No unified approach, ad hoc efforts
  - Unclear revenue streams
  - No viable as out of pocket market

- Buyers’ fragmentation
  - Locally based strategies
  - Looking in to many directions
  - Institutional and market fragmentation feed each other

- Entry “barriers”
  - End-to-end provision by suppliers not easily accepted
  - Space for local opportunistic initiatives
  - Need of intermediary between healthcare system and suppliers

HC experts and insiders views

- Unfavourable incentives
  - Neither “fee for service” nor “capitation” incentives work for RMT
  - Outcomes based reimbursement?
  - Create incentives for HC players

- Missing policy box
  - RMT is part of ‘territorial’ medicine
  - Not always finds clear policy sponsors
  - Compete for attention and funds with other applications

- Primary, secondary & social care
  - Success due to personal commitments or top down decisions
  - No spontaneous emergence of seamless integrated care

- Evidence/awareness vicious circle

Unclear business model, shaky revenues, diversification

Lack of strategic vision on organisationally embedded RMT
The technology dimension (all)

- **Infrastructural bottlenecks**
  - Low level of interoperability with EHR is a clear bottleneck
  - Uneven broadband coverage, lack of roaming further play against RMT

- **RMT today**
  - Most of the time, rather basic solutions, far away from the PHS research level of sophistication
  - Due to affordability, broadband divide, and greater reliability of basic solutions vs. New system

- **What to do then?**
  - More intelligent data gathering would help reduce human involvement in RTM thus reducing workload
  - Scale is a must for solving affordability issues
  - To increase reliability of more sophisticated systems, more pilots needed
Need to break the stalemate

Low take up

Limited evidence (or awareness about it)

Lag time for RCT

Delayed investment resistances reinforced

Local champions and hubs lose support

Market scale limited

Little increased affordability of devices & services

Mimetic process by mainstream players delayed
- General discussion
- End of Day 1