

# Making the person the centre of healthcare

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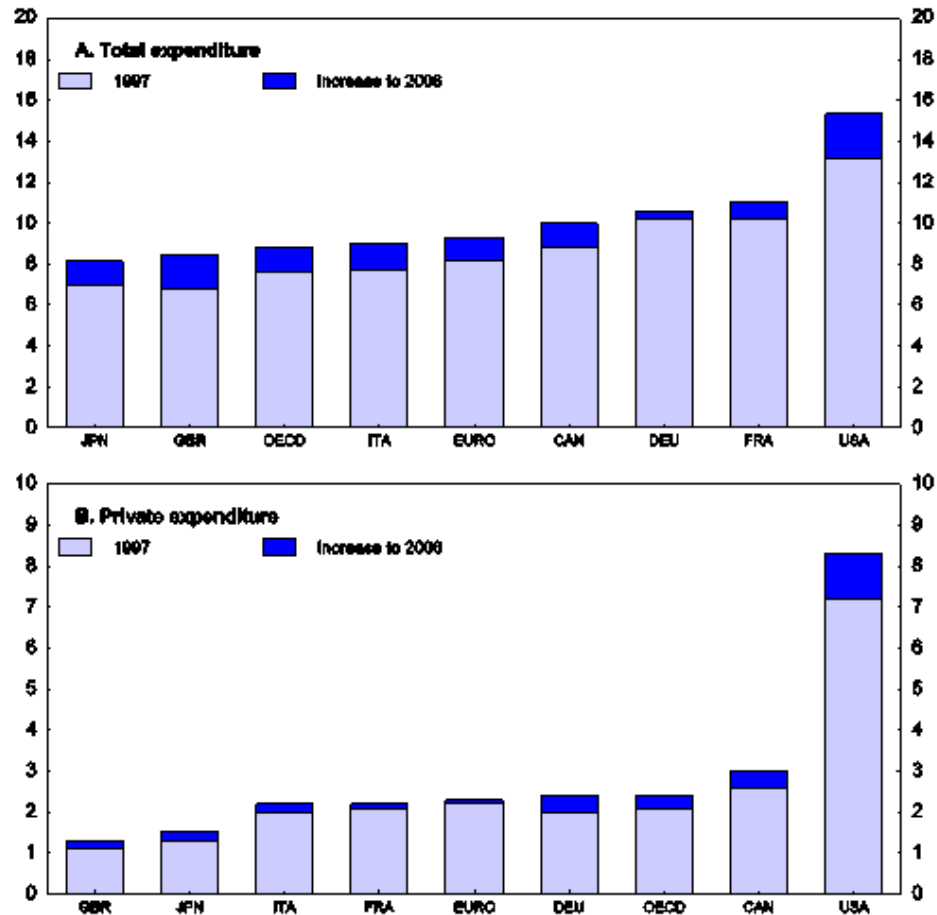
# Delivering healthcare is expensive



# Some statistics (UK)

- ▶ UK spent £118 billion (~NZ\$ 250B) on health care (public and private) in 2007 [ONS]
- ▶ 8.4% of GDP
- ▶ Was 6.6% of GDP in 1997
- ▶ Aim (pre-recession) to get to 9.5% – around EU average

# Some statistics (world)



Source:  
OECD

# Reasons for increases

- ▶ **patients become more demanding**
- ▶ **new technologies**
- ▶ **ageing of the baby-boom generation**
- ▶ **increasing life expectancy**
- ▶ **population growth**

# Patient demands

- ▶ Increasing consumerism about health
  - if banks can provide access 24/7 why can't doctors?
  - patient convenience (for minor conditions)
- ▶ Political factors
  - postcode lotteries
  - waiting list times
  - Choose & Book

# Reasons for decreases

- ▶ Shorter lengths of stay
  - Clinical developments
    - e.g. keyhole surgery
  - Emphasis on relieving bed blocking
    - e.g. with social services
- ▶ Productivity rises
- ▶ Competition for provision of services



# Patients want...

- ▶ Reduced repetition
  - Taking history
  - Doing tests
- ▶ Safer care
  - Evidence-based
  - Better checks on its delivery
- ▶ Reduced travel
- ▶ Shorter stays
- ▶ More convenience

# In sickness or in health

»» Is the NHS a health service or a sickness service?

# Would be better if healthcare...

- ▶ kept people "healthy" rather than interact with them only when they fall ill
- ▶ was more integrated into everyday life
- ▶ was more proactive than reactive
- ▶ was personalised to an individual's needs, desires and lifestyle

# How to "treat" the healthy

- ▶ Educate and inform
- ▶ Encourage reduction of unhealthy behaviours
  - smoking
  - drinking
- ▶ Encourage fitness
  - weight
  - mobility and flexibility
- ▶ Support for self-monitoring and self-diagnosis

# How can we integrate healthcare more into daily life?

- ▶ **Deliver health nearer to the patient**
  - in local clinics
  - in the patient's home
  - in the patient's workplace
  - in places they would normally visit
- ▶ **Deliver health when the patient wants it**
  - not just 9–5
  - weekend opening
  - 24/7 access to services

