Will COVID-19 Accelerate the Adoption of Digital Health Technologies?

Perspectives on Evaluating Digital Health Technologies during Global Disease Outbreaks

November 16, 2020

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Conflict of Interests

- Kristian Kidholm: No conflicts of interests declared
- Maja Kjær Rasmussen: No conflicts of interests declared
- Jason Shafrin: Employee of and holds equity in PRECISIONheor, a consulting firm to the life sciences industry. Founder and Editor of the Healthcare Economist blog.
- Hans C. Ossebaard: No conflicts of interests declared

Panelists

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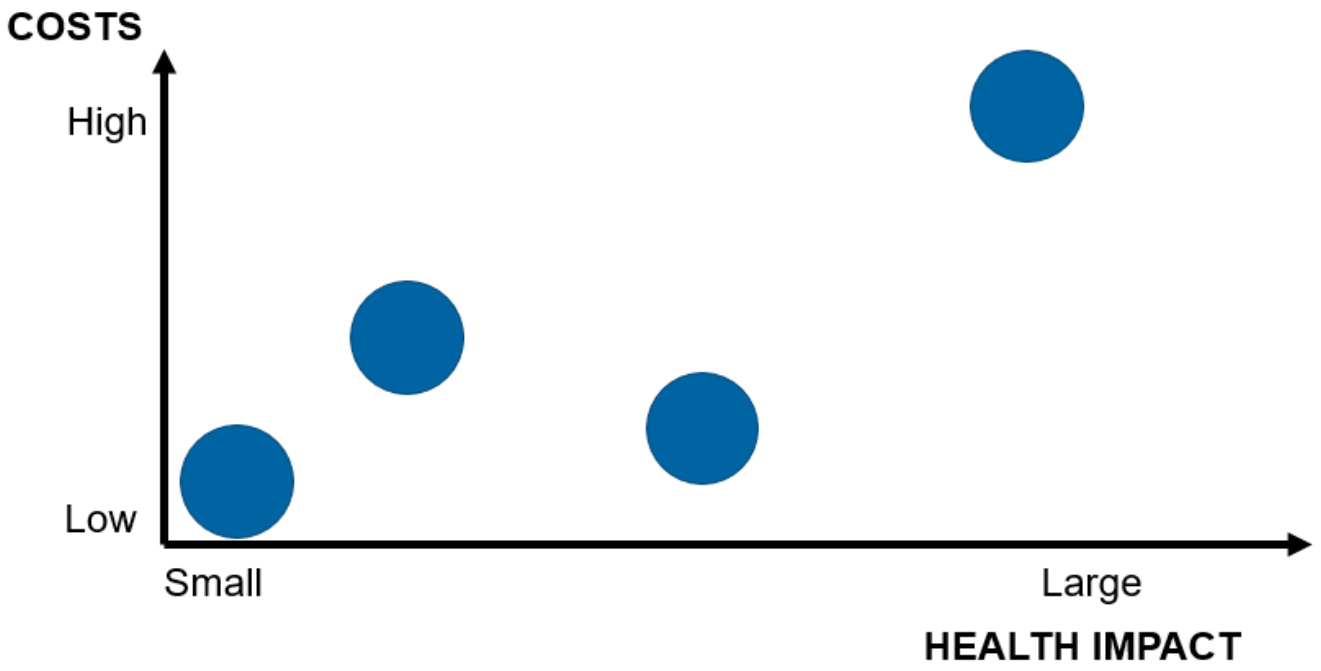
Examples of Digital Health Technologies – used in response to COVID-19

1. Telephone consultation with patients
2. Video consultation with patients
3. Apps with information and text-messages for patients
4. Collection of PRO – Patient Reported Outcomes
5. Home monitoring of clinical data from patients
6. Home treatment of patients by use of digital devices e.g. pumps for intravenous injection of antibiotics

