BMJ Open

Improving primary care referral to specialist services: a protocol for a 10-year global systematic review in the Australian context

Siyaguna Kosgamage Dilum Manthinda Ekanayake ,[1,2] Aletha E Ward ,[3] Diane Heart ,[3] Patricia Valery ,[2] Jeffrey Soar[4]

To cite: Ekanayake SKDM, Ward AE, Heart D, *et al*. Improving primary care referral to specialist services: a protocol for a 10-year global systematic review in the Australian context. *BMJ Open* 2023;**13**:e068927. doi:10.1136/bmjopen-2022-068927

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2022-068927).

Received 05 October 2022
Accepted 16 August 2023

For numbered affiliations see end of article.

Correspondence to
Dr Siyaguna Kosgamage Dilum Manthinda Ekanayake; dilum.ekanayake@uqconnect.edu.au

ABSTRACT

Introduction Barriers to accessing specialist services impart a significant burden on patient outcomes and experience as well as a cost and administrative burden on health systems due to healthcare wastage and inefficiencies. This paper outlines the planned protocol for a systematic review relating to how health systems perform with regard to patient access to specialist care, and the efficacy of interventions aimed at improving this.

Methods and analysis Systematic review of the literature will be carried out on publications retrieved by searching the following electronic literature databases: EBSCOhost Megafile Ultimate (Cumulative Index to Nursing and Allied Health Literature (CINAHL), Academic Search Ultimate, APA Psychological Abstracts (PsycINFO), HealthSource), PubMed (Medical Literature Analysis and Retrieval System Online (MEDLINE)), Elsevier Bibliographic Database (Scopus), Excerpta Medica Database (EMBASE), Web of Science and The Cochrane Library. Articles published over a 10-year period (2012–2022) will be analysed to determine; current accessibility and availability problems faced by primary care services when referring patients to specialist care, and the effectiveness of interventions to improve primary care access to specialist services. Grey literature publications (ie, government reports, policy statements and issues papers, conference proceedings) will not be analysed in this review. Articles not published in English, Spanish or Portuguese will not be included. Two independent reviewers will conduct the initial screening, disagreements will be resolved by a third independent reviewer, following which data extraction and selection of eligible sources will be carried out. Selected articles will be categorised on study design, setting and participants. Methodological quality and heterogeneity will subsequently be assessed using the Mixed Methods Appraisal Tool. A descriptive approach will be used to review and synthesise the findings.

Ethics and dissemination This study does not require ethics committee review as it solely focuses on analysing published literature. Findings will be published and disseminated through a peer-reviewed journal.

PROSPERO registration number CRD42022354890.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ A search of nine electronic bibliographic databases gives this review breadth and comprehensiveness.
⇒ Rigorous screening, data extraction, quality assessment and synthesis carried out by a group of three investigators is a study strength. This will aim to reduce the likelihood of personal biases.
⇒ The exclusion of other language articles, grey literature and limiting the review to 10 years may introduce publication bias and there is the possibility that some relevant articles may have been missed.
⇒ Limiting the reviewer time frame to 10 years has the potential to have introduced bias against innovation, interventions and research from the developing world.

INTRODUCTION

Access to specialist care is a key determinant in patient outcomes globally. Primary care providers usually act as the first point of call for patients.[1–4] A broad range of health concerns are managed and coordinated at this level. However, a significant number of patients will require higher levels of care requiring input from specialist services at some point in their care journey.[5–8] As such wait listing for specialist care remains a crucial barrier to healthcare access. Resultant sequelae can detriment patient outcomes such as morbidity, mortality and clinical deterioration which may then prompt preventable hospital admission or emergency department presentation. Patient experience such as needing to travel excessive distances and healthcare related anxiety are also adversely affected by excessive wait times.[9–11] This review is intended for a global audience, however, undertaken in the Australian context. All jurisdictions and nations were included in the review. For those jurisdictions that do not mandate primary care as a prerequisite to access specialist care, such as the USA or America, where primary care providers do not usually act as the first point of call, we excluded all studies that do not directly address referrals made by primary care providers to specialists.

