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Factors Determining the Success and Failure of Digital Health Interventions

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Acknowledgements

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Wide range of excellent colleagues across the world but especially Profs Carl May, Kate O'Donnell, Victor Montori, Tracy Finch and Drs Katie Gallacher and Marilyn Lennon.

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Layout of My Talk……

- Context
- Experience From A National Deployment
- Can Theory Help?
- Key Implementation Issues to Consider
- Putting Users at the Centre Of Design
- Engaging with Users
- Concluding Thoughts

Enthusiasm for New Technologies in Health Care Delivery

- The possibilities that new technologies/health informatics present to health care systems; practitioners, and carers and patients are considerable.

- Policymakers have been quick to recognise the possibilities of new technologies in the health service.

- BUT new technologies have often struggled to become part of routine service delivery.

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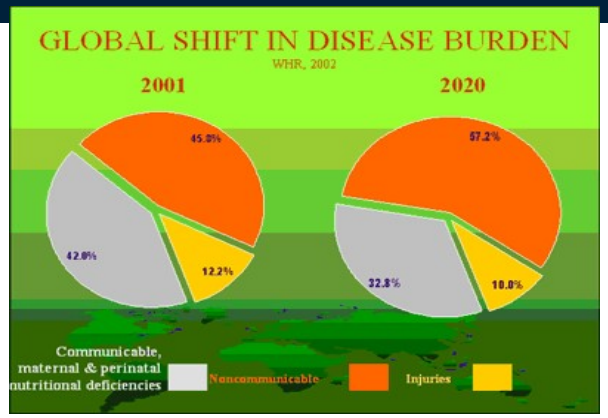
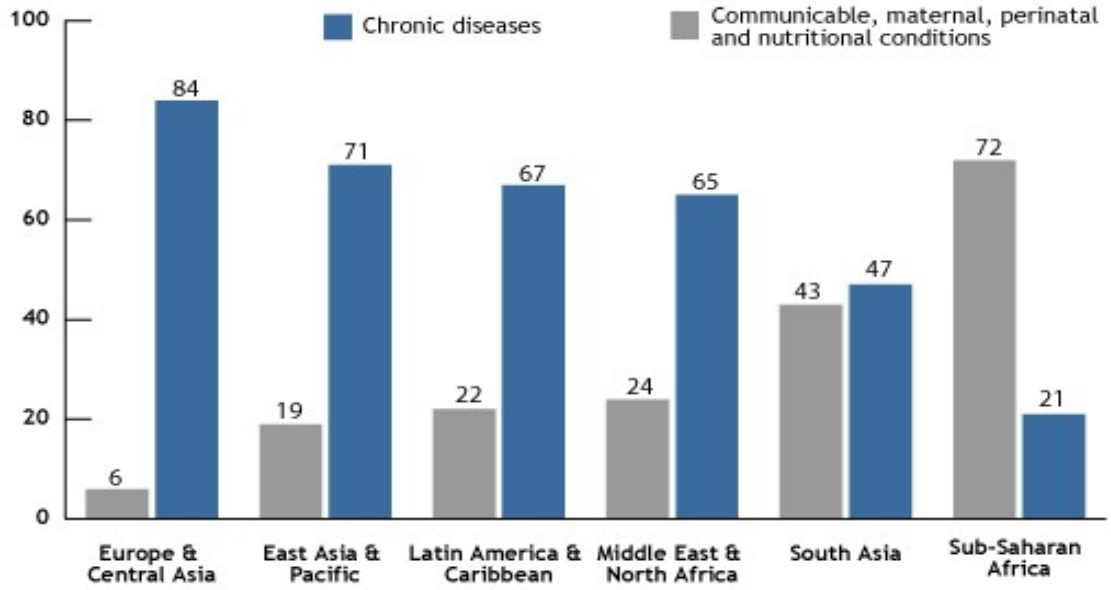
THE RISE OF NON-COMMUNICABLE DISEASES





