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Needs and strategies targeting health inequalities in the adoption and spread of healthcare innovations – a rapid scoping review

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Summary

- The aim of this report is **to explore the current and future research and practice needs** around health inequalities in the adoption and spread of healthcare innovation and **to identify good practices**.
- We conducted **a rapid scoping review** of the international scientific literature to identify and synthesize the most relevant evidence. We searched Medline database and Google Scholar and hand-searched references and citation search of included studies. The evidence was synthesized using **a narrative synthesis**.
- Our report finds that the **literature on the topic is scarce**, but it is growing and there is a trend to focus on digital innovation.
- The review finds evidence supporting the **'inverse equity hypothesis'**, which suggests that innovation initially increases inequalities, as it reaches first those of higher socio-economic status, but as diffusion increases and innovation reaches more in the population, inequalities decrease.
- Our findings also highlight **a bias in the development of technology** that tends to consider certain groups more than others. This is particularly true for digital technology and highlights the need for these technologies to account for different ethnic, gender and socio-economic characteristics when developed.
- The studies suggested **good practices** to target health inequalities when spreading innovation included:
 - Patient-centered rather than technology-centered approaches
 - Inclusive and representative datasets in digital health care innovation
 - Transparent, effective communication to patients and the public
 - Community engagement and multi-stakeholder approaches in the development and implementation of innovation
- A number of **useful frameworks** have been developed including the Health Equity Implementation Framework by Woodward et al (2019).
- Other specific examples include an initiative from The Campbell and Cochrane Equity Methods Group and a Knowledge Translation Centre.

I. Introduction & methods

In a previous report, we focused on structural changes that are needed to deal with health inequalities among specific groups. As with the previous report, we highlight that inequalities linked to accessing health services cannot be seen in isolation from the wider socio-economic inequalities linked to health, institutional and structural racism and more recently COVID-19. While acknowledging this, it is beyond the scope of this report, to identify practices targeting socio-economic inequalities as this is a much broader and wider literature.

Study aims

The report aims to answer two research questions:

1. What current/future **research and practice needs** around health inequalities in the adoption and spread of healthcare innovations can be identified from the scientific literature?
2. What **good practices** can be identified from the scientific literature targeting health inequalities in the adoption and spread of healthcare innovations?

Research methods

We conducted a rapid scoping review of the international scientific literature including a systematic search of the Medline database, a scoping search of Google Scholar, handsearching of references and citation search of included studies.

We used the following search limits:

- English language, Humans, Past 10 years

When searching Medline via OVID, we applied the following search string:

- ("Healthcare Disparities"[Mesh] OR "Health Equity"[Mesh]) AND ("Diffusion of Innovation"[Mesh] OR "Translational Medical Research"[Mesh])

We applied the following Inclusion/exclusion criteria:

- Sample/setting: healthcare, high income countries, no exclusion on populations or health conditions
- Phenomenon of interest: any type of health inequality in adoption and spread of any healthcare innovation
- Evaluation/outcomes: current/future research and practice needs, good practice activities/strategies
- No exclusion on research design and publication type
- We excluded protocols

The evidence was synthesised using a narrative synthesis of the results.

The study was conducted by two members of the Centre for Healthcare Innovation Research (CHIR), Dr Charitini Stavropoulou, CHIR Co-Director and Dr Alexandra Ziemann, CHIR Senior Research Fellow.

II. Findings

Results of the searches

Our searches of Medline (via Ovid) returned 50 titles, suggesting the literature is relatively scarce. Of these papers, 16 met our inclusion/exclusion criteria and were analysed here. In addition, 4 papers were identified by searching Google Scholar.

Inverse equity hypothesis

Our review finds evidence supporting the inverse equity hypothesis, which argues that technology reaches first those in higher socio-economic status groups, hence increasing inequalities, while it has the potential to diminish inequalities over time as technology diffuses and reaches more individuals in the population. A scoping review looking at innovative technologies and social inequalities in health (Weiss et al 2018) aimed to conceptualise the relationship between innovation and inequalities in health. Among the studies they reviewed, six used Rogers diffusion of innovation theory (Rogers 2003) to argue that lower socio-economic status groups are slowest to adopt, and therefore benefit less from, innovative health technologies. However, as access to these technologies “diffuses” throughout the population, and lower socio-economic status groups begin to adopt, these inequalities begin to diminish and may potentially disappear.

Korda et al (2011) in an earlier study of coronary procedures found a lag in diffusion for angiography and CABG, though not for angioplasty. Confirming the inverse equity hypothesis too. Yet, if diffusion rates remain scattered, as showed in a Norwegian study among diabetic patients (Weiss et al 2020) and another on blood pressure medication (Rydland 2019) inequalities may persist.

The digital health divide

Four studies focused on digital health and health inequalities. Although they acknowledge the potential of digital health and big data to accelerate translation of health disparities studies (Breen et al 2019) they talk about a digital divide and highlight that “relatively little work has been performed to explore the transformative potential of technology in addressing prevalent and enduring health care inequities” (Mullani et al 2019).

