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# BMJ Open

## Alternative service models for delivery of healthcare services in high-income countries: a scoping review of systematic reviews (Protocol)

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3 **Alternative service models for delivery of healthcare services in high-income countries: a**  
4  
5 **scoping review of systematic reviews (Protocol)**  
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## Abstract

**Introduction:** Costs associated with the delivery of healthcare services are growing at an unsustainable rate. There is a need for health systems and healthcare providers to consider the cost effectiveness of the service models they deliver, and to determine if alternative models may lead to improved efficiencies without compromising quality of care. The aim of this protocol is to describe a scoping review of the extent, range and nature of available synthesised research on alternative delivery arrangements for health systems relevant to high-income countries published in the last five years.

**Design:** We will perform a scoping review of systematic reviews of trials and economic studies of alternative delivery arrangements for health systems relevant to high-income countries published on PDQ-Evidence between 1<sup>st</sup> January 2012 and 20<sup>th</sup> September 2017. All English language systematic reviews will be included. The Cochrane Effective Practice and Organisation of Care (EPOC) taxonomy of health system interventions will be used to categorise delivery arrangements according to: how and when care is delivered; where care is provided and changes to the healthcare environment; who provides care and how the healthcare workforce is managed; co-ordination of care and management of care processes; and information and communication technology systems. This work is part of a five-year Partnership Centre for Health System Sustainability aiming to investigate and create interventions to improve health system performance sustainability.

**Ethics and dissemination:** No primary data will be collected, so ethical approval is not required. The study findings will be published and presented at relevant conferences.

## Strengths and limitations

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3 • A high level synthesis of the available evidence on alternative delivery arrangements  
4 will be a useful resource for decision makers involved in health system planning,  
5 health system performance sustainability initiatives and future research directions.  
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10 • We have followed published methodological guidance in planning our methods for  
11 conducting this scoping review, and additionally performed independent double  
12 data extraction to enhance the robustness of our findings where consistency of  
13 extraction is <90%.  
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19 • The search date will be limited to the last five years to retrieve useful, up-to-date  
20 reviews of alternative delivery arrangements relevant to high-income countries. As a  
21 consequence, it is possible that we may miss delivery arrangements included in out-  
22 of-date systematic reviews (published prior to 2012).  
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28 • We will limit our search to systematic reviews published in PDQ – Evidence, a  
29 database focusing on high quality evidence about health systems. Systematic  
30 reviews that are not captured in this database, and those awaiting classification in  
31 PDQ-Evidence, will not be assessed as part of this review.  
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## Background

The provision of sustainable, appropriate healthcare is an ongoing challenge for health systems worldwide. There are many drivers of increasing healthcare costs. They include growing pressure from an ageing population[1, 2], growth in the prevalence of chronic and preventable diseases, increasing availability of (more expensive) clinical tests and treatment[3], medicalisation of risk factors and active screening of people who are well[4, 5], lowering of diagnostic and intervention thresholds for high prevalence conditions[6-8], and changing community expectations[9, 10]. In addition, high-income countries are experiencing increasing inflationary pressures and workforce shortages[11-15]. In order to be sustainable, health systems and providers must be able to endure and adapt to these growing pressures by delivering services that maintain a high quality of care while providing better value for money[16]. In practice, this means health systems and providers need to consider the effectiveness and cost effectiveness of existing service models, and also determine if there are alternative models that might lead to improved efficiencies without compromising the quality of care and patient outcomes.

There are examples of models of service delivery that have been adopted in practice that offer modest benefits for patients when compared to usual care, but where effects on costs are uncertain (e.g. early discharge hospital at home)[17], or not known (e.g. mid-wife led models of care)[18]. In addition, some alternative delivery arrangements have been implemented despite uncertainty about effects on patient care and costs (e.g. primary care physicians providing care in emergency departments)[19]. For this reason, efforts that aim to manage expenditure need to focus not just on benefits to patients, but on the value of

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2  
3 the delivery arrangement relative to the cost. This distinction is important, as high cost  
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5 models of care may still be good value if they deliver high levels of benefit to patients, while  
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7 low-cost models of care may have no value if they provide little or no benefit[20]. In 2017,  
8  
9 the Australian Productivity Commission released a report identifying that there are  
10  
11 considerable efficiencies to be gained through identifying enablers and barriers to more  
12  
13 efficient models of care, and that eliminating financial reward for delivery of services where  
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15 there is clear evidence of a lack of efficacy or cost effectiveness, or where the benefits do  
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17 not justify the associated costs, should be part of future health planning[21].  
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23 Alternative models of service delivery offer an opportunity for healthcare providers to  
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25 deliver healthcare services in different and potentially more cost-effective ways through  
26  
27 lower cost providers, locations and formats of delivery. Examples include changing the site  
28  
29 of the service delivery from a more expensive to less expensive option, providing care in a  
30  
31 group setting rather than to individuals, substituting the care that is provided by a highly  
32  
33 trained or specialised health worker to care provided by a less specialised or lay health  
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35 worker, or using technology to deliver care (e.g. telemedicine). Provision of services in this  
36  
37 way may lead to the same, and in some cases better, outcomes for patients without  
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39 compromising the quality of care. However, these alternative models may also increase  
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41 costs, so they must undergo robust economic evaluations that not only take account of  
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43 improvements in patient and carer outcomes, but also consider the benefit and costs to the  
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45 health system as a whole.  
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53 A number of reviews of alternative delivery models have been published in the past five  
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55 years. Most reviews have focused on delivery of a single test or treatment for a particular  
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3 disease or condition[22, 23], or a single delivery arrangement type such as chronic disease  
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5 programs [24], multidisciplinary care, or integrated care interventions[25]. As such, these  
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7 reviews do not adequately summarise the volume and scope of existing synthesised  
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9 research on alternative delivery arrangements. A recent Cochrane overview has focused on  
10  
11 delivery arrangements relevant to low-income countries[26]. However low-income  
12  
13 countries struggle with different health system demands, including a predominance of  
14  
15 communicable diseases and resource constraints, and limited access to new technologies  
16  
17 and other resources. Therefore, the findings of this overview may be less applicable to high-  
18  
19 income countries (for example, it includes delivery arrangements for HIV/AIDs, malaria,  
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21 childhood diarrhoea, pneumonia and vaccination, and antenatal care).  
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28 To the best of our knowledge, no scoping review or overview of alternative delivery  
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30 arrangements for health systems relevant to high-income countries has been conducted to  
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32 date. This work is likely to be useful for decision makers by mapping the availability of  
33  
34 existing synthesised evidence, including where economic analysis of alternative delivery  
35  
36 arrangements exists, and in highlighting gaps for future research. The proposed scoping  
37  
38 review forms part of a five-year Partnership Centre for Health System Sustainability, funded  
39  
40 by the Australian National Health and Medical Research Council (NHMRC) and other  
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42 partners, and aims to investigate and create interventions to improve health system  
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44 performance sustainability ([http://aihi.mq.edu.au/project/nhmrc-partnership-centre-  
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60](http://aihi.mq.edu.au/project/nhmrc-partnership-centre-health-system-sustainability)  
[health-system-sustainability](http://aihi.mq.edu.au/project/nhmrc-partnership-centre-health-system-sustainability)).