To clarify this further, studies that assessed some aspect of the primary care to specialist referral interface were within scope and included for review.[12–14] In Australia during 2020–2021, 46.8 million outpatient clinic service appointments were provided for non-admitted patients through public services. There was a 23% increase in service events compared with the previous year with an average of 6.9% increase per annum over the previous 5 years.[15–21] Looking at the quantum of time patients spend on wait lists, data from Canada indicate an average wait of 11.1 weeks from referral to service provision in 2021, reflecting a threefold increase compared with 1993 when the wait time was 3.7 weeks.[22] Published literature and government reports from other countries also reflect a growing need for improvement in specialist access.[2 23 24] Government expenditure has tried to keep pace with this growing demand.[25] Resultant healthcare wastage and inefficiencies also represent a significant cost and administrative burden to health systems globally.

In recognition of these factors, various initiatives have been implemented with the explicit aim of ameliorating barriers to specialist access. These include but are not limited to; rapid access clinics, telemedicine and central referral hubs.[26–28] Some interventions focus on particular specialties, others on specialty groups, while others focus more broadly on health system wide improvements. These vary from in house changes to patient flow to implementation of health system wide remote consultation frameworks.[29–31] Commonly, the baseline comparators of these interventions are the existing health system on which the study was conducted with outcome measures varying from cost to patient outcomes and experience.

This study is being undertaken in Australia where primary care plays a central referral and coordination role in the patient journey through navigating the health system.[32] As such it will explore the interplay between primary and specialist care. Specialist care for the purposes of this study will be defined with reference to the Australian context. As such what defines a 'specialist' has been anchored on the Medical Board of Australia's list of recognised medical specialties. Therefore, by way of example, rapid access clinics if run under the supervision of or within a recognised specialty department would be within scope, even if those rapid access clinics were conducted by professionals of other streams (ie, advanced care physiotherapists, or clinical nurse consultants). However, other professional streams providing services independently were outside the scope of this review and excluded. This study will interrogate the interaction between primary and secondary care from the point of view of primary care utilisation of outpatient specialist clinics.

OBJECTIVES

This study aims to primarily investigate the interactions between primary care providers and patients' journey to accessing specialist care after being referred for higher level care, in terms of:

1. Interventions aimed at improving primary care access to specialist services.
2. Specific barriers these interventions are aimed at alleviating in accessing specialist services.
3. In consideration of factors that influence the availability and accessibility of specialist services to patients referred by primary care providers.
4. Finally, the patient impacts and clinical sequelae of poor access and barriers to obtaining specialist care

METHODS AND ANALYSIS

The Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols guidelines were used to guide and inform the design of this study.[33] The final report of the results will be based on these guidelines. Implementation and analysis of this review will take place in the fourth quarter of 2022. This review was registered with PROSPERO (International prospective register of systematic reviews); trial registration number CRD42022354890.[34]

Eligibility criteria

The study design was informed by multiple initial literature scans. Results from these indicate that limitation to only randomised control trials or purely quantitative studies may limit the final relevance and scope of the study. Therefore, this study will investigate all quantitative and qualitative reports within the search criteria. The inclusion criteria for qualitative and quantitative studies included in this are described using the Sample, Phenomena of Interest, Design, Evaluation, Research type and Population, Intervention, Comparison group, Outcome, Study design eligibility criteria, respectively.[35–37]

Population, Intervention, Comparison group, Outcome, Study

Patients: Patients referred by primary care providers to specialist services. Interventions: Any intervention aimed at improving patient outcomes (morbidity, mortality, wait times, etc). Comparator: Variable comparators as described in each study, this will usually, likely be the current standard of care. Outcome: multiple variable quantitative measures as appropriate for each study. Study design: interventional (quasi-experimental studies, randomised control studies, community trials etc) and observational (case reports, case series, cross-sectional, cohort etc).

