End-User Perception Towards Pervasive Cardiac Healthcare Services: Benefits, Acceptance, Adoption, Risks, Security, Privacy and Trust.
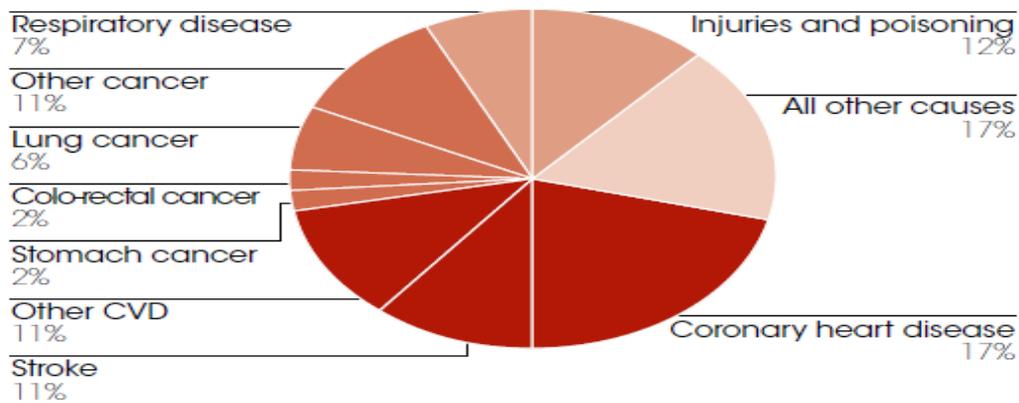
BraveHealth
The heart of e-health

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Cardio-Vascular Disease (CVD)

Figure: Deaths by cause, men, latest available year, Europe

- Respiratory disease 7%
- Other cancer 11%
- Lung cancer 6%
- Colo-rectal cancer 2%
- Stomach cancer 2%
- Other CVD 11%
- Stroke 11%
- Injuries and poisoning 12%
- All other causes 17%
- Coronary heart disease 17%

European Heart Network, Annual Report 2008

CVD Healthcare Cost

Costs of CVD to the health care system, 2006, EU

- Inpatient care 54%
- Primary care 10%
- Outpatient care 6%
- Accident and Emergency 2%
- Medications 28%
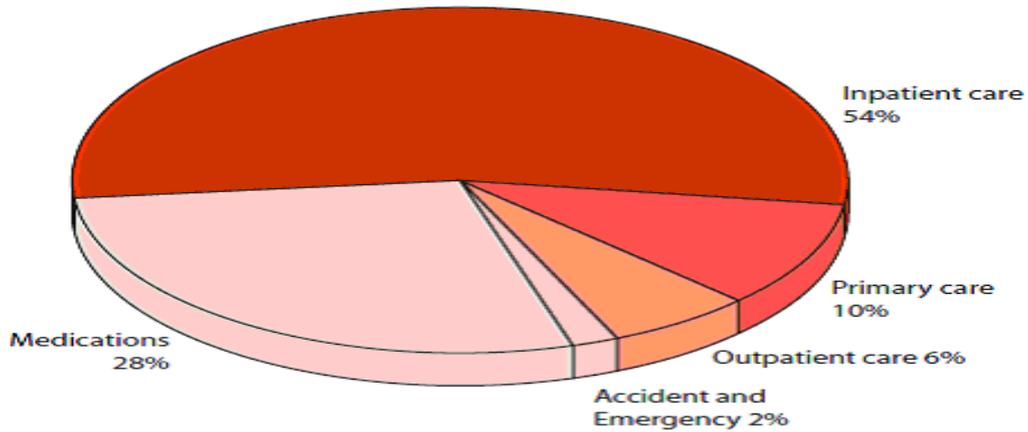
European Heart Network

Pervasive Healthcare Monitoring

DATA FROM THE WERABLE UNIT

Angina
Heart Rate (bpm)
Blood Pressureand trend
O2 Saturation (%)

DECISION SUPPORT SYSTEM
OUTPUT

Aspirin recommendation
Clopidogrel recommendation
Oxygen recommendation
Send to NTG algorithm
Send to beta-blocker algorithm