Examples of Digital Health Technologies – used in response to COVID-19



RCT approach for measuring Digital Health Technologies

Maja Kjær Rasmussen

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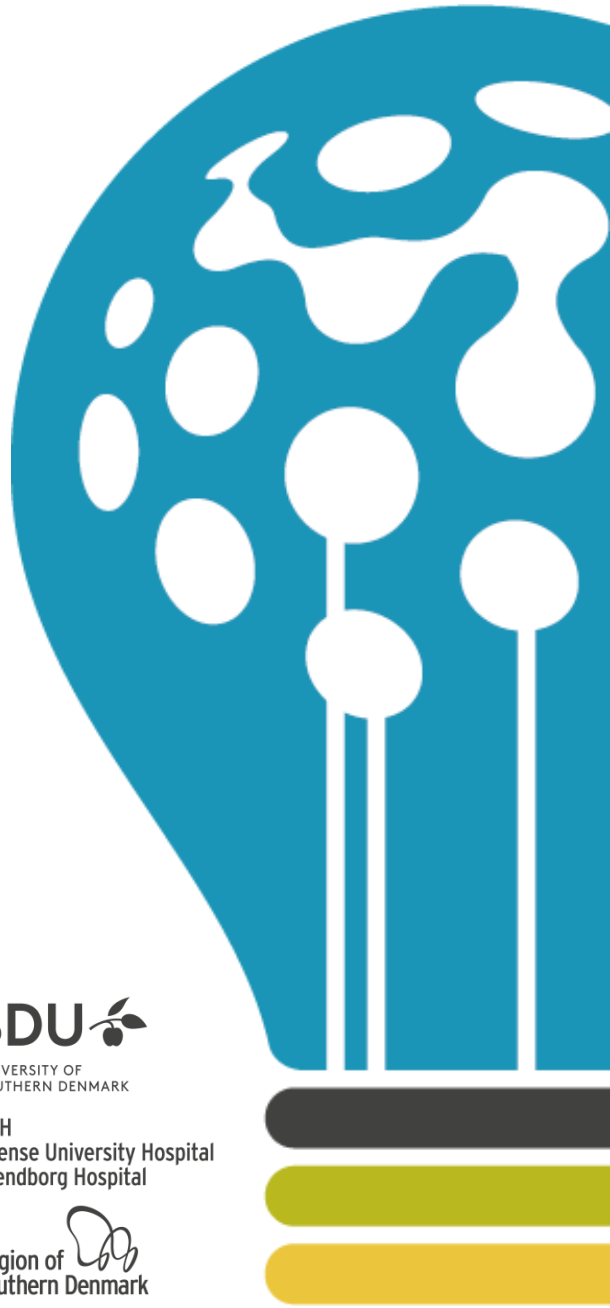

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RCT approach for measuring Digital Health Technologies – The Teledi@log Project

Cardiac rehabilitation (CR) leads to reductions in mortality, but suffered from low participation

Purpose of Teledi@log:
Develop and test individualized cardiac tele rehabilitation (CTR) program.

Aim of study: Assess costs and cost-utility of Teledi@log
Methods:

- RCT
- Primary outcome: Incremental cost-effectiveness ratio
- Secondary outcomes: Total Health-care costs, QALY
- Data from national registries and the project
- 12 m follow-up

Kidholm et al 2015: Cost-Utility Analysis of a Cardiac Tele rehabilitation Program: The Teledialog Project

RCT approach for measuring Digital Health Technologies – The Teledi@log Project

Results:

- Cost Δ = 1,653
- QALY Δ = 0.004
- Mean ICER (bootstrap resample) = €483,608 per QALY gained.

- Findings indicate that the tele rehabilitation approach is not cost-effective in a small-scale study.

Mean costs per patient,€:	Telemedicine (n=72)	Control (n=69)
Telemedicine service:	€341	-
Rehabilitation	€326	€229
Hospital Care	€4,757	€3,521
GP	€234	€258
Total costs:	€5,658	€4,005

Kidholm et al 2015: Cost-Utility Analysis of a Cardiac Telerehabilitation Program: The Teledialog Project

RCT approach for measuring Digital Health Technologies

Discussion

Pros

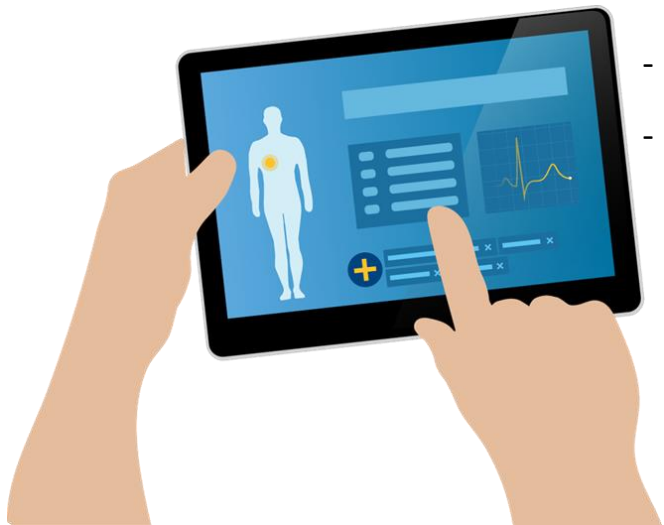
- RCT can be used for measuring clinical and economic value
- Estimates with internal validity
- Commonly recognized evidence
- RCTs have overturned assumptions drawn from non-randomized studies.

Cons

- Small sample size – a few expensive patients have large impact on costs.
- Larger study with long follow up needed.

