Predicting telehealth infrastructure needs
Laurie Wilson and Jane Li

The background

- Communications/IT revolution
- Construction of large infrastructure
- National Broadband Network
- Expectations for telehealth to address significant health issues
  - Ageing population
  - Workforce pressures
  - Cost pressures

The basic question

- How can we ensure that future infrastructure (e.g. NBN) is future-proofed from the point of view of telehealth?
- How will telehealth itself evolve over the lifetime of infrastructure such as the NBN?
- NBN often promoted as justified by health applications

NBN – large area covered by wireless or satellite

Most remote users may be limited by
- Latency
- Bandwidth
- Symmetry
Prediction of infrastructure needs => Prediction of telehealth developments

Predicting the future

- “It’s tough to make predictions, especially about the future”

Life in 2000AD (1960s)

Telehealth future – one vision
(Science & Invention, Feb 1925)

Materials and methods

- Literature search
  - Telehealth literature
  - Computer Supported Cooperative Work (CSCW) literature
  - CSIRO Broadband Pilots
  - Interviews with panel of thought leaders
Literature search

- Articles from
  - CINAHL
  - Medline
  - Contents search of JTT & ToH
- Satisfying one of
  - At least one bandwidth-critical current application is described
  - An application in the frontier of current practice is described
  - A technology associated with advanced networks is discussed in the context of telehealth
- There is a substantial discussion of future trends
- In total, 147 articles were analysed

Expert panel

- Recruited from Australia and USA
- 11 participants
- Semi-structured interview performed by researchers
- Each interview lasted around 45 minutes
- In person, Skype or telephone
- Analysed using thematic coding

High-end systems Evidence base

Three advanced telehealth systems trialed in the CSIRO CeNTIE program

Expert panel

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Analysis

Telehealth literature

Analysed for trends

CSCW literature

Analysed for trends

CeNTIE pilots

Analysed for trends

Expert panel

Analysed for trends

Meta-analysis for trends

Research questions

Conclusions
Predicting telehealth infrastructure needs

Laurie Wilson

Care models → Patient centricity

- Both a driver and beneficiary of telehealth evolution
- Key technologies
  - Home-based systems
  - Mobile applications
  - Personal health records
  - Implies ubiquity of access
- Also includes such issues as
  - Human factors/culture
  - Process change
  - Policy/regulation
  - Business model, funding
  - Implementation and sustainability
  - Legal/liability issues.

High end & point of care systems

- Emerging applications, e.g.
  - Telestroke
  - ICU
  - Emergency
  - Workforce issues
  - Networked of caregivers
  - Possibly increased use of store and forward
Telehealth evolution

Conclusions 1

• Future infrastructure needs cannot easily be predicted from current applications
• Telehealth will need to evolve with care models, technology and clinical applications developing interdependently
• These will facilitate a more patient-centric model of healthcare delivery.
• Home and mobile-based healthcare delivery will be the fastest-growing area.
• “The more bandwidth the better”

Conclusions 2

• Infrastructure needs to provide:
  • Ubiquity
  • Support on mobile devices
  • Symmetrical if possible
  • Fixed systems supporting one or more channels broadcast-quality video
  • Reliable and easy to use by non-professionals

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