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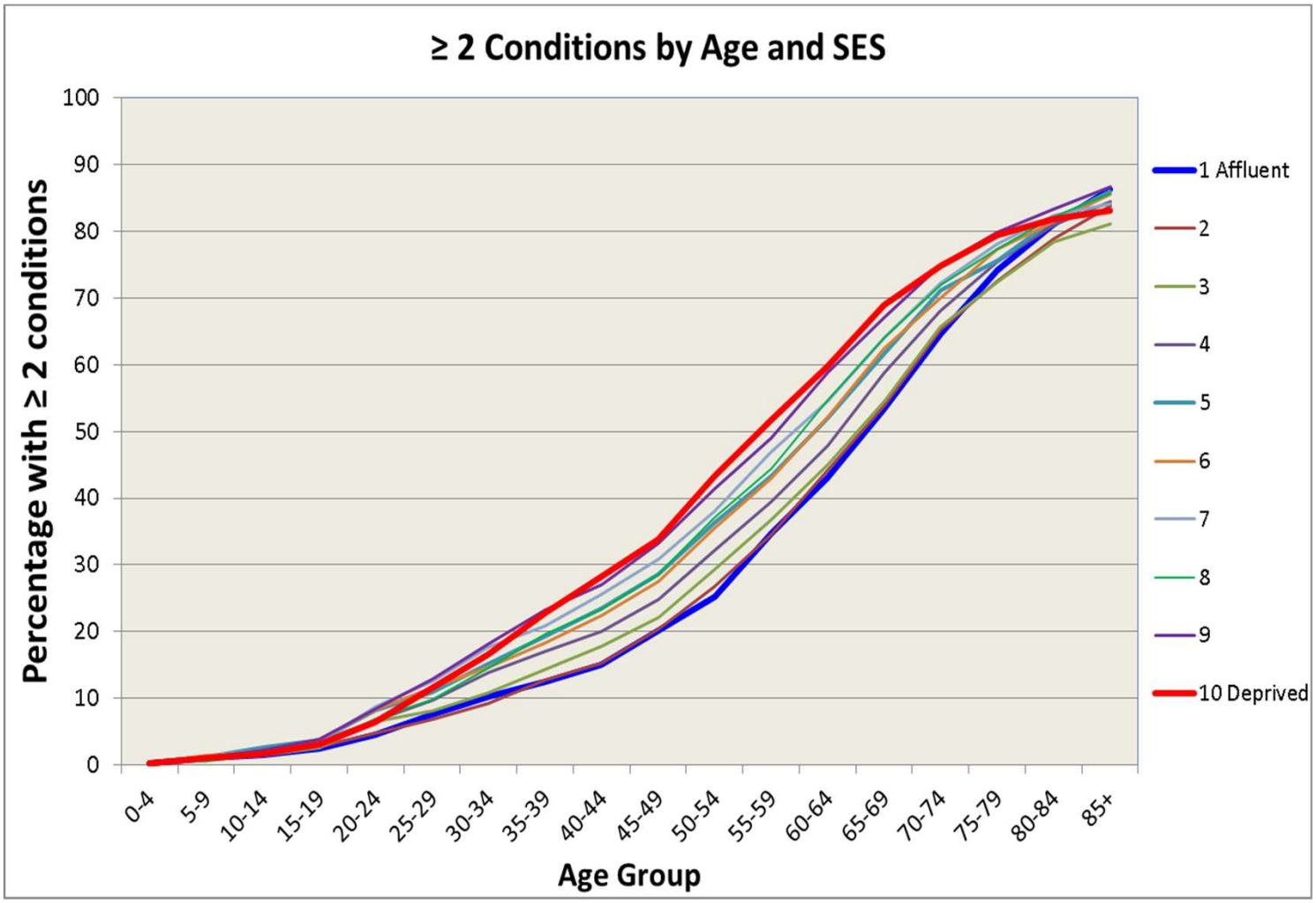
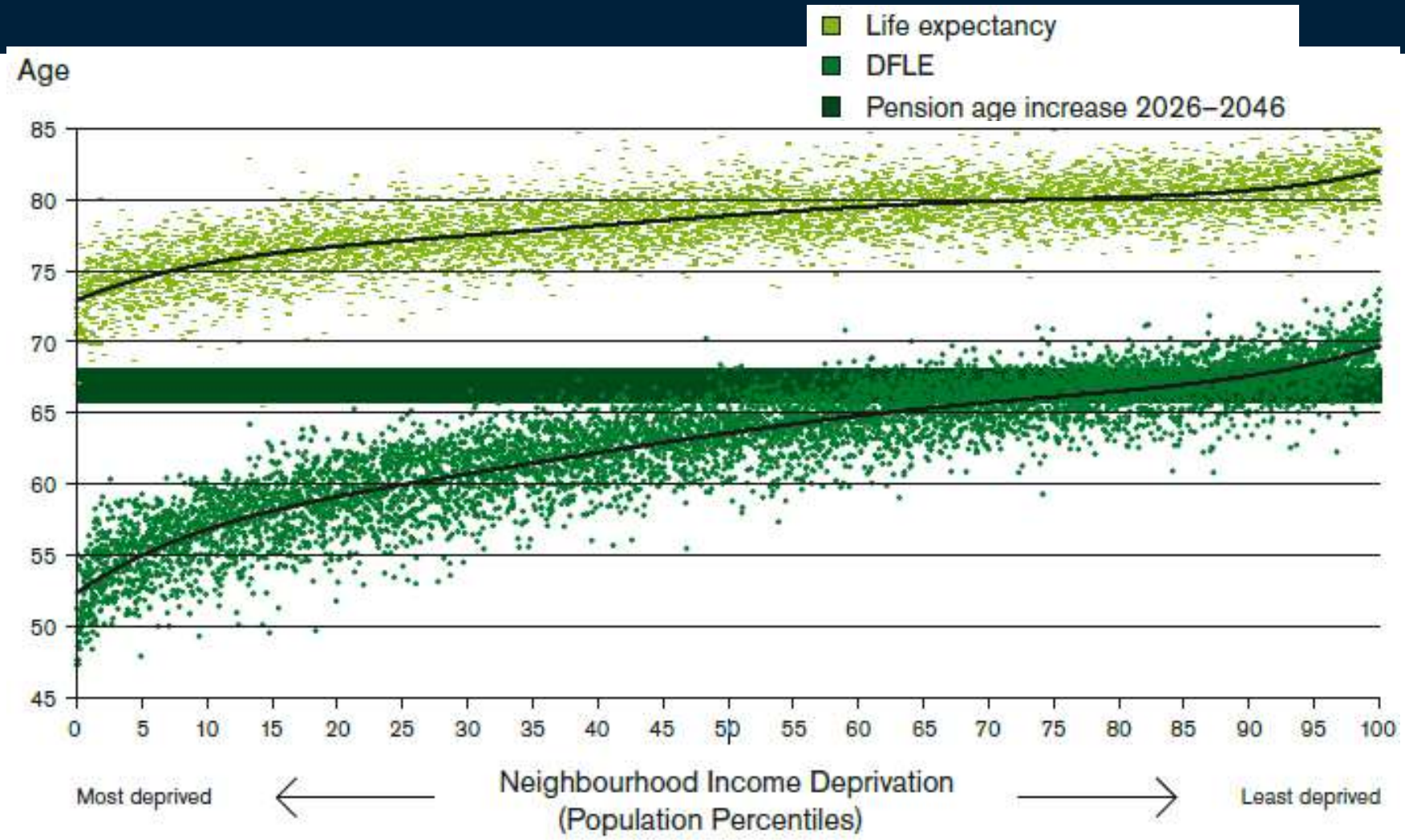


