Reviewer’s report

Title: Does the implementation of a care pathway for patients with hip or knee osteoarthritis lead to fewer diagnostic imaging and referrals by general practitioners? A pre-post-implementation study of claims data.

Version: 0 Date: 23 Apr 2019

Reviewer: Isabella Moroz

Reviewer's report:

Overall, it is a very interesting observational study of claims data, aiming to determine whether the implementation of a stepped-care pathway for osteoarthritis management leads to decreases in diagnostics and referrals for orthopaedic consultations. The points below are meant to convey some praises to the authors for what was done well and pose some questions on aspects that were not clear.

* Background - very good introduction to the rationale for the study, leading to clear objectives and hypotheses.

* Design - clever in terms of i) comparing claims for hip and knee diagnostics and initial consultations to those for other osteoarthritis related care consumption, and ii) having a control region.

* Setting - for comparison purposes, it would be