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Title:

National quality indicators and policies from 15 countries leading in adult end-of-life care: a systematic environmental scan

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ABSTRACT:

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Background: The importance of measuring the quality of end-of-life care provision is undisputed, but determining how best to achieve this is yet to be confirmed. This study sought to identify and describe national end-of-life care quality indicators and supporting policies used by countries leading in their end-of-life care provision.

Methods: A systematic environmental scan that included: a web search to identify relevant national policies and indicators; hand searching for additional materials; information from experts listed for the top ten (n=15) countries ranked in the 'quality of care' category of *the 2015 Quality of Death Index study;* and snowballing from Index experts.

Findings: Ten countries (66%) have national policy support for end-of-life care measurement, five have national indicator sets, with two indicator sets suitable for all service providers. No countries mandate indicator use and there is limited evidence of consumer engagement in development of indicators. Two thirds of the 128 identified indicators are outcomes measures (62%) and 38% are process measures. Most indicators pertain to symptom management (38%), social care (32%) or care delivery (27%).

Interpretations: Measurement of end-of-life care quality varies globally and rarely covers all care domains or service providers. There is a need to reduce duplication of indicator development, involve consumers, consider all care providers and ensure measurable and relevant indicators to improve end-of-life care experiences for patients and families.

Introduction:

The importance of measuring the quality of end-of-life care is well established and central to informing better clinical care, research, policy reform and service commissioning.[1-5] For over two decades, measuring the quality of end-of-life care through clinically meaningful standards,[5] indicators and data collection tools has been recommended.[6] These terms have been used interchangeably but in this article the following definitions apply: 'standard' is an agreed and preferably evidence-based process that should be undertaken or outcome to be achieved for a defined circumstance, symptom, sign or diagnosis;[7] 'indicator' is a measurable statement '*with explicit criteria for inclusion, exclusion, time frame and setting*' (p79);[7] 'tool' is a method and/or instrument used to gather data to inform a quality indicator and standard;[7, 8] and 'measure' is used only as a verb to avoid ambiguity. Progressing measurement of end-of-life care quality would benefit from: collation, analysis

and adaptation of current indicators for use across different societies and health systems, cultures, care settings and diagnoses; [2, 3, 9, 10] development of indicators where gaps exist; [2, 3, 11] and decreased variation in indicators to enable greater comparative and collaborative opportunities. [3, 9] Given end-of-life care complexity, there is a need for suites of indicators that reflect multiple domains of care [1, 2, 5] as well as measuring structures, process and outcomes to elucidate the relationship between these. [10, 11]

A recent international review of quality indicators for end-of-life care was published in 2013 and concluded that the large number of indicators developed over the preceding years had been subject to limitations in quality and capacity for clinical implementation.[10] We went beyond this work by examining supporting policies.[10] Better understanding how countries are undertaking national quality measurement of end-of-life care to drive improvements and commissioning of new services is critical to improving care experiences for those who require it.

Aim:

To identify and describe national quality indicators and supporting policies used by countries leading in their provision of quality end-of-life care.

Method:

Design: A systematic environmental scan, undertaken from November 2016 – February 2017.

Eligibility criteria

Data pertaining to a country listed in the top ten countries (n=15) ranked in the 'quality of care' category within the 2015 Quality of Death Index study[12] were eligible for inclusion. This design allowed analysis of methods used to support system-wide end-of-life care improvements and the identification of indicators used by both specialist and/or primary care providers. This article defines end-of-life care as care provided to a person living with, and impaired by, a progressive and eventually fatal condition;[13] specialist palliative care as care provided by clinicians whose substantive role is within palliative care;[14] and primary care providers as any clinician providing care to those with end-of-life care needs, where their substantive work is not within specialist palliative care. This includes, but is not limited to, general practitioners, community nurses, staff of aged care facilities and acute care hospitals as well as specialist staff (eg. oncologists, geriatricians, renal, cardiac or respiratory physicians).[14]

Data sources

A systematic web search with predefined search terms and review of the first 10 webpages for each search, was undertaken. This search was designed to identify peer reviewed publications, non-peer reviewed reports, policies, standards and/or resources relevant to measuring quality of end-of-life care. Once this was completed, additional details from the countries ranked in the top 10 of the 'quality of care' domain of *The 2015 Quality of Death Index: Ranking palliative care across the world*[12] ('Index') were sought via: i) A systematic Google search to identify all relevant national policy and indicators, augmented with

handsearching of retrieved documents to identify additional sources for review; and ii) Listed key informants ('experts') named in the Index[12] who were emailed a set of standard questions about the availability and implementation of quality indicators in their country. Experts identified in the 'Index'[12] were asked to address the following three questions:

- 1. Does your country have any quality indicators to measure end-of-life care?
- Does your country have specific policy guidance in relation to measuring quality of end-of-life care?
- 3. Is there another key informant who works within this area who I should contact?

