BMJ Open

The role of academic health centres in building equitable health systems: a systematic review protocol

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2016-015435
Article Type:	Protocol
Date Submitted by the Author:	04-Dec-2016

Complete List of Authors:	Edelman, Alexandra; James Cook University, Division of Tropical Health and Medicine Taylor, Judy; James Cook University, College of Medicine and Dentistry Ovseiko, Pavel; University of Oxford Medical Sciences Division Topp, Stephanie; James Cook University, College of Public Health, Medical and Veterinary Sciences; James Cook University, Australian Institute of Tropical Health and Medicine (AITHM)

Primary Subject Heading:	Health policy
Secondary Subject Heading:	Public health
Keywords:	academic health centre, health equity, health systems, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

SCHOLARONE™ Manuscripts

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

4 December 2016

Corresponding author:
Ms Alexandra Edelman
James Cook University
Townsville QLD 4811
Alexandra.edelman@jcu.edu.au

Editor

BMJ Open

Dear Editor,

We are pleased to enclose a manuscript for your consideration in publishing through BMJ Open.

The manuscript is a systematic review protocol entitled: *The role of academic health centres in building equitable health systems: a systematic review protocol*.

The protocol was registered on 23 November 2016 with the International Prospective Register for Systematic Reviews (PROSPERO) (Registration number CRD42016051802). A Prisma-P Checklist has also been completed and is enclosed along with the manuscript. Piloting of the study design is expected to commence in December 2016, with anticipated completion of the review by 31 January 2017.

To the best of our knowledge, only one global review using systematic methods (scoping review) has been undertaken to date of the literature on academic health centres (AHCs). This review assessed the literature exploring the managerial, political and cultural perspectives of AHCs, finding the literature on AHCs largely atheoretical, and dominated by case study reports from North America. Other studies have also recognised a need for more theoretically informed studies on AHCs, both within and across nations. Examining the role of AHCs in relation to broader health care goals, therefore, appears to fill an important gap in the literature and offer utility to those involved in AHC activity and/or health system development and reform.

We appreciate your consideration of this manuscript and look forward to receiving comments and suggestions from reviewers.

Yours sincerely

Alexandra Edelman

[encl: Cover page, manuscript and Prisma-P checklist]

For peer review only

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

The role of academic health centres in building equitable health systems: a systematic review protocol

Authors:

Edelman A[1,2,5], Taylor J[3], Ovseiko PV [4], Topp S[1]

[1]College of Public Health, Medical and Veterinary Sciences, Division of Tropical Health and Medicine, James Cook University, Queensland, Australia 4811

[2]Tropical Australian Academic Health Centre, Queensland, Australia 4811

[3]College of Medicine and Dentistry, James Cook University, Queensland, Australia 4811

[4]Radcliffe Department of Medicine, Medical Sciences Division, University of Oxford, John Radcliffe Hospital, Oxford OX3 9DU, UK.

[5]Corresponding author details:

Alexandra Edelman

Address: James Cook University, Angus Smith Drive, Douglas, QLD 4811

Phone: +61 (07) 4781 4150

Email: Alexandra.edelman@jcu.edu.au

ORCID ID: 0000-0002-2021-5266

Keywords:

Academic health centre, health equity, health systems, health policy

Total word count: 2701

For peer review only

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

ABSTRACT

Introduction

Academic health centres (AHCs) are complex organisations often defined by their 'tripartite' mission: to achieve high standards of clinical care, undertake clinical and laboratory research, and educate health professionals. In the last decade, AHCs have moved away from what was a dominant focus on high impact (clinical) interventions for individuals, towards a more population-oriented paradigm requiring networked institutions and responsiveness to a range of issues including distribution of health outcomes and health determinants. Reflective of this paradigm shift is a growing interest in the role of AHCs in addressing health disparities and improving health system equity. This protocol outlines a systematic review that seeks to synthesise and critically appraise the current state of evidence on the role of AHCs in contributing to equitable health systems locally and globally.

Methods and analysis

Electronic searches will be conducted on a pilot list of bibliographic databases, including Google Scholar, Scopus, MEDLINE, PsycInfo, CINAHL, ERIC, ProQuest Dissertations & Theses, Cochrane Library, Evidence Based Medicine Reviews, Campbell Library, and A+ Education, from 1 January 2000 until 31 December 2016. Apart from studies reporting clinical interventions or trials, all types of published peer-reviewed and grey literature will be included in the review. The single screening method will be employed in selecting studies, with two additional reviewers consulted where allocation is unclear. Quality and relevance appraisal utilising Joanna Briggs Institute critical appraisal tools will follow data extraction to a pre-prepared template. Thematic synthesis will be undertaken to develop descriptive themes and inform analysis.

Ethics and dissemination

As the review is focused on the analysis of secondary data, it does not require ethics approval. The results of the study will be disseminated through articles in peer-reviewed journals and trade publications as well as presentations at relevant national and international conferences. Results will be further disseminated through networks and associations of AHCs.

Protocol registration

International Prospective Register for Systematic Reviews (PROSPERO) number CRD42016051802.

Abstract word count: 307

For peer review only

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This will be one of the first attempts to synthesise and critically appraise evidence on the role of AHCs in contributing to equitable health systems locally and globally.
- The systematic review protocol is developed using the Preferred Reporting Items for Systematic Reviews and Meta-analyses for Protocols (PRISMA-P) guidelines.
- Included studies will be assessed for methodological quality using the relevant Joanna Briggs Institute (JBI) critical appraisal tools.
- The quality of synthesised evidence will be limited by the study designs of included studies, which are likely to be mostly observational studies.
- Limiting searches to the literature published in the English language may lead to the omission of studies from non-English speaking countries.

For peer review only

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

INTRODUCTION

Academic health centres (AHCs) are complex organisations that are largely defined by their 'tripartite' mission: to achieve high standards of clinical care, undertake clinical and laboratory research, and educate health professionals.(1) To deliver this mission, AHCs combine accredited higher education institutions delivering medical and other health professional education with one or more affiliated or owned teaching hospitals or health systems,(2) employing a wide variety of governance and operational models.(3 ,4) AHCs are well-established in the United States, and are either established or newly developing in a number of other high-income countries worldwide.(1 ,5-7) Establishment of AHCs within Australia has commenced within recent years,(8) including initiation of government-driven AHC designation processes for both metropolitan and regional models.