Sample, Phenomena of Interest, Design, Evaluation, Research

Sample: Patients referred by primary care providers to specialist service. Phenomena of interest: At least one overall theme about the referral process or patient, provider or specialist experience. Design: Any qualitative methods. Evaluation: Factors, beliefs, perceptions, attitudes, opinions, etc. Research type: Qualitative.

English, Spanish and Portuguese language studies published between 2012 and 2022, where primary care access to specialist services is explored. Grey literature,

previous literature review and review articles will be excluded, and animal studies will not be considered.

Types of participants

This systematic review will interrogate studies where groups or subgroups of participants are comprised of primary care provider referrals to specialist services. There will be no exclusion by age, gender or other demographic factors. Nor will there be exclusion by diagnosis, specialty or other clinical factors.

Public and participant involvement

The public and individual participants were not involved in any part of this study.

Setting and time frame

Considering the pace of technological innovation in digital health and the rapidly changing landscape of how specialist referral management, this study will be limited to exploring the latest literature published in the last 10 years (2012–2022).[38–40] All studies regardless of other setting characteristics will be included for review.

Publication characteristics

Only English, Spanish and Portuguese language articles published between 2012 and 2022 in peer-reviewed journals will be considered for inclusion. Grey literature and other language articles will not be included in analysis. If full text of the article cannot be retrieved, the authors will be contacted, if full text is still unavailable, then these articles will also be excluded from the final review.

Information sources

Information sources for this systematic review will only include well-known electronic databases. Electronic searches will be conducted on:

1. EBSCOhost Megafile Ultimate—Cumulative Index to Nursing and Allied Health Literature (CINAHL), Academic Search Ultimate, APA Psychological Abstracts (PsycINFO), HealthSource
   n.b. PsycINFO was included in this review as it is the preferred indexing databases for mental health research including but not limited to psychology and psychiatry. In the Australian context, and globally, mental health and psychiatric illness imparts a significant disease burden. Hence, the referral interface to specialist mental health services is within the scope of the review.
2. PubMed—Medical Literature Analysis and Retrieval System Online (MEDLINE).
3. Elsevier Bibliographic Database (Scopus).
4. Web of Science.
5. Excerpta Medica Database (EMBASE).
6. The Cochrane Library.

Search terms related to the phrases “primary care”, “referral” and “specialist care” will be used, as these are commonalities in the quantitative and qualitative reviews’ eligibility criteria. The search strategy will be developed and refined with the help of a subject specialist librarian. Appropriate search terms will be identified using commonly used phrases, relevant keywords, Medical Subject Headings terms and popular terminology. The search strategy will be primarily developed and completed on Web of Science and then applied to other databases. A log of all searches trialled in the development of the final search syntaxes will be kept from initial search terms through modification to the final syntaxes described here. Where possible it will be aimed to run the searches over a 7-day period to ensure the data extracted for analysis is extracted in a small time window. If the study process takes over 6 months from the initial searches to drafting, the searches will be repeated quarterly to ensure sources remain up to date. Alerts will also be placed on the relevant databases to ensure the research team is kept informed of any new studies.

Search strategy

The initial search syntax for Web of Science will be:

1. ((TI=((“Primary Health Care” OR “Family Practice” gp OR gps OR “Family Physician” OR “Family Physicians” OR “Primary Health” OR “Primary Healthcare” OR “Primary Care” OR “Family Practice” OR “General Practice” OR “General Practitioner” OR “General Practitioners” OR “Family Medicine” OR “family doctor” OR “family practitioner” OR “Family Practitioners” OR “family doctors”))) OR AB=((“Primary Health Care” OR “Family Practice” gp OR gps OR “Family Physician” OR “Family Physicians” OR “Primary Health” OR “Primary Healthcare” OR “Primary Care” OR “Family Practice” OR “General Practice” OR “General Practitioner” OR “General Practitioners” OR “Family Medicine” OR “family doctor” OR “family practitioner” OR “Family Practitioners” OR “family doctors”))) OR KP=((“Primary Health Care” OR “Family Practice” gp OR gps OR “Family Physician” OR “Family Physicians” OR “Primary Health” OR “Primary Healthcare” OR “Primary Care” OR “Family Practice” OR “General Practice” OR “General Practitioner” OR “General Practitioners” OR “Family Medicine” OR “family doctor” OR “family practitioner” OR “Family Practitioners” OR “family doctors”))
2. ((TI=((specialist* OR “Speciali?ation” OR “specialism”))) OR AB=((specialist* OR “Speciali?ation” OR “specialism”))) OR KP=((specialist* OR “Speciali?ation” OR “specialism”))
3. (TI=(referral OR referred OR referring OR referrals)) OR AB=(referral OR referred OR referring OR referrals)) OR KP=(referral OR referred OR referring OR referrals)
4. ((TI=((gatekeep* OR access* OR barrier* OR obstacle* OR delay* OR improv* OR “demand management”))) OR AB=((gatekeep* OR access* OR barrier* OR obstacle* OR delay* OR improv* OR “demand management”))) OR KP=((gatekeep* OR access* OR barrier* OR obstacle* OR delay* OR improv* OR “demand management”))
5. ((TI=((“randomized controlled trial*” OR “randomised controlled trial*” OR random OR interven-

tion* OR control* OR evaluat* OR effect* OR rct OR "clinical trial"))) OR AB=(("randomized controlled trial*" OR "randomised controlled trial*" OR random OR intervention* OR control* OR evaluat* OR effect* OR rct OR "clinical trial"))) OR KP=(("randomized controlled trial*" OR "randomised controlled trial*" OR random OR intervention* OR control* OR evaluat* OR effect* OR rct OR "clinical trial"))

6. 6. #5 AND #4 AND #3 AND #2 AND #1
7. #5 AND #4 AND #3 AND #2 AND #1 | Exact search
8. #5 AND #4 AND #3 AND #2 AND #1 and 2012 or 2013 or 2014 or 2015 or 2016 or 2017 or 2018 or 2019 or 2020 or 2021 or 2022 (Publication Years) | Exact search
9. #5 AND #1 AND #2 AND #3 AND #4 and 2022 or 2021 or 2020 or 2019 or 2018 or 2017 or 2016 or 2015 or 2014 or 2013 or 2012 (Publication Years) and English or Spanish or Portuguese (Languages) | Exact search

The search syntax for other databases is presented in online supplemental appendix 1.

Study records

Selection process

Two reviewers (SKDME and DH) will independently perform primary title and abstract screening. Afterwards articles will be categorised into two groups; relevant or irrelevant. Where there is an agreement, either both reviewers agree the article is relevant, or both reviewers agree the article is irrelevant, the article will be categorised accordingly. Articles in Portuguese or Spanish will be translated by one reviewer (PV) and, via a meeting with two reviewers (SKDME and DH), categorised as relevant or irrelevant. Where there is a disagreement between the two reviewers and a third expert reviewer (AW) will act as arbiter and resolve the conflict through discussion. Researchers will discuss the screening process after the first one hundred records to clarify interpretation of the inclusion criteria, and this will be repeated until there is >90% agreement between the reviewers. Quantitative, Qualitative and Mixed Methods studies will be separated during the title and abstract review. The first two reviewers will then review the full texts of the articles classified as relevant. A similar process to the title and abstract reviews will be followed for the full text review, with SKDME and DH conducting the full text review and PV translating articles in Portuguese or Spanish. However, in addition to the decision on relevance, each reviewer will be required to give a reason for exclusion or inclusion. Where there is disagreement in terms of reason or decision the third reviewer, AW, will again act as arbiter and the group will resolve the conflicts through discussion.

Data management

Data from the initial searches will be extracted and uploaded to the Covidence system by the principal investigator, SKDME and duplicates will be removed using software and hand search.[41] A backup of the initial search will also be stored in EndNote for reference if a future need arises. All reviewers will have access to the same initial article list: however, the review process will be blinded. Title and abstract, and full text screening, as well as quality and risk of bias assessment, and data extraction will be conducted on Covidence and all accepted articles will be stored in password protected cloud-based storage accessible to all investigators.

