

1 **Health Information Work – a scoping review protocol**

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24 Abstract

25 **Background.** The work of managing health data, health information and health knowledge is a
26 vital, yet unacknowledged, function in our current health system, especially in the era of digital
27 health. This protocol is for a literature review which explores the evolution and development of
28 the concept of health information work.

29 **Methodology.** A scoping review of published literature in the domains of health sciences,
30 information technology and information sciences has been carried out. A thematic and
31 bibliometric analysis of the resulting set of publications is currently being undertaken.

32 **Results.** The review results will shed light on the responsibilities and the contributions of the
33 health information workforce, with a synthesis of capability or competency related themes
34 identified in the literature, and analysis of publication year spans, prominent authors, institutions
35 and source journals.

36 **Conclusion.** As research interest in the wide array of health information work is increasing, the
37 way this work is reflected in the global literature and trends reported in key publications will
38 provide useful evidence for health information workforce planning and positioning for the future.

39

40 Introduction

41 *Why look at the concept of health information work?*

42 The health information workforce comprises a range of people from specialised occupations who
43 together are responsible for the systems for capturing and using health data, health information,
44 and health knowledge, thus directly impacting the quality and safety of patient care. Yet, precise
45 data about the health information workforce is difficult to obtain, as it is largely invisible, ill-
46 defined, unregulated and unmonitored.

47

48 "Health information" as a specialist work domain emerged in the 20th century. Individual
49 professions and occupations, such as medical records managers and medical librarians, arose in
50 the early decades of the 1900s, and developed in parallel, rather than intersecting, streams.
51 Further specialisations emerged during the latter decades of the 1900s, in particular health
52 informatics from mid-century onward.

53

54 However more recently the field has become very fluid, due in part to technological changes that
55 enhance collaboration between computing or IT staff and those working with health data or
56 health information. A range of professions now claim expertise in health information work, and
57 position titles and career paths also vary greatly. Moreover, in the current era of digital health,
58 the health information workforce is in a dynamic situation, confronting issues of relevance and
59 sustainability in the face of possible workforce structuring.

60

61 As the imperative strengthened to define and predict this workforce, surveys of workforce
62 numbers and characteristics have been undertaken. In 2006, the UK National Health Service
63 report on its informatics workforce was published (Eardley, 2006), followed by a review of the
64 Australian health informatics workforce in 2009 (Legg & Lovelock, 2009), and a Canadian
65 report in the same year on its health informatics and health information management human
66 resources (O'Grady, 2009). Hersh (2010) reviewed prior research on the health information
67 technology workforce as part of estimating future demand, and concluded:

68 "There is increasing recognition that a competent and well-trained workforce is required for
69 successful implementation of health information technology...Substantial numbers of individuals
70 are needed with diverse competencies." (p. 204)

71

72 In 2013 the national government agency Health Workforce Australia (HWA) examined the
73 Australian health information workforce. HWA concluded that the workforce was poorly
74 defined, with a lack of accurate data about the professional areas that comprise the workforce.
75 HWA recommended that the workforce should be clearly delineated, data collection should be
76 improved, and its future configuration should be addressed - not least to deal with anticipated
77 workforce shortfalls. Extensive research has been conducted in Australia, both prior to and
78 following the HWA recommendations, to examine health information competencies for
79 specialists, recognition of health information in the standard occupational classifications, and
80 education requirements in health information for the clinical workforce.

81

82 This present literature review is part of a larger research program in Australia which is looking at
83 the changing nature and scope of the existing health information workforce, and clarifying the
84 roles and responsibilities of those in it. A national Health Information Workforce Census was
85 conducted in May 2018. The Census invited participation by:

86 "...anyone who self-identifies as part of the health information workforce working for/with an
87 organisation that operates in Australia. You are part of the workforce if you work (including

88 volunteer or actively seeking) in a role where the primary function is related to developing,
89 maintaining, or governing the systems for the management of health data, health information, or
90 health knowledge" (Butler-Henderson & Gray, 2018a). Close to 1,600 usable responses were
91 received in the first Census, and it is planned to run it again in 2020, and every three years
92 thereafter. Broad description of the responses is reported elsewhere (Butler-Henderson & Gray,
93 2018b). A New Zealand version of the census was conducted in late 2018, auspiced by
94 collaboration with the Australian developers of the tool. It is hoped that further international
95 replications will take place, with the benefit of a common schedule of questions to enable
96 multinational statistical data to be gathered.

97

98 We chose a scoping review methodology for this review, as we wished to gain an overview of
99 the size and nature of the literature on a topic that is inherently diffuse, heterogeneous and
100 dynamic. Our review shares the first and third of Paré et al.'s (2015) three possible purposes for
101 this type of review:

102 "to examine the extent, range and nature of research activities [in a subject]; determine the value
103 of undertaking a full systematic review; or identify research gaps in the extant literature."