## Objectives



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3 This scoping review aims to describe the extent, range and nature of available systematic  
4  
5 reviews of alternative delivery arrangements for health systems relevant to high-income  
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7 countries published in the last five years. A secondary aim is to identify gaps in the  
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9 availability of up-to-date systematic reviews of alternative delivery arrangements needed to  
10  
11 inform health system sustainability initiatives and future research directions.  
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## 14 15 16 **METHODS AND ANALYSIS**

### 17 18 **Protocol development**

19  
20 The protocol for this scoping review is underpinned by the methodological framework first  
21  
22 suggested by Arksey and Malley[27], and further described by Levac and colleagues[28].  
23  
24 This framework emphasises transparency of the protocol development and scoping review  
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26 process to increase the reliability of the findings.  
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### 30 31 32 **Criteria for considering studies for this review**

33  
34 We will include all English language systematic reviews examining the effects of alternative  
35  
36 delivery arrangements for health systems relevant to high-income countries published  
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38 between 1<sup>st</sup> of January 2012 and 20<sup>th</sup> of September 2017. Alternative delivery arrangements  
39  
40 include changes to how and when care is delivered, where care is provided and changes to  
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42 the healthcare environment, who provides care and how the workforce is managed, co-  
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44 ordination of care and management of care processes, and information and communication  
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46 technology systems.  
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52 For inclusion, systematic reviews must assess the effects of alternative delivery  
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54 arrangements of relevance to high-income countries (as classified by the World Bank for the  
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3 2017 fiscal year)[29], have a methods section with explicit inclusion criteria, and report at  
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5 least one of the following outcomes: patient outcomes (health and health behaviours),  
6  
7 quality of care, access and/ or utilisation of healthcare services, resource use, impacts on  
8  
9 equity and/ or social outcomes, healthcare provider outcomes, and adverse effects. We will  
10  
11 consider for inclusion systematic reviews in any setting, including hospital (inpatient or  
12  
13 outpatient care, acute or subacute), primary care, long-term care facilities and the  
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15 community.  
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### 21 **Search methods for identifying studies**

22  
23 We will search PDQ ('pretty darn quick')-Evidence for systematic reviews published  
24  
25 between 1<sup>st</sup> January 2012 and 20<sup>th</sup> September 2017. PDQ-Evidence is a database of evidence  
26  
27 for decisions about health systems derived from the Epistemonikos database of systematic  
28  
29 reviews. It includes the following databases: Cochrane Database of Systematic Reviews  
30  
31 (CDSR), Database of Abstracts of Reviews of Effectiveness (DARE), MEDLINE via PubMed,  
32  
33 EMBASE, CINAHL, PsycINFO, Latin American and Caribbean Health Sciences Literature  
34  
35 (LILACS), JBI Database of Systematic Reviews and Implementation Reports, Evidence for  
36  
37 Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) Evidence Library,  
38  
39 and the Campbell Collaboration online library. The 'intervention' publication filter will be  
40  
41 used to exclude systematic reviews of non-intervention studies.  
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### 49 **Study selection**

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51 Two review authors will independently screen the titles and abstracts retrieved by the  
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53 search for inclusion and code as 'retrieve' (potentially eligible or unclear) or 'do not retrieve'  
54  
55 (ineligible). We will retrieve the full text reports of potentially eligible and unclear titles and  
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3 abstracts. Two (of a team of four) review authors will independently screen the full text  
4 reports and identify systematic reviews for inclusion and exclusion. We will record the  
5 reasons for exclusion of ineligible systematic reviews. We will resolve disagreements  
6 regarding eligibility through discussion, and if consensus is not achieved, by involving a third  
7 review author. We will prepare a PRISMA flow chart summarising the search and selection  
8 process and the number of articles reviewed at each stage.  
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### 19 **Data extraction and management/ charting the data**

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21 We will extract data on systematic review characteristics (year, authors, number and design  
22 of included studies, Cochrane review), delivery arrangement category and strategy, target  
23 population, setting, health issue/s, outcome categories and main effects (patient outcomes,  
24 quality of care, access and/ or utilisation of healthcare services, resource use, impacts on  
25 equity and/ or social outcomes, healthcare provider outcomes, adverse effects), and cost-  
26 effectiveness (where reported). First, the research team will develop, pilot and refine a data  
27 extraction form[28].  
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40 Four review authors involved in data extraction will independently extract data from the  
41 first ten included systematic reviews and discuss their findings to ensure the process for  
42 extraction is consistent. Then, at least two of four authors will independently extract data  
43 from 1/3 of the included systematic reviews. We will assess consistency of data extraction  
44 across review authors and resolve disagreements through discussion and consensus. If the  
45 mean agreement in data extraction across authors is < 90%, two review authors will  
46 independently extract data from the remaining included reviews to ensure reliability of  
47 results. Independent data extraction of included studies by two review authors is not  
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3 routinely recommended in methods guidance for scoping reviews[28] given the scope is  
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5 typically broad and is designed to map available evidence to determine the value of  
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7 undertaking full systematic reviews.  
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### 10 11 12 **Collating and summarising results**