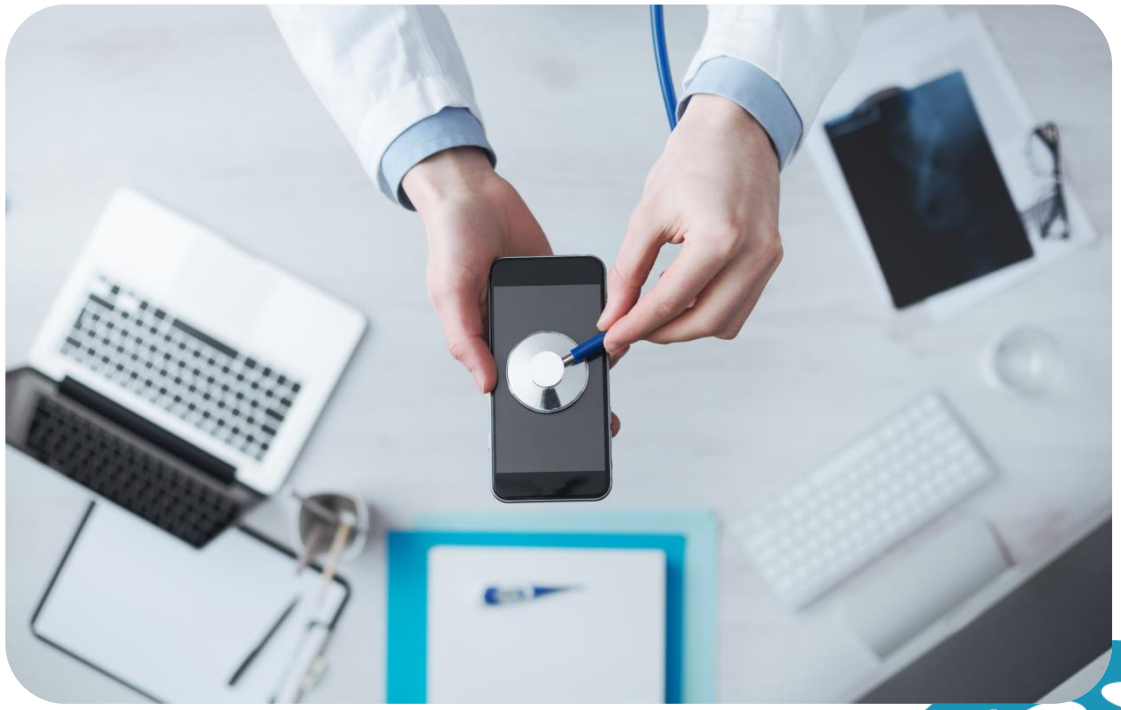
- RCT does not provide answers to evolving questions as:

- Was the TM intervention tailored to individual needs?
- Were costs under-estimated because of the project setting?
- Was SF-36 the right tool?



Conclusion

- High evidence level is trusted by providers.
- Often powered to detect stat. significance in clin. outcomes.
- Before planning, consider which research questions are necessary and realistic to answer.
- Should only be planned if there is likelihood for improved outcomes/ equivalent outcomes at lower cost.
- RCT can be used for measuring value of Digital health technologies
- Useful as part of a multidisciplinary assessment



Kidholm K, Clemensen J, Caffery LJ, Smith AC. The Model for Assessment of Telemedicine (MAST): A scoping review of empirical studies. *Journal of Telemedicine and Telecare*. 2017;23(9):803-813. doi:10.1177/1357633X17721815

Murray E, Hekler EB, Andersson G, Collins LM, Doherty A, Hollis C, Rivera DE, West R, Wyatt JC. Evaluating Digital Health Interventions: Key Questions and Approaches. Am J Prev Med. 2016 Nov;51(5):843-851. doi: 10.1016/j.amepre.2016.06.008. PMID: 27745684; PMCID: PMC5324832.

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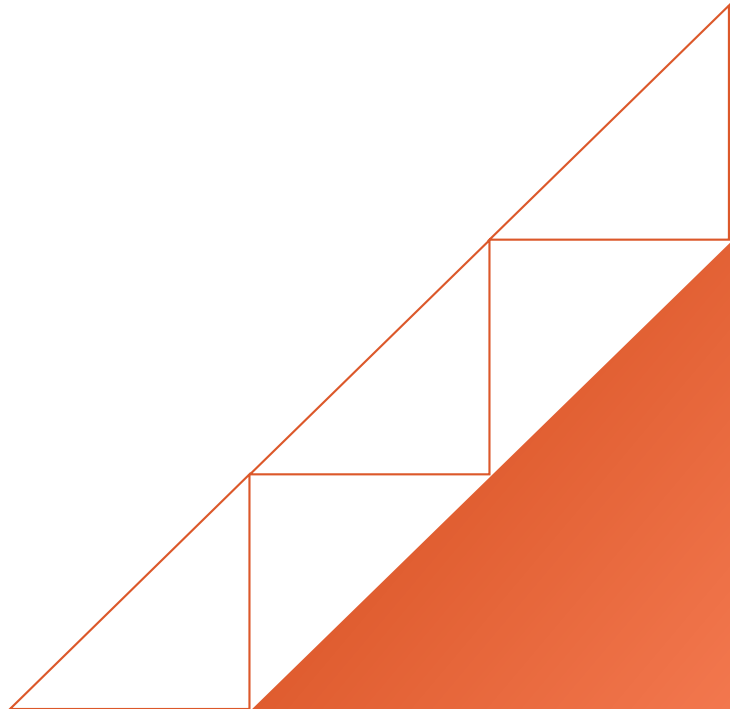
shift the trajectory