Follow-up emails were sent on two occasions, as needed. Snowballing was utilised if the initial experts suggested additional informants. Validation was assured by a review of country specific summaries by each relevant expert (Appendix 1).

Search

Seven systematic Google searches were completed using the following search terms: dying and acute care and/or hospital; palliative and quality; end-of-life care and quality; dying and quality; palliative and measures; end-of-life and measures; dying and measures. Within each website retrieved, a secondary search for all relevant references was completed, through accessing all appropriate hyperlinks (published documents and / or additional web content).

Ethics approval

Ethics approval was obtained from a University (HREC ETH16-0939).

Data collection and items

The data collected for each of the 15 eligible countries included: all national policy guidance for end-of-life care; and national structural, process and/or outcome indicators used to monitor quality of end-of-life care by specialist and/or primary care providers. Data were extracted into MS Word templates developed *a priori* that included: information from the Google search (date of search, search terms used, number of results, documents retrieved per webpage including URL link); information from key countries contacted (details of expert, date of emails and all related information categorised by country) and a handsearching overview (citation details, abstract and key points of relevance to this study). Duplicate files were identified at the file management stage (saving files per country) and where a duplicate occurred, these were not saved a second time nor counted within the initial documents retrieved or screened (Figure 1). Where a country had updated reports or policies, the most recent policy informed indicator data for use (prior indicators were removed from analysis if no longer in use). However, where relevant several policies informed analysis of approaches used to quality measurement of end-of-life care, given policy reform often continued to build on work from prior publications.

Synthesis

Concurrent data analysis occurred via a two step process: i) Analysis of supporting policies and national approaches to quality measurement of end-of-life care within each participating country; ii) Analysis of the nationally available end-of-life care indicators from participating countries. Mapping was completed to identify availability of national standards, national quality indicators, whether they were designed for specialist palliative care or primary care providers and whether they were supported by national policy and/or mandated for use. Information provided by Index experts was summarised to provide a country specific overview and to describe any identified measurement barriers and enablers. Identified indicators were categorised in accordance with the Donabedian model[15] and the US National Consensus Project Guidelines[16] ('US Guidelines'), mapped to the recent systematic review of available indicators[10] and summarised via descriptive analysis. The Donabedian model[15] enabled collation of indicator types (structure, process or outcome), independantly categorised by two researchers (CV & TL). Adopting the approach used by two recent systematic reviews[10, 11] all indicators were mapped independently by two researchers (CV & TL) to the 'US Guidelines' domains.[16] Mapping to those indicators reported in the most recent systematic review[10] was then completed (CV) with 10% of this work independently coded and checked for accuracy (JP). Lastly, to summarise the content descriptively, we grouped the indicators into measurement domains (CV & TL). Any

disagreement in categorisation, mapping or grouping of indicators was discussed to ensure consensus.

Results:

Seven Google searches, generated 10 items per webpage across 10 webpages per search, resulting in a review of 700 items with 99 items meeting the inclusion criteria, including:

- 28 peer reviewed manuscripts;
- 40 policy / report documents from: United Kingdom UK (n=15 includes UK n=11, England n=2, Scotland n=2), Australia (n=14), US (n=6), Ireland (n=3), Canada (n=1), Global (n=1); and
- 31 webpages US (n=16), Australia (n=7), UK (n=6), Canada (n=2) resulting in an additional 89 documents downloaded for review.

Handsearching generated another 68 documents for inclusion. Targeted searches of the 15 countries participating in this study, led to an additional 49 documents for review, a total of 274 documents included overall (Refer Figure 1).