# Being proactive about health

- ▶ Regular wellness checks
- ▶ Screening programmes detect conditions before they get too bad to be difficult/expensive to treat
  - breast cancer
  - diabetes
- ▶ Support for self–diagnosis

**That's the problem.  
What's the solution?**



# Centre healthcare around the patient

The Personal Health Service



# Not that easy

- ▶ Health is a complex subject
  - can't educate everyone to doctor level
- ▶ Many providers of care
  - many different agencies involved across several sectors
  - including the patient and their family and friends
- ▶ Many levels of care
- ▶ Care is provided in many different locations

# ICST helps



# What is ICST?

- ▶ IT = "Information Technology"
- ▶ ICT added "Communication"
- ▶ ICST adds "Sensing" reflecting:
  - wide range of sensing devices
  - environmental
  - personal

# Key need

- »» Collect and share information about the patient

# Patient information

- ▶ Demographics
- ▶ Medical history
- ▶ Symptoms and problems
- ▶ Results of tests/investigations

# Our proposition

If you want a patient-centred health service, you  
need to collect information about the patient  
**near to the patient**

# What isn't "near" the patient?

- ▶ Location shifting
  - patient (or a sample from them) has to go somewhere else for some information to be collected
- ▶ Time shifting
  - information not available until some period after it is required or desired
  - delay may be consequence of location shifting; or
  - delay in arranging for test; or
  - delay in obtaining results

# What is "near" the patient?

- ▶ Not
  - "right here; right now" immediacy and proximity
- ▶ But as:
  - duration of clinical session (while clinician with patient)
  - within patient's sight and sound
- ▶ Consultations where the required or desired information is not available are sub-optimal



# How the world is changing



# What is changing?

- ▶ Five drivers of change
  - New ways of collecting information
  - Richer information
  - Bigger markets
  - Technology as an enabler
  - Increasing partnerships

# 1 a. New ways of collecting data

- ▶ new sensors:
  - wearable devices
  - devices that measure things that previously couldn't be measured
  - devices that can measure:
    - more accurately
    - more frequently
    - more conveniently
    - at less cost
- ▶ miniaturisation
  - data can be collected in ways that were not feasible
  - reduced discomfort to patient

# 1 b. New ways of collecting data

- ▶ development and reduced cost of mobile devices
- ▶ wide availability and low cost of mobile networking
- ▶ ubiquity of web-based apps as a user interface

## 2. Richer information

- ▶ Reduced cost of networking and data storage means more data can be shared in more places
- ▶ Easier to store/transmit complete record
  - Reduced pressure to summarise (and thereby lose) information
- ▶ Images of various types can be used in preference to text

# 3. Bigger markets

- ▶ Partly due to people's increasing
  - familiarity
  - ability
  - willingnessto use technology
- ▶ Partly due to demands on providers to invest in technology
- ▶ Partly due to internationalisation

# 4. Technology as an enabler

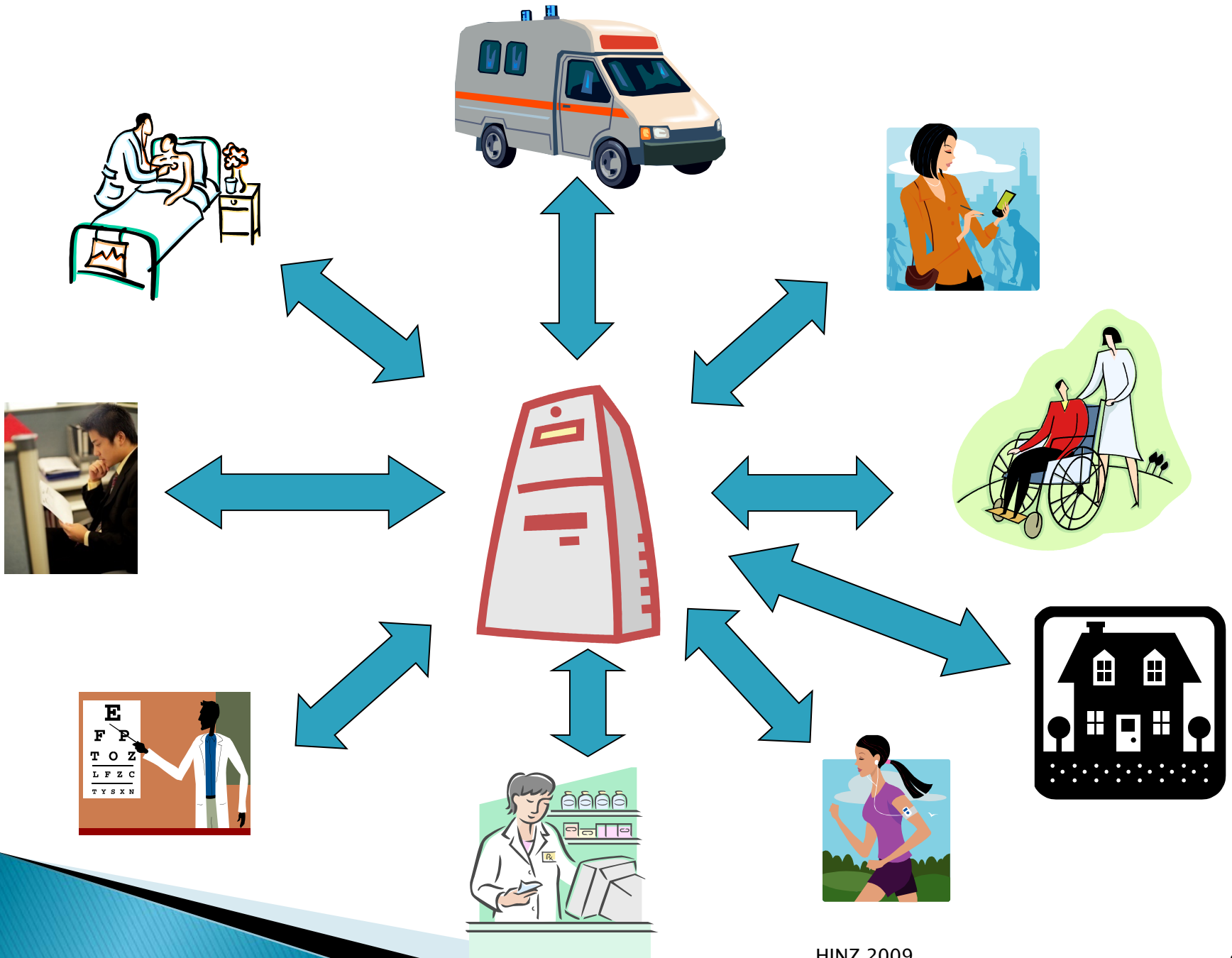
- ▶ Technology enables care to be given by wider range of care professionals:
  - nurses instead of doctors
  - junior doctors instead of consultants
  - general practitioners rather than hospital doctors
  - nursing auxiliaries instead of registered nurses
  - care workers rather than health workers
- ▶ Technology enables care to be given by:
  - the patient him/herself
  - their friends, family and neighbours