104

105 **Survey methodology**

106 This protocol reflects the stages for a scoping review, as outlined by Arksey & O'Malley (2005).
107 We have also followed the PRISMA Extension for Scoping Reviews (PRISMA-ScR) reporting
108 guideline (Tricco et al., 2018).

109

110 **Research Question.** How has the concept of health information work emerged and developed
111 within the wider health sector, information technology or information sciences workforces?

112

113 **Aim.** A thematic and bibliometric literature review to trace the evolution of the idea of health
114 information work.

115

116 **Objectives.** The review has four objectives:

- 117 1. To map the published international literature discussing an instrumental or professional
118 human role in health information work from inception to the present, describing its
119 extent, range and nature
- 120 2. To provide a review summary of the literature
- 121 3. To inform further research
- 122 4. To contribute to the current work promoting health information workforce planning, in
123 Australia and internationally.

124 **Definition.** For the purpose of this study, "health information work" is defined as *human agency*
125 in the performance of work with health information.

126

127 **Identifying relevant studies.** Because of the multidisciplinary nature of health information, a
128 variety of databases are potential sources of the publications to be included in this review. There
129 are multiple databases in each of the three key domains. The resources selected to search were:
130 Ovid Medline (1946 to June 2017), CINAHL Full Text, Embase, Applied Social Sciences Index
131 and Abstracts, and Library, Information Science and Technology Abstracts.

132
133 Both authors of this review are health information professionals, with experience developing
134 systematic literature searches. The first author (KG) conceptualized the search, covering the
135 three concepts of health information, management or systems, and work or role or profession.
136 The second author (CG) developed the preliminary search strategy in Ovid Medline using a
137 combination of index terms and keywords. When tested, this strategy yielded over 2,000 results,
138 with a high proportion of irrelevant items. Following discussion, it was agreed to narrow the
139 range of search terms. The final strategy used combinations of keyword searches in title or
140 abstract fields to identify items containing all three concepts:

141 (health OR healthcare) adjacent to (information OR knowledge OR data)

142 AND

143 informatics OR management OR technology OR library OR systems OR digital

144 AND

145 work* OR profession* OR role* OR staff* OR expert* OR leader* OR champion* OR special*

146 Once finalized the search was translated to the other bibliographic databases. The searching was
147 performed by two information professionals between July 2017 and March 2018. Each specialist
148 searched a number of the nominated databases; there was no staff cross-over in this searching.

149
150 A search for grey literature was also performed, with principal sources being the repository
151 search core.ac.uk and Google Scholar. This yielded fewer than 50 additional relevant English
152 language items. Relevant items were also identified through citation checking.

153
154 The final results sets for all database searches were combined, de-duplicated, and exported into
155 the Covidence program to manage the study screening stage.

156
157 **Study Selection.** Items were assessed in two stages, using the pre-determined criteria.