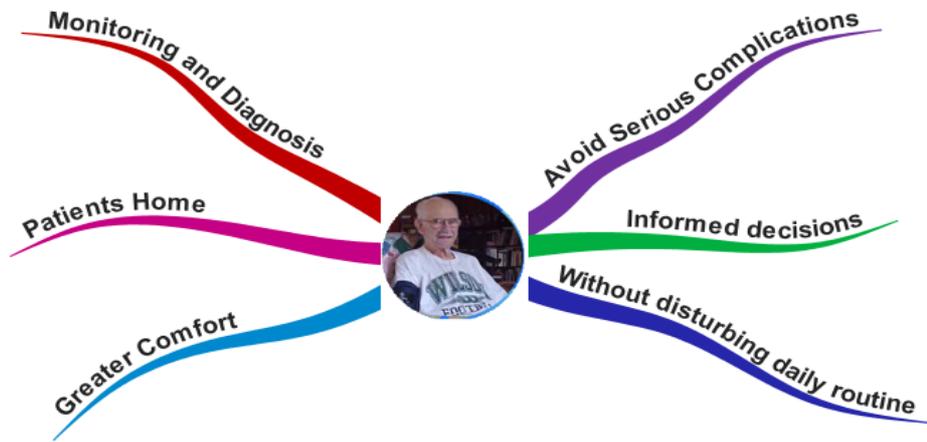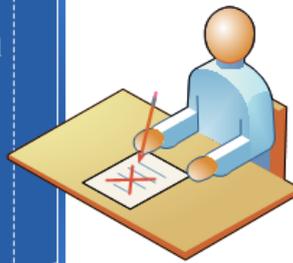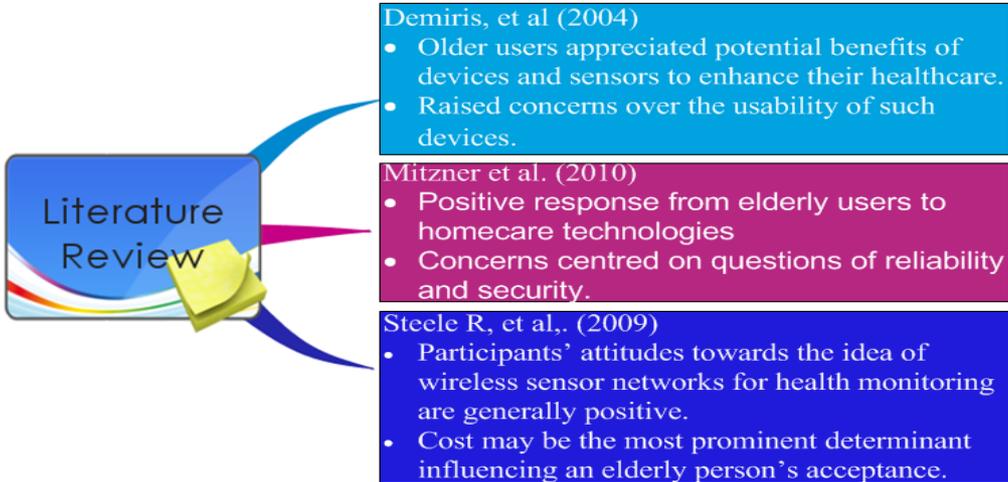DATA FROM THE ELECTRONIC PATIENT RECORD

Angina OR heart failure
Aspirin in the treatment
CI to aspirin
Baseline ECG features:
RV infarction
Anxiety
History of asthma
History of bronchial spasm

http:// bravehealth.eu

Benefits

- Monitoring and Diagnosis
- Patients Home
- Greater Comfort
- Avoid Serious Complications
- Informed decisions
- Without disturbing daily routine