Country experts

Of the 39 experts identified from the 15 included countries, 18 responded (46% response rate) with an additional 46 nominees contacted, with 27 providing additional data (59% response rate) (see acknowledgements). Comprehensive responses were obtained for all 15 countries. Verified summaries for each country are presented in Appendix 1. *National approaches to quality measurement of end-of-life care across 15 countries* Two thirds (n=10, 66%) of participating countries have current national policy supporting the use of quality indicators to measure end-of-life care (Table 1). These policies vary considerably. Policies from New Zealand (NZ) and Singapore focus predominantly on specialist palliative care provision. England, Australia, NZ and Singapore have national standards for end-of-life care. Sweden, Australia, Belgium, The Netherlands and the US each have indicator sets available for national end-of-life care measurement. While the Australian and Belgian indicator sets are for specialist palliative care services, the Swedish

indicators are for primary care services and the Dutch and US sets are applicable for use by all services. Involvement of consumers in the development of indicators is rarely, if at all, described by those countries with indicator sets.

None of the included countries mandate the implementation of their national quality indicators with all relying on policy guidance to spur measurement of the quality of end-of-life care. In 8 (53%) of the 15 included countries, policy guidance has not led to indicator development. Australia is the only country with a: national policy supporting measurement of quality end-of-life care; national standards for optimal end-of-life care; and a national indicator set available for use. However, these 20 indicators do not directly map to all 13 Australian palliative care standards[17] and are only applicable to specialist palliative care services.

'Index'[12] ranking/ Country	National policy supporting use of quality indicators for end-of-life	National standards available for quality end-of-life care	National end-of-life care quality indicators available for use by specialist	National end-of-life care quality indicators available for use by primary care	Use of quality indicators for end-of-life care mandatory for specialist palliative care	Use of quality indicators for end-of-life care mandatory for primary care providers
A United Kingdom	care	/ *		providers	providers	Y
England	Ý	v "	X	X	×	X (Hospital accreditation notes EOL care)
1. United Kingdom:	\checkmark	X *	Х	X (under review)	Х	Х
Scotland						
1. United Kingdom:	\checkmark	Χ*	Х	X	X	Х
Wales						
1. United Kingdom: Northern Ireland	√	X *	Х	Х	Х	Х
2. Sweden	\checkmark	X *	Х	\checkmark	Х	Х
3. Australia	\checkmark	\checkmark	\checkmark	Х	Х	Х
4. New Zealand	 ✓ (focused on specialist palliative care) 	✓	Х	Х	Х	Х
5. France	Х	X *	X	Х	Х	X (Hospital accreditation notes EOL care)
6. Canada	\checkmark	X *	X	Х	Х	Х
7. Belgium	Х	X *	\checkmark	Х	Х	Х
8. Netherlands	Х	X *	\checkmark	\checkmark	Х	Х
8. Singapore	 ✓ (focused on specialist palliative care) 	✓ **	Х	Х	Х	X (Hospital accreditation notes EOL care)
8. Switzerland	✓ (expired)	X *	Х	Х	Х	Х
8. Taiwan	X	Х	X	X	Х	Х
8. United States	Х	X *	\checkmark	\checkmark	X (Some payment incentives linked to indicator use)	X (Some payment incentives linked to indicator use)
Totals	10/15	4/15	4/15	3/15	0/15	0/15
* National guidelines for quality end-of-life care available; **Singapore's standards are called 'guidelines' but written in a very similar way to standards from Australia and New Zealand and therefore have been classified as standards for this study. To see referencing for each policy informing the above table, please refer to Appendix 2.						

Table 1: Availability of national policies, standards and/or indicators to ensure quality end-of-life care across 15 countries

Enablers and barriers to implementing national end-of-life care quality indicators

Significant work is underway to strengthen the measurement of quality end-of-life care provision globally (Appendix 1), with four key enablers for development and implementation of national end-of-life quality indicators identified, namely:

- 1. National project / program work (Australia, Belgium and The Netherlands);
- Use of mandatory accreditation frameworks (England, France, Australia and Singapore);
- 3. Availability of a national palliative care data registry (Sweden); and
- 4. Incentivising quality indicator use (US).

Three main barriers were identified by experts that prevent quality measurement of end-oflife care, including:

- Lack of a national data collection system focused on quality of end-of-life care (England);
- 2. Legal and regulatory constraints in relation to data access (England); and
- 3. Policy frameworks that focus on availability, access and activity, rather than a more holistic understanding of quality end-of-life care (England and France).