Missing data

Where there are missing data or the group cannot resolve conflicts without further information, the original article authors will be contacted for clarification. If the authors are uncontactable, these studies will be excluded from the final analysis and synthesis.

Data items

All relevant data items will be extracted from the selected articles. This will include publication data (journal, publication date, format, etc), author and affiliation data (institutions, funding, authors, etc), study design, study setting, study methodology data (control group, participants, outcomes, quantitative and qualitative measures, etc), geographical location, health system information and time range of data collection.

Quality and risk of bias assessment

Articles will be critically appraised using the Mixed Methods Appraisal Tool.[42]

Disagreements will be resolved through discussion between the three reviewers. The appraisal will be carried out by two reviewers (SKDME and DH) with arbitration by a third reviewer (AEW), as already discussed.

Data synthesis

The final report will present a summary of: (1) all interventions aimed at improving primary care access to specialist services; (2) the current state of affairs regarding issues and pitfalls in this process and (3) the sequelae of poor specialist access. Articles will be grouped into qualitative, quantitative and mixed-methods studies, and stratified by level of evidence, type of intervention, specialty or specialties involved, and study setting. Articles will also be stratified by the quality of methodology, the results robustness and levels of evidence.

For quantitative studies, if possible and multiple homogenous study populations and studies are available meta-analysis and synthesis will be attempted. However, initial searches have indicated that this is highly unlikely, and given the likely heterogeneity of the literature captured in this search it is anticipated to be unlikely that statistical metanalysis will be possible. Therefore, a qualitative descriptive approach will be used to review and synthesise the findings from quantitative and qualitative papers. This will be carried out using Microsoft Excel.

Results of the quantitative and qualitative reviews will be combined using mixed-methods synthesis methodology. The synthesis will aim to determine extent to which the described interventions (results of quantitative review) addressed the factors (results of qualitative review); patient experience and outcomes in those referred by

primary care services for specialist input. All findings will be presented in separate tables for discussion.

TIMELINE

By February 2023, the following progress has been completed:

- Research question formulation.
- Consultation and input with three expert research librarians.
  - Medical librarian.
  - Review librarian.
  - Epidemiology librarian.
- Formulation testing and finalisation of search terms, with ongoing feedback from the expert librarians, of which a log has been maintained.
- Formulation, review and finalisation of review methodology with input from expert librarians.
- Submission of the finalised research question, design and search strategy to PROSPERO for registration—pending review and final publication of the record.
- Initial searches completed and alerts set.
- Accepting and publication of PROSPERO record.
- Extraction and upload of search results to Covidence—number of records—5534.
- Duplicates removed—number of records—3069.
- Title and abstract screening completed—2465 records screened.
- A total of 2104 records removed at the Title and Abstract review stage.
- Full text screening commenced.

It is expected that full text screening, and thereby the screening process will be completed by the end of April 2023. By June 2023, quality assessment and data synthesis are planned to be completed. A first draft of the manuscript for the complete review is expected to be ready by August 2023. Allowing 1 month for drafting and corrections between the project team, it is expected that the final manuscript be submitted for peer review by September 2023.

DISCUSSION

Health systems globally have been plagued by delays to specialist care access in the face of ever-increasing demand year on year.[43 44] Reported effects of this phenomenon range from poorer patient outcomes and experience, to growing inefficiencies and healthcare cost. Patients waiting for extended periods of time may experience deterioration in their original condition, worsening comorbidities, healthcare-related anxiety and a variety of other factors related to morbidity and mortality.[45 46] Conversely, health systems carrying a high burden of waitlisted patients have the added administrative burden of managing these in an equitable way and maintaining their duty of care obligations.[47 48] This article presents a basic outline and detailed methodology for a proposed 10-year systematic review of the literature to describe the current pitfalls and effects of existing systems and the impacts of interventions aimed at improving these.