13  
14 We will categorise the delivery arrangements according to the Cochrane Effective Practice  
15  
16 and Organisation of Care (EPOC) taxonomy of health system interventions[30]. This  
17  
18 taxonomy is useful for organising and characterising health system interventions according  
19  
20 to conceptual, functional and/ or practical similarities. The delivery arrangement domain of  
21  
22 the taxonomy classifies interventions based on changes to the following:  
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- 25 • how and when care is delivered;
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- 27 • where care is provided and changes to the healthcare environment;
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- 29 • who provides care and how the healthcare workforce is managed;
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- 31 • co-ordination of care and management of care processes; and
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- 33 • information and communication technology systems;
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38 In addition, we will use a category titled 'multiple (goal-focussed)' to categorise systematic  
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40 reviews that include all relevant delivery arrangements from across the above categories to  
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42 address a specific problem or goal (e.g. interventions for enhancing medication adherence).  
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46 We will summarise our findings quantitatively by presenting a numerical count of reviews in  
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48 each category, and visually using bubble charts to represent the quantity and range of  
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50 systematic reviews across the delivery arrangement categories and to highlight gaps in the  
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52 available synthesised evidence. We will also describe the extent, range and nature of  
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54 available systematic reviews using a narrative synthesis. This process will allow for  
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3 identification of gaps in the availability of up-to-date systematic reviews and areas of  
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5 delivery arrangements where the evidence is limited. Specifically, results will be used to 1)  
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7 quantify the extent, range and nature of delivery strategies reported in systematic reviews;  
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9 2) quantify the number of systematic reviews where the cost-effectiveness of the  
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11 arrangement was reported; and 3) determine the gaps and suggest delivery arrangements  
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13 where future systematic reviews might be of use.  
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### 16 17 18 19 **Strengths and limitations**

20  
21 A high level synthesis of the available evidence in this area is much needed and will be a  
22  
23 useful resource for decision makers involved in health system planning, health system  
24  
25 performance sustainability initiatives and future research directions. We have followed  
26  
27 published methodological guidance in planning our methods for conducting this scoping  
28  
29 review, however we will additionally perform independent double data extraction to  
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31 enhance the robustness of our findings where consistency of extraction is <90%. The search  
32  
33 date will be limited to the last five years to retrieve useful, up-to-date reviews of alternative  
34  
35 delivery arrangements relevant to high-income countries. As a consequence, it is possible  
36  
37 that we may miss delivery arrangements included in out-of-date systematic reviews  
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39 (published prior to 2012). In addition, systematic reviews that are awaiting classification in  
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41 PDQ-Evidence will not be assessed as part of this review.  
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### 48 49 **Conclusion**

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51 This scoping review will describe the volume and scope of available up-to-date systematic  
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53 reviews of alternative delivery arrangements relevant to high-income countries, and identify  
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3 gaps in the synthesised evidence, needed to inform health system planning, health system  
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5 sustainability initiatives and future research directions.  
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### 8 9 **Ethics and dissemination**

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11 As no primary data will be collected, ethical approval is not required. The study findings will  
12  
13 be disseminated via reports, manuscript in a peer-reviewed journal and via conference  
14  
15 presentations.  
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17

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33 not reviewed the content and are not responsible for any injury, loss or damage however  
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37 material is solely the responsibility of the authors and does not reflect the view of the  
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### 51 **Authors' contributions**

52  
53 The study and overall design was conceived by RB and DAO. RLJ wrote the first draft and all  
54  
55 authors critically reviewed the manuscript and approved the final version.  
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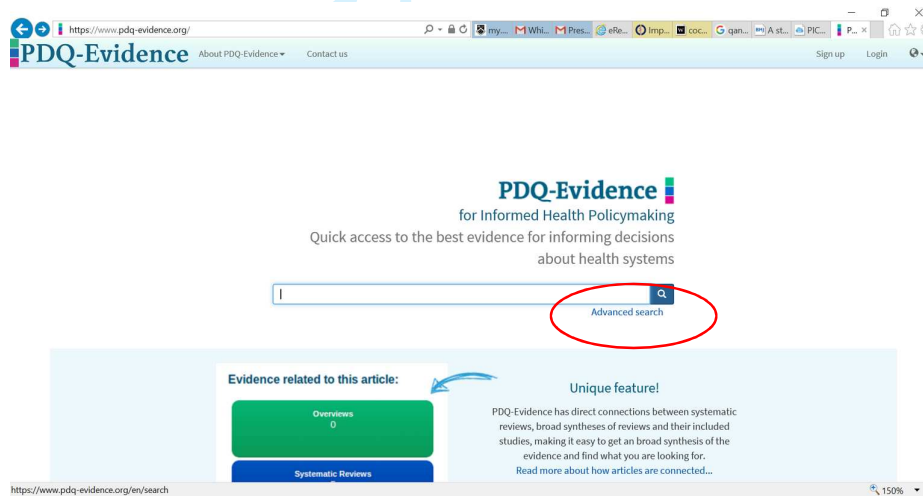
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3 29. World Bank. World Bank Country and Lending Group. Available at:  
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5 <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country->  
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7 [and-lending-groups2017](https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-)  
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10 30. Effective Practice and Organisation of Care (EPOC). EPOC Taxonomy; 2015. Available  
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12 at: <https://epoc.cochrane.org/epoc-taxonomy>  
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## PDQ search strategy

PDQ-Evidence is a database of evidence for decisions about health systems derived from the Epistemonikos database of systematic reviews. It includes the following databases: Cochrane Database of Systematic Reviews (CDSR), Database of Abstracts of Reviews of Effectiveness (DARE), MEDLINE via PubMed, EMBASE, CINAHL, PsycINFO, Latin American and Caribbean Health Sciences Literature (LILACS), JBI Database of Systematic Reviews and Implementation Reports, Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) Evidence Library, and the Campbell Collaboration online library. The 'intervention' publication filter will be used to exclude systematic reviews of non-intervention studies.

