Digital Health & Care Innovation Centre

How to navigate the digital shift in healthcare?

An international review and analysis of frameworks used to support digital working by frontline healthcare staff - Summary Booklet January 2024

Introduction

The digital transformation of health and care started accelerating around 2016, but leapt forward unexpectedly forced by the Covid-19 pandemic. Successful digital transformation of health and care requires an appropriately skilled workforce. 'Digital skills' have become a burning issue in workforce development discussions, research, governmental strategies and policies world-wide. With these, there has also been a hike in published frameworks intended to support digital working by healthcare staff. The purpose of this study has been to make sense of the different frameworks developed to support work in a digitally enabled context, specifically in healthcare; to understand who and what they are for, what their intended purposes and the shared elements across frameworks are. Unlike previous reviews, this report focusses on frameworks purposed for active use around the world.

The study unfolded through a two-phase iterative rapid search process, resulting in six complementary analyses of English-language frameworks applicable in healthcare. Phase 1 search was not time-limited and included both health and care-specific frameworks (20) as well as 'general' citizen-facing ("patient") frameworks (37), 57 in total. Phase 2 search focussed on healthcare-related frameworks published in 2018-2023 (189 prior to categorisation, see Analysis 4 below), with the final 27 frontline staff frameworks analysed in-depth and presented in a form of case studies.

Phase 1 – Analysis 1 – Chronological Overview

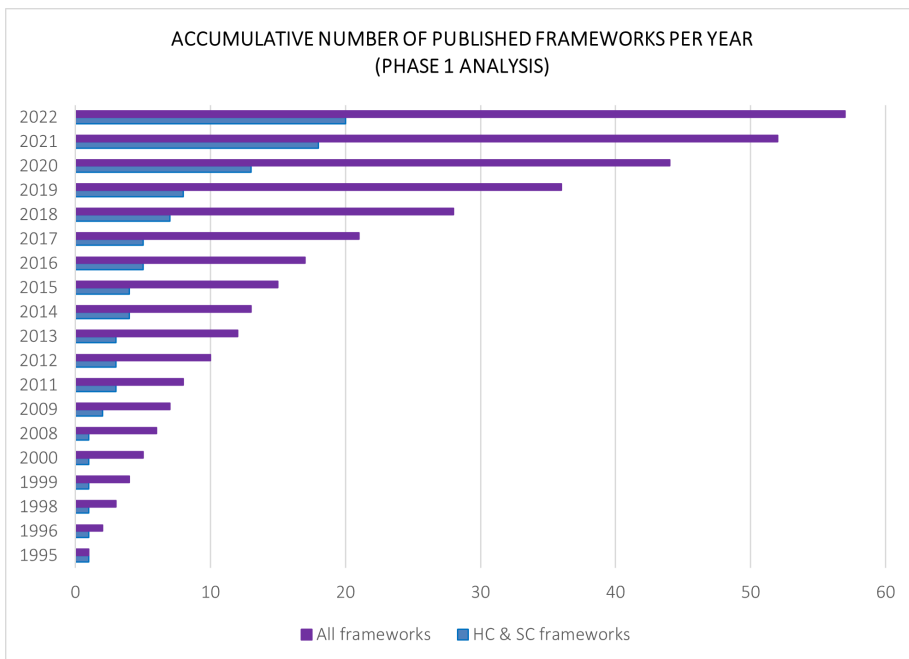ACCUMULATIVE NUMBER OF PUBLISHED FRAMEWORKS PER YEAR (PHASE 1 ANALYSIS)

Figure 1. Proliferation of frameworks over time 1995-2022, for application in healthcare (HC) & social care (SC) as well as for citizens and the general workforce.

Analysis 1 looked at the chronological emergence of frameworks over time. The first ever digital skills framework identified was intended for nursing informatics, published by the American Nurses Association (ANA) in 1995, entitled "Nursing informatics: scope and standards of practice". Several organisations published seminal frameworks in the late 1990s and early 2000s still in use by citizens.