Measuring the value of digital medicine

ISPOR Europe 2020

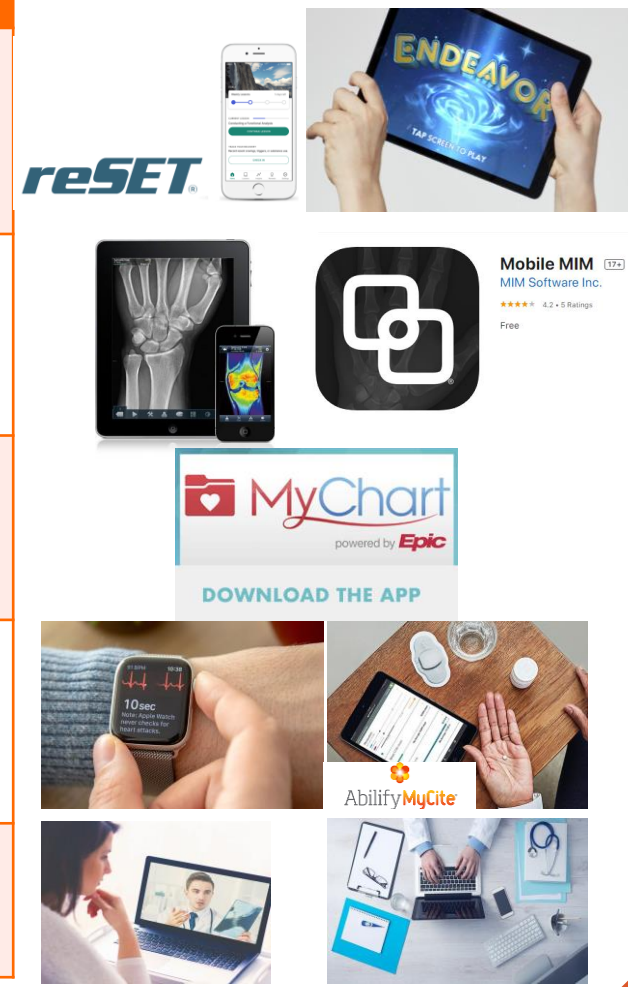
Jason Shafrin, PhD

PRECISIONheor



Defining digital medicine

Category	Description	Delivery
Digital therapeutics (DTx)	Evidence-based interventions that are driven by software programs to prevent, diagnose, manage, or treat a medical disorder or disease	Software, hardware, device, service, or medication
Mobile health (mHealth)	Practice of medicine and public health supported by mobile devices	Software via a mobile device
Health information technology (HIT)	Provides support and security of health information management and exchange	Software or platform
Devices, sensors, wearables	Can be worn, attached on skin, or ingested to continuously and closely monitor an individual's health without limiting user's motions	Hardware and software
Telehealth	Provision of health care remotely by means of telecommunications technology	Software or platform



Abraham, J., et al., *AMCP Partnership Forum: Digital Therapeutics-What Are They and Where Do They Fit in Pharmacy and Medical Benefits?* JOURNAL OF MANAGED CARE & SPECIALTY PHARMACY, 2020. **26**(5): p. 674-681.

How can I measure the value of digital without an RCT?