The following provides an overview of how the search for the scoping review on alternative service models for delivery of healthcare services in high-income countries.

1. On the navigation page of PDQ-Evidence, advanced search was entered.



2. In the query box, an \* was entered into the Query box, and then Search. This filtered for all English language articles on PDQ.

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PDQ-Evidence About PDQ-Evidence Contact us Sign up Login

### Advanced search

Important: Advanced search only supports English

Use the editor below or paste your strategy here.

Title/Abstract Query

Search Save Export History Help

Search history

#	Query	Date	Remove
1	(title:(*) OR abstract:(*))	01-06-2018 01:34:51 +10:00	X

Clear history

We need your feedback. How can we make this site better for you?

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3. On the left hand side of the screen, results were then filtered for the following:

Custom year: 2012 to 2017 (search date 20<sup>th</sup> September, 2017), so date range was

01/01/2012 to 20/09/2017

Added to data base: All

Publication type: Systematic Review

Cochrane Review: All

Pubmed central (PMC): All

Systematic Review Question: Interventions

Type of meta-analysis: All

Country or regional focus: leave blank

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### Advanced search

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Showing items - Total: Export results

**Filters**

Publication year  
Custom year range  
From: 2012 To: 2017

Added to database  
All

Publication type  
Systematic Review

Cochrane review  
All

Pubmed central (PMC)  
All

Systematic Review Question  
Interventions

Type of meta-analysis  
All

Country or regional focus

**Systematic review**  
**Mobile phone messaging for communicating results of medical investigations**

Authors » Ipek GuroI-Urganci, Thyra de Jongh, Vlasta Vodopivec-Jamsek, Josip Car, Rifat Atun  
Journal » Cochrane Database of Systematic Reviews  
Year » 2012  
Links » Pubmed, DOI

This article is included in 2 Broad syntheses  
This article includes 1 Primary study

**Systematic review**  
**Chronic Care Model Decision Support and Clinical Information Systems interventions for people living with HIV: a systematic review.**

Authors » Pasricha A, DeinStadt RT, Moher D, Killoran A, Rourke SB, Kendall CE  
Journal » Journal of general internal medicine  
Year » 2013  
Links » Pubmed, DOI, PubMed Central,

Abstract About this article Related evidence

**BACKGROUND:**  
Mobile phone messaging, such as Short Message Service (SMS) and Multimedia Message Service (MMS), has rapidly grown into a mode of communication with a wide range of applications, including communicating the results from medical investigations to patients. Alternative modes of communication of results include face-to-face communication, postal messages, calls to landlines or mobile phones, through web-based health records and email. Possible advantages of mobile phone messaging include convenience to both patients and healthcare providers, reduced waiting times for health services and healthcare costs.

**OBJECTIVES:**  
To assess the effects of mobile phone messaging for communicating results of medical investigations, on people's healthcare-seeking behaviour and health outcomes. Secondary objectives include assessment of participants' evaluation of the intervention, direct and indirect healthcare costs and possible risks and harms associated with the intervention.

**SEARCH METHODS:**  
We searched the Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library 2009, Issue 2), MEDLINE (OvidSP) (January 1993 to June 2009), EMBASE (OvidSP) (January 1993 to

No other restrictions were made to the search. This search yielded 829 results.

# BMJ Open

## Alternative service models for delivery of healthcare services in high-income countries: a scoping review of systematic reviews (Protocol)

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2018-024385.R1
Article Type:	Protocol
Date Submitted by the Author:	04-Oct-2018
Complete List of Authors:	Jessup, Rebecca; Monash University, Clinical Epidemiology and Preventative Medicine, Cabrini Institute O'Connor, Denise; Monash University, School of Public Health and Preventive Medicine Putrik, Polina; Monash University, Clinical Epidemiology and Preventative Medicine, Cabrini Institute Rischin, Kobi; Monash University, Clinical Epidemiology and Preventative Medicine, Cabrini Institute Nezon, Janet; Monash University, Clinical Epidemiology and Preventative Medicine, Cabrini Institute Cyril, Sheila; Cabrini Institute, Monash Department of Clinical Epidemiology; Monash University, Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine Shepperd, S; University of Oxford, Nuffield Department of Population Health Buchbinder, Rachelle; Monash University, School of Epidemiology and Preventive Medicine, Cabrini Institute
<b>Primary Subject Heading</b>:	Health services research
Secondary Subject Heading:	Public health, Evidence based practice
Keywords:	healthcare delivery, sustainability, alternative healthcare models, delivery arrangement, high-income, scoping review

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Manuscripts

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3 **Alternative service models for delivery of healthcare services in high-income countries: a**  
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5 **scoping review of systematic reviews (Protocol)**  
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7 **Rebecca L Jessup<sup>1,2\*</sup>, Denise A O'Connor<sup>1,2\*</sup>, Polina Putrik<sup>1,2</sup>, Kobi Rischin<sup>1,2</sup>, Janet Nezon<sup>3</sup>,**  
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9 **Sheila Cyril<sup>1,2</sup>, Sasha Shepperd<sup>4</sup>, Rachelle Buchbinder<sup>1,2</sup>**  
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## Abstract

**Introduction:** Costs associated with the delivery of healthcare services are growing at an unsustainable rate. There is a need for health systems and healthcare providers to consider the economic impacts of the service models they deliver, and to determine if alternative models may lead to improved efficiencies without compromising quality of care. The aim of this protocol is to describe a scoping review of the extent, range and nature of available synthesised research on alternative delivery arrangements for health systems relevant to high-income countries published in the last five years.