Healthcare-specific frameworks emerged from 2011 onwards with 49 published since then (Figure 1). This surge is assigned to a combination of government initiatives and strategies as drivers and technological advancement as enablers (e.g., machine learning and digital solutions, mHealth) in that period.

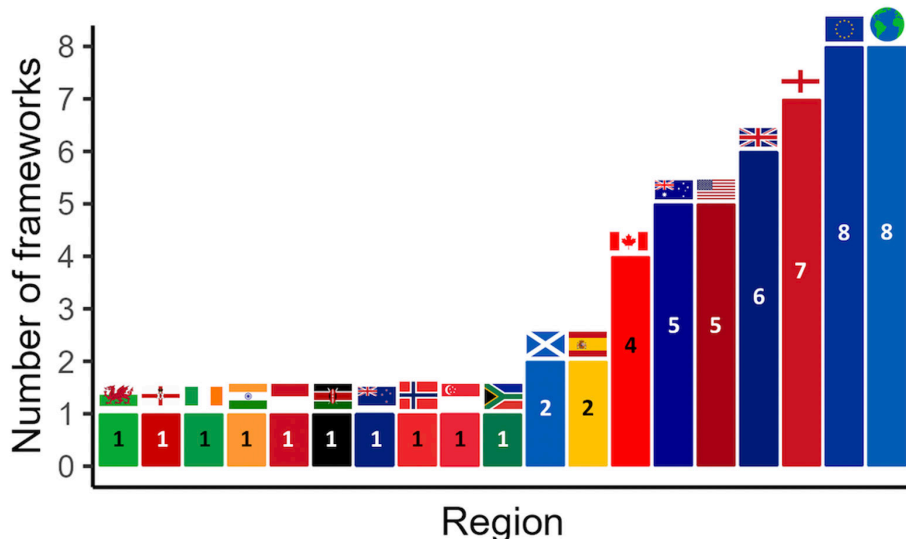# Phase 1 – Analysis 2 – Geographic origin of frameworks

Analysis 2 examined the geographic spread of the frameworks. Seventeen out of the 57 frameworks were published in the UK from 2011 onwards, with as many as 14 intended for health and care applications. Eight frameworks were published (mainly) by the European Commission between 2008 and 2021 to provide digital skills standards across EU member states. Eight international frameworks were published, mainly through collaborations between European and US organisations to support digital skills competencies in healthcare. Fewer frameworks were available from Asia, Africa, and South America (Figure 2).

Figure 2. *Stage 1 Data - Distribution of digital skills frameworks across continents and countries/areas.*

Phase 2 - Analysis 3: Genealogic mapping of frameworks

Organising the frameworks chronologically and analysing their geographic origins and content showed that many of the frameworks cross-referenced each other. Analysis 3 helped us to create a genealogical mapping of 16 related frameworks/documents. These were mainly from the UK, Australia and Ireland (Figure 3, see long report for detailed mapping). The Jisc (2015) framework 'Digital Capabilities: The 6 Elements Defined' skill 'domains' provided the basis for skill groupings/descriptions for all other interrelated 15 frameworks. From this analysis onwards, we focussed on frameworks published since 2018.
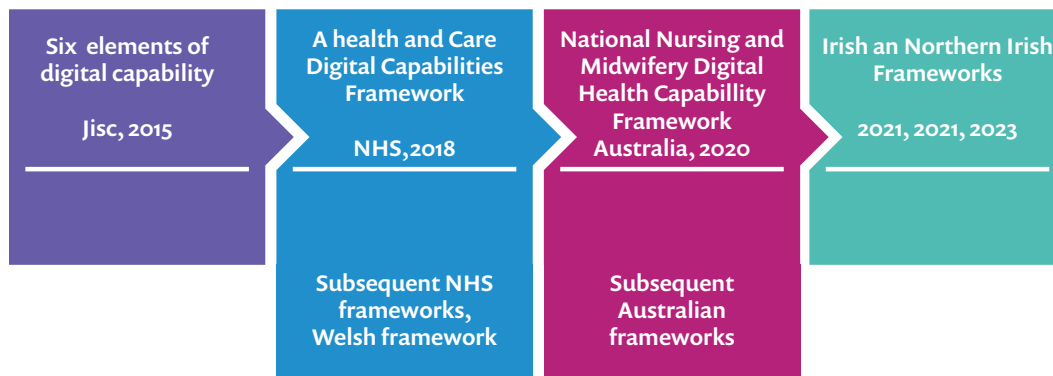

