Effectiveness of Telehealth and Telecare: The Whole Systems Demonstrator Project

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content:

assistive technology topology
overview of the wsd project
patient reported outcomes
lessons and challenges
technological advances

the vision – tele assistive devices
terminology for technology enabled practice

**TC** telecare

**TH** telehealth

**TM** telemedicine

key:
*remote* delivery of services and *remote* exchange of info

### tele-care

- **TC** passive monitoring (reduce technophobia?)
- **TC** synchronous monitoring (24-7)

- functional
- security
- environmental
- stand-alone
- via needs assessment
tele-health

- active monitoring (take measures, react to)
- synchronous (24-7) or asynchronous (s&f)
- stepped care responses

tele-medicine

- remote consultations (inc. access to service)
- pre-prepared packages of therapy
- real-time therapy (most extreme robotics)
envisaged benefits

...
**DH - whole systems demonstrator**

**aim** to provide a comprehensive evaluation of the addition of **telecare** and **telehealth** to whole systems re-design

**plan** to assess up to 6,000 individuals and up to 660 carers with a variety of methods and levels of analysis

**wsd evaluation**

- kent
- newham
- cornwall

**TC** patients with social care needs

- patients with long-term conditions **TH**

- diabetes
- heart failure
- copd
**pragmatic cluster randomised trial**

- **gp randomisation**
  - algorithm
  - group 1 practices
    - SCN pts receive TC + comparison of TC & UC → SCN pts receive UC
    - LTC pts receive UC + comparison of TH & UC → LTC pts receive TH
  - group 2 practices

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**tele-health participants (18+yoa)**

- **TH** identified from GP databases
- **TH** confirmed diagnosis of diabetes, COPD, HF
- **TH** required a telephone line (TV in newham)
- **TH** sufficient english skills (for kit use)
- **TH** no cognitive impairments (co-morbidities and physical impairments okay)
Tele-health service

Site differences between services, however all had a focus on monitoring vital signs, symptoms and self-management behaviour.

tele-care participants (18+yoa)

- Individuals with social care needs (scn), identified via databases or lists of service users with known need.
- Receiving:
  (i) Night sitting
  (ii) 10+ hrs/week home care
  (iii) 1+ days/week of care
  (iv) Mobility difficulties
  (v) Risk of fall
  (vi) Cognitive impairment
  (vii) Live-in/nearby carer facing difficulty
tele-care participants (18+yoa)

- appropriate power supplies and telephone
- no existing ‘connected’ telecare
- fewer site differences in service provision

wsd evaluation

1. service utilisation
2. patient reported outcomes
3. cost effectiveness
4. patient & professional experience
5. service delivery & organisation

- quantitative
- quantitative
- quantitative
- qualitative
- qualitative
patient reported outcomes

generic health related quality of life – psych wellbeing

+ socio-demographic and trial related variables

patient reported outcomes

measurement points

controls post-recruitment

recr 4m 12m

TH TH TH

baseline short-term long-term

pre 4m 12m

TC TC TC

intervention post-tech
analyses

- TH & TC datasets were treated independently

- covariates were slightly different for the two datasets, reflecting the different contexts – both included baseline scores of outcome

- key effects: trial arm, time & trial arm*time

tele-health participants

- 3230 participants in the TH trial (238 GPs)
- 1573 (49%) participated in the TH questionnaire study (154 GPs)
- 986 (63%) – complete ST FU
- 974 (62%) – complete LT FU
- 1201 (76%) completed baseline plus one follow-up questionnaire

participants for available case cohort – intention to treat analyses

- 531 – usual care
- 670 – intervention
- copd – 576
- diabetes – 488
- heart failure – 532
478 – female
723 – male
cornwall – 389
kent – 501
newham – 311
(of) usual care
(of) intervention
males
324 (61%)
399 (60%)
ethnicity (non-white)
68 (13%)
75 (11%)
age (yrs)
70.5 (11.6)
70.1 (11.0)
depprivation
28.1 (13.8)
26.2 (14.2)
no. of comorbidities
2.0 (1.9)
1.9 (1.8)
no. of TH devices
0.1 (0.5)
2.7 (0.7)

tele-health results
## tele-health results

<table>
<thead>
<tr>
<th>Trial Arm</th>
<th>Time</th>
<th>Physical Health</th>
<th>Mental Health</th>
<th>EQ5D Health Status</th>
<th>Anxiety</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