**Design:** We will perform a scoping review of systematic reviews of trials and economic studies of alternative delivery arrangements for health systems relevant to high-income countries published on PDQ-Evidence between 1<sup>st</sup> January 2012 and 20<sup>th</sup> September 2017. All English language systematic reviews will be included. The Cochrane Effective Practice and Organisation of Care (EPOC) taxonomy of health system interventions will be used to categorise delivery arrangements according to: how and when care is delivered; where care is provided and changes to the healthcare environment; who provides care and how the healthcare workforce is managed; co-ordination of care and management of care processes; and information and communication technology systems. This work is part of a five-year Partnership Centre for Health System Sustainability aiming to investigate and create interventions to improve health system performance sustainability.

**Ethics and dissemination:** No primary data will be collected, so ethical approval is not required. The study findings will be published and presented at relevant conferences.

1  
2  
3 **Keywords:** health-care delivery, sustainability, high-income, alternative healthcare delivery,  
4  
5 delivery arrangement  
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8 **Strengths and limitations of this study**  
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- 12 • A high level synthesis of the available evidence for alternative models of health  
13 service delivery is much needed and will be a useful resource for decision makers  
14 involved in health system planning, health system performance, sustainability  
15 initiatives and future research directions.  
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  - 18 • We have followed published methodological guidance in planning our methods for  
19 conducting this scoping review, and we will additionally perform independent  
20 double data extraction to enhance the robustness of our findings where consistency  
21 of extraction is <90%.  
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23
  - 24 • The search date will be limited to the last five years to retrieve useful, up-to-date  
25 reviews of alternative delivery arrangements relevant to high-income countries.  
26  
27
  - 28 • Limiting the search date to the last five years means it is possible that we may not  
29 capture delivery arrangements included in out-of-date systematic reviews (published  
30 prior to 2012).  
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  - 33 • Systematic reviews that are awaiting classification in PDQ-Evidence will not be  
34 assessed as part of this review.  
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## Background

The provision of sustainable, appropriate healthcare is an ongoing challenge for health systems worldwide. There are many drivers of increasing healthcare costs. They include growing pressure from an ageing population (1, 2), growth in the prevalence of chronic and preventable diseases, increasing availability of (more expensive) clinical tests and treatments (3), medicalisation of risk factors and active screening of people who are well (4, 5), lowering of diagnostic and intervention thresholds for high prevalence conditions (6-8), and changing community expectations (9, 10). In addition, high-income countries are experiencing increasing inflationary pressures and workforce shortages (11-15). In order to be sustainable, health systems and providers must be able to endure and adapt to these growing pressures by delivering services that maintain a high quality of care while providing better value for money (16). In practice, this means health systems and providers need to consider the effectiveness and economic impact of existing service models, and also determine if there are alternative models that might lead to improved efficiencies without compromising the quality of care and patient outcomes.

There are examples of models of service delivery that have been adopted in practice that offer modest benefits for patients when compared to usual care, but where the economic impact is uncertain (e.g. early discharge hospital at home) (17), or not known (e.g. mid-wife led models of care) (18). In addition, some alternative delivery arrangements have been implemented despite uncertainty about effects on patient care and economic impact (e.g. primary care physicians providing care in emergency departments) (19) and in some cases where effectiveness is later shown to be low and associated costs are high (e.g., rapid

1  
2  
3 exchange of operating room air to reduce infection rates) (20). For this reason, efforts that  
4  
5 aim to manage expenditure need to focus not just on benefits to patients, but on the value  
6  
7 of the delivery arrangement relative to the cost. This distinction is important, as high cost  
8  
9 models of care may still be good value if they deliver high levels of benefit to patients, while  
10  
11 low-cost models of care may have no value if they provide little or no benefit (21). In 2017,  
12  
13 the Australian Productivity Commission released a report identifying that there are  
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15 considerable efficiencies to be gained through identifying enablers and barriers to more  
16  
17 efficient models of care, and that eliminating financial reward for delivery of services where  
18  
19 there is clear evidence of a lack of efficacy or cost effectiveness, or where the benefits do  
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21 not justify the associated costs, should be part of future health planning (22).  
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26 Alternative models of service delivery offer an opportunity for healthcare providers to  
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28 deliver healthcare services in different and potentially more cost-effective ways through  
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30 lower cost providers, locations and formats of delivery. Examples include changing the site  
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32 of the service delivery from a more expensive to less expensive option, providing care in a  
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34 group setting rather than to individuals, substituting the care that is provided by a highly  
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36 trained or specialised health worker to care provided by a less specialised or lay health  
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38 worker, or using technology to deliver care (e.g. telemedicine). Provision of services in this  
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40 way may lead to the same, and in some cases better, outcomes for patients without  
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42 compromising the quality of care. However, these alternative models may also increase  
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44 costs, so they must undergo robust economic evaluations that not only take account of  
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46 improvements in patient and carer outcomes, but also consider the benefit and costs to the  
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48 health system as a whole.  
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3 A scoping review provides a rapid method of mapping key concepts within a research area  
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5 and provides an overview of the main sources and types of evidence available (23). It is  
6  
7 most useful when the research question is complex or has not been reviewed  
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9 comprehensively before. A number of reviews of alternative delivery models have been  
10  
11 published in the past five years. Most reviews have focused on delivery of a single test or  
12  
13 treatment for a particular disease or condition (24, 25), or a single delivery arrangement  
14  
15 type such as chronic disease programs (26), multidisciplinary care, or integrated care  
16  
17 interventions (27). As such, these reviews do not adequately summarise the volume and  
18  
19 scope of existing synthesised research on alternative delivery arrangements. A recent  
20  
21 Cochrane overview has focused on delivery arrangements relevant to low-income countries  
22  
23 (28). However low-income countries struggle with different health system demands,  
24  
25 including a predominance of communicable diseases and resource constraints, and limited  
26  
27 access to new technologies and other resources. Therefore, the findings of this overview  
28  
29 may be less applicable to high-income countries (for example, it includes delivery  
30  
31 arrangements for HIV/AIDs, malaria, childhood diarrhoea, pneumonia and vaccination, and  
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33 antenatal care).