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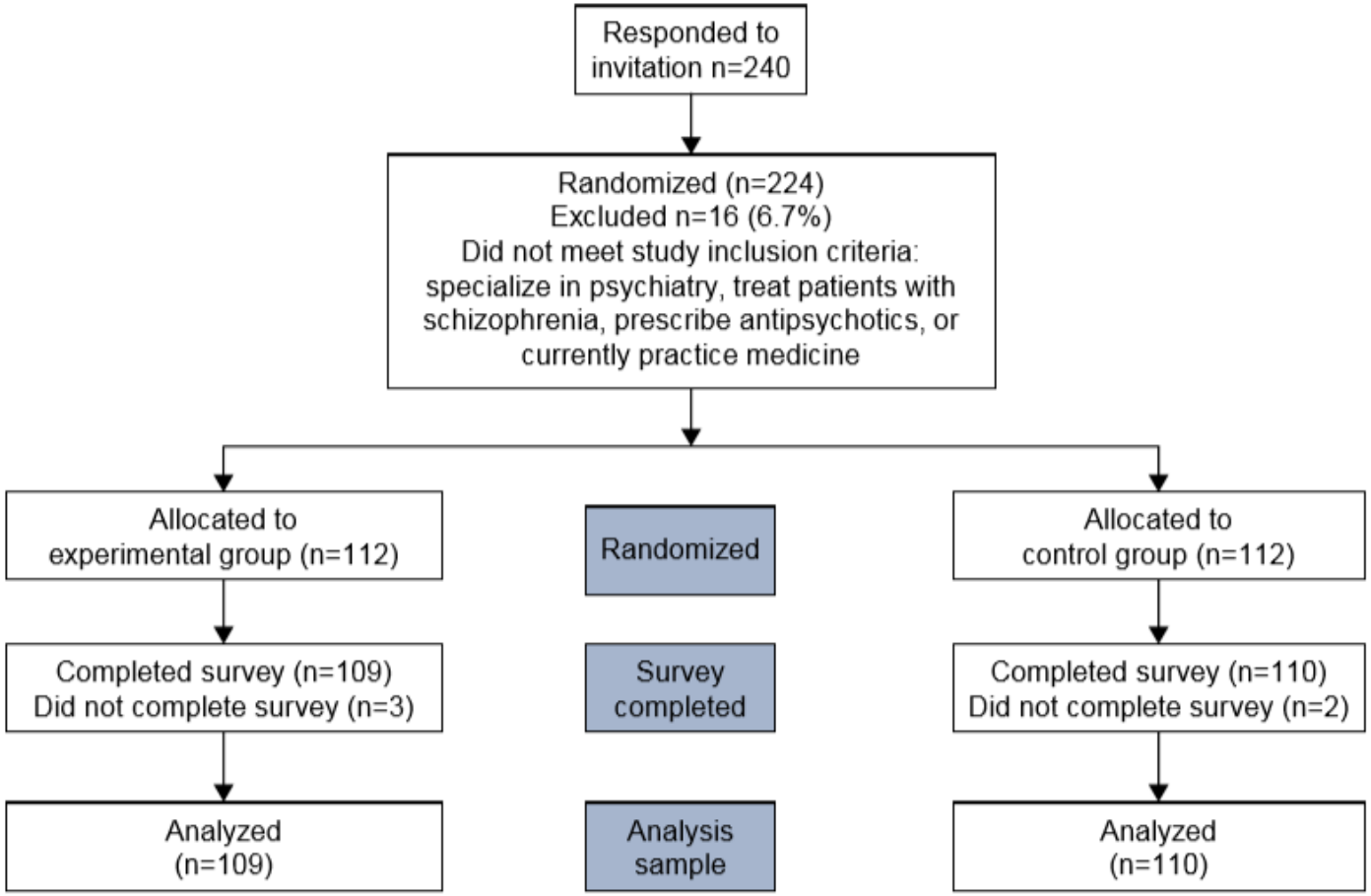
A survey-based approach



CONSORT diagram

Shafrin, J., et al., *Access to credible information on schizophrenia patients' medication adherence by prescribers can change their treatment strategies: evidence from an online survey of providers.* Patient preference and adherence, 2017. **11**: p. 1071.

Models can combine survey, real-world evidence and literature can be used to estimate treatment value