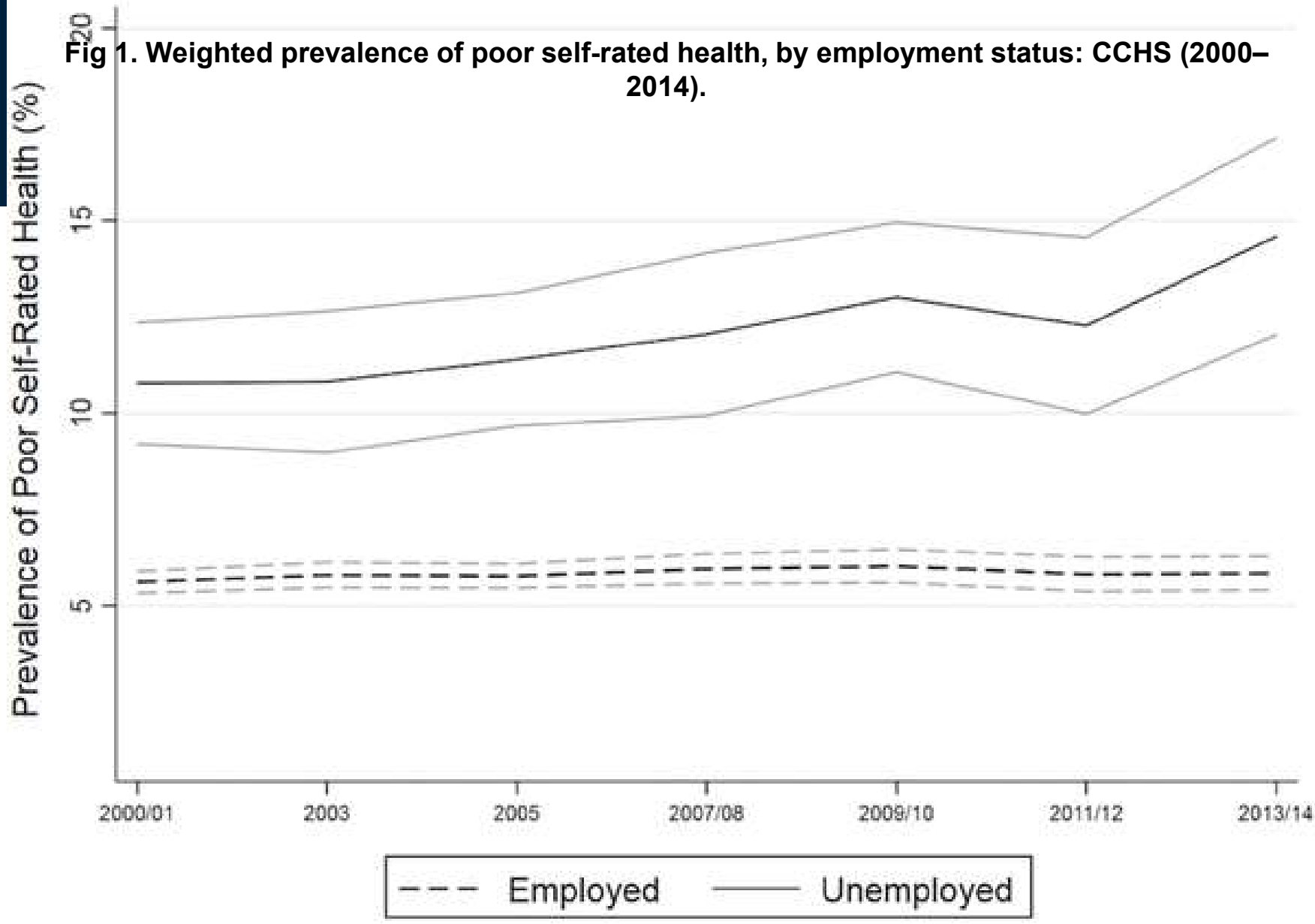
Barnett, K., Mercer SW et al. (2012) Epidemiology of multimorbidity and implications for healthcare, research, and medical education: a cross-sectional study. Lancet, 380 (9836). pp. 37-43

Life expectancy and disability-free life expectancy (DFLE) at birth, persons by neighbourhood income level, England, 1999–2003



Source: Marmot Review (2010) Fair Society, Healthy Lives
http://www.ucl.ac.uk/gheg/marmotreview/Documents/finalreport

Fig 1. Weighted prevalence of poor self-rated health, by employment status: CCHS (2000–2014).