A recent scoping review of AHCs identified that much of the literature on AHCs – and close to 95% of studies included in the review – reflect the Northern American context due to historical usage of the term 'AHC' in those countries.(1) Within the literature identified in the scoping review, a key theme was a focus on AHC responses to a range of external challenges.(1) One such external influence, the health care reform 'triple aim' of improving the health of individuals and populations while controlling health care costs,(9) is driving a 'transformation' of AHCs in the United States.(10 ,11) This transformation entails a departure from the traditional model of AHCs as organisations which focus primarily on high impact interventions for individuals with serious disease,(12) and from existing paradigms of health integration involving large urban hospitals and elite centres in capital cities,(13) to a population-oriented paradigm across the three domains of patient care, education and research.(14)

The transformation is reflected in a growing interest in the role of AHCs in global health,(15) as well as in developing 'broad, inexpensive and preventive treatment strategies among populations.'(16) Interest in the potential for AHCs to develop 'community-engaged' research agendas, which seek to address health disparities and uneven access to health care through better community engagement,(17) and in the capacity of AHCs to develop innovative approaches to health workforce challenges, (18) also attest to this new paradigm. A corresponding terminology change has been proposed – from academic health 'centres', implying health care in a single location, to academic health 'systems', reflecting the integrated, networked models of health care needed to meet new health care objectives.(16 ,19)

The perceived role and capacity of AHCs to drive progress towards broader health care goals, in the context of persisting global health disparities, has led to calls for AHCs to 'accept responsibility' for the health of their communities by addressing population health.(15) Indeed, as the locus for health

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

professional training and as organisations uniquely capable of generating and translating evidence and testing interventions, AHCs are seen by some as being particularly well situated to lead initiatives to improve care for vulnerable populations.(20) Activities in service to this responsibility have been suggested, and include new approaches to scaling up best practice, fostering multidimensional research platforms involving consideration of the social determinants of health, and including cross-cultural competence and inter-professional education in AHC curricula.(20)

The convergence of the growing interest in population health as a foundational aspect of healthcare reform, with a sense that AHCs can play a critical role in addressing health disparities locally, nationally and globally, suggests significant potential for AHCs to contribute to health system change and improvement in service to health care goals. As population health is not only concerned with the health outcomes of a group of people but also with the distribution of health outcomes within the group, patterns of health determinants and related policies and interventions,(21) health equity is at the heart of this convergence.

Thus, the aim of this systematic review will be to review the literature on the role of AHCs in contributing to equitable health systems locally and globally. To achieve this aim, the review will address the following research questions sequentially:

1. Why are AHCs engaging with health equity agendas?
2. In what forms is AHC engagement with health equity agendas taking place?
3. What are the barriers and facilitators to AHCs engaging with health equity agendas?

METHODS AND ANALYSIS

Study design

Efforts to encourage adoption of systematic review methodology within health policy research reflect its dominance in quantitative research fields.(22) These efforts recognise the utility of systematic reviews as helpful tools enabling appraisal of complex findings from multiple disciplines and methods.(23) Accordingly, a systematic methodology, following the PRISMA 2009 checklist,[1] has been identified as the method best able to address the research questions of this review, as well as to maximise reproducibility and confidence in the findings.

Following the definition of 'systematic review' in the PRISMA-P guidelines,(24) this protocol outlines the review objectives (aim and research questions), proposed systematic search methods meeting identified eligibility criteria, proposed assessment of quality and relevance of included studies, and

[1] http://www.prisma-statement.org/

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

proposed approach to systematic synthesis of the characteristics and findings of the included studies. A preliminary search of the literature has informed the design of this review.

Eligibility Criteria

Reflecting the likelihood that valuable information may be found within non-peer-reviewed sources, all types of published peer-reviewed and grey (non-peer reviewed reports and other protocol materials) literature will be included in the review. Studies reporting clinical interventions or trials, however, will be excluded from the review as they are unlikely to supplement review findings.

In order to maximise contemporary policy relevance of the findings, literature searching will be limited to the time frame of 1 January 2000 to 31 December 2016. Literature on AHCs in any country will be included, although for pragmatic reasons the review will only include literature published in the English language. As the interest of the review is on the role of AHCs in contributing to equitable health systems, literature not explicitly addressing connection between AHCs and issues relevant to health equity will be excluded.

Table 1 summarises the inclusion and exclusion criteria which will define the scope and number of publications included in the review.

Table 1: Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Time period	• 2000-2016	• Publications outside the inclusion period
Language	• English	• Materials not published in English
Literature type	• Published peer-reviewed and grey literature	• Clinical intervention or trial • Unpublished data
Research questions	• Identifies AHCs as a unit of analysis • Addresses health equity concepts in relation to AHC activity/role • Identifies reasons for success or failure in engaging with health equity agendas	• AHCs not a unit of analysis • Study does not address health equity concepts in relation to AHC activity/role

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Literature Search

Search strategy

For the purpose of the review, AHCs will include all organisations that self-identify as academic health/medical (science) centres/systems/networks, integrated health research centres, advanced health research and translation centres, and/or other proxy terms. Health equity agendas will include all policies, programs and objectives that aim to address inequalities in health that are avoidable yet not avoided.(25) Implicit in this definition of health equity are concepts of addressing disadvantage and improving health for underserved populations, which include consideration of the social determinants of health.(26)

Drawing from these broad definitional parameters, search keywords will be derived using the pearl harvesting method as described by Sandieson et al.(27) This will be undertaken in consultation with a university librarian with database and search strategy expertise. Boolean operators and truncated terms will be used to maximise the sensitivity and efficiency of the search strategy, and medical subject headings (MeSH) terms will be included where applicable. The search keywords will be piloted before the final list of search terms is selected.

Databases

A pilot list of bibliographic databases, below, was selected for its breadth of subject matter and likelihood of containing a wide range of study types. This list will be refined based on identification of duplication and expert consultation.

1. Google Scholar
2. Scopus
3. MEDLINE (Ovid)
4. PsycInfo (Ovid)
5. CINAHL (Ebsco)
6. ERIC
7. ProQuest Dissertations & Theses
8. Cochrane Library
9. Evidence Based Medicine (EBM) Reviews
10. Campbell Library
11. A+ Education (Informit)

Other data sources

For peer review only

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

As systematic reviews of complex evidence have been shown to benefit from a range of search strategies,(28) the searching strategy will also include snowballing (pursuing references of references), browsing of library shelves, asking colleagues, and being alert to serendipitous discovery. In addition, direct contact will be made with authors or experts in the field, in order to seek suggestions on additional literature sources relevant to the review, particularly grey literature.