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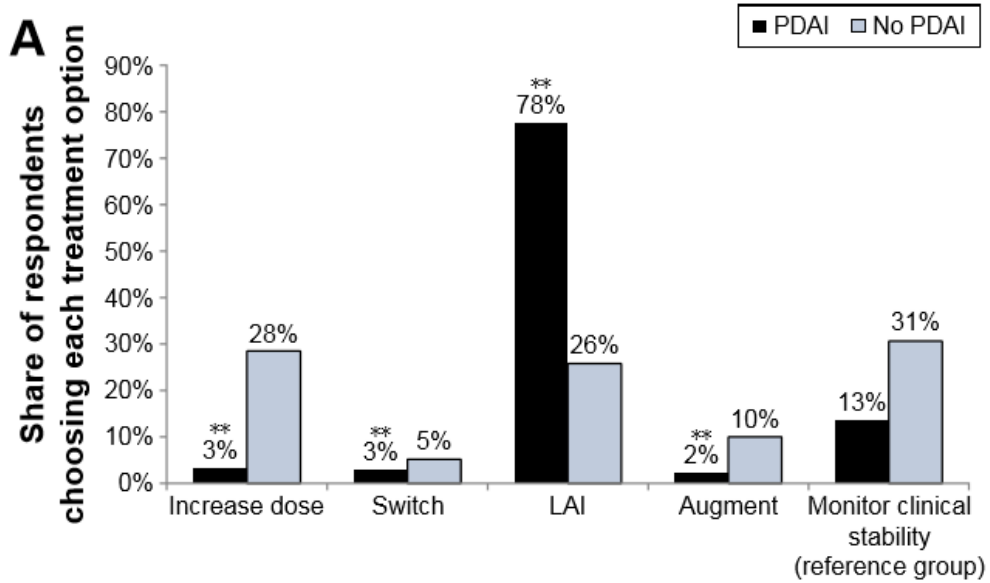
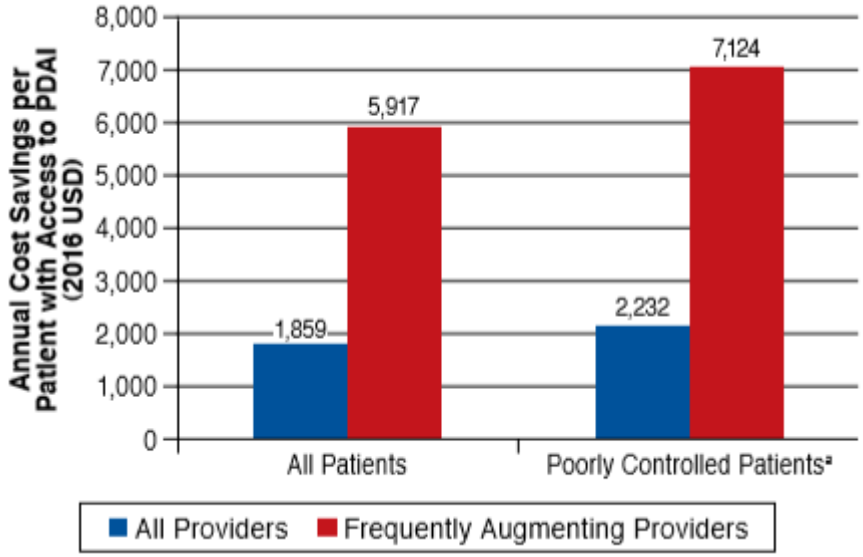
A survey-based approach: Results

Effect of PDAI on treatment decision for (**A**) nonadherent patients (results represent average from 3 vignettes)[1]



Annual incremental cost saving when providers have access to PDAI by baseline treatment pattern[2]



PDAI: Patient drug adherence information

1. Shafrin, J., et al., *Access to credible information on schizophrenia patients' medication adherence by prescribers can change their treatment strategies: evidence from an online survey of providers.* Patient preference and adherence, 2017. **11**: p. 1071.

2. Shafrin, J., et al., *Estimating the value of new technologies that provide more accurate drug adherence information to providers for their patients with schizophrenia.* Journal of Managed Care & Specialty Pharmacy, 2016. **22**(11): p. 1285-1291.