An overview and analysis of nationally available end-of-life care indicators

There are 128 indicators identified from five countries: The Netherlands (n=43), Belgium (n=31), US (n=25), Australia (n=20) and Sweden (n=9) (Appendix 3). The majority (62%, n=79) are outcome indicators, with the remaining (38%, n=49) classified as process indicators. No structural indicators were identified (Figure 2).

The majority of indicators, when mapped to the 'US Guidelines' domains,[16] refer to physical care (n=48, 38%), social care (n=41, 32%) or processes of care delivery (n=35, 27%). There are a smaller number of indicators measuring psychological (n=21, 16%), spiritual / religious care (n=21, 16%) or the quality of care throughout the dying process (n=17, 13%). Few indicators measure cultural (n=9, 7%) or ethical and legal aspects of care

(n=9, 7%). Belgium and the Netherlands are the only countries with a set of indicators that map to all domains. Physical aspects of care are the major focus for Australia (n=15, 75%) and Sweden (n=6, 67%). Cultural aspects of care are never explicitly referred to, with indicators mapped to this domain measuring either quality of life, how a patient or family member was feeling, degree of preparedness for saying goodbye and perceptions of the quality of death.

Mapping the 128 national indicators (Appendix 3) to the 2013 systematic review of quality end-of-life care indicators[10], found: 32 (18%) were listed, considerable overlap in indicator availability (e.g., multiple indicators measuring aspects of pain screening, assessment and/or management) with 'similar' indicators used on 73 occasions. There are 390 distinct quality indicators listed across the systematic review[10] and this study. Three of the five participating countries with national indicators sets (Australia, The Netherlands and US) were within the published review's indicator set.[10] Appendix 4 provides an overview of this mapping work, including visibility of all such indicators.

The descriptive summation of the 128 national indicators reveals: 36 key measurement domains; 13 occasions where a single country is measuring a key area in isolation (e.g. nausea measured by Australia and pressure ulcers measured by Sweden); and 23 occasions where two or more countries are measuring the same key area using different indicators. There are 37 indicators measuring symptom management with 15 specifically for pain (inclusive of screening, assessment and / or management). There are 9 indicators for psychological / spiritual / religious aspects of care and 8 measuring information provision to the patient. There are 11 occasions where the indicators measure multiple components of care and could not be mapped to one domain. Figure 3 provides an overview of the mapping of indicators to key domains, Table 2 notes the mapping in line with each participating country and Appendix 3 at each indicator level. All five countries with national indicators for measuring the quality of end-of-life care have indicators relating to general symptom management and pain. No other key area is measured by all five participating countries.

Table 2: Number and type of indicators available for national use to measure quality of end-of-life care listed by country of origin, mapped to the 'US Guidelines' domains[16] and key measurement domains

Indicators available by participating country.	Type of Indicator (structure / process / outcome)	'US Guidelines'[16] Domains*	Key domains of measurement
Australia – 20 indicators for use by specialist palliative care providers	1 Process 19 Outcome	Domains 1, 2, 3, 4 and 5	General symptom management; Pain; Fatigue; Dyspnoea; Nausea; Bowel management; Psychological / spiritual / religious care for the patient; Family problems; Service access; Resolution of unstable phase.
Belgium – 31 indicators available for specialist palliative care providers	14 Process 17 Outcome	Domains 1 – 8	General symptom management; Pain; Dyspnoea; Quality of life measure; Respect for patient autonomy; Information provision – patient; Information provision – family; Family support; Evident MDT care; Treatment preference discussion and/or documentation – patients; Treatment preference discussion and/or documentation – families; Discussion about care objectives; Family physician contact for patient; Quality of death measure; Service access; Acute care use; Indicators covering multiple categories.
Netherlands – 43 indicators available for generalist and specialist palliative care providers	14 Process 29 Outcome	Domains 1 – 8	General symptom management; Pain; Fatigue; Dyspnoea; Bowel management; Physical care; Psychological / spiritual / religious care for the patient; Respectful care; Respect for patient autonomy; Preparation for death; Quality of death measure; Location of preference; Integrated / coordinated care and care expertise; Information provision – patient; Treatment preference discussion and/or documentation – patients; Service access; Family support; Respect for family member's autonomy; Information provision – family; Bereavement; Indicators covering multiple categories.
Sweden – 9 indicators available for generalist providers	8 Process 1 Outcome	Domains 1, 2 and 7	General symptom management; Pain; Oral health; Pressure ulcers; Psychological / spiritual / religious care for the patient; Discussion about care objectives; Coverage in a registry of palliative care; Acute care use.
United States – 25 indicators available for generalist and specialist palliative care providers	12 Process** 13 Outcome**	Domains 1, 2, 3, 4, 5, 7 and 8	General symptom management; Pain; Dyspnoea; Bowel management; Psychological / spiritual / religious care for the patient; Respectful care; Treatment preference discussion and/or documentation – patients; ICD deactivation; Information provision – family; Family support; Service access; Acute care use; Receiving chemotherapy in last 14 days of life; Hospice evaluation; Indicators covering multiple categories.
*Domain headings from the Un Care; Domain 3: Psychological an Care; Domain 7: Care of the Patie ** The Unites States note their inc	ited States Clinical Pra nd Psychiatric Aspects o ent at the End of Life; Dc dicator 'type' on each pu	ctice Guidelines for Quality Pal f Care; Domain 4: Social Aspects main 8: Ethical and Legal Aspect blished indicator. Therefore, this	lliative Care, Third Edition: Domain 1: Structure and Processes of Care; Domain 2: Physical Aspects of of Care; Domain 5: Spiritual, Religious and Existential Aspects of Care; Domain 6: Cultural Aspects of ts of Care was recorded and used.

