

eHealth and Telemedicine in Daily and Long-Term Ambulatory Care

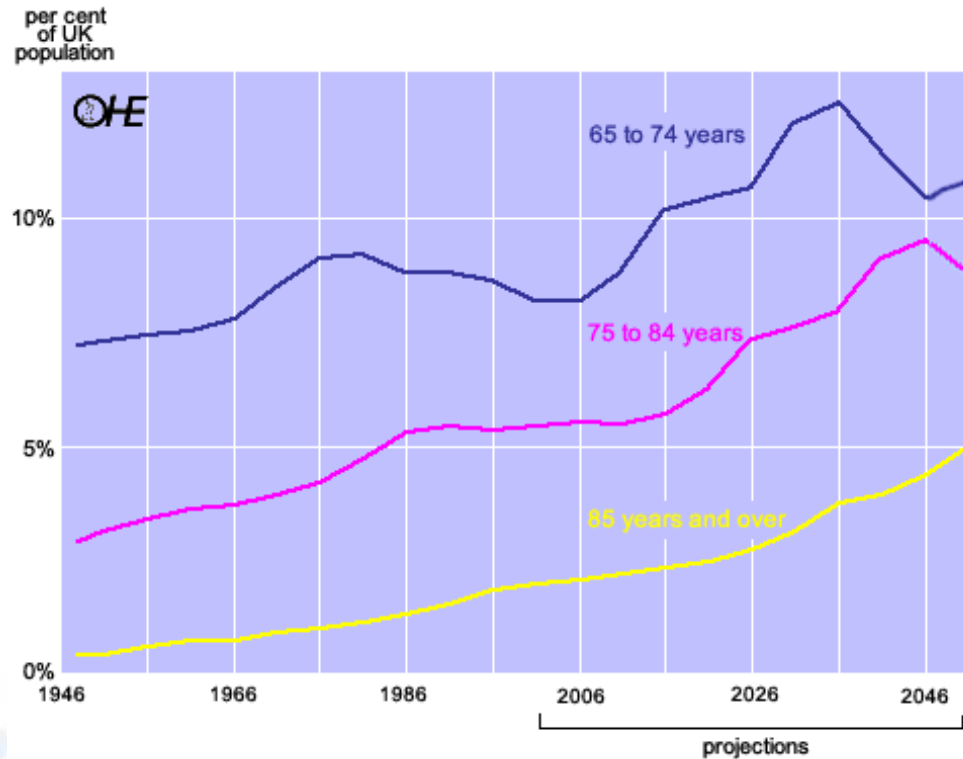
A REALITY CHECK

Brian McKinstry

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- Brief exploration of the background to our telehealth work in Scotland
 - Early data about what patients and clinicians think of telehealth
 - Challenges posed in interpreting physiological measures
 - Challenges in implementation