Model-based approaches can also be used to measure the value of diagnostics

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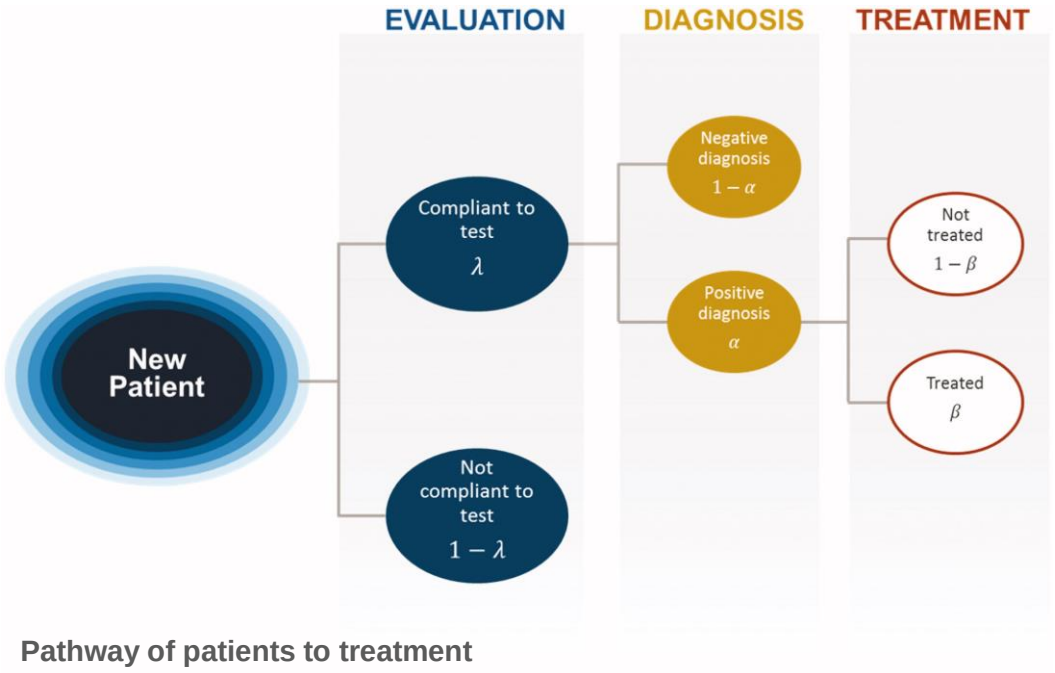
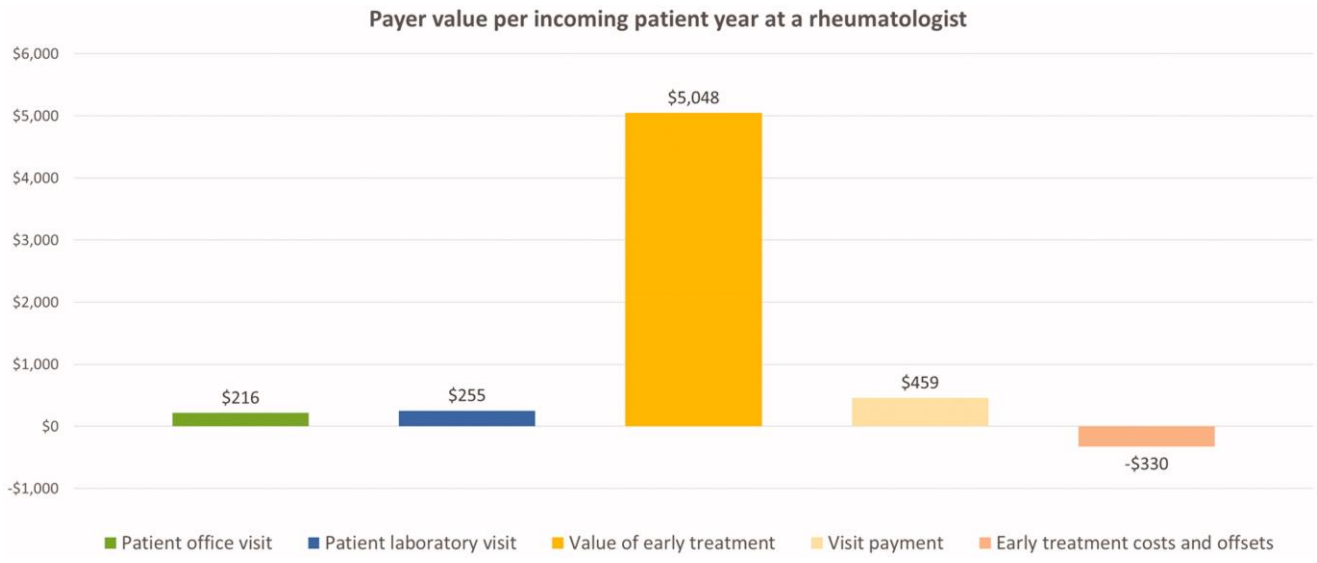
A model-based approach

For some diagnostics, a model based approach may be most appropriate, particularly when incorporating factors relevant to COVID with RWE



Pathway of patients to treatment



Components of payer value per incoming patient year

Bognar, K., et al., *The potential value of rapid, cloud-enabled onsite testing for the diagnosis of rheumatoid arthritis in the United States.* Journal of Medical Economics, 2018. **21**(11): p. 1057-1066.

Key issues with RCT and non-RCT approaches in a world with COVID

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	RCT Approach	Non-RCT Approach
Advantages	• Able to infer causal impact	• Flexible, lower cost • Pragmatic trials can look at real-world impact • Surveys/models can be implemented quickly
Disadvantages	• Not representative of real-world (unless pragmatic) • Expensive and slow • COVID dynamics may change value rapidly and make design out of date	• Causal inference may be difficult • Pragmatic trials: Results may be due to a multitude of factors • Survey: Stated and revealed preferences may differ if survey used • Model: Results may be sensitive to assumptions

National Health Care Institute

HTA approach to eHealth

Hans C Ossebaard

16 Nov. 2020

Will COVID-19 Accelerate the Adoption of Digital Health Technologies? Perspectives on Evaluating Digital Health Technologies during Global Disease Outbreaks

COVID-19

Health Technology Assessment frameworks for eHealth
a systematic review

Abstract no: 1878

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[1]Clinical Psychology, VU Amsterdam; [2]Research and Innovation, GGZ InGeest;
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This research was conducted by the VU Amsterdam, dept. of Clinical Psychology and commissioned by the Dutch National Health Care Institute (Zorginstituut Nederland).

Research question

Which frameworks are available to assess the impact of eHealth services on health and health care provisions?