Study selection

Search results will be uploaded into Endnote, combined, and duplicates removed. Unique records will then enter the title-abstract screening stage. Following the 'single screening' method,(29) one reviewer will screen and assign an 'included', 'provisionally included' or 'excluded' code to a title-abstract record, based on assessment of relevance to the research questions. Records deemed relevant to either question will be included. Two additional reviewers will be consulted where records are deemed 'provisionally included' by the first reviewer. Full text papers will be accessed for the selected reviews. A PRISMA flow diagram will be used to report the results of this process.

Data extraction

Data from selected articles will be recorded in a locally developed data extraction form, and independently validated by one reviewer. Standard information will be extracted on each paper, as well as data specific to the review questions. Data will be extracted against the following categories:

- Full reference: including author names, year of publication, and journal;
- Country of origin: country of the study institution;
- Study setting: country of the study subject;
- Study type: for example, empirical research, policy paper, commentary, review;
- Theoretical or conceptual perspective;
- Link to equity agenda: short summary of nature of relevance to health equity agenda; and
- Quality and relevance assessment outcomes.

Quality and relevance assessment

Quality and relevance appraisal of selected publications will involve two assessment components as described by Gough et al:(22) assessment of the study's relevance to the review questions, and the quality of the execution of the methods employed by the study.

Relevance will be assessed qualitatively with reference to the inclusion/exclusion criteria, with highly relevant publications scoring 1, and less relevant publications scoring 0. To assess quality, an initial appraisal will be undertaken of the level of evidence according to the Joanna Briggs Institute (JBI) criteria.(30) Following this, studies will be assessed for methodological quality and approach to bias

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

For peer review only

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

using the relevant JBI critical appraisal tools aligned with study type, such as the systematic review, qualitative, or text and opinion checklists.(31) Studies showing 50 per cent or more compliance with the checklist will receive a score of 1, with studies showing less than this scoring 0.

The results of this appraisal will be recorded against each listing within the data extraction template, and scores aggregated. Although it is not anticipated that any studies will be excluded from the review, findings demonstrating limited relevance and/or quality of studies will contribute to analysis of review limitations.

Data analysis

Data analysis will follow a thematic synthesis(32) approach to enable the development of descriptive themes from the research. Analytic themes will then be generated through a process of interpretation and analysis. A narrative summary will interpret the results and describe how they relate to the review's aim and questions.

ETHICS AND DISSEMINATION

As the review is focused on the analysis of secondary data, it does not require ethics approval. The results of the study will be disseminated through articles in peer-reviewed journals and trade publications as well as presentations at relevant national and international conferences. Results will be further disseminated through networks and associations of AHCs, including the Association of Academic Health Centers International. It is also anticipated that this study will inform the activity and development of the Tropical Australian Academic Health Centre being established in northern Queensland, Australia. This study is being undertaken as part of a PhD thesis by the first author.

DISCUSSION AND CONCLUSION

To the best of our knowledge, only one global review using systematic methods (scoping review) has been undertaken to date of the literature on AHCs.(1) This review assessed the literature exploring the managerial, political and cultural perspectives of AHCs, finding the literature on AHCs 'largely atheoretical and heavily dominated by case study reports from North America'.(1) The need for more theoretically informed studies on AHCs, both within and across nations, has been previously identified.(6) Examining the role of AHCs in relation to broader health care goals, therefore, appears to fill an important gap in the literature.

The current review is one of the first attempts to synthesise and critically appraise evidence on the role of AHCs in contributing to equitable health systems locally and globally. Other strengths of this review include the use of the novel PRISMA-P guidelines and the relevant JBI critical appraisal tools. However, the results of the review will be limited by the study designs of included studies, which are

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

likely to be mostly observational studies. Limiting searches to the literature published in the English language may lead to the omission of studies from non-English speaking countries. Although it is difficult to predict in which cases the exclusion of studies published in languages other than English will bias review findings,(33) this review will consider the possible effect of language bias in relation to the findings.

AHC models are being adopted and adapted worldwide within health systems that are evolving in line with local and global reform and development agendas. As such, explicit consideration of the intersection between the development and transformation of AHCs and broader activity to establish equitable health systems may clarify the purpose of AHCs, their structures and even geographic locations. It might also encourage policy makers to draw AHCs further into health system reform agendas as implementation vehicles. This review may therefore offer utility to those involved in both AHC activity and health system development across a range of countries.

ACKNOWLEDGEMENTS

AE is a PhD Candidate within the College of Public Health, Veterinary and Medicine Sciences, Division of Tropical Health and Medicine, James Cook University; ST and JT are thesis supervisors; PVO is an external thesis advisor.

CONTRIBUTORS

AE conceived and designed the study and drafted the manuscript. ST, JT, and PVO provided input into study design and helped revise the manuscript. All authors read and approved the final version of the manuscript.

FUNDING

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

COMPETING INTERESTS

AE is Program Operations Manager at the Tropical Australian Academic Health Centre – a developing alliance between the Cairns and Hinterland, Mackay, North West, Torres and Cape, and Townsville Hospital and Health Services; the Northern Queensland Primary Health Network; and James Cook University, including the Australian Institute of Tropical Health and Medicine.