158 Inclusion criteria:

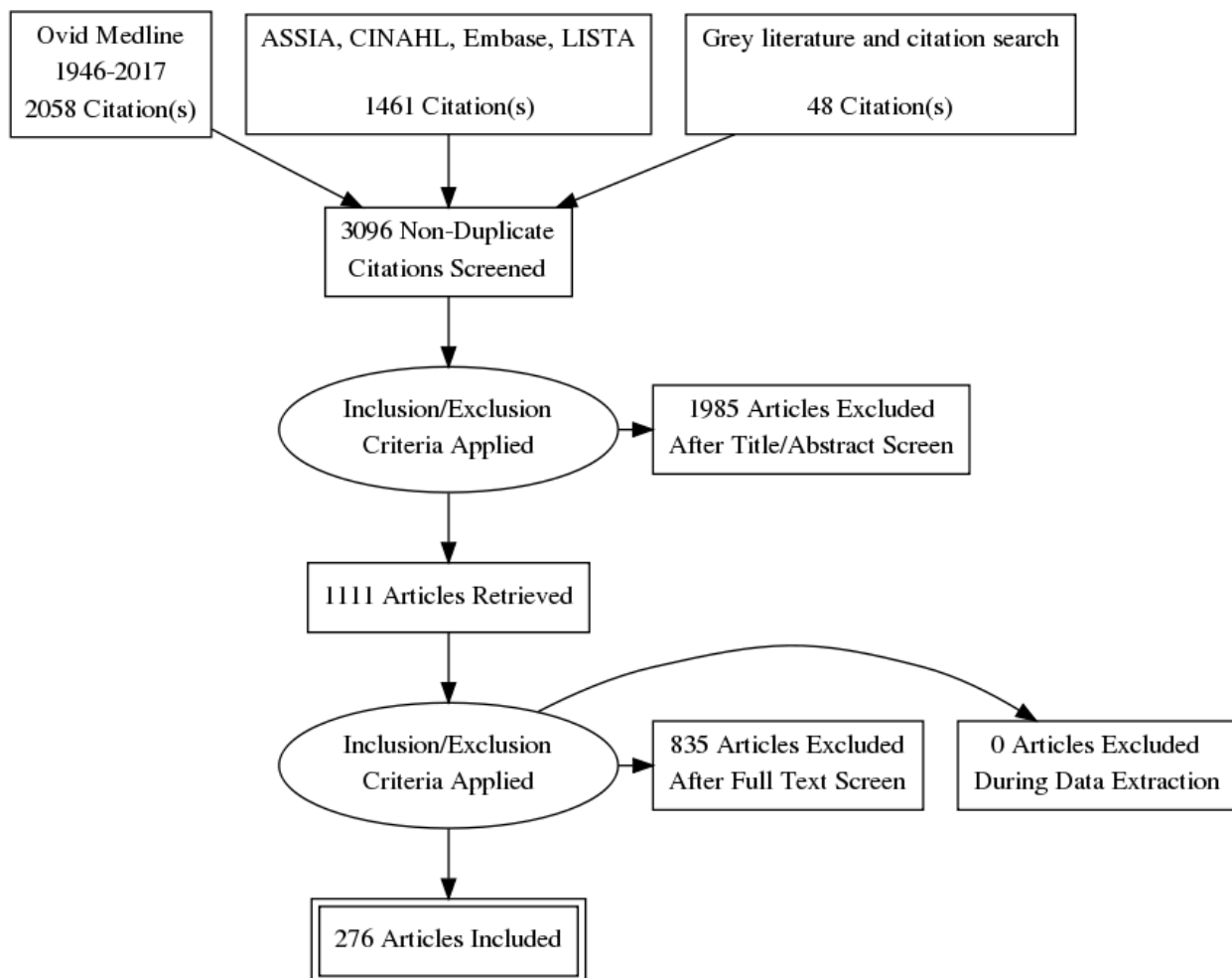
- 159 1. Items referring to an instrumental or professional human role in health information work
- 160 2. Types of studies: primary research, case studies, reviews, theoretical or analytical studies,
161 policy or planning items
- 162 3. Participants: People involved in managing health information, health data, health
163 knowledge; jobs, roles, positions.

164 Exclusion criteria:

- 165 1. Items describing health information work by consumers, patients, carers (non-
166 professional actors)

- 167 2. Items describing ‘champions’ or stakeholders if not recognizing a specialist health
 168 information work role
 169 3. Article types: Not editorials, letters
 170 4. Language: Exclude if not in English or no English abstract.
 171

172 In the first stage, title and abstract screening was performed with each of the two information
 173 specialists reviewing half of the citations. Eligible items then passed to the second screening
 174 round, which involved review of the article full-text by both information specialists.
 175 Discrepancies were resolved through discussion. The search and screening process is shown in
 176 the PRISMA diagram (Fig. 1) below.
 177



178
 179

180 **Figure 1: Flow of citations in the Health Information Work scoping review**

181

182 For items from the grey literature, two additional criteria were used:

- 183 1. Published by a reputable organisation

184 2. Contains empirical data about the health information work (i.e. commentary, editorials,
185 or opinion items were not eligible).

186

187 **Data extraction.** A data charting form was devised to standardize extraction of data about each
188 item in the final set. The following characteristics were recorded: year of publication, author(s),
189 country, setting/context, health information position identity, role, responsibilities, functions,
190 knowledge, skills, attributes. Analysis of these features has commenced.

191

192 Unlike a systematic review, a scoping review has no requirement to assess the methodological
193 strengths and weaknesses of each included study, nor are the studies assessed for quality or risk
194 of bias (Tricco et al., 2018). We do not aim to report on these characteristics in this review.

195

196 **Collating, summarizing and reporting results.** The review results will give an overview of the
197 evolution and current status of the concept of human agency in health information work. They
198 will include a synthesis of the themes in the included literature, based on deductive analysis
199 related to relevant models of capability or competence (e.g. Sanz et al., 2018, Topi et al., 2017).
200 Results from the data charting will be presented in narrative text, tables and diagrams as
201 appropriate. A descriptive bibliometric analysis will also be undertaken on the publications in the
202 final set. Statistical information will be extracted about the documents in the set, and charts or
203 graphs will be used to display features such as span of publication years and growth rate,
204 prominent authors, authors' geographic distribution, frequently-occurring journals, range of
205 professional identities reported, and other notable characteristics.