Background

- Traditionally Health Technology Assessment (HTA) focusses on assessing the impact of pharmaceutical technologies.
- Resources are scarce and decisions and policies aim to achieve effective, affordable, accessible health care.
- Digital health technologies (eHealth) are increasingly integrated in all health care domains.
- Sustainable integration of eHealth in daily care practice requires a multi-perspective and multi-method approach to eHealth impact assessment.
- How eHealth is assessed in advance of its implementation in care practices is unclear.
- To support evidence-informed decisions and policy making, this study aims to identify frameworks and methods for assessing eHealth's impact on health care.

Methods

- The scientific literature in 5 databases was systematically searched and reviewed.
- Two key search terms with 155 synonyms for eHealth and health technology assessment
- 2,068 articles screened for eligibility (Fig.1)
- Articles included if the study: (a) was conducted in a clinical setting, (b) used an HTA-framework and (c) assessed an eHealth service.
- A standardised data extraction form was used for extracting the information from the articles.
- A systematic qualitative narrative approach was applied for data analysis and reporting.

Results

- 21 eHTA-frameworks were identified.
- All frameworks address technical performance and functionalities of the eHealth service.
- The majority also address costs, clinical outcomes, organisational and system level aspects (Table 1).
- Two frameworks were reported in multiple articles: MAST (Kidholm 2012) and CHEATS (Shaw 2002).

Staged frameworks (n=3): sequential phased approach to assessing certain dimensions of the eHealth service.

- e.g. Device Selection Matrix (Casper 2005), Staged approach to evaluating telemedicine (DeChant 1996), Stepped evaluation of eHealth services (Vimarlund 2013)

Dimensional frameworks (n=3): dimensions are categorised in accordance to the expected eHealth impacts at the time of assessment, irrespective of development stage.

- e.g. TEMPEST (Currie 2012), CHEATS (Shaw 2002) TeleHealth Evaluation Framework (Hebert 2001)

Hybrid frameworks (n=13): sets of criteria that are assessed in a predefined sequential or staged order combined with a phased perspective on development stage.

- e.g. TM-QC framework (Giansanti 2007), KDS (Khoja 2013), MAST (Kidholm 2012)

Business modelling frameworks (n=2): focus on economic viability and business models for eHealth services.

- e.g Comprehensive telemedicine evaluation model (Alfonzo 2007), Innovating in Health care framework (Grustam 2017)

Table 1: Classification of the frameworks identified in the review

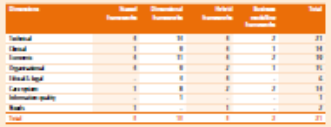
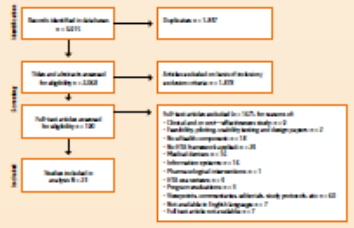


Figure 1: PRISMA flowchart illustrating study identification and selection process.



Conclusions

- 21 eHTA-frameworks are available for a priori impact assessment of eHealth services.
- Frameworks vary in assessment indicators and methods.
- Demonstrated real world applicability is limited.

Recommendations

- Standardise the reporting of eHealth using Template for Intervention Description and Replication (TIDieR) checklist (Hoffmann 2014).
- Standardise assessment indicators and methods by incorporating a stepped-approach tailored to the functional characteristics of eHealth services.
- Standardisation might improve the quality and comparability of eHTA assessments.

Discussion

- Considerable variation in guidelines provided by the frameworks in what and how.
- Comprehensiveness versus specificity: importance of a generic assessment framework.
- Specificity is sacrificed and applicability of the frameworks for assessing certain eHealth services is reduced.

- Assessment frameworks for evaluating eHealth technologies vary greatly in indicators and methods used
- Real world applicability is limited
- Standardization is needed

Vis, C., Bührmann, L., Riper, H., & Ossebaard, H. (2020). Health Technology Assessment Frameworks for eHealth: A systematic review. *Int J Technology Assessment Health Care,* 1-13. doi: 10.1017/S026646232000015X

Necessity knows no law - but did it accelerate adoption of digital health tech in NL?

- Reduction in care demand / scaling down
- Initial scarcity medical supplies for patients and professionals
- Up-scalability of testcapacity and hosptitals
- Importance of mental health care ‘behind the front door’
- Resilience and capacity
- System flaws under the looking glass

Necessity knows no law - but did it accelerate adoption of digital health tech in NL?

- THE NEW NORMAL: home when you can, doctor when you must
  - Less waiting time
  - Less travelling (CO_2 emission)
  - Less infection risk
- Low code solutions prevail
- Mental health less flexible
- Old issues yet unresolved (privacy, security, interoperability)

- Too early for final lessons but the urgency of digital solutions in health care has grown under emergency conditions
- Now reimbursement issues and old issues must be solved bravely
- Digital solutions must serve sustainable, green care for economic and health benefits*
- Managing uncertainty

* www.lancetcountdown.org

Discussion

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