Discussion:

This environmental scan identified wide global variability in progress towards establishing national approaches to robust, feasible and sustainable mechanisms for measurement of the quality of end-of-life care provision.[18-21] Belgium and the Netherlands currently have the most comprehensive indicator sets available at national levels. However, Belgium's set is currently only for specialist palliative care providers and the Netherlands' indicator set was made available as part of a five-year project, due for completion this year.

Indicators are currently only used by a third of countries identified as leading in end-of-life care provision, and none of the countries mandated indicator use. Two of the five indicator sets we identified: were designed for use by specialist palliative care services rather than more generally measuring end-of-life care provided by primary care providers; and only two addressed all of the 'US Guidelines' domains.[16] While hospital accreditation requirements in England, France and Singapore incorporate aspects of end-of-life care, no national indicators have been developed specifically to support this process in acute care.

Enabling system-wide improvements for end-of-life care provision, requires: the integration of indicators into existing healthcare systems; and indicators that are relevant to primary care providers and specialist palliative care providers. While, Sweden reports improvements in end-of-life care resulting from integration of indicators across all care settings, for all care providers, [18] their current indicator set does not: cover all care domains; or consider structural, process and outcomes and subsequent causal linkages. No participating countries had a comprehensive set of national end-of-life care indicators, relevant to all care providers across care settings. The development and implementation of a comprehensive set of indicators would support wide-scale improvements in patient and family experiences. Given the increasing number of people living with complex illnesses, focusing indicator development only on specialist palliative care services alone reinforces the status quo and does little to highlight the need for all health systems to prioritise end-of-life care.

Debate continues as to whether indicators should be mandated or voluntary, with a recent US publication proposing that a nationally mandated approach will enable progression in measurement of, and improvements within, patient safety.[22] Without a mandated approach, our data suggest that implementation is inconsistent and/or reliant upon project funding affecting sustainability and usability of data for comparative purposes. However, mechanisms to mandate need careful consideration with a specific focus on whether incentivising is useful, whether public reporting of data assists performance and whether data should be used with a punitive intention.[23] Given the aim for such reporting is to drive system-wide improvements, policy makers and standard enforcers are advised to consider such approaches in line with best practice for performance management.[23] However, the complexity of this work should not be underestimated. Each country has unique data collection, data regulation, policy and population requirements to consider. Nevertheless, development of national data registries, incentivising indicator use, appropriate utilisation of accreditation processes and commencing work through funded national programs have all been highlighted as mechanisms for enabling progression in quality measurement of end-oflife care (Appendix 1).

Current development and implementation of quality indicators for end-of-life care falls short of key recommendations from a recent systematic review.[10] No national indicator sets include structural measures with recommendations highlighting the need for structure, process and outcome indicators to truly inform a review of quality end-of-life care; and advice to adapt indicators across countries to limit development of new indicators and enhance opportunities for benchmarking has not been implemented with all countries having unique sets of indicators with both duplication and heterogeneity evident. There are opportunities to learn from different approaches and indicators used, to share successes and challenges in the measurement of optimal end-of-life care and for policy makers, researchers and service commissioners to use this information in line with cultural and contextual factors at the national level.