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42 To the best of our knowledge, no scoping review or overview of alternative delivery  
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44 arrangements for health systems relevant to high-income countries has been conducted to  
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46 date. This work is likely to be useful for decision makers by mapping the availability of  
47  
48 existing synthesised evidence, including where economic analysis of alternative delivery  
49  
50 arrangements exists, and in highlighting gaps for future research. The proposed scoping  
51  
52 review forms part of a five-year Partnership Centre for Health System Sustainability, funded  
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54 by the Australian National Health and Medical Research Council (NHMRC) and other  
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3 partners, and aims to investigate and create interventions to improve health system  
4 performance sustainability (29). This scoping review complements a systematic review  
5 currently underway by the Partnership Centre that will review the sustainability of  
6 interventions, improvement efforts and change strategies in the health system through an  
7 examination of trial data published in the last five years (16).  
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### 17 **Objectives**

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19 This scoping review aims to describe the extent, range and nature of available systematic  
20 reviews of alternative delivery arrangements for health systems relevant to high-income  
21 countries published in the last five years. A timeframe of five years was chosen to ensure  
22 that the review contained evidence and data about effects that are up-to-date, reliable and  
23 ready to implement. A secondary aim is to identify gaps in the availability of up-to-date  
24 systematic reviews of alternative delivery arrangements needed to inform health system  
25 sustainability initiatives and future research directions.  
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## 39 **METHODS AND ANALYSIS**

### 40 **Protocol development**

41  
42 The protocol for this scoping review is underpinned by the methodological framework first  
43 suggested by Arksey and Malley (30), and further described by Levac and colleagues (31).  
44  
45 This framework emphasises transparency of the protocol development and scoping review  
46 process to increase the reliability of the findings.  
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### 55 **Criteria for considering studies for this review**

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3 We will include all English language systematic reviews examining the effects of alternative  
4 delivery arrangements for health systems relevant to high-income countries published  
5 between 1<sup>st</sup> of January 2012 and 20<sup>th</sup> of September 2017. Alternative delivery arrangements  
6 include changes to how and when care is delivered, where care is provided and changes to  
7 the healthcare environment, who provides care and how the workforce is managed, co-  
8 ordination of care and management of care processes, and information and communication  
9 technology systems.  
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21 For inclusion, systematic reviews must assess the effects of alternative delivery  
22 arrangements of relevance to high-income countries (as classified by the World Bank for the  
23 2017 fiscal year)(32), have a methods section with explicit inclusion criteria, and report at  
24 least one of the following outcomes: patient outcomes (health and health behaviours),  
25 quality of care, access and/ or utilisation of healthcare services, resource use, impacts on  
26 equity and/ or social outcomes, healthcare provider outcomes, and adverse effects. We will  
27 consider for inclusion systematic reviews in any setting, including hospital (inpatient or  
28 outpatient care, acute or subacute), primary care, long-term care facilities and the  
29 community.  
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#### 44 **Search methods for identifying studies**

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46 We will search PDQ ('pretty darn quick')-Evidence for systematic reviews published  
47 between 1<sup>st</sup> January 2012 and 20<sup>th</sup> September 2017. PDQ-Evidence is a database of evidence  
48 for decisions about health systems derived from the Epistomonikos database of systematic  
49 reviews. It includes the following databases: Cochrane Database of Systematic Reviews  
50 (CDSR), Database of Abstracts of Reviews of Effectiveness (DARE), MEDLINE via PubMed,  
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3 EMBASE, CINAHL, PsycINFO, Latin American and Caribbean Health Sciences Literature  
4 (LILACS), JBI Database of Systematic Reviews and Implementation Reports, Evidence for  
5 Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) Evidence Library,  
6 and the Campbell Collaboration online library. The 'intervention' publication filter will be  
7 used to exclude systematic reviews of non-intervention studies. An example of the search  
8 method has been provided as an online supplementary file.  
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### 19 **Study selection**

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21 Two review authors will independently screen the titles and abstracts retrieved by the  
22 search for inclusion and code as 'retrieve' (potentially eligible or unclear) or 'do not retrieve'  
23 (ineligible). We will retrieve the full text reports of potentially eligible and unclear titles and  
24 abstracts. Two (of a team of four) review authors will independently screen the full text  
25 reports and identify systematic reviews for inclusion and exclusion. We will record the  
26 reasons for exclusion of ineligible systematic reviews. We will resolve disagreements  
27 regarding eligibility through discussion, and if consensus is not achieved, by involving a third  
28 review author. We will prepare a PRISMA flow chart summarising the search and selection  
29 process and the number of articles reviewed at each stage.  
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### 44 **Data extraction and management**

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46 We will extract descriptive data on systematic review characteristics (year, authors, journal,  
47 number and design of included studies), delivery arrangement category and subcategory,  
48 target population, setting, target health issue/s. Outcome categories and the main effects  
49 searched for by systematic review authors will also be collected (patient outcomes, quality  
50 of care, access and/ or utilisation of healthcare services, resource use, impacts on equity  
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3 and/ or social outcomes, healthcare provider outcomes, adverse effects), and economic  
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5 analysis (where reported). The research team will develop, pilot and refine a data extraction  
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7 form (31) (preliminary version of the data extraction form is presented in Table 1).  
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**Table 1. Preliminary version of the data extraction form**