This protocol presents a mixed, quantitative and qualitative review methodology to synthesise a descriptive summary. Due to the baseline heterogeneity of global health systems and the myriad potential solutions that may be implemented, a standardised single recommendation may not be possible at the conclusion of this exercise. Rather we aim to present and discuss the overall themes and findings in a narrative fashion.

Strengths and limitations

The broad scope and aims of this planned review necessitate some methodological limitations to ensure a meaningful result can be achieved. The basic aims of this study are to investigate and define; current accessibility and availability problems faced by primary care services when referring patients to specialist care, and the effectiveness of interventions to improve primary care access to specialist services. This is impacted by how different health manage access to specialist care and baseline differences therein. In turn, the impact on initiatives to improve these systems then also varies. So, the first limitation is that a formal meta-analysis and statistical literature review will likely not be possible. Second, as discussed above, the demand on specialist services and the landscape in which they operate evolve and change significantly overtime. Additionally, advances in healthcare technology and digital health exponentially allow for novel solutions over time. While this means studies conducted over a decade prior may be of limited relevance at present, there is a small but non-zero likelihood that the exclusion of these studies may in turn exclude some studies of interest.

Using three reviewers to conduct screening, data extraction, quality assessment and synthesis will reduce the effect of personal biases. Furthermore, including both quantitative and qualitative peer-reviewed literature will increase the generalisability and applicability of the review findings. Finally reviewing studies published in two languages in addition to English will increase the scope and reach of this review. However, articles published in other languages, non-peer-reviewed publications and grey literature will be excluded in the review increasing the potential for publication bias.

Despite these limitations in methodology and necessary boundaries, conducting a systematic review of this subject is expected to inform future initiatives by concisely describing and summarising previous successes and shortfalls.

Implications for research

This protocol describes a comprehensive systematic review that will synthesise and summarise the most recent literature from various heterogeneous jurisdictions to inform future health systems research. This will form a general and broadly applicable descriptor, rigorous comparator and evidence base for developing future initiatives to improve primary care access to specialist outpatient

services. Eventually helping to reduce resultant loss in patient outcomes, experience and cost.

ETHICS AND DISSEMINATION

In accordance with human research and ethics committee guidelines in the jurisdiction in which this study will be undertaken, as no collection of subject information, or direct intervention is being implemented, this study is exempt from ethics committee review and approval. Final findings will be disseminated through peer-reviewed journal publications and conference presentations.

Review status

The study is currently ongoing, and it is anticipated that a draft will be ready by by the third quarter of 2023.

Amendments

In the event of protocol amendments, the date of the amendment and rationale for deviation will be provided.

Author affiliations
[1]School of Nursing and Midwifery, University of Southern Queensland, Darling Heights, Queensland, Australia
[2]Population Health, Cancer and Chronic Disease Group QIMR-Berghofer Medical Research Institute, QIMR Berghofer Medical Research Institute, Herston, Queensland, Australia
[3]Faculty of Health, Sciences and Engineering, University of Southern Queensland - Ipswich Campus, Ipswich, Queensland, Australia
[4]School of Business, University of Southern Queensland, Darling Heights, Queensland, Australia

Twitter Aletha E Ward @DrAlethaWard1 and Diane Heart @Diane Heart@1DianeHeart

Acknowledgements The authors would like to thank the following expert librarians for their invaluable contributions to this review; Tricia Kelly, Rowena McGragor, and Lars Eriksson.

Contributors SKDME and DH designed the study with assistance from research librarians from The University of Southern Queensland. JS, PV and AEW participated in the study design. SKDME, AEW and DH drafted the manuscript. PV will aid in the translation of Spanish and Portuguese studies. All authors contributed to the revision and approval of the final manuscript.