In April 2021, Lancet Digital Health published a viewpoint on data-driven digital health technologies arguing that although these technologies have the potential to improve equitable access to care, it is highly possible that they could exacerbate existing health-care inequalities (Ibrahim et al 2021). They provide a number of recommendations:

- Increasing awareness within data and digital health communities and beyond
- Transparent, effective communication to citizens
- Improving equity of digital access for data-gathering as well as health provision
- Building inclusive and representative datasets to support equitable discovery and innovation in digital health care

Banarjee (2017) focused specifically on cardiovascular disease and argues that if digital solutions are to reduce health inequalities in this area they will benefit from being:

- locally driven rather than externally driven
- patient-centered rather than technology-centered
- driven by science, evidence, and care; and
- evaluated, not just implemented.

Health inequalities in other areas

In a study exploring the uptake of HPV vaccines, Fenton et al (2018) showed that patient-centered care, which has been a relatively understudied factor in the unequal diffusion of medical innovations, deserves more attention. Efforts to raise HPV vaccination rates should explore why certain patient groups may be

less likely to receive recommendations and should support providers to consistently inform all patient groups about vaccination.

Roberts et al (2019) highlight the importance of collaborative multi-stakeholder approaches that engage public health agencies, professional societies, academic health and research centers, community clinics, and patients and their families to work collectively to improve population health and reduce or eliminate health inequities.

Frameworks and guidelines

Woodward et al (2019) developed the Health Equity Implementation Framework to better assess health equity determinants as well. Researchers may be able to optimize the scientific yield of research inquiries by identifying and addressing factors that promote or impede implementation of novel treatments in addition to eliminating healthcare disparities.

Sterling et al (2020) also discuss a number of frameworks implementation science offers to advance health equity in heart, lung, blood and sleep-related research that also highlight the importance of multi-stakeholder approaches.

Phad et al (2019) developed a framework of 10 priority areas to guide current and future efforts in diabetes translation research to achieve health equity. These included:

- Community and partner engagement
- Enrichment and capacity building
- Interventions for specific populations
- Context specific interventions
- Dissemination and implementation principles
- Non-traditional setting and strategies
- Cost and health economics
- Innovation methods and metrics
- Policy approaches
- Next generation interventions

The Equator network developed CONSORT-Equity 2017, an extension to report items to assess the effects of an intervention on health equity (Jull et al 2019).

Good practice in research and practice

A few examples of good practice in research to improve the translation of research in practice to improve inequalities include:

- The Campbell and Cochrane Equity Methods Group that encourages the application of an 'equity lens' to systematic reviews. Stakeholder panels identified the top 10 interventions from their respective topic areas. The evidence on these interventions is being summarized with an equity focus and the results posted online, at <http://methods.cochrane.org/equity/e4e-series>. (Tugwell et al 2017)
- A Knowledge Translation Centre in the US, The National Center on Health, Physical Activity and Disability (NCHPAD) is tackling health disparities in the areas of physical activity, healthy nutrition, and healthy weight management among people with disability by 'systematically facilitating, monitoring, and evaluating inclusive programmatic, policy, systems, and environmental (PPSE) changes in communities and organizations at a local and national level' (Vanderbom et al 2018).
- Plamondon et al (2019) summarise promising practices for doing research connecting knowledge with action (KWA) for health equity, which involved: embracing complexity in health equity work, using dialogic-relational methods, and ameliorating data gaps. More importantly, they summarise practices for knowledge translation (see table 1 below).

Table 1: Promising Practices for Knowledge Translation (adapted from Plamondon et al (2019))

Promising Practices	How to do it
Practice integrated approaches	<p>Prioritize processes that include a broad range of research users alongside producers in research in social processes that foster trust and dialogue and are responsive to context and issues of power.</p> <p>Critically reflect upon and strategically respond to political will and political economy.</p> <p>Package evidence in ways that present a concise and compelling story that includes feasible policy options and presents timely, real-life data to policy makers.</p>
Be creative	<p>Produce non-academic outputs (e.g., documentary, imagery) to share results of research, particularly with the public.</p> <p>Use metaphors and other arts-based approaches to curating evidence.</p>
Use evocative messages that spark empathy and connection.	<p>Humanize data through use of stories told in the voices of people with lived experience.</p> <p>Use stories that illuminate the ways in which structural and social power work to create inequities, countering norms of focusing on individuals and behaviours.</p>

Crook et al (2019) address four potential roadblocks which, if solved, will have a great impact on achieving health equity. They are:

- expanding the definition of basic discovery to include all facets of health disparities science,
- understanding the daily factors that affect a community's well-being,
- including diverse populations in clinical trials, and
- training the right scientists to perform the community-engaged research required to move discovery to application in the community.

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