Study ID	Author, year	Brief description of intervention/objective	Place published	EPOC Delivery arrangement strategy	Subcategory	Number and type of trials included	Target population	Setting	Target health issue/s	Patient outcomes (health and health behaviours eg. mortality, cure rates)	Quality of care (systems or processes for improving quality of care eg. timeout before surgery)	Resource use	Impacts on equity	Social outcomes (eg. poverty, unemployment)	Access, utilisation (eg. readmission rates, length of stay)	Healthcare provider outcomes (eg. overall wellbeing, fatigue, stress, satisfaction)	Adverse effects	Economic analyses
ID1																		
ID2																		
ID3																		

For peer review only



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5 As we anticipate a large volume of included studies, four review authors will be involved in  
6  
7 the data extraction process. Initially, all four will independently extract data and populate  
8  
9 the data extraction form for ten systematic reviews and discrepancies will be discussed to  
10  
11 ensure the process for extraction is consistent. The remaining systematic reviews will then  
12  
13 be divided between reviewers.. While independent data extraction of included studies by  
14  
15 two review authors is not routinely recommended in method guidance for scoping reviews  
16  
17 (31), we will have a second reviewer allocated to extract a random sample of one third of  
18  
19 included systematic reviews to assess for level of consistency and determine the accuracy of  
20  
21 our process. Any disagreement between reviewer extraction process will be resolved  
22  
23 through discussion until consensus reached. If the mean agreement in data extraction  
24  
25 across this subset of systematic reviews is >90%, no further checks will be conducted. The  
26  
27 data extraction process is illustrated in Figure 1.  
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### 35 **Collating and summarising results**

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37 We will categorise the delivery arrangements according to the Cochrane Effective Practice  
38  
39 and Organisation of Care (EPOC) taxonomy of health system interventions (33). This  
40  
41 taxonomy is useful for organising and characterising health system interventions according  
42  
43 to conceptual, functional and/ or practical similarities. The delivery arrangement domain of  
44  
45 the taxonomy classifies interventions based on changes to the following:  
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- 48 • how and when care is delivered;
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- 51 • where care is provided and changes to the healthcare environment;
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- 54 • who provides care and how the healthcare workforce is managed;
- 55
- 56 • co-ordination of care and management of care processes; and
- 57

- information and communication technology systems;

In addition, we will use a category titled 'multiple (goal-focussed)' to categorise systematic reviews that include all relevant delivery arrangements from across the above categories to address a specific problem or goal (e.g. interventions for enhancing medication adherence).

We will summarise our findings quantitatively by presenting a numerical count of reviews in each category, and visually using bubble charts to represent the quantity and range of systematic reviews across the delivery arrangement categories and to highlight gaps in the available synthesised evidence. Bubble charts allow the reader to see an overview of the spread of data across and within EPOC categories (34). We will also describe the extent, range and nature of available systematic reviews using a narrative synthesis. This process will allow for identification of gaps in the availability of up-to-date systematic reviews and areas of delivery arrangements where the evidence is limited. Specifically, results will be used to 1) quantify the extent, range and nature of delivery strategies reported in systematic reviews; 2) quantify the number of systematic reviews where an economic analysis of the arrangement was reported; and 3) determine the gaps and suggest delivery arrangements where future systematic reviews might be of use.

### **Patient and public involvement**

The Consumers Health Forum of Australia, a representative advocate body for consumers in healthcare, have had oversight in the development and design of the protocol for this scoping review. Specifically, two members of the forum participated in stakeholder workshops during the design of the scoping review. The results will be disseminated among all stakeholders of the Partnership Grant, including consumer representatives.

## Conclusion

This scoping review will describe the volume and scope of available up-to-date systematic reviews of alternative delivery arrangements relevant to high-income countries, and identify gaps in the synthesised evidence, needed to inform health system planning, health system sustainability initiatives and future research directions.

## Ethics and dissemination

As no primary data will be collected, ethical approval is not required. The study findings will be disseminated via reports, manuscript in a peer-reviewed journal and via conference presentations.

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### 39 **Figure 1 legend**

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42 Figure 1. Data extraction process for included systematic reviews. All four authors will extract data  
43  
44 from the first ten systematic review. The remaining systematic reviews will be divided between four  
45  
46 review authors, and each author will have 1/3 of their studies reviewed by a second author to assess  
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48 for level of agreement. If this is round to be >90% agreement is reached, no further checks of data  
49  
50 extraction process will be completed.  
51  
52

### 53 **Authors' contributions**

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3 The study conception and overall design was conceived by RB and DAO. RLJ, DAO and PP  
4  
5 designed the data extraction tool and RLJ, PP, KR and JN all assisted in piloting. RLJ wrote  
6  
7 the first draft of this protocol and RB, DAO, PP, KR, JN, SC and SS critically reviewed the  
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9 manuscript, contributed improvements and approved the final version.  
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#### 30 **Competing interests**

31  
32 The authors have no competing interests to declare.  
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Figure 1: Data extraction process for included systematic reviews

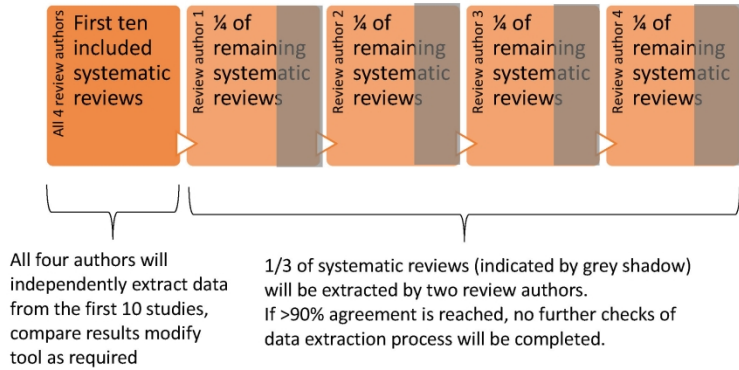


Figure 1: Data extraction process for included systematic reviews

210x297mm (300 x 300 DPI)