Given the focus on person-centred care and consumer-driven healthcare, it is time that the healthcare sector also partnered with consumers to: identify a set of indicators that can assist optimal end-of-life care provision across all care settings (acute, community and aged care); and implement these nationally so service commissioning is in line with best practice. Driving such work from a consumer perspective will ensure that all system level improvements are in line with patient and family expectations of what constitutes good end-of-life care.[24, 25] It is also timely to develop an international repository of available indicators to limit ongoing development of 'similar' indicators and inform development of indicators where these are not available (E.g. cultural care). Such work could lead to international consensus on specific indicators that are of shared importance – for example, in relation to symptom management. Opportunities for collaboration and learning from other countries will flow directly from such an approach.

Crafting a set of national quality indicators that draws together key information from multiple tools in a feasible and sustainable way is complex. For an indicator set to be feasible for clinical settings, the number and frequency of measuring is an important consideration. It also requires a commitment to: utilise existing data sources[26]; carefully consider tools that inform quality indicators and standards,[1-3, 5, 6, 27] prioritise tools that assess consumer-identified areas of importance;[27] can be implemented into routine clinical practice[1, 28] and preference patient reported data.[1, 9, 29] Enabling quality measurement of end-of-life care also requires assessing the validity and usefulness of available national data sets[2] and better understanding how to use information from proxies when patients are unable to self-report.[2] Finally, ensuring a pathway between indicators and improved patient and family experience is fundamental to successfully effecting system level improvements.

Strengths and limitations

The involvement of key experts from all participating countries is a strength of this study. Their contribution has ensured a realistic view of practice within the context of future plans, that would not have been available from the published literature only. Furthermore, the use

of standardised questions for experts and the systematic approach we used to search for and collect data limits the risk of bias. We adhered to standards for reporting a systematic review to the degree possible, recognising that such standards do not currently account for internet inclusive searches.

The study's main limitation is that we restricted participation to the 15 countries ranked in the top 10 countries delivering quality end-of-life care according to the 'Index'.[12] Other countries may be working in this area and may have national quality indicators not included in our review. Focusing on the countries ranked in the top 10 for quality of care was intended to instil at least some confidence in the quality of policies in the absence of research evidence. Limiting our inclusion to national indicators rather than those used at local or regional levels means we have not identified quality indicators currently used by some services. This approach enabled reviewing in line with national policy guidance and reduced contextual heterogeneity at least to some extent. Whilst the 'US Guidelines' [16] had previously been used to map indicators to key domains, [10, 11] these were hard to separate at times (E.g. significant overlap between domain 1 – structure and processes of care and domain 4 – social aspects of care) and this led to us taking an inclusive approach. As a result, the mapping may over represent availability of measures in some domains. Finally, similar to other reviews, this study has focused purely on quality measurement, without inclusion of safety.[3, 5, 10] Despite some progress noted in healthcare safety measurement over the past 15 years, considerable work is required to enable this in a systematic way[22] for people with end-of-life care needs.[30]

Conclusion

Measuring the quality of end-of-life care is a global priority, as it is key to ensuring access to high quality care across all settings, regardless of where you live. The collaborative development of a consumer-centred set of quality indicators, mapped to available standards and data sources, to inform local, regional and national understanding of end-of-life care provision is a good starting point to strengthen the quality and safety agenda. Indicator

development that supports system-level improvements in end-of-life care provision will need to consider both primary care providers as well as specialist palliative care providers and all care settings. A collaborative approach will reduce duplication of effort, facilitate rapid transfer of learnings from key successes and provide the foundation for future

benchmarking.

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Declaration of interests

We have no conflicts of interest to disclose.

Contribution of authors

All authors (CV, TL, KL and JP) contributed to the research design, consensus discussions for inclusion / exclusion of data and finalising data analysis. All authors (CV, TL, KL and JP) contributed to manuscript preparation, editing and finalisation, including figure and table design. The systematic search, including email communications with 'contacts' and data collection was completed by CV. Mapping of data to the Donabedian model and to US guideline domains was completed independently by CV and TL with meetings held to enable full consensus. Mapping to the most recent systematic review was completed by CV with an audit of 10% of this work completed independently by JP. Descriptive analysis of indicators was completed independently by CV and TL with close review and input from JP.

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Competing Interest

None declared.

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