Despite potential benefits, technical maturity of the solutions and the number of pilot applications running across the World, widespread adoption of such solutions in health care delivery are rare.
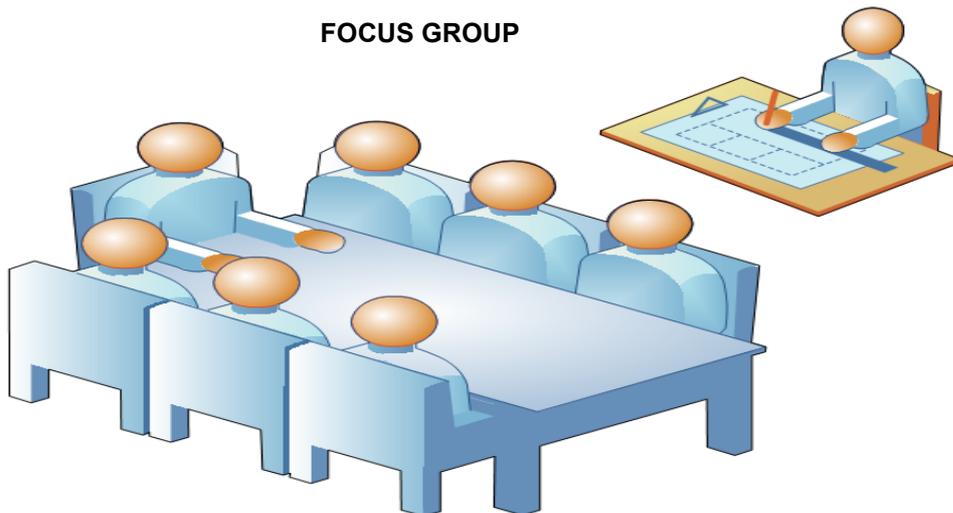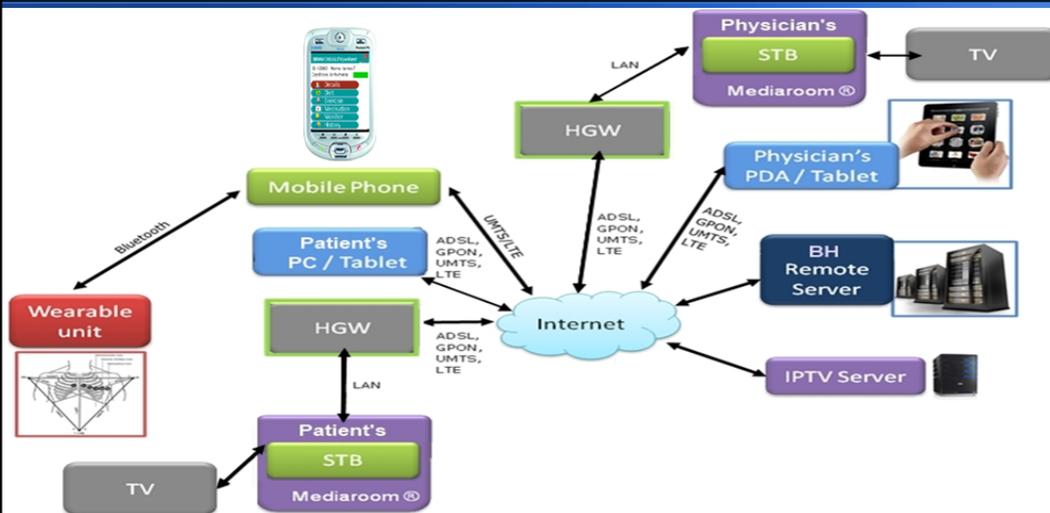
Prior Research

Demiris, et al (2004)
- Older users appreciated potential benefits of devices and sensors to enhance their healthcare.
- Raised concerns over the usability of such devices.

Mitzner et al. (2010)
- Positive response from elderly users to homecare technologies
- Concerns centred on questions of reliability and security.

Steele R, et al,. (2009)
- Participants' attitudes towards the idea of wireless sensor networks for health monitoring are generally positive.
- Cost may be the most prominent determinant influencing an elderly person's acceptance.

Research Method

FOCUS GROUP

BraveHealth System Architecture
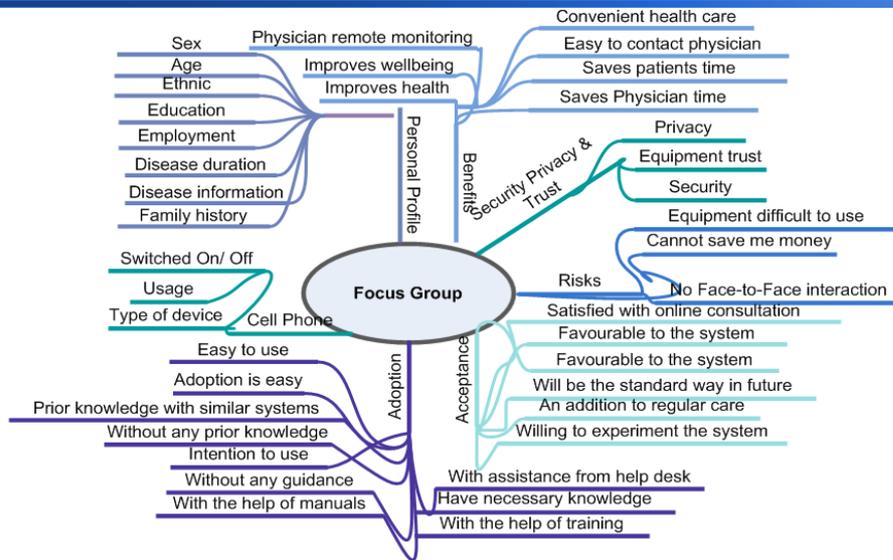

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Motivation For This Study

> Do patients perceive the benefits of pervasive monitoring systems? What do patients see as the most important benefit?