Vahid Shahidi F, Muntaner C, Shankardass K, Quiñonez C, Siddiqi A (2018) Widening health inequalities between the employed and the unemployed: A decomposition of trends in Canada (2000-2014). PLOS ONE 13(11): e0208444. https://doi.org/10.1371/journal.pone.0208444
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0208444

While new technologies are subject to very rapid development, the professional, organizational and institutional terrain on which this technology is set in play is much less amenable to change.

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- Implementing and embedding new technologies of any kind involves complex processes of change at the micro level for professionals and patients and at the meso level for health-care organizations themselves.

- EU has argued that implementing e-health strategies "*has almost everywhere proven to be much more complex and time-consuming than initially anticipated*"

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Oh dear, is this another costly IT failure? - Telegraph - Internet Explorer provided by The University of Glasgow

http://www.telegraph.co.uk/news/politics/109

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Oh dear, is this another costly IT failure?

Taxpayers deserve to know why Whitehall computer contracts keep going wrong

128 0 0 111 239 Email

Insufficient attention paid to implementation issues

- When you introduce a new technology you are seeking to seeking to influence *how people think*, *act* and *organise* themselves.
- True of all types of digital health
  - **EMR**
  - **CDSS**
  - **Apps**
  - **Telehealth**
  - **Sensor based technologies etc……**

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The Translational Gap Remains Wide.....

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Implementing new technologies necessitates changes in *expertise* and *actions*

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- Getting new technologies used in practice so that they become routinely embedded in social contexts is the result of people working, individually and collectively, to implement them.

- Important to also take a “whole systems view”

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This paper is in the following e-collection/theme issue:

Clinical Informatics Telehealth and Telemonitoring Adoption and Change Management of eHealth Systems

Electronic Health Records eHealth Infrastructures

Article | Cited By (5) | Tweetations (179) | Metrics

Original Paper

Readiness for Delivering Digital Health at Scale: Lessons From a Longitudinal Qualitative Evaluation of a National Digital Health Innovation Program in the United Kingdom

Marilyn R Lennon[1], BSc, PGDip, PhD ; Matt-Mouley Bouamrane[1], PhD ; Alison M Devlin[2], BSc (Hons), PhD ; Siobhan O'Connor[3], RN, BSc, CIMA CBA ; Catherine O'Donnell[2], BSc (Hons), MPH, FHEA, PhD ; Ula Chetty[2], BSc, MRCGP, MBChB, MRCP ; Ruth Agbakoba[2], MSc, B Sc (Hons) ; Annemieke Bikker[2], MSc ; Eleanor Grieve[4], BA (Hons), MPH ; Tracy Fi

Sally Wyke[6], FRSE, FRCGP, PhD, B Sc (Hons)

Delivering digital health and well-being at scale: lessons learned during the implementation of the dallas program in the United Kingdom

Alison M Devlin, Marilyn McGee-Lennon, Catherine A O'Donnell, Matt-Mouley Bouamrane, Ruth Agbakoba, Siobhan O'Connor, Eleanor Grieve, Tracy Finch, Sally Wyke, Nicholas Watson, ... Show more

Journal of the American Medical Informatics Association, Volume 23, Issue 1, 1 January 2016, Pages 48–59, https://doi.org/10.1093/jamia/ocv097

Published: 08 August 2015 **Article history** ▾

The dallas Programme

n	To transform digitally supported self care
nities	i-focus · LIVING IT UP · Mi more independent · YEAR
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tory es	Coherence · Cognitive Participation · Collective Action · Refle Monit
es	Choice · Control · Community · Collaboration · Contribution · C