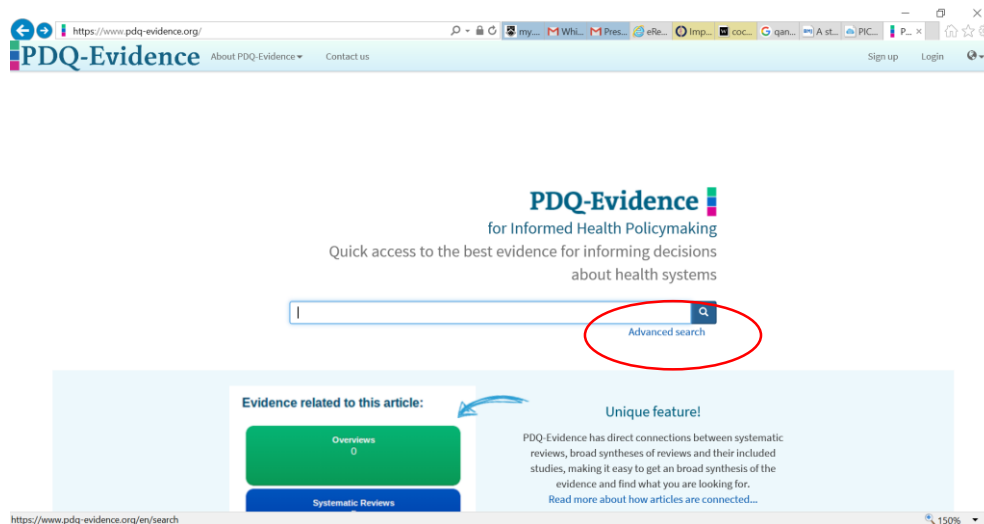


## PDQ search strategy

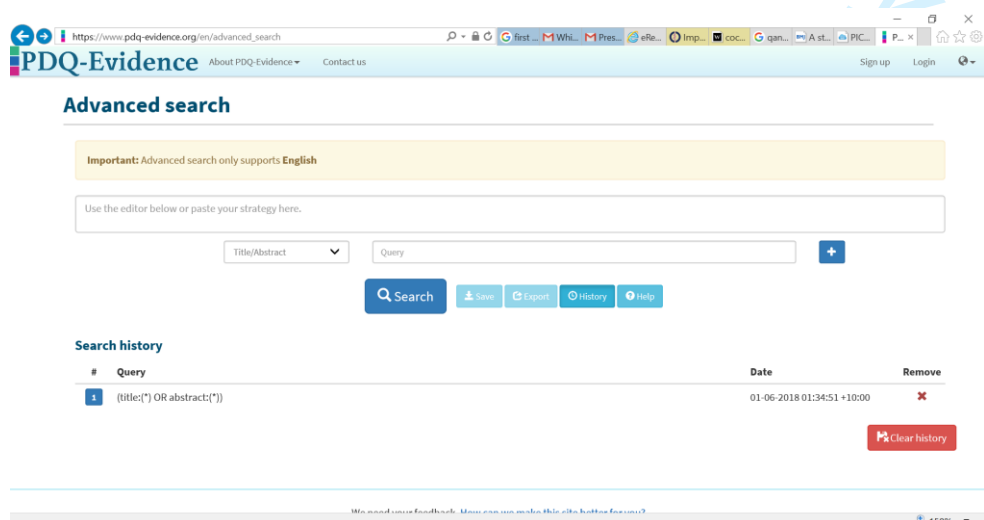
PDQ-Evidence is a database of evidence for decisions about health systems derived from the Epistemonikos database of systematic reviews. It includes the following databases: Cochrane Database of Systematic Reviews (CDSR), Database of Abstracts of Reviews of Effectiveness (DARE), MEDLINE via PubMed, EMBASE, CINAHL, PsycINFO, Latin American and Caribbean Health Sciences Literature (LILACS), JBI Database of Systematic Reviews and Implementation Reports, Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) Evidence Library, and the Campbell Collaboration online library. The 'intervention' publication filter will be used to exclude systematic reviews of non-intervention studies.

The following provides an overview of how the search for the scoping review on alternative service models for delivery of healthcare services in high-income countries.

1. On the navigation page of PDQ-Evidence, advanced search was entered.



2. In the query box, an \* was entered into the Query box, and then Search. This filtered for all English language articles on PDQ.



3. On the left hand side of the screen, results were then filtered for the following:

Custom year: 2012 to 2017 (search date 20<sup>th</sup> September, 2017), so date range was 01/01/2012 to 20/09/2017

Added to data base: All

Publication type: Systematic Review

Cochrane Review: All

Pubmed central (PMC): All

Systematic Review Question: Interventions

Type of meta-analysis: All

Country or regional focus: leave blank

The screenshot displays the PDQ-Evidence advanced search interface. The search bar contains the query "(title:(\*) OR abstract:(\*))". The left sidebar shows the following filters:

- Publication year:** Custom year range, From: 2012, To: 2017.
- Added to database:** All.
- Publication type:** Systematic Review.
- Cochrane review:** All.
- Pubmed central (PMC):** All.
- Systematic Review Question:** Interventions.
- Type of meta-analysis:** All.
- Country or regional focus:** (blank).

The main content area shows two search results:

- Mobile phone messaging for communicating results of medical investigations** (Systematic review). Authors: Ipek Guroi-Urganci, Thyra de Jongh, Vlasta Vodopivec-Jamsek, Josip Car, Rifat Atun. Journal: Cochrane Database of Systematic Reviews. Year: 2012. Links: Pubmed, DOI.
- Chronic Care Model Decision Support and Clinical Information Systems interventions for people living with HIV: a systematic review** (Systematic review). Authors: Pasricha A, Deinstadt RT, Moher D, Killoran A, Rourke SB, Kendall CE. Journal: Journal of general internal medicine. Year: 2013. Links: Pubmed, DOI, PubMed Central.

The right sidebar shows the article details for the first result, including the **BACKGROUND:** and **OBJECTIVES:** sections.

No other restrictions were made to the search. This search yielded 829 results.