For peer review only

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

REFERENCES

1. French CE, Ferlie E, Fulop NJ. The international spread of academic health science centres: a scoping review and the case of policy transfer to England. *Health Policy* 2014;**117**(3):382-91.
2. Wartman SA. The Academic Health Center: Evolving Organizational Models. *Association of Academic Health Centers* 2007.
3. Culbertson RA, Goode LD, Dickler RM. Organizational models of medical school relationships to the clinical enterprise. *Acad Med* 1996;**71**(11):1258-74.
4. Weiner BJ, Culbertson R, Jones RF, et al. Organizational models for medical school-clinical enterprise relationships. *Acad Med* 2001;**76**(2):113-24.
5. Ovseiko PV, Davies SM, Buchan AM. Organizational models of emerging academic health science centers in England. *Acad Med* 2010;**85**(8):1282-9.
6. Davies SM, Tawfik-Shukor A, de Jonge B. Structure, governance, and organizational dynamics of university medical centers in the Netherlands. *Acad Med* 2010;**85**(6):1091-7.
7. National Task Force on the Future of Canada's Academic Health Sciences Centres. Three missions one future: optimizing the perfomance of Canada's academic health sciences centres: Association of Canadian Academic Healthcare Organizations, 2010.
8. Fisk NM, Wesselingh SL, Beilby JJ, et al. Academic health science centres in Australia: let's get competitive. *Med J Aust* 2011;**194**(2):59-60.
9. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health Aff* 2008;**27**(3):759-69.
10. Kirch DG, Ast CE. Health Care Transformation: The Role of Academic Health Centers and Their Psychologists. *J Clin Psychol Med Settings* 2016.
11. Wartman SA. *The Transformation of Academic Health Centers*. Boston: Academic Press, 2015.
12. Rahn DW. Foreword. In: Wartman SA, ed. *The Transformation of Academic Health Centers*. Boston: Academic Press, 2015:xv-xvii.
13. Jennings GL, Walsh MK. Integrated health research centres for Australia. *Med J Aust* 2013;**199**(5):320-1.
14. Gourevitch MN. Population Health and the Academic Medical Center: The Time Is Right. *Acad Med* 2014;**89**(4):544-49.
15. Ackerly DC, Udayakumar K, Taber R, et al. Perspective: global medicine: opportunities and challenges for academic health science systems. *Acad Med* 2011;**86**(9):1093-9.
16. Dzau VJ, Ackerly DC, Sutton-Wallace P, et al. The role of academic health science systems in the transformation of medicine. *Lancet* 2010;**375**(9718):949-53.
17. Michener L, Cook J, Ahmed SM, et al. Aligning the goals of community-engaged research: why and how academic health centers can successfully engage with communities to improve health. *Acad Med* 2012;**87**(3):285-91.
18. Golden RN, Drezner MK, Grossman JE, et al. Chapter 4 - The Changing Roles and Expectations of Faculty. In: Wartman SA, ed. *The Transformation of Academic Health Centers*. Boston: Academic Press, 2015:29-37.
19. DiSesa VJ, Kaiser LR. What's in a Name? The Necessary Transformation of the Academic Medical Center in the Era of Population Health and Accountable Care. *Acad Med* 2015;**90**(7):842-5.
20. Perman JA, Mullins CD, Newhouse R. Chapter 19 - Population Health and the Patient. In: Wartman SA, ed. *The Transformation of Academic Health Centers*. Boston: Academic Press, 2015:195-202.
21. Kindig D, Stoddart G. What Is Population Health? *Am J Public Health* 2003;**93**(3):380-3.
22. Gough D, Oliver S, Thomas J. Learning from research: systematic reviews for informing policy decisions, a quick guide. London: A paper for the Alliance for Useful Evidence, 2013.
23. World Health Organisation. Systematic Reviews for Health Policy and Systems Research: Alliance for Health Policy and Systems Research, September 2009.
24. Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015;**4**:1.

For peer review only

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

25. Marmot M. Achieving health equity: from root causes to fair outcomes. *Lancet* 2007;**370**(9593):1153-63.
26. Marmot M, Friel S, Bell R, et al. Closing the gap in a generation: health equity through action on the social determinants of health. *Lancet* 2008;**372**(9650):1661-69.
27. Sandieson RW, Kirkpatrick LC, Sandieson RM, et al. Harnessing the power of education research databases with the pearl-harvesting methodological framework for information retrieval. *J Spec Educ* 2014;**44**(3):161-75.
28. Greenhalgh T, Robert G, Macfarlane F, et al. Storylines of research in diffusion of innovation: a meta-narrative approach to systematic review. *Soc Sci Med* 2005;**61**(2):417-30.
29. Shemilt I, Khan N, Park S, et al. Use of cost-effectiveness analysis to compare the efficiency of study identification methods in systematic reviews. *Syst Rev* 2016;**5**(1):1-13.
30. The Joanna Briggs Institute and the University of Adelaide. New JBI Levels of Evidence. Developed by the Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party October 2013, 2014.
31. The Joanna Briggs Institute and The University of Adelaide. Critical Appraisal Tools. <http://joannabriggs.org/research/critical-appraisal-tools.html> (accessed 9 November 2016).
32. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol* 2008;**8**(1):45.
33. Higgins JPT, Green S. Section 10.2.2.4: Language bias. In: Higgins JPT, Green S, eds. *Cochrane Handbook for Systematic Reviews of Interventions Version 510*: The Cochrane Collaboration 2011.

For peer review only

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	
ADMINISTRATIVE INFORMATION			**Reported on page #**
Title:			**2**
Identification	1a	Identify the report as a protocol of a systematic review	
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	**3**
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	**2**
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	**11**
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	**N/A**
Support:			**11**
Sources	5a	Indicate sources of financial or other support for the review	
Sponsor	5b	Provide name for the review funder and/or sponsor	
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	**5,6**
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	**6**
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	**7**
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	**8,9**

For peer review only

Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	**Search strategy plan on pp 8,9**
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	**9**
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	**9**
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	**9**
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	**9**
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	**9**
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	**9,10**
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	**10**
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	**10,11**
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	**9,10**

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated.** **The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

For peer review only

BMJ Open

The role of academic health centres in building equitable health systems: a systematic review protocol

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2016-015435.R1
Article Type:	Protocol
Date Submitted by the Author:	21-Feb-2017
Complete List of Authors:	Edelman, Alexandra; James Cook University, Division of Tropical Health and Medicine Taylor, Judy; James Cook University, College of Medicine and Dentistry Ovseiko, Pavel; University of Oxford Medical Sciences Division Topp, Stephanie; James Cook University, College of Public Health, Medical and Veterinary Sciences; James Cook University, Australian Institute of Tropical Health and Medicine (AITHM)
Primary Subject Heading:	Health policy
Secondary Subject Heading:	Public health
Keywords:	academic health centre, health equity, health systems, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

SCHOLARONE™
Manuscripts

For peer review only

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

VERSION 2 – Revised 10 January 2016

The role of academic health centres in building equitable health systems: a systematic review protocol

Authors:

Edelman A[1,2,5], Taylor J[3], Ovseiko PV[4], Topp SM[1]

[1]College of Public Health, Medical and Veterinary Sciences, Division of Tropical Health and Medicine, James Cook University, Queensland, Australia 4811

[2]Tropical Australian Academic Health Centre, Queensland, Australia 4811

[3]College of Medicine and Dentistry, James Cook University, Queensland, Australia 4811

[4]Radcliffe Department of Medicine, Medical Sciences Division, University of Oxford, John Radcliffe Hospital, Oxford OX3 9DU, UK.