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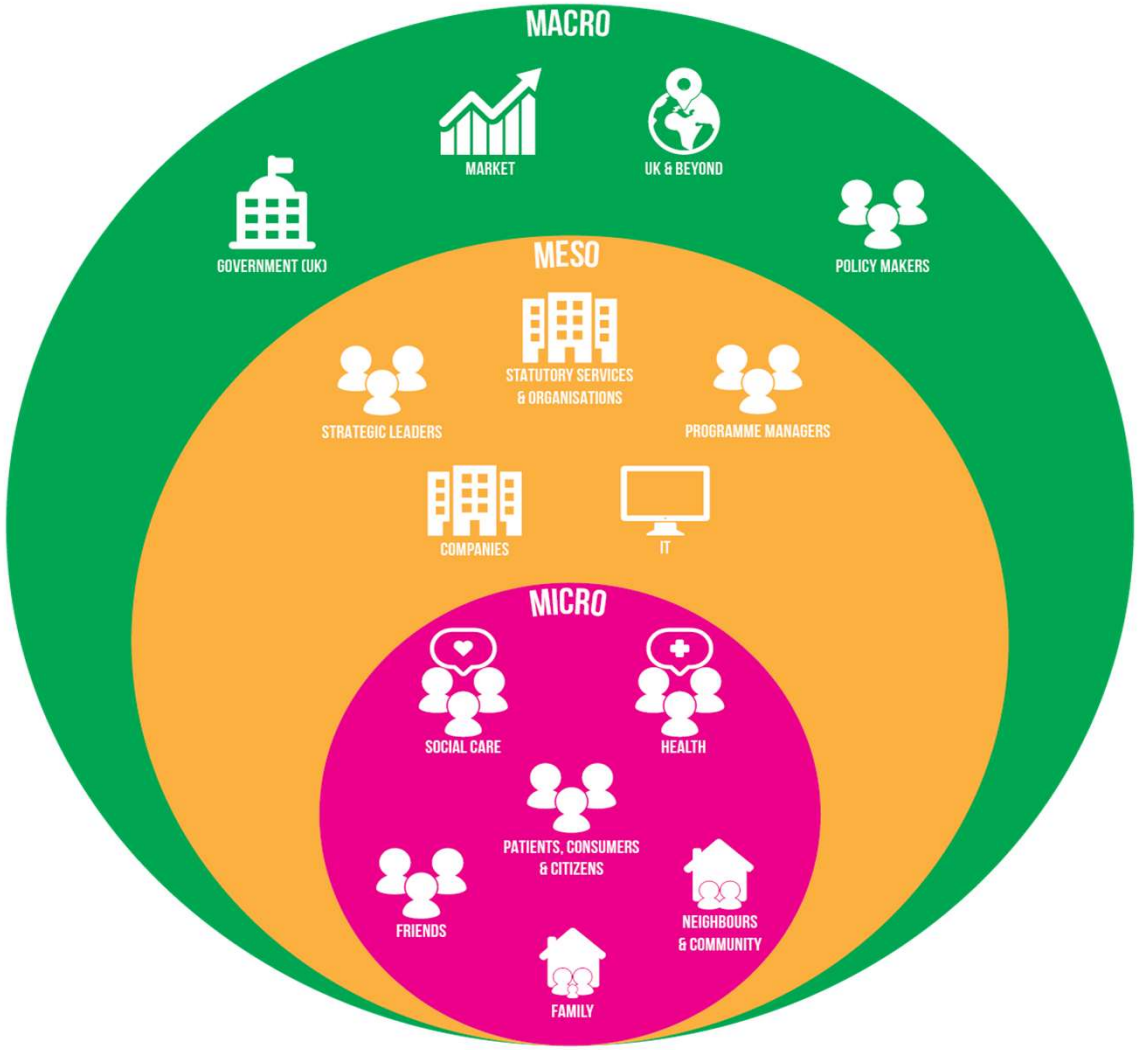
Considering Macro, Meso and Micro Issues



Recommendations

- Invest in infrastructure (national and local)
- Brand Trust and Confidence is Crucial – Consider Accreditation/Kitemarking
- Interoperability (may need incentivised)
- Invest in Engagement and Enablement
- Make digital health services more accessible .

- The importance of tailoring to meet user's needs – self management is only one part of the workload in a person's life
- Co-design
- Engagement and Enablement
  - The need for investment in upskilling to promote access and expedite uptake and utilisation of digital health and wellbeing technologies.
- Infrastructure
- Accreditation/Quality Assurance
- Policy (Data privacy regulations etc)

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- So what factors will inhibit or promote the implementation and embedding of health informatics interventions in clinical practice in different settings: primary care, hospital, community and home?

- What needs to be considered?

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In the context of digital health interventions…..

Participants: Are all those involved in operationalising these technologies:

e.g. Practitioners
Health service managers
Public/Caregivers/Wider Family
Wider Community
Policymakers

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Normalisation Process Theory (NPT) – can help .....

Construct	What it addresses
Coherence	Can stakeholders make sense of a new health informatics intervention?
Cognitive Participation	Can stakeholders get others involved and engaged with implementation of the new technology?
Collective Action	What has to be done to make the technology work in routine practice?
Reflexive Monitoring	How can use of the technology be monitored and evaluated?

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Thinking about doing

Coherence

Cognitive Participation

Reflexive Monitoring

Collective Action

Doing the doing

Courtesy of Prof Kate O'Donnell

Coherence - Key questions

- Are the key attributes of the new technology easy to describe?
- Is the planned health informatics intervention different/distinct from other
- established ways of working?
- Are all the relevant individuals clear about what specific tasks and responsibilities will be reqd of them during implementation of the new technology?
- Do participants have a shared understanding of what is hoped to be achieved by introducing the new technology?
- Do individuals understand the value, benefits and importance of the new technology; and for whom?

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- So for a new health informatics intervention..
  - **Is the rationale for the new technology clear?**
  - **Will benefits be valued by participants?**
-
- OR will it all just be perceived as just more work.....?

Cognitive Participation - Engagement

- How much will individuals commit to and engage with implementing the new technology
- How much they are able to get others to buy-into the innovation. (Often referred to as enrolment).

Key questions:

- Are people prepared to invest time, energy and work in implementing and sustaining the new technology in practice?
- Do they think this is a legitimate use of their time?

Achieving “Buy In” Can Be A Struggle!

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Will the new technology be seen as a good idea?

- *Will people be prepared to invest time, energy and work in implementing the new technology and sustaining it in practice?*

MAYBE or MAYBE NOT?