> Do patients see any risk in using the system or the equipment?

> Do patients use any monitoring equipments at home?

> Do patients currently use the Internet and mobile phones?

Questionnaire

1. Personal Profile

		Frequency
Gender:	Male	22
	Female	12
Age:	50-59	5
	60-69	18
	70-79	10
	80-89	1
Education:	Graduate Education	5
	College	8
	Secondary School	7
	Below secondary school	14
Employment:	Employed	5
	Not Employed	15
	Retired	14
History of heart condition:	Less than 6 months	4
	6 months -1 year	2
	2 – 3 years	2
	4 – 5 years	8
	5 – 10 years	11
	10+ years	7
Have you gathered information from friends and family		14 (yes)
		20 (no)
Do you have a family history of cardiac problems?		7 (yes)
		21 (no)
		6 (not sure)

2. Benefits

"People don't have time, for regular checkups on health. Sometimes getting a doctor's appointment is very difficult. If you can do the consultation through internet that would be great."

"My husband had a cardiac arrest and he didn't have any feeling... the pain he thinks was just indigestion. I think this (monitoring) would have been great."

3. Adoption

• Almost all participants use some sort of health monitoring equipments at home.

• Most of the participants use internet.

• For some participants use of BRAVEHEALTH system would not be a challenge.

• Some needed training, manuals and access to help desk.

4. Risks

"In an emergency I would contact doctor or 999 rather than trusting the equipment."

"I will not use the equipment at all as it will make me very conscious of my health and will be wondering what is going on"

"New technology should not interfere with existing devices like; I have a pacemaker fitted in and once my pacemaker stopped because of some equipment there."

"If you go to the hospital they go through all the procedures like urine test, check weight … you are in touch with what is going on…I am afraid you won't be getting it there"

5. Security, Privacy and Trust

"There is a lot of problem in sending the data online as it could be accessed by anyone. If it is secure then I would use it."

"I don't know what's going on in the computer and who sees my records. I would be weary of it. I am very protective."
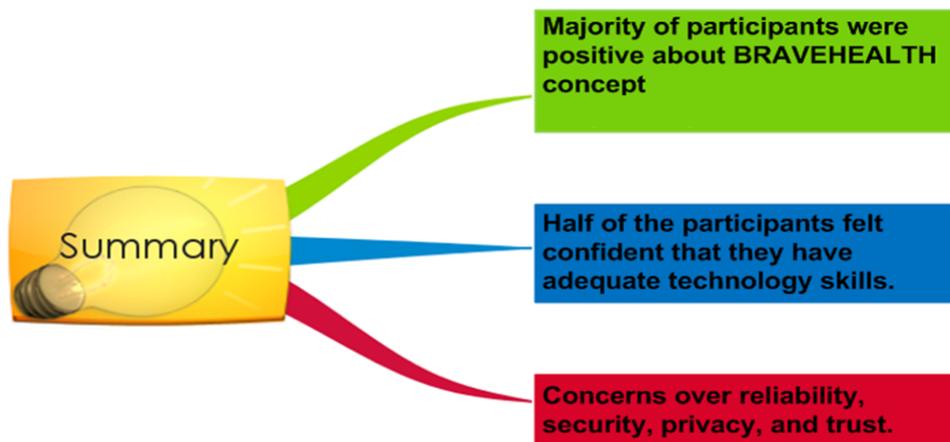
"I am not sure who sees our records. I think it all depends on who is using it."

"If the health data you are passing over the internet goes to my own GP then it is fine but if goes to others then it is not good."

6. Acceptance

- Most participants were willing to accept such a technology

- A great addition for future healthcare

- Some participants preferred face-to-face consultation

Discussion

Summary
- Majority of participants were positive about BRAVEHEALTH concept
- Half of the participants felt confident that they have adequate technology skills.
- Concerns over reliability, security, privacy, and trust.

Next Steps

- Monitoring
- Security
- Education
- Prototypes
- User Evaluation

Thank You

Questions