[5]Corresponding author details:

Alexandra Edelman

Address: James Cook University, Angus Smith Drive, Douglas, QLD 4811

Phone: +61 (07) 4781 4150

Email: Alexandra.edelman@jcu.edu.au

ORCID ID: 0000-0002-2021-5266

Keywords:

Academic health centre, health equity, health systems, health policy

Total word count: 3265

For peer review only

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

ABSTRACT

Introduction

Academic health centres (AHCs) are complex organisations often defined by their 'tripartite' mission: to achieve high standards of clinical care, undertake clinical and laboratory research, and educate health professionals. In the last decade, AHCs have moved away from what was a dominant focus on high impact (clinical) interventions for individuals, towards a more population-oriented paradigm requiring networked institutions and responsiveness to a range of issues including distribution of health outcomes and health determinants. Reflective of this paradigm shift is a growing interest in the role of AHCs in addressing health disparities and improving health system equity. This protocol outlines a systematic review that seeks to synthesise and critically appraise the current state of evidence on the role of AHCs in contributing to equitable health systems locally and globally.

Methods and analysis

Electronic searches will be conducted on a pilot list of bibliographic databases, including Google Scholar, Scopus, MEDLINE, PsycInfo, CINAHL, ERIC, ProQuest Dissertations & Theses, Cochrane Library, Evidence Based Medicine Reviews, Campbell Library, and A+ Education, from 1 January 2000 until 31 December 2016. Apart from studies reporting clinical interventions or trials, all types of published peer-reviewed and grey literature will be included in the review. The single screening method will be employed in selecting studies, with two additional reviewers consulted where allocation is unclear. Quality and relevance appraisal utilising Joanna Briggs Institute critical appraisal tools will follow data extraction to a pre-prepared template. Thematic synthesis will be undertaken to develop descriptive themes and inform analysis.

Ethics and dissemination

As the review is focused on the analysis of secondary data, it does not require ethics approval. The results of the study will be disseminated through articles in peer-reviewed journals and trade publications as well as presentations at relevant national and international conferences. Results will be further disseminated through networks and associations of AHCs.

Protocol registration

International Prospective Register for Systematic Reviews (PROSPERO) number CRD42016051802.

Abstract word count: 307

For peer review only

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This will be one of the first attempts to synthesise and critically appraise evidence on the role of AHCs in contributing to equitable health systems locally and globally.
- The systematic review protocol is developed using the Preferred Reporting Items for Systematic Reviews and Meta-analyses for Protocols (PRISMA-P) guidelines, with reference to the PRISMA-Equity 2012 Extension.
- Included studies will be assessed for methodological quality using the relevant Joanna Briggs Institute (JBI) critical appraisal tools.
- The quality of synthesised evidence will be limited by the study designs of included studies, which are likely to be mostly observational studies, and limiting the review to published papers only will omit unpublished documentation of relevance to the review questions.
- Limiting searches to the literature published in the English language may lead to the omission of studies from non-English speaking countries.

For peer review only

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

INTRODUCTION

Academic health centres (AHCs) are complex organisations that are largely defined by their 'tripartite' mission: to achieve high standards of clinical care, undertake clinical and laboratory research, and educate health professionals.(1) To deliver this mission, AHCs combine accredited higher education institutions delivering medical and other health professional education with one or more affiliated or owned teaching hospitals or health systems,(2) employing a wide variety of governance and operational models.(3 ,4) AHCs are well-established in the United States, and are either established or newly developing in a number of other high-income countries worldwide.(1 ,5-7) Establishment of AHCs within Australia has commenced within recent years,(8) including initiation of government-driven AHC designation processes for both metropolitan and regional models.

A recent scoping review of AHCs identified that much of the literature on AHCs – and close to 95% of studies included in the review – reflect the Northern American context due to historical usage of the term 'AHC' in those countries.(1) Within the literature identified in the scoping review, a key theme was a focus on AHC responses to a range of external challenges.(1) One such external influence, the health care reform 'triple aim' of improving the health of individuals and populations while controlling health care costs,(9) is driving a 'transformation' of AHCs in the United States.(10 ,11) This transformation entails a departure from the traditional model of AHCs as organisations which focus primarily on high impact interventions for individuals with serious disease,(12) and from existing paradigms of health integration involving large urban hospitals and elite centres in capital cities,(13) to a population-oriented paradigm across the three domains of patient care, education and research.(14)

The transformation is reflected in a growing interest in the role of AHCs in global health,(15) as well as in developing 'broad, inexpensive and preventive treatment strategies among populations' – beyond the creation of 'novel drugs, devices and other technologies' considered the traditional domain of AHCs.(16) Interest in the potential for AHCs to develop 'community-engaged' research agendas, which seek to address health disparities and uneven access to health care through better community engagement,(17) and in the capacity of AHCs to develop innovative approaches to health workforce challenges, (18) also attest to this new paradigm. A corresponding terminology change has been proposed – from academic health 'centres', implying health care in a single location, to academic health 'systems', reflecting the integrated, networked models of health care needed to meet new health care objectives.(16 ,19)

The perceived role and capacity of AHCs to drive progress towards broader health care goals, in the context of persisting global health disparities, has led to calls for AHCs to 'accept responsibility' for

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

the health of their communities by addressing population health.(15) Indeed, as the locus for health professional training and as organisations uniquely capable of generating and translating evidence and testing interventions, AHCs are seen by some as being particularly well situated to lead initiatives to improve care for vulnerable populations.(20) Activities in service to this responsibility have been suggested, and include new approaches to scaling up best practice, fostering multidimensional research platforms involving consideration of the social determinants of health, and including cross-cultural competence and inter-professional education in AHC curricula.(20)

The convergence of the growing interest in population health as a foundational aspect of healthcare reform, with a sense that AHCs can play a critical role in addressing health disparities locally, nationally and globally, suggests significant potential for AHCs to contribute to health system change and improvement in service to health care goals. As population health is not only concerned with the health outcomes of a group of people but also with the distribution of health outcomes within the group, patterns of health determinants and related policies and interventions,(21) health equity is at the heart of this convergence.