Collective Action : Does it Help?

- What do people have to do to make the new technology work in practice?
- How does the new technology affect the work of individuals?
- Does the technology change existing work at all e.g. are new staff required?
- Does the technology make existing work easier or harder?
- Do staff have confidence in the new technology?
- Do staff need training before using the technology?
- Will organisations support the deployment of the new technology?

Reflexive Monitoring: Appraisal

- How are users likely to perceive the new technology once it has been in use for a while?
- Is the technology intervention likely to be thought of as advantageous e.g .for staff, for patients?
- Will the effects of the new technology be easily identifiable?
- Can relevant participants contribute to feedback about the technology, once it is in use?
- Can the new technology be adapted/improved on the basis of feedback and experience?

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- What mechanisms are in place to allow individuals to provide feedback on the new technology?
- What scope is there for iterative development?

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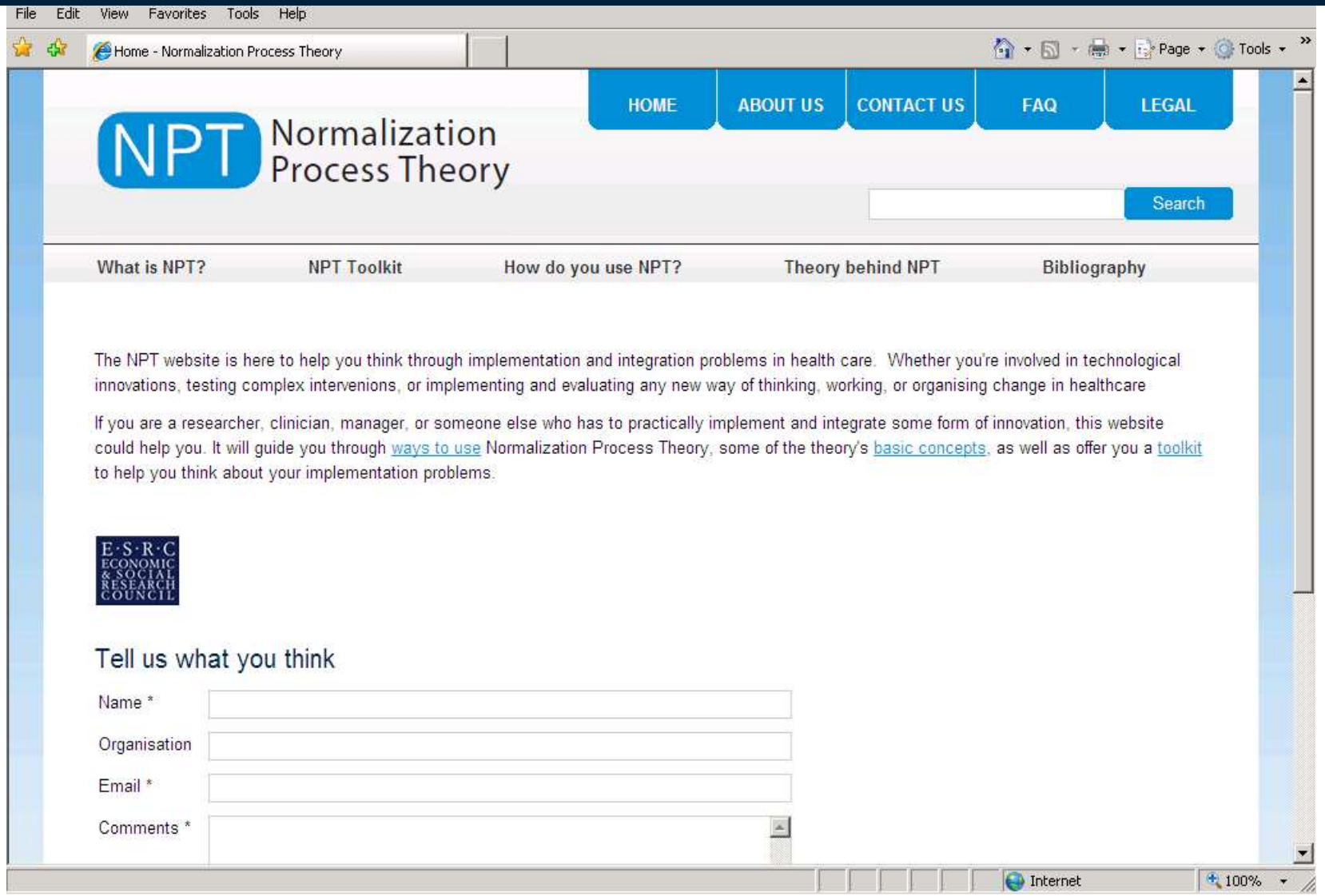
NPT Toolkit provides a simple way to think through key issues around implementation, embedding, and integration

http://www.normalizationprocess.org/



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WHAT ARE THE IMPLICATIONS OF NEW DIGITAL HEALTH INTERVENTIONS FOR PUBLIC AND CAREGIVERS?

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- Courtesy of BMJ 29 august 2009 Vol 339. May, Montori and Mair. We need Minimally Disruptive Medicine.