# 5. Partnerships

- ▶ Increasing number of partnerships between health and care providers
- ▶ Existing partnerships are becoming better recognised
- ▶ Partnerships tend to break down barriers to information sharing
- ▶ New partnerships between:
  - public and private sector organisations
  - health sector and social care
  - professionals and patients



# Sources of information



# Sources of information

- ▶ Hospital in-patient records
- ▶ Hospital out-patient records
- ▶ GP and other primary care records
- ▶ Out of hours services
- ▶ Ambulance service
- ▶ Treatment/walk-in centres
- ▶ Pharmacies
- ▶ Opticians, dentists, ...
- ▶ Patient self-testing
- ▶ Home monitoring
- ▶ Care home monitoring
- ▶ Friends and family
- ▶ Sport/leisure monitoring
- ▶ Workplace monitoring
- ▶ Many more ...

# Opportunities arising from having the information

- ▶ Information contributing to improving processes
  - decision support
  - better care (spot outliers)
  - identify deterioration
  - predict adverse outcome and prevent
- ▶ Audit to gain knowledge
  - symptoms
  - diagnosis
  - treatment
  - outcome

# What can you do with quantity?

- ▶ Population-level analyses
- ▶ Monitor patient's whole life rather than episodes
- ▶ Assess risk to individual patient, e.g.:
  - mortality
  - morbidity (e.g. bed stays, frequent flyers)
- ▶ Specialise/focus on:
  - specific medical condition
  - specific physiological state (incl. age, chronic condition)
  - environmental factors

# Future sources of data

- ▶ Observations (informal) from family, friends or neighbours
  - integration in email, calendar or mobile phone systems
- ▶ Monitor use of credit/debit cards, travel passes and other forms of identification/entitlement
- ▶ Supermarket loyalty schemes provide information about food buying (link to obesity)
- ▶ International sources
- ▶ Genomic information

# Issues 1

- ▶ Integrating data
  - common means of identifying patients
  - provenance (quality) of data
    - accuracy
    - confidence levels
    - context
  - quantity of data is always going to be an issue
  - much data is redundant but you don't know which
  - timeliness (for diagnosis or prevention)
  - centralisation (logically yes, but often physically no)

# Issues 2

- ▶ Confidentiality and privacy
  - spectre of Big Brother
- ▶ Convenience or expediency often trumps security
  - in which case, obtaining consent is meaningless
- ▶ Many patients assume that their records are already integrated



# Observations 1

- ▶ Quality comes from closing the feedback loop
  - patient is usually best quality checker
    - self-interest as motivation
  - clinician who records information is next best
  - make quality part of the process
  - make data visible to patient at time of collection
    - indicate whether it is out of "normal" range

# Observations 2

- ▶ Organisational factors play a considerable role in determining whether healthcare services can respond to increasing demand
- ▶ Inducement to re-engineer services comes from increasing budgets at a lower rate than costs
- ▶ However, this leads to evolution
- ▶ Revolution may be better!
  - Radical solutions

# Challenge

- ▶ Not the technology
- ▶ engineering services to ensure that the right information gets to the right place at the right time

# Summary

The personal health service needs excellent information about its patient