Health inequity, as a concept, refers to differences in health status of different nations and different groups which are unnecessary and avoidable, and are also considered unfair and unjust.(22) Health equity, as a concept, is therefore defined as the absence of avoidable and unfair inequalities in health,(23) and can be differentiated from health inequalities or statistically-described disparities alone by its moral and ethical dimension (‘unfairness’) – the determination of which involves examination of the inequalities in a social context.(22) Equitable health systems, therefore, can be defined as those that have established goals and initiatives to improve health care coverage across disadvantaged populations.(24)

Thus, the aim of this systematic review will be to review the literature on the role of AHCs in contributing to equitable health systems locally and globally. To achieve this aim, the review will address the following research questions sequentially:

(1) How is health equity characterised, described and/or operationalised in relation to AHC activity?

(2) What are the drivers, barriers and facilitators of AHC activity relevant to health equity?

By positioning AHCs, in their health system context, as the unit of analysis, this review identifies AHCs as key health system structures that are being established or are undergoing transformation in a range of countries and settings, and endeavours to shed light on whether they have a particular role to play in aiding efforts to build equitable health systems locally and globally. While significant diversity in AHC structures and their health system contexts is acknowledged (AHCs, like health

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

systems more broadly, have a large 'menu' of policy options available to them to reach health equity goals), this review intends to identify any commonalities that might exist in published experiences and approaches, across different settings, of organisations identified as AHCs.

METHODS AND ANALYSIS

Study design

Efforts to encourage adoption of systematic review methodology within health policy research reflect its dominance in quantitative research fields.(25) These efforts recognise the utility of systematic reviews as helpful tools enabling appraisal of complex findings from multiple disciplines and methods.(26) Accordingly, a systematic methodology, following the PRISMA 2009 checklist,[1] has been identified as the method best able to address the research questions of this review, as well as to maximise reproducibility and confidence in the findings. The approach also recognises the increasingly acknowledged value of equity-focused systematic reviews as sources of evidence for health care and health systems decision-making.(23)

Following the definition of 'systematic review' in the PRISMA-P guidelines,(27) this protocol outlines the review objectives (aim and research questions), proposed systematic search methods meeting identified eligibility criteria, proposed assessment of quality and relevance of included studies, and proposed approach to systematic synthesis of the characteristics and findings of the included studies. Consideration has also been given to the extensions for equity-focused reviews described in the PRISMA-Equity 2012 Extension.[2] A preliminary search of the literature has informed the design of this review. Any updates and amendments to this protocol will be summarised in the final review manuscript.

Eligibility Criteria

Reflecting the likelihood that valuable information may be found within non-peer-reviewed sources, all types of published peer-reviewed and grey (non-peer reviewed reports and other protocol materials) literature will be included in the review. Studies reporting clinical interventions or trials, however, will be excluded from the review as they are unlikely to supplement review findings.

In order to maximise contemporary policy relevance of the findings, literature searching will be limited to the time frame of 1 January 2000 to 31 December 2016. Literature on AHCs in any country will be included, although for pragmatic reasons the review will only include literature published in the English language. As the interest of the review is on the role of AHCs in contributing to equitable

[1] http://www.prisma-statement.org/
[2] http://prisma-statement.org/Extensions/Equity.aspx

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3 health systems, literature not explicitly addressing connection between AHCs and issues relevant to
4 health equity will be excluded.

Table 1 summarises the inclusion and exclusion criteria which will define the scope and number of publications included in the review.

Table 1: Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Time period	• 2000-2016	• Publications outside the inclusion period
Language	• English	• Materials not published in English
Literature type	• Published peer-reviewed and grey literature	• Clinical intervention or trial • Unpublished data
Research questions	• Identifies AHCs as a unit of analysis • Addresses health equity concepts in relation to AHC activity/role	• AHCs not a unit of analysis • Study does not address health equity concepts in relation to AHC activity/role

Literature Search

Search strategy

For the purpose of the review, AHCs will include all organisations that self-identify or are identified by others as academic health/medical (science) centres/systems/networks, integrated health research centres, advanced health research and translation centres, and/or other proxy terms. While it is acknowledged that not all organisations that might objectively be defined as an AHC would self-identify as such, this operational definition was determined for pragmatic reasons and to enable assessment of the literature using these terms. Health equity will include all policies, programs and objectives that aim to address inequalities in health that are avoidable yet not avoided.(28) Implicit in this definition of health equity are concepts of addressing disadvantage and improving health for underserved populations, which include consideration of the social determinants of health.(29)

Drawing from these broad definitional parameters, search keywords will be derived using the pearl harvesting method as described by Sandieson et al.(30) This will be undertaken in consultation with a university librarian with database and search strategy expertise. Boolean operators and truncated terms will be used to maximise the sensitivity and efficiency of the search strategy, and medical

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

subject headings (MeSH) terms will be included where applicable. The search keywords will be piloted before the final list of search terms is selected.

Databases

A pilot list of bibliographic databases, below, was selected for its breadth of subject matter and likelihood of containing a wide range of study types. This list will be refined based on identification of duplication and expert consultation.

1. Google Scholar
2. Scopus
3. MEDLINE (Ovid)
4. PsycInfo (Ovid)
5. CINAHL (Ebsco)
6. ERIC
7. ProQuest Dissertations & Theses
8. Cochrane Library
9. Evidence Based Medicine (EBM) Reviews
10. Campbell Library
11. Informit health suite

Other data sources

As systematic reviews of complex evidence have been shown to benefit from a range of search strategies,(31) the searching strategy will also include snowballing (pursuing references of references), browsing of library shelves, asking colleagues, and being alert to serendipitous discovery. In addition, direct contact will be made with authors or experts in the field, in order to seek suggestions on additional literature sources relevant to the review, particularly grey literature.