BMJ 2014;349:g6680 doi: 10.1136/bmj.g6680 (Published 10 November 2014)

EDITORIALS

Thinking about the burden of treatment

Should it be regarded as an indicator of the quality of care?

Frances S Mair *professor of primary care research*[1], Carl R May *professor of healthcare innovation*[2]

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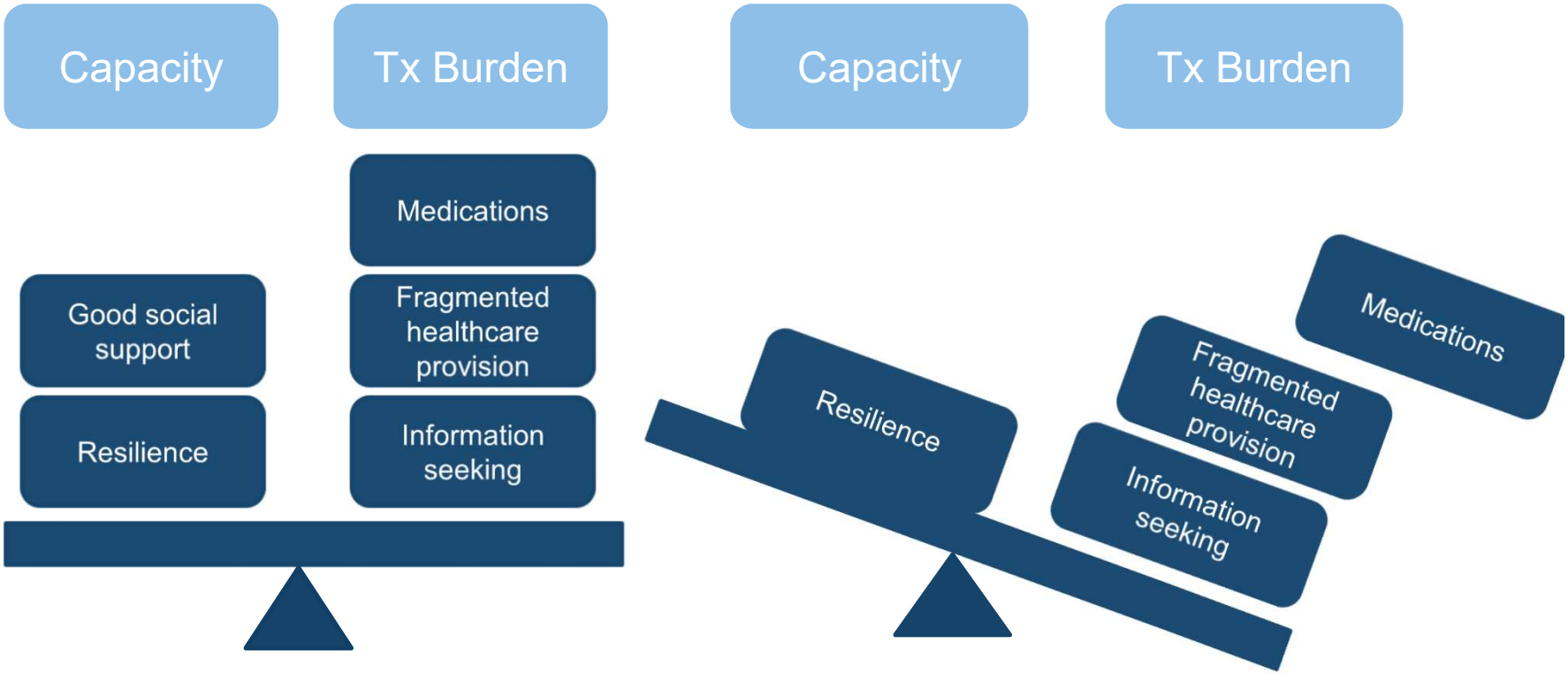
Coping Threshold



1.Gallacher K, May CR, Montori V, Mair FS.Treatment Burden in Multimorbidity. In ABC of Multimorbidity.2014

2. Leppin A, Gionfriddo MR, Kessler M, Brito JB, Mair FS, Gallacher K, Wang Z, Erwin PJ, Sylvester T, Boehmer K, Ting HH, Murad H, Shippee ND, Montori VM. Preventing 30-Day Hospital Readmissions A Systematic Review and Meta-Analysis of Randomized Trials. JAMA Internal Medicine. 2014.

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Life Workload – self-management workload is only part of the workload in a person's life!