206

207 **Current status of the review**

208 Preliminary results of the scoping review will be presented in mid-February 2019 at the ITCH
209 Conference (Information Technology & Communications in Health), University of Victoria, BC,
210 Canada. A detailed report of the review findings will be published in 2019 in an open access
211 publication.

212

213 **Conclusions**

214 Major digital health initiatives are being implemented in many countries, at levels from whole-
215 of-hospital to whole-of-health system. Their effects are anticipated to be transformative, and
216 disruptive. An emerging feature of digital health delivery is predicted to be a more fluid health
217 workforce: less routinized, more mobile, more globalized. In contrast, the expertise of a
218 specialist professionalized workforce responsible for the development, maintenance, and
219 governance of the systems for managing health data, health information and health knowledge is
220 considered to be critical to enable safe patient care and health care delivery. This review will
221 contribute to wider research on the present and future health information workforce.

222

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225 substantial contribution to the searching and screening stages of the review.

226

227

228

229 **References**

230 Arksey H & O'Malley L. 2005. Scoping studies: towards a methodological framework.

231 *International Journal of Social Research Methodology*, 8:19-32. DOI:

232 10.1080/1364557032000119616.

233

234 Butler-Henderson K. & Gray K. 2018a. *Health information workforce census*. Available at

235 <http://www.utas.edu.au/business-and-economics/hiwcensus> (accessed 10 February 2019)

236

237 Butler-Henderson K & Gray K 2018b. *Australia's health information workforce: Census*

238 *summary report 2018*. Launceston: University of Tasmania. Available at

239 [http://www.utas.edu.au/__data/assets/pdf_file/0003/1163487/Australias-HIW-Census-Summary-](http://www.utas.edu.au/__data/assets/pdf_file/0003/1163487/Australias-HIW-Census-Summary-Report-2018.pdf)

240 [Report-2018.pdf](http://www.utas.edu.au/__data/assets/pdf_file/0003/1163487/Australias-HIW-Census-Summary-Report-2018.pdf) (accessed 10 February 2019)

241

242 Eardley T. 2006. NHS Informatics workforce survey. London: ASSIST. Available at

243 http://www.bcs.org/upload/pdf/finalreport_20061120102537.pdf (accessed 10 February 2019)

244

245 Health Workforce Australia. 2010. Health information workforce report. Available at

246 [http://industry.gov.au/Office-of-the-Chief-](http://industry.gov.au/Office-of-the-Chief-Economist/SkilledOccupationList/Documents/2015Submissions/HIMAA-Attachment-4.pdf)

247 [Economist/SkilledOccupationList/Documents/2015Submissions/HIMAA-Attachment-4.pdf](http://industry.gov.au/Office-of-the-Chief-Economist/SkilledOccupationList/Documents/2015Submissions/HIMAA-Attachment-4.pdf)

248 (accessed 10 February 2019)

249

250 Hersh W. 2010. The health information technology workforce: estimations of demands and a

251 framework for requirements. *Applied clinical informatics*, 1:197-212. DOI:10.4338/ACI-2009-

252 11-R-0011.

253

254 Legg M & Lovelock B 2009. A review of the Australian health informatics workforce.

255 Melbourne: Health Informatics Society of Australia. Available at [https://hisa-site-](https://hisa-site-ym.com/resource/resmgr/hisa-resources_page/2009_ahi_workforce-review_v1.pdf)

256 [ym.com/resource/resmgr/hisa-resources_page/2009_ahi_workforce-review_v1.pdf](https://hisa-site-ym.com/resource/resmgr/hisa-resources_page/2009_ahi_workforce-review_v1.pdf) (accessed 10

257 February 2019)

258

259 Paré G, Trudel M-C, Jaana M, & Kitsiou S. 2015. Synthesizing information systems knowledge:

260 A typology of literature reviews. *Information & Management*, 52:183-199.

261 DOI:10.1016/j.im.2014.08.008.

262

- 263 Sanz LF, Gomez-Perez J, Castillo-Martinez A. 2018. Analysis of the European ICT competence
264 frameworks. In: Ahuja V & Rathore S. eds. *Multidisciplinary perspectives on human capital and*
265 *information technology professionals*. Hershey, PA: IGI Global, 225-245. DOI:10.4018/978-1-
266 5225-5297-0.
- 267
- 268 Topi H, Karsten H, Brown SA, Carvalho JA, Donnellan B, Shen J, Tan BC & Thouin MF. 2017.
269 MSIS 2016 global competency model for graduate degree programs in information systems.
270 *Communications of the Association for Information Systems*, 40. DOI:10.17705/ICAIS.04018.
- 271
- 272 Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. 2018. PRISMA
273 Extension for Scoping Reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal*
274 *Medicine*, 169:467–473. DOI: 10.7326/M18-0850.