Funding This project received funding from a University of Southern Queensland PhD scholarship stipend.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iDs
Siyaguna Kosgamage Dilum Manthinda Ekanayake http://orcid.org/0000-0002-5005-9858
Aletha E Ward http://orcid.org/0000-0003-4549-0704
Diane Heart http://orcid.org/0000-0003-3782-7530
Patricia Valery http://orcid.org/0000-0002-8823-3006

REFERENCES

1 Harrington DW, Wilson K, Rosenberg M, *et al*. Access granted! barriers endure: determinants of difficulties Accessing specialist care when required in Ontario, Canada. *BMC Health Serv Res* 2013;13:146.
2 Osman MA, Schick-Makaroff K, Thompson S, *et al*. Barriers and Facilitators for implementation of electronic consultations (eConsult) to enhance access to specialist care: a Scoping review. *BMJ Glob Health* 2019;4:e001629.
3 Ellison-Loschmann L, Firestone R, Aquilina L, *et al*. Barriers to and delays in Accessing breast cancer care among New Zealand women: disparities by Ethnicity. *BMC Health Serv Res* 2015;15:394.
4 Habashi P, Bouchard S, Nguyen GC. Transforming access to specialist care for inflammatory bowel disease: the PACE Telemedicine program. *J Can Assoc Gastroenterol* 2019;2:186–94.
5 Jaakkimainen L, Upshur R, Klein-Geltink J, *et al*. *Primary care in Ontario: ICES atlas*. Toronto: Institute for Clinical Evaluative Sciences, 2006.
6 Chen AHM, Yee HF Jr. Improving the primary care–specialty care interface: getting from here to there. *Arch Intern Med* 2009;169:1024–6.
7 Davis K, Schoenbaum SC, Audet A-M. A 2020 vision of patient-centered primary care. *J Gen Intern Med* 2005;20:953–7.
8 Grumbach K, Selby JV, Damberg C, *et al*. Resolving the Gatekeeper conundrum: what patients value in primary care and referrals to specialists. *JAMA* 1999;282:261–6.
9 Rankin NM, York S, Stone E, *et al*. Pathways to lung cancer diagnosis: a qualitative study of patients and general practitioners about diagnostic and pretreatment intervals. *Ann Am Thorac Soc* 2017;14:742–53.
10 Podubinski T, Townsin L, Thompson SC, *et al*. Experience of Healthcare access in Australia during the first year of the COVID-19 pandemic. *Int J Environ Res Public Health* 2021;18:10687.
11 Perry C, Papachristou I, Ramsay AIG, *et al*. Patient experience of centralized acute stroke care pathways. *Health Expect* 2018;21:909–18.
12 Williams PT, Peet G. Differences in the value of clinical information: referring physicians versus consulting specialists. *J Am Board Fam Pract* 1994;7:292–302.
13 Piterman L, Koritsas S. General practitioner–specialist referral process. *Intern Med J* 2005;35:491–6.
14 Mehrotra A, Forrest CB, Lin CY. Dropping the baton: specialty referrals in the United States. *Milbank Q* 2011;89:39–68.
15 Health AIo, Welfare. *Primary health care*. Canberra: AIHW, 2020.
16 Welfare AIoHa. *Rural & remote health*. Canberra: AIHW, 2019: 23.
17 Welfare AIoHa. *Australia's health 2020: in brief. Australia's health series*. Canberra: AIHW, 2020: 76.
18 Welfare AIoHa. *Australia's health 2018: in brief*. Canberra: AIHW, 2018: 56.
19 Welfare AIoHa. *Australia's health 2019: in brief*. 2019: 78.
20 Welfare AIoHa. *Primary health care in Australia*. 2016: 3.
21 Welfare AIoHa. *Primary health care*. 2020: 14.
22 Moir M, Barua B. *Waiting Your Turn: Wait Times for Health Care in Canada, Report. 2022*. 2022.
23 Alkmim MB, Figueira RM, Marcolino MS, *et al*. Improving patient access to specialized health care: the Telehealth network of Minas Gerais. *Bull World Health Organ* 2012;90:373–8.
24 World Health Organization. *Increasing access to health workers in remote and rural areas through improved retention: global policy recommendations*. 2010.
25 Keehan SP, Sisko AM, Truffer CJ, *et al*. National health spending projections through 2020: economic recovery and reform drive faster spending growth. *Health Affairs* 2011;30:1594–605.
26 Desai B, McKoy K, Kovarik C. Overview of international Teledermatology. *Pan Afr Med J* 2010;6:3.
27 Arnaout A, Smylie J, Seely J, *et al*. Improving breast diagnostic services with a rapid access diagnostic and support (RADS) program. *Ann Surg Oncol* 2013;20:3335–40.