**Trial Arm Time**

<table>
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<th>physical health</th>
<th>mental health</th>
<th>EQ5D health status</th>
<th>anxiety</th>
<th>depression</th>
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</table>
### tele-care participants

- **2600 participants in the TC trial (238 GPs)**
  - **1189 (46%)** participated in the TC questionnaire study (204 GPs)
  - **535 (45%)** – complete ST FU
  - **763 (64%)** – complete LT FU
  - **873 (73%)** completed baseline plus one follow-up questionnaire

- **participants for available case cohort – intention to treat analyses**
  - **443 – usual care**
  - **430 – intervention**

**568 – female**
- **cornwall – 188**
- **568 – female**
  - **ột (of) usual care**
  - **148 (34%)**
  - **54 (12%)**
  - **239 (54%)**
  - **73.3 (13.6)**
  - **29.4 (15.7)**
  - **0.2 (0.9)**

- **kent – 247**
  - **157 (37%)**
  - **49 (11%)**
  - **218 (51%)**
  - **73.7 (13.9)**
  - **27.4 (14.4)**

- **newham – 258**
  - **430 – intervention**
  - **3.9 (1.7)**

**305 – male**
- **cornwall – 188**
- **kent – 247**
- **newham – 258**
  - **males**
  - **ethnicity (non-white)**
  - **living alone**
  - **age (yrs)**
  - **deprivation**
  - **no. of TC devices**
tele-care results

Physical Health – (range 0-100)

Mental Health – (range 0-100)

Health Status – ICECAP (range 0-1)

Health Status – EQ5-D (range 0-1)
tele-care results

<table>
<thead>
<tr>
<th></th>
<th>Total Arm</th>
<th>Time</th>
<th>Total Arm*Time</th>
</tr>
</thead>
<tbody>
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<td>physical health</td>
<td>⊗</td>
<td>⊗</td>
<td>⊗</td>
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<tr>
<td>mental health</td>
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<td>⊗</td>
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<tr>
<td>EQ5D health status</td>
<td>⊗</td>
<td>√</td>
<td>⊗</td>
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<tr>
<td>ICECAP capability</td>
<td>⊗</td>
<td>⊗</td>
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<td>anxiety</td>
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<tr>
<td>depression</td>
<td>⊗</td>
<td>√</td>
<td>⊗</td>
</tr>
</tbody>
</table>

Hedge’s g effect size = 0.18
tele-care results

Health Status - EQ5-D (range 0-1)

Depression - CESD10 (range 0-10)

what have we learnt?
what are the challenges?
service-user technology acceptance questionnaire - SUTAQ

Enhanced Care
- mean = 4.80, SD = 1.03

Increased Accessibility
- mean = 4.13, SD = 1.33

Privacy & Discomfort
- mean = 1.94, SD = 1.01

Care Personnel Concerns
- mean = 2.43, SD = 1.17

Kit as substitution
- mean = 3.35, SD = 1.21

Satisfaction
- mean = 5.29, SD = 0.93

SUTAQ sub-scale differences in TC (passive kit) and TH (active kit) users

<table>
<thead>
<tr>
<th>Sub-scale</th>
<th>TC Mean</th>
<th>TH Mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced care</td>
<td>4.7070</td>
<td>4.4424</td>
<td>&lt;0.001</td>
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<tr>
<td>Increased accessibility</td>
<td>4.1058</td>
<td>3.7300</td>
<td>&lt;0.001</td>
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<tr>
<td>Privacy/discomfort</td>
<td>1.0421</td>
<td>1.0888</td>
<td>0.053</td>
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<tr>
<td>Care personnel concerns</td>
<td>2.4289</td>
<td>2.6904</td>
<td>0.0396</td>
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<tr>
<td>Kit as substitution</td>
<td>3.3529</td>
<td>3.0196</td>
<td>0.076</td>
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<tr>
<td>Satisfaction</td>
<td>5.2078</td>
<td>5.2058</td>
<td>0.842</td>
</tr>
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</table>
SUTAQ sub-scale differences in rejecters of kit and service completers

what have we learnt? what are the challenges?
thank you

questions?

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