Study selection

Search results will be uploaded into Endnote, combined, and duplicates removed. Unique records will then enter the title-abstract screening stage. Following the 'single screening' method,(32) one reviewer will screen and assign an 'included', 'provisionally included' or 'excluded' code to a title-abstract record, based on assessment of relevance to the research questions. Records deemed relevant to either question will be included. Two additional reviewers will be consulted where records are deemed 'provisionally included' by the first reviewer. Full text papers will be accessed for the selected reviews. A PRISMA flow diagram will be used to report the results of this process.

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

For peer review only

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Data extraction

Data from selected articles will be recorded in a locally developed data extraction form, and independently validated by one reviewer. Standard information will be extracted on each paper, as well as data specific to the review questions. Data will be extracted against the following categories:

- Full reference: including author names, year of publication, and journal;
- Country of origin: country of the study institution;
- Study setting: country of the study subject;
- Study type: for example, empirical research, policy paper, commentary, review;
- Theoretical or conceptual perspective;
- Link to equity agenda: short summary of nature of relevance to health equity agenda; and
- Quality and relevance assessment outcomes.

As there is significant variation in the contexts in which AHCs operate, which is likely to impact on AHC activity relevant to health equity, a separate table will list the AHCs identified in the included papers alongside key features of the health systems in which they operate. Health status statistics relevant to the locations of activity of these AHCs will also be listed in this table to identify key population characteristics. Information in both tables will be included in the analysis of the review findings.

Quality and relevance assessment

Quality and relevance appraisal of selected publications will involve two assessment components as described by Gough et al:(25) assessment of the study's relevance to the review questions, and the quality of the execution of the methods employed by the study.

Relevance will be assessed qualitatively with reference to the inclusion/exclusion criteria, with highly relevant publications scoring 1, and less relevant publications scoring 0. To assess quality, an initial appraisal will be undertaken of the level of evidence according to the Joanna Briggs Institute (JBI) criteria.(33) Following this, studies will be assessed for methodological quality and approach to bias using the relevant JBI critical appraisal tools aligned with study type, such as the systematic review, qualitative, or text and opinion checklists.(34) Studies showing 50 per cent or more compliance with the checklist will receive a score of 1, with studies showing less than this scoring 0.

The results of this appraisal will be recorded against each listing within the data extraction template, and scores aggregated. Although it is not anticipated that any studies will be excluded from the review, findings demonstrating limited relevance and/or quality of studies will contribute to analysis of review limitations.

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Data analysis

Data analysis will follow a thematic synthesis(35) approach to enable the development of descriptive themes from the research. Analytic themes will then be generated through a process of interpretation and analysis. A narrative summary will interpret the results and describe how they relate to the review's aim and questions, with reference to the key contextual information obtained in the data extraction phase described above. Development of mid-range theory or a conceptual framework to better understand the roles and functions of AHCs will then be undertaken to aggregate the results into hypotheses for future research.

ETHICS AND DISSEMINATION

As the review is focused on the analysis of secondary data, it does not require ethics approval. The results of the study will be disseminated through articles in peer-reviewed journals and trade publications as well as presentations at relevant national and international conferences. Results will be further disseminated through networks and associations of AHCs, including the Association of Academic Health Centers International. It is also anticipated that this study will inform the activity and development of the Tropical Australian Academic Health Centre being established in northern Queensland, Australia. This study is being undertaken as part of a PhD thesis by the first author.

DISCUSSION AND CONCLUSION

To the best of our knowledge, only one global review using systematic methods (scoping review) has been undertaken to date of the literature on AHCs.(1) This review assessed the literature exploring the managerial, political and cultural perspectives of AHCs, finding the literature on AHCs 'largely atheoretical and heavily dominated by case study reports from North America'.(1) The need for more theoretically informed studies on AHCs, both within and across nations, has been previously identified.(6) Building a conceptual framework to examine the role of AHCs in relation to broader health care goals, therefore, appears to fill an important gap in the literature.

The current review is one of the first attempts to synthesise and critically appraise evidence on the role of AHCs in contributing to equitable health systems locally and globally. Other strengths of this review include the use of the novel PRISMA-P guidelines and the relevant JBI critical appraisal tools.

Limiting our search to literature published in the English language may lead to the omission of studies from non-English speaking countries. Although it is difficult to predict in which cases the exclusion of studies published in languages other than English will bias review findings,(36) this review will also consider the possible effect of language bias in relation to the findings. Limiting the review to published papers only will also result in the omission of unpublished documentation of

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

possible relevance to the review questions. It is also acknowledged that the search terms used to describe AHCs in the review may lead to the omission of activity of AHCs in countries that do not use these terms, or that do not describe themselves as such even though they may fulfil an objective definition of an AHC. Finally, the results of the review may also be limited by the study designs of included studies, which are likely to be mostly observational studies and may present challenges in the quality assessment phase. These limitations and challenges will be considered in relation to the review findings.

AHC models are being adopted and adapted worldwide within health systems that are evolving in line with local and global reform and development agendas. As such, explicit consideration of the intersection between the development and transformation of AHCs and broader activity to establish equitable health systems may clarify the purpose of AHCs, their structures and even geographic locations. It might also encourage policy makers to draw AHCs further into health system reform agendas as implementation vehicles. This review may therefore offer utility to those involved in both AHC activity and health system development across a range of countries.

ACKNOWLEDGEMENTS

AE is a PhD Candidate within the College of Public Health, Veterinary and Medicine Sciences, Division of Tropical Health and Medicine, James Cook University; SMT and JT are thesis supervisors; PVO is an external thesis advisor. The authors thank the reviewers for their valuable input on the first version of this manuscript.

CONTRIBUTORS

AE conceived and designed the study and drafted the manuscript. ST, JT, and PVO provided input into study design and helped revise the manuscript. All authors read and approved the final version of the manuscript.

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

FUNDING

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

COMPETING INTERESTS

AE is Program Operations Manager at the Tropical Australian Academic Health Centre – a developing alliance between the Cairns and Hinterland, Mackay, North West, Torres and Cape, and Townsville Hospital and Health Services; the Northern Queensland Primary Health Network; and James Cook University, including the Australian Institute of Tropical Health and Medicine.

