Node-making processes in network meta-analysis of non-pharmacological interventions should be well planned and reported

DOI: 10.1016/j.jclinepi.2018.04.009

Document Version
Accepted author manuscript

Link to publication record in Manchester Research Explorer

Citation for published version (APA):

Published in:
Journal of Clinical Epidemiology

Citing this paper
Please note that where the full-text provided on Manchester Research Explorer is the Author Accepted Manuscript or Proof version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version.

General rights
Copyright and moral rights for the publications made accessible in the Research Explorer are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Takedown policy
If you believe that this document breaches copyright please refer to the University of Manchester’s Takedown Procedures [http://man.ac.uk/04Y6Bo] or contact uml.scholarlycommunications@manchester.ac.uk providing relevant details, so we can investigate your claim.
Node-making processes in network meta-analysis of non-pharmacological interventions should be well planned and reported

Chunhu Shi, Maggie Westby, Gill Norman, Jo Dumville, Nicky Cullum

PII: S0895-4356(18)30053-2
DOI: 10.1016/j.jclinepi.2018.04.009
Reference: JCE 9636

To appear in: Journal of Clinical Epidemiology

Received Date: 17 January 2018
Accepted Date: 11 April 2018

Please cite this article as: Shi C, Westby M, Norman G, Dumville J, Cullum N, Node-making processes in network meta-analysis of non-pharmacological interventions should be well planned and reported, Journal of Clinical Epidemiology (2018), doi: 10.1016/j.jclinepi.2018.04.009.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.
Node-making processes in network meta-analysis of non-pharmacological interventions should be well planned and reported

Chunhu Shi (1), Maggie Westby (1), Gill Norman (1), Jo Dumville (1), Nicky Cullum (1) (2)

Affiliations:

(1) Division of Nursing, Midwifery & Social Work, School of Health Sciences, Faculty of Biology, Medicine & Health, University of Manchester, Manchester Academic Health Science Centre, Manchester, UK, M13 9PL

(2) Research and Innovation Division, Manchester University NHS Foundation Trust, Manchester Academic Health Science Centre, 1st Floor, Nowgen Building, 29 Grafton Street, Manchester, UK, M13 9WU

Corresponding author:

Chunhu Shi

Division of Nursing, Midwifery & Social Work, School of Health Sciences, Faculty of Biology, Medicine & Health, University of Manchester, Manchester Academic Health Science Centre, Manchester, UK, M13 9PL

Mobile: +44 (0) 7421 239 138

E-mail: chunhu.shi@postgrad.manchester.ac.uk

Word count:

- Full text: 497
We read with interest the paper of James and colleagues [1]. We agree there is a lack of guidance for generating nodes for network meta-analyses (NMAs) of non-pharmacological interventions, and the proposed elements are useful. Based on our experience of conducting NMAs of wound care devices [2, 3], we offer the following new considerations.

The authors have focused on approaches to lumping or splitting as covered by the PRISMA extension for NMAs [4]. We consider it useful to discuss four possible approaches: (1) a broad lumping approach that groups similar interventions at a broad level and is useful to estimate effects of intervention groups, (2) a clinically-meaningful-element approach that groups interventions with similar components together, taking account of clinically important variables, (3) a component lumping-and-dismantling approach informed by meta-regression to investigate effects attributed to different components [5, 6], and (4) a class-effect model approach that lumps similar interventions together as a class, but assumes effect variations between these interventions; using modelling to estimate effects of specific interventions [7]. The choice of node-making method can drastically alter the network and subsequent results both between and within NMAs; therefore pre-specification of methods is essential and should be based on NMA objectives.

Support surfaces for pressure ulcer prevention, the focus of our recent NMA [2], can be grouped in several ways e.g. by their construction materials or their mechanism of action (reactive or active surfaces) [8]. Had we wanted to compare all reactive surfaces with all active surfaces we would have used approach (1). However, our objective was to investigate the effects of different types of reactive surface, so we used approach (2): drawing on important clinical classifications relating to materials and other features. This approach was both clinically relevant and allowed a more expansive network: comparisons of interventions within the same node in approach (1) (and thus excluded) remained in the NMA in approach (2), so increasing power.

In our NMA of dressings for pressure ulcers [3] the main analysis used approach (2) based on widely used clinical classifications. However, we also conducted a sensitivity analysis using approach (1) to lump dressing groups more broadly. This reduced the numbers of included studies (39 to 22) and participants (2127 to 959). Additionally, the network became unbalanced, increasing the risk of biased estimates of rank probabilities [9]; therefore, we questioned the validity of excluding a high proportion of participants. This emphasises the importance of considering the effect of lumping on exclusion of studies from the NMA [4].

We agree with James and colleagues [1] that limited description of non-pharmacological interventions in publications [10] can affect subsequent node-making. We recommend using additional sources of information to support node-making judgements [11] and that NMAs should report the sources of information (e.g., manufacturers’ and/or product websites).
We believe that the formation of nodes should be undertaken independently by two reviewers, following a pre-planned node-making process, and that NMA reports should include a description of the methods used (e.g., dual process) to avoid arbitrary node-making.
References


Suggested amendments to memory Box 1: Elements proposed to consider for the node-making process in network meta-analyses (NMAs) assessing non-pharmacological treatments

Planning the node-making process might include:

1. Criteria for eligibility of the primary studies
2. Pre-specified inclusion criteria for each node

Reporting the node-making process might include:

1. A pre-specification of lumping and/or splitting approach to node-making on the basis of the objectives of the NMA and sensitivity analyses proposed to examine alternative approaches (new consideration)
2. A description of sources of information for describing eligible interventions (new consideration)
3. A description of each intervention assessed in primary studies included in the NMA
4. Explanation of the node’s inclusion criteria (e.g., expert consensus, previous classification, international standards or conceptual frameworks)
5. If the content of nodes differs from that in other NMAs assessing the same clinical question, this point must be discussed
6. A description of the methods used (e.g., dual process) to avoid arbitrary node-making (new consideration)
7. Justification for secondarily lumping or splitting nodes
8. Discussion of the effect of lumping on exclusion of studies from the NMA (new consideration)