Figure 3. *Summary of framework development and progression over time among interrelated frameworks from the main report (16).*

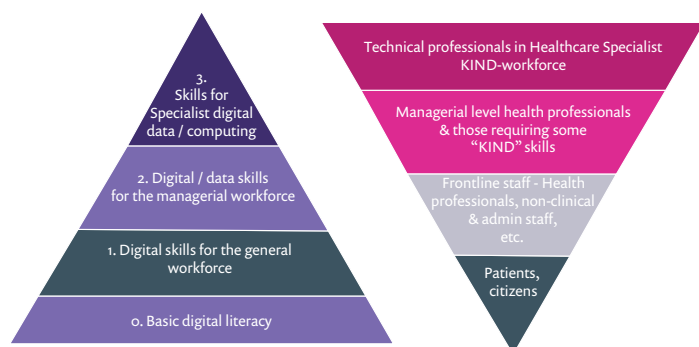## Phase 2 - Analysis 4: Classifying frameworks according to target audience

Figure 4. *Triangles depicting levels of digital proficiency required by different professional categories.*

In Analysis 4, the Phase 2 frameworks (189) were classified according to their target audience – one of three professional groups: frontline staff, specialist digital and data (KIND) workforce and technical staff. This helped bring focus on frontline healthcare staff in the subsequent analyses with 27 frameworks aimed at e.g., doctors, nurses, psychologists, pharmacists, allied health professionals (AHPs), administrators, etc.

The specialist digital and data (KIND) staff and the technical staff working in health and care require higher level digital capability / competency to do their jobs to begin with, so upscaling in basic digital literacy is not a concern.

Phase 2 – Analysis 5: Use of Terminology

Analysis 5 sought to make sense of the terminology used in frameworks to refer to digital working: digital skill, literacy, competency, and capability. A considerable disagreement about how the terms should be defined in digital healthcare remains, with them often being used interchangeably and inconsistently between sources, leading to confusion around the precise intention or scope of the frameworks. The report proposes these definitions for each term:

Digital literacy – foundational ability prerequisite to developing digital skills (e.g., being able to locate and open your email programme), OR as an umbrella term to denote the wider ability to do one's work in a digital context.

Digital skill – the ability to perform a digital task (e.g., being able to send an email).

Digital competency – the ability to perform a given digital task to an agreed job specific standard (e.g., being able to send an email that meets the organisational standards for your job role).

Digital capability – the ability to use transferable skills to learn to perform a future, yet to be defined digital task (e.g., being able to use digital means to communicate with your colleagues or your patients).

Furthermore, the 27 frontline staff frameworks were analysed based on the language used in their titles to assess the use of terminology and the intended purposes of the frameworks. There were 8 digital capability frameworks; 5+13 digital competency frameworks; and 1 digital literacy framework. The "skills" descriptions, usually in the form of 'capability' or 'competency' statements, reflected the inconsistent use of these terms (please, see the long report for more). The report suggests that:
- A framework with generic or aspirational descriptions of digital skills without detailing professional standards or tasks from healthcare workplace settings should be viewed as a 'capability framework'.
- If a framework describes specific and observable actions aligned with healthcare roles' professional standards and role-specific tasks it should be viewed as a 'competency framework'.