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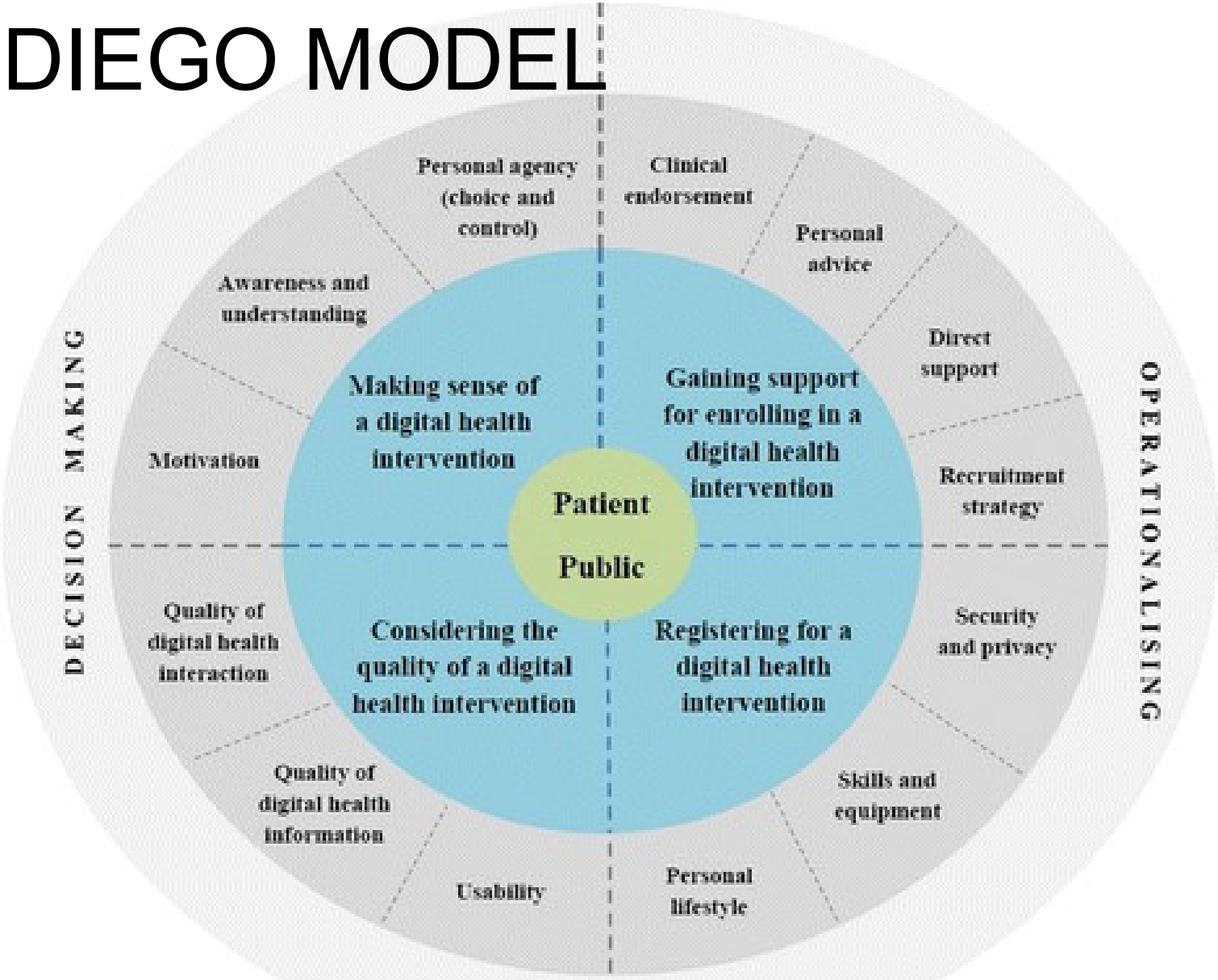
- WHO IS AT RISK? – EVERYONE!
- ALL THOSE WITH CAPACITY ISSUES
- Those with LTCs especially Multimorbid
- Vulnerable: migrants, those with learning difficulties,
- Those with health literacy issues, socially isolated, mental health problems, addiction problems, those lacking good social support networks and so on.....

EMERGING EVIDENCE OF THE VALUE OF INTERVENTIONS TO ADDRESS THESE ISSUES.....[1]

- 1. Leppin A, Gionfriddo MR, Kessler M, Brito JB, Mair FS, Gallacher K, Wang Z, Erwin PJ, Sylvester T, Boehmer K, Ting HH, Murad H, Shippee ND, Montori VM. Preventing 30-Day Hospital Readmissions A Systematic Review and Meta-Analysis of Randomized Trials. JAMA Internal Medicine. Published Online May 12, 2014.

DIEGO MODEL



O'Connor S, Hanlon P, O'Donnell CA, Garcia S, Glanville J, Mair FS. (2016) Understanding factors affecting patient and public engagement and recruitment to digital health interventions: a systematic review of qualitative studies. BMC Medical Informatics and Decision Making 16:120.

Key Messages

- Buying the kit only the beginning.....
- Need to invest heavily in a communication strategy – targeting all relevant stakeholders
- Target policymakers to ensure national/local policies support the implementation of the new technology.
- Reconfiguration of services may be reqd/Cost implications
- Education/support essential
- Staff/Public/Patients/caregivers need to be ENABLED and not overwhelmed.....

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- Frequently, the technology is over-emphasised .

- Whereas the crucially important issue is the ways in which the ways of working need to be adapted to make the new systems work in practice.

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If equipment is simply parachuted into an existing clinical context, the chances for successful introduction and integration of the digital health system as reconfigured practice will be severely compromised.

CONTEXT

- Understanding current healthcare challenges: Multimorbidity and complex needs
- What are the implications of new Digital Health Interventions for Patients and Caregivers?

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Concluding Thoughts

- Many challenges
- Not insurmountable
- BUT need ACKNOWLEDGED and ADDRESSED if digital health deployment at scale is to be realised.
- Development and Evaluation with users as partners likely to reap greatest benefit for all.

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Questions?

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