REFERENCES

1. French CE, Ferlie E, Fulop NJ. The international spread of academic health science centres: a scoping review and the case of policy transfer to England. *Health Policy* 2014;**117**(3):382-91.
2. Wartman SA. The Academic Health Center: Evolving Organizational Models. *Association of Academic Health Centers* 2007.
3. Culbertson RA, Goode LD, Dickler RM. Organizational models of medical school relationships to the clinical enterprise. *Acad Med* 1996;**71**(11):1258-74.
4. Weiner BJ, Culbertson R, Jones RF, et al. Organizational models for medical school-clinical enterprise relationships. *Acad Med* 2001;**76**(2):113-24.
5. Ovseiko PV, Davies SM, Buchan AM. Organizational models of emerging academic health science centers in England. *Acad Med* 2010;**85**(8):1282-9.
6. Davies SM, Tawfik-Shukor A, de Jonge B. Structure, governance, and organizational dynamics of university medical centers in the Netherlands. *Acad Med* 2010;**85**(6):1091-7.
7. National Task Force on the Future of Canada's Academic Health Sciences Centres. Three missions one future: optimizing the perfomance of Canada's academic health sciences centres: Association of Canadian Academic Healthcare Organizations, 2010.
8. Fisk NM, Wesselingh SL, Beilby JJ, et al. Academic health science centres in Australia: let's get competitive. *Med J Aust* 2011;**194**(2):59-60.
9. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health Aff* 2008;**27**(3):759-69.
10. Kirch DG, Ast CE. Health Care Transformation: The Role of Academic Health Centers and Their Psychologists. *J Clin Psychol Med Settings* 2016.
11. Wartman SA. *The Transformation of Academic Health Centers*. Boston: Academic Press, 2015.
12. Rahn DW. Foreword. In: Wartman SA, ed. *The Transformation of Academic Health Centers*. Boston: Academic Press, 2015:xv-xvii.
13. Jennings GL, Walsh MK. Integrated health research centres for Australia. *Med J Aust* 2013;**199**(5):320-1.
14. Gourevitch MN. Population Health and the Academic Medical Center: The Time Is Right. *Acad Med* 2014;**89**(4):544-49.
15. Ackerly DC, Udayakumar K, Taber R, et al. Perspective: global medicine: opportunities and challenges for academic health science systems. *Acad Med* 2011;**86**(9):1093-9.
16. Dzau VJ, Ackerly DC, Sutton-Wallace P, et al. The role of academic health science systems in the transformation of medicine. *Lancet* 2010;**375**(9718):949-53.
17. Michener L, Cook J, Ahmed SM, et al. Aligning the goals of community-engaged research: why and how academic health centers can successfully engage with communities to improve health. *Acad Med* 2012;**87**(3):285-91.

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

18. Golden RN, Drezner MK, Grossman JE, et al. Chapter 4 - The Changing Roles and Expectations of Faculty. In: Wartman SA, ed. *The Transformation of Academic Health Centers*. Boston: Academic Press, 2015:29-37.
19. DiSesa VJ, Kaiser LR. What's in a Name? The Necessary Transformation of the Academic Medical Center in the Era of Population Health and Accountable Care. *Acad Med* 2015;**90**(7):842-5.
20. Perman JA, Mullins CD, Newhouse R. Chapter 19 - Population Health and the Patient. In: Wartman SA, ed. *The Transformation of Academic Health Centers*. Boston: Academic Press, 2015:195-202.
21. Kindig D, Stoddart G. What Is Population Health? *Am J Public Health* 2003;**93**(3):380-3.
22. Whitehead M. The concepts and principles of equity and health. *Int J Health Serv* 1992;**22**(3):429-45.
23. Welch V, Petticrew M, Petkovic J, et al. Extending the PRISMA statement to equity-focused systematic reviews (PRISMA-E 2012): explanation and elaboration. *J Clin Epidemiol* 2016;**70**:68-89.
24. Gwatkin DR, Bhuiya A, Victora CG. Making health systems more equitable. *The Lancet*;**364**(9441):1273-80.
25. Gough D, Oliver S, Thomas J. Learning from research: systematic reviews for informing policy decisions, a quick guide. London: A paper for the Alliance for Useful Evidence, 2013.
26. World Health Organisation. Systematic Reviews for Health Policy and Systems Research: Alliance for Health Policy and Systems Research, September 2009.
27. Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015;**4**:1.
28. Marmot M. Achieving health equity: from root causes to fair outcomes. *Lancet* 2007;**370**(9593):1153-63.
29. Marmot M, Friel S, Bell R, et al. Closing the gap in a generation: health equity through action on the social determinants of health. *Lancet* 2008;**372**(9650):1661-69.
30. Sandieson RW, Kirkpatrick LC, Sandieson RM, et al. Harnessing the power of education research databases with the pearl-harvesting methodological framework for information retrieval. *J Spec Educ* 2014;**44**(3):161-75.
31. Greenhalgh T, Robert G, Macfarlane F, et al. Storylines of research in diffusion of innovation: a meta-narrative approach to systematic review. *Soc Sci Med* 2005;**61**(2):417-30.
32. Shemilt I, Khan N, Park S, et al. Use of cost-effectiveness analysis to compare the efficiency of study identification methods in systematic reviews. *Syst Rev* 2016;**5**(1):1-13.
33. The Joanna Briggs Institute and the University of Adelaide. New JBI Levels of Evidence. Developed by the Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party October 2013, 2014.
34. The Joanna Briggs Institute and The University of Adelaide. Critical Appraisal Tools. Secondary Critical Appraisal Tools 2016. http://joannabriggs.org/research/critical-appraisal-tools.html (accessed 9 November 2016).
35. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol* 2008;**8**(1):45.
36. Higgins JPT, Green S. Section 10.2.2.4: Language bias. In: Higgins JPT, Green S, eds. *Cochrane Handbook for Systematic Reviews of Interventions Version 510*: The Cochrane Collaboration 2011

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Reported on page #
ADMINISTRATIVE INFORMATION			
Title:			**2**
Identification	1a	Identify the report as a protocol of a systematic review	
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	**3**
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	**2**
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	**12**
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	**7**
Support:			**13**
Sources	5a	Indicate sources of financial or other support for the review	
Sponsor	5b	Provide name for the review funder and/or sponsor	
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	**5,6,7**
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	**6**
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	**7,8**
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	**8,9**

For peer review only

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49

Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	**Search strategy plan on pp 8,9**
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	**9,10**
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	**9,10**
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	**10**
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	**10**
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	**10**
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	**10,11**
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	**11**
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	**12**
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	**10,11**

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated.** **The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

For peer review only