28 Puchner R, Janetschko R, Kaiser W, *et al*. Efficacy and outcome of rapid access rheumatology consultation: an office-based pilot cohort study. *J Rheumatol* 2016;43:1130–5.
29 Tosi LL, Gliklich R, Kannan K, *et al*. "The American Orthopaedic Association's "own the bone" initiative to prevent secondary fractures". *J Bone Joint Surg Am* 2008;90:163–73.
30 Mayer-Amberg N, Woltmann R, Walther S. An integrated care initiative to improve patient outcome in schizophrenia. *Front Psychiatry* 2015;6:184.
31 Kirby AM, Kruger B, Jain R, *et al*. Using clinical decision support to improve referral rates in severe symptomatic aortic stenosis: a quality improvement initiative. *CIN* 2018;36:525–9.
32 Clarke SE. *Gatekeeping and general practice in the Australian health system*. 2020.
33 PRISMA-P Group, Moher D, Shamseer L, *et al*. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015;4:1–9.
34 Booth A, Clarke M, Dooley G, *et al*. PROSPERO at one year: an evaluation of its utility. *Syst Rev* 2013;2:4.
35 Methley AM, Campbell S, Chew-Graham C, *et al*. PICO, PICOS and SPIDER: a comparison study of specificity and sensitivity in three search tools for qualitative systematic reviews. *BMC Health Serv Res* 2014;14:579.
36 Schardt C, Adams MB, Owens T, *et al*. Utilization of the PICO framework to improve searching PubMed for clinical questions. *BMC Med Inform Decis Mak* 2007;7:16.
37 Cooke A, Smith D, Booth A. Beyond PICO: the SPIDER tool for qualitative evidence synthesis. *Qual Health Res* 2012;22:1435–43.
38 Patrick K, Hekler EB, Estrin D, *et al*. The pace of Technologic change: implications for Digital health behavior intervention research. *Am J Prev Med* 2016;51:816–24.
39 Michie S, Yardley L, West R, *et al*. Developing and evaluating Digital interventions to promote behavior change in health and health care: recommendations resulting from an international workshop. *J Med Internet Res* 2017;19:e232.
40 Meskó B, Drobni Z, Bényei É, *et al*. Digital health is a cultural transformation of traditional Healthcare. *Mhealth* 2017;3:38.
41 Covidence. *Covidence systematic review software: Veritas health innovation Melbourne, Australia*. 2020.
42 Hong QN, Fàbregues S, Bartlett G, *et al*. The mixed methods appraisal tool (MMAT) version 2018 for information professionals and researchers. *EFI* 2018;34:285–91.
43 Rouppe van der Voort MMBV, van Merode FGG, Berden BHJJM. Making sense of delays in outpatient specialty care: A system perspective. *Health Policy* 2010;97:44–52.
44 Murray MF. Improving access to specialty care. *Jt Comm J Qual Patient Saf* 2007;33:125–35.
45 Lewis AK, Taylor NF, Carney PW, *et al*. What is the effect of delays in access to specialist epilepsy care on patient outcomes? A systematic review and meta-analysis. *Epilepsy Behav* 2021;122:S1525-5050(21)00453-4.
46 Franks P, Fiscella K. Primary care physicians and specialists as personal physicians: health care expenditures and mortality experience. *J Fam Pract* 1998;47:105–9.
47 Iversen T. A theory of hospital waiting lists. *J Health Econ* 1993;12:55–71.
48 Stainkey LA, Seidl IA, Johnson AJ, *et al*. The challenge of long waiting lists: how we implemented a GP referral system for non-urgent specialist' appointments at an Australian public hospital. *BMC Health Serv Res* 2010;10:303.