Phase 2 - Analysis 6: Content analyses of frameworks

Analysis 6 consists of nine short case studies of clusters of frameworks. Case studies 6.1-6.4 cover the different capability frameworks; Case studies 6.5-6.9 cover the competency ones, and the one digital literacy framework. The final section of the report exemplifies each of the earlier points made in more detail, discussing the evolution and inter-relatedness of frameworks, how the digital maturity of the health and care infrastructure and that of the workforce is reflected in the frameworks; the importance of being clear about the terminology used to describe the content and purpose of the frameworks, and how these impact expectations laid upon the frameworks; the different culture or traditions underlying the framework development, and more.
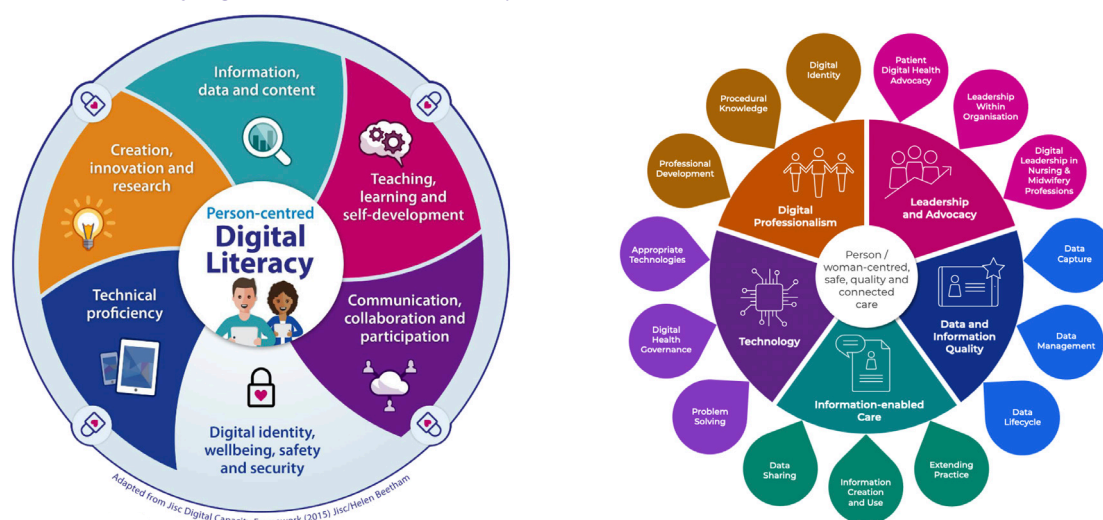

Figure 5. *On the left: 6 digital capability domains in NHS HEE (2018) framework. On the right: 5 digital capability domains in the Australian Digital Health Agency (2020) framework.*

Discussion and Recommendations

The review of the selected frameworks showcases the different traditions and approaches in place to support digital working by frontline staff around the world. It also testifies that there are numerous, readily accessible, comprehensive frameworks with demonstrably shared key areas of digital capability or competency, which have seen real-world application across healthcare services. Considering this, the report recommends that organisations:

- Use, or adapt for use in the local context, one of the existing frameworks.
- Find a way to assess the digital maturity level of the service and the digital upskilling needs of the staff, which in turn will help with selecting the appropriate framework(s) to use.
- Develop and/or adapt/adopt new frameworks only when that is relevant (e.g., pending implementation of a newly emerged digital innovation; staff digital literacy needs change significantly; changes in legislation).
- When developing new frameworks:
  1. ensure the terminology is clearly defined and is consistently used throughout; and
  2. follow an agile development approach to allow flexibility in a fast-changing job landscape, such as in the NHS HEE (2023) AI and *Digital Healthcare Technologies Capability framework*, which uses archetypes/personas with various proficiency levels for digital literacy.

Other recommendations include:

- Using the frameworks to help identify emerging skills gaps and shortages across the sector to inform targeted opportunities for upskilling/training.
- Conducting further research to analyse frameworks used to support digital working in social care.
- Implementing digital as a core part of Further and Higher Education curricula for health & social care to help standardise digital literacy of the future workforce.
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