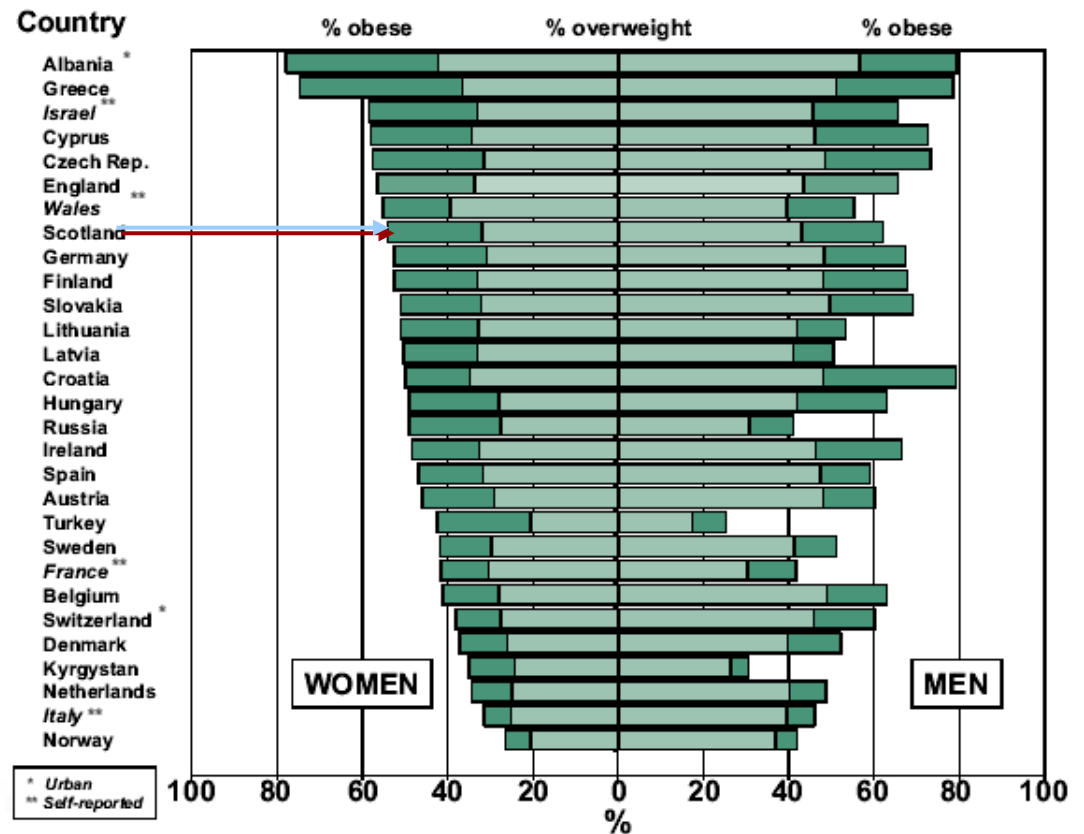
Rapidly Aging Population

Expected growth in elderly population Scotland



Increasingly Unhealthy

Figure 1: Obesity levels in Europe



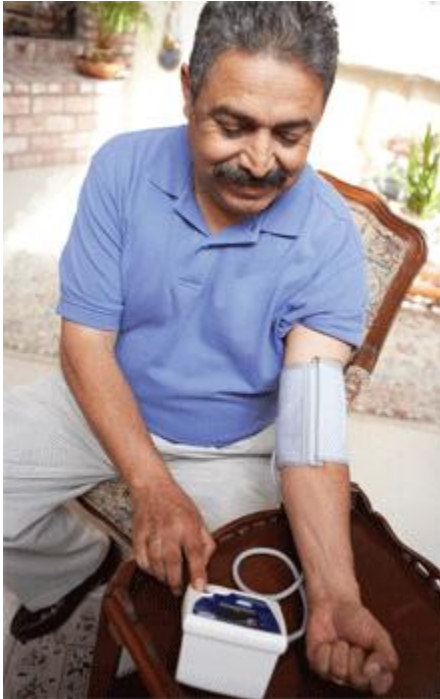
Source: International Obesity Task Force



Rise in Long Term Conditions

- **17.5 million** UK adults are living with a chronic disease
- **By 2030 the incidence of chronic disease will double**

So how do we cope?



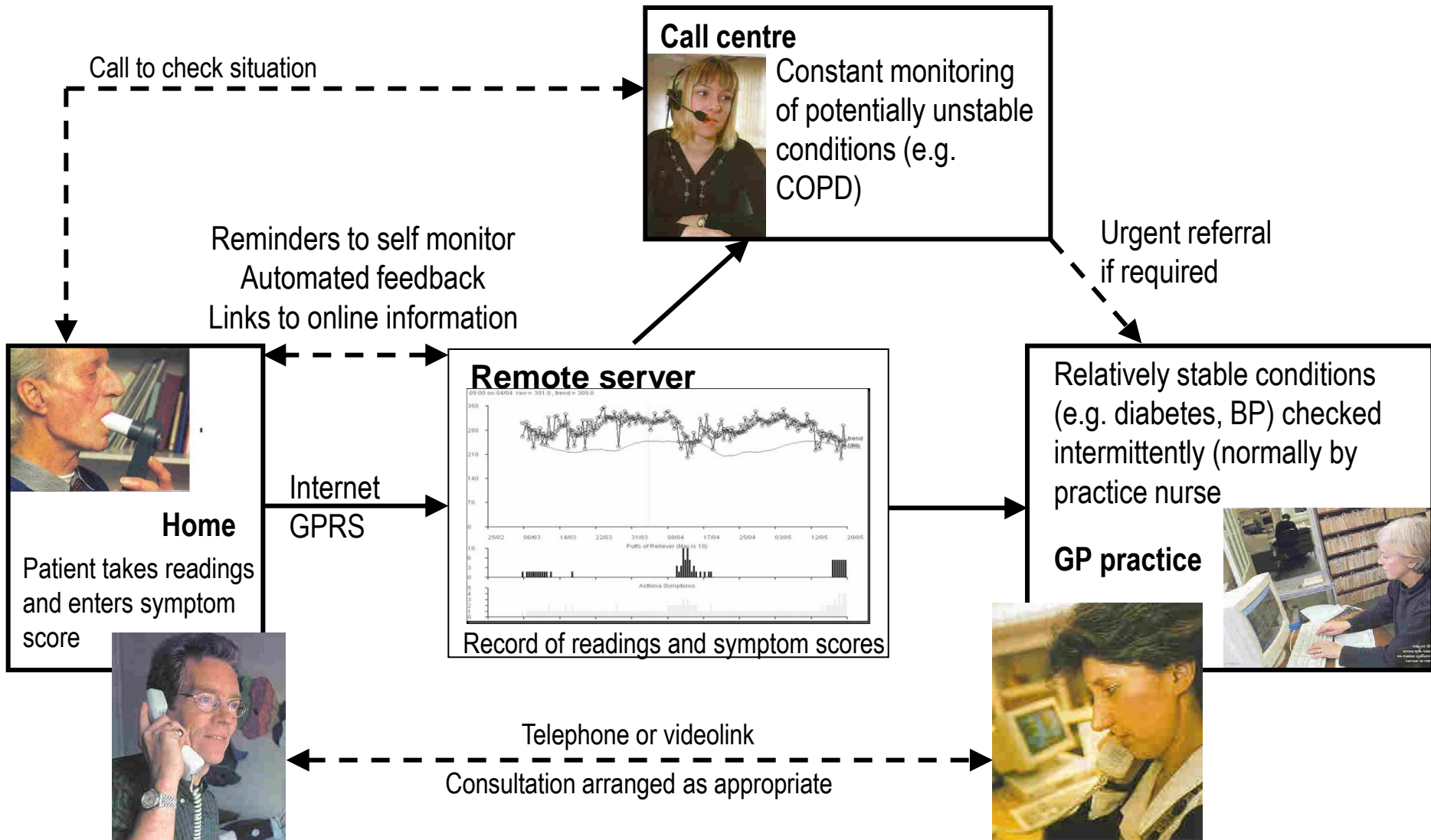
- Policy drive towards self-monitoring and self-care
- Is self-monitoring effective?

Why does self-monitoring fail

- Difficulty in maintaining motivation
- Infrequent feedback from clinical staff
- Therapeutic inertia

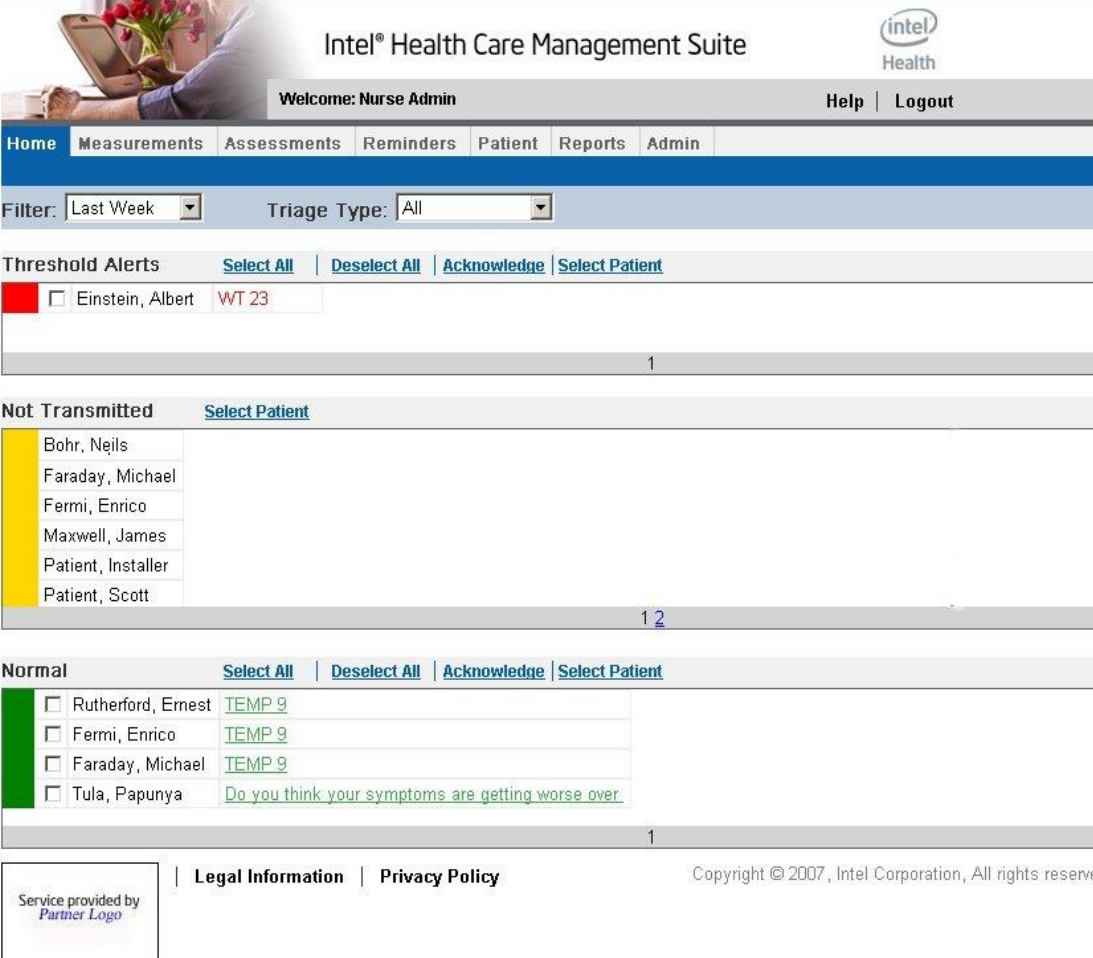
Telemetrically supported supervised self-monitoring





Models of telemetric supported self monitoring

Clinician View



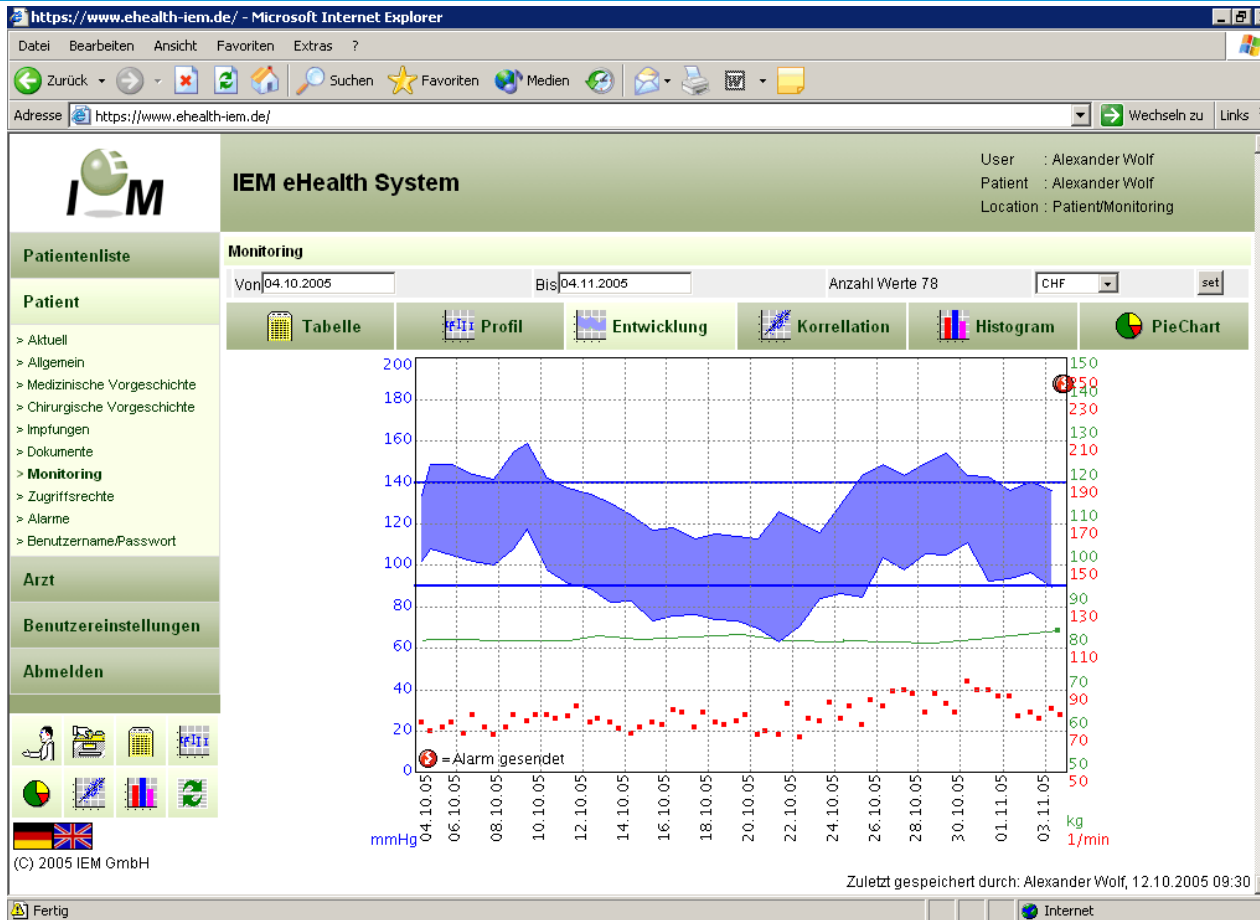
The screenshot shows the Intel Health Care Management Suite interface. At the top, there is a header with the Intel Health logo and the text "Intel® Health Care Management Suite". Below this, a navigation bar includes "Welcome: Nurse Admin" and "Help | Logout". A secondary navigation bar contains tabs for "Home", "Measurements", "Assessments", "Reminders", "Patient", "Reports", and "Admin".

The main content area features a filter section with "Filter: Last Week" and "Triage Type: All". Below this are three sections of patient alerts:

- Threshold Alerts:** Includes a red square icon, a checkbox for "Einstein, Albert", and a "WT 23" value. Action links include "Select All", "Deselect All", "Acknowledge", and "Select Patient". A summary bar shows "1".
- Not Transmitted:** Includes a yellow square icon and a list of patient names: Bohr, Neils; Faraday, Michael; Fermi, Enrico; Maxwell, James; Patient, Installer; Patient, Scott. Action link: "Select Patient". A summary bar shows "1 2".
- Normal:** Includes a green square icon and a list of patient names with their symptoms: Rutherford, Ernest (TEMP 9); Fermi, Enrico (TEMP 9); Faraday, Michael (TEMP 9); Tula, Papunya (Do you think your symptoms are getting worse over...). Action links include "Select All", "Deselect All", "Acknowledge", and "Select Patient". A summary bar shows "1".

At the bottom, there is a footer with "Service provided by Partner Logo", "Legal Information | Privacy Policy", and "Copyright © 2007, Intel Corporation, All rights reserved".

Streaming Data



Does it work?

- Do patients and doctors like it?
- Are outcomes improved?
- Does it actually save time and resources?

telescot Randomised Controlled Trials



- Hypertension

- A common largely asymptomatic condition (n=400)



- Stroke/HBP

- Affecting older frailer group with challenging targets (n=400)



- Diabetes

- A condition requiring multiple measurements, blood pressure, blood glucose and weight (n=270)



- COPD

- A symptomatic potentially unstable progressive condition (n=300)

With qualitative and economic evaluations

Early Results COPD

- Complete questionnaire each day
- Physiological measures as needed
- Call centre monitors



COPD monitoring

Each day, please record any WORSENING of symptoms from your usual daily level.

I am more breathless than usual

My sputum has increased in colour

My sputum has increased in amount

I have a cold (such as runny or blocked nose)

I have increased wheeze or chest tightness

I have an increased cough

I have a fever

I have a sore throat

<3 is OK

3-4 watch next day

5+ take action



Do the patients like it?

“I’ve never felt so well looked after in my life. I think it’s a godsend like.” (Patient aged 58)

“I don’t worry about him the same as I used tae. It’s all taken care of before it can get tae that level. That machine can tell Alec he’s ill even before he kens it hisself” (Spouse of patient aged 75)

“There’s some times you phone them up for an appointment ye cannae get one. . . So I feel if I’ve got that (telehealth device) I’ve got a chance of a doctor anyway.” (Patient age 75)

What do the clinicians think?

- Some concerns about workload
- Worries about medicalisation
- Concerns about false positives
- Worries about the utility of physiological measurements
- Some medicolegal worries

Workload

Doubling of prescriptions of antibiotics, prednisolone

Large increase in telephone consultations

Similar face to face and home visits.

Similar hospital stays

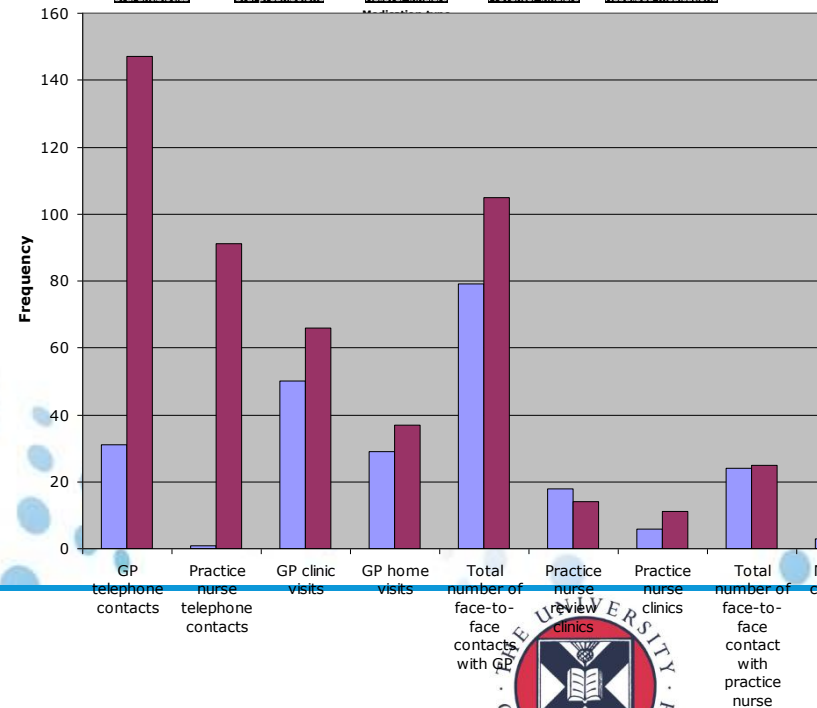
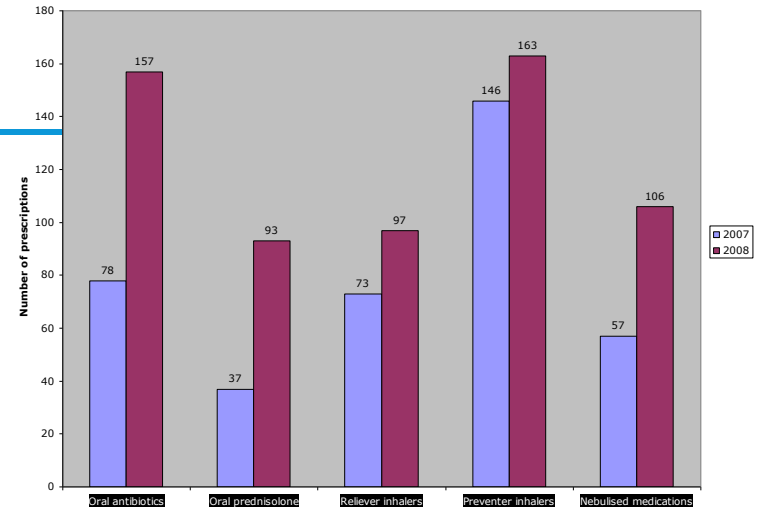
But

Probably reflects:-

previously undiagnosed deteriorations

previously non-optimised care

Caution among clinicians

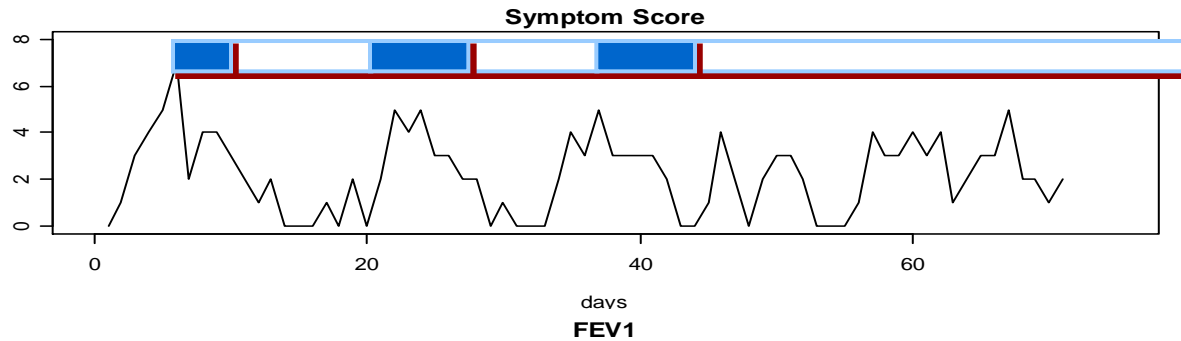


Making sense of the symptom and telemetry data

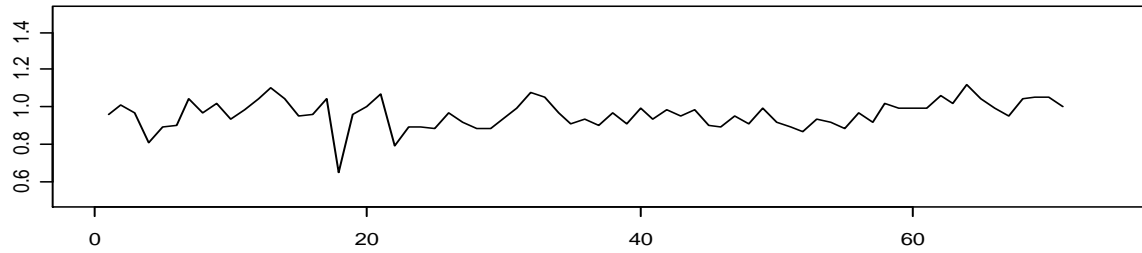
- Some patients have difficulty distinguishing ‘bad days’ from significant deterioration
- Physiological measures did not always relate well to symptoms and deteriorations

Variation in events and data

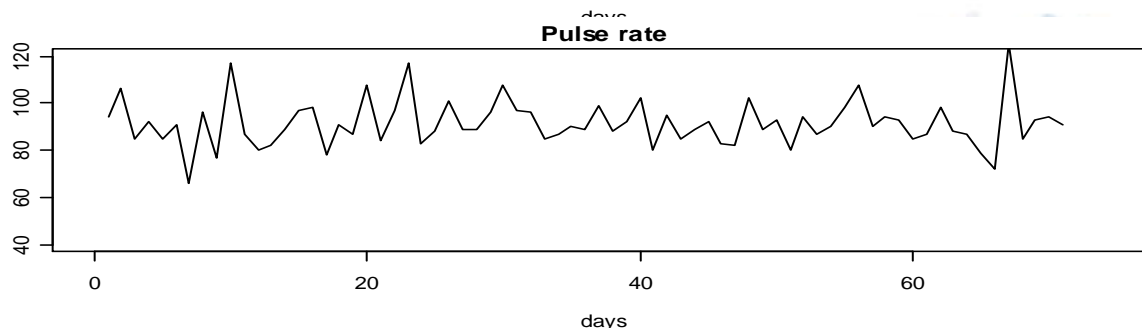
Symptom Score



FEV1



Pulse



Implementation issues

“Moving on from the work of a small group of enthusiasts into a quasiroutine clinical service involved a significant level of investment in accommodation.

This was not simply around building a technology that works, but actually reengineering the organization of knowledge in it, and constructing a service into which it could be practicably incorporated” (MAY ET AL)

Implementation Issues

- Difficult to persuade doctors and nurses to take part
- New monitoring system had to be introduced involving increased resource
- Co-ordination with clinicians, management, NHS IT, equipment suppliers, broadband suppliers was difficult

Why is it resisted? Clinician concerns

Is there evidence this intervention works in practices like mine?

Is the equipment reliable and well maintained?

Will it mean changing what I do?

Will it mean increased workload?

Is it easy to learn how to use?

Will additional resources be transferred to me?

Implementation: what have we learned so far

- The infrastructure planning is more important than the device
- Clinicians need to believe there is a clear need for the device
- They will become involved if they believe patients will benefit
- Equipment should be easy to use and ideally, designed around the existing service

Implementation: what have we learned so far

- Protected time set aside for training, close to starting the service
- A clear plan to mitigate the effects of the workload associated with the introduction of the new system must be in place
- Changes in role must be negotiated in advance, well defined and not as the technology is introduced.

Conclusions

- Patients like Telehealth
- It encourages evidence based practice and quality care
- Telehealth systems need robust underpinning structures to observe and manage the data provided
- Implementation needs to involve users early and must emphasise patient benefit
- They may not save time/resources in primary care
- We need rigorous research to discover where and how the systems are best applied

Introducing new systems

There is nothing more difficult to execute, nor more dubious of success, nor more dangerous to administer than to introduce a new system of things; for he who introduces it has all those who profit from the old system as his enemies, and has only lukewarm allies in those who might profit from the new system.

Niccolò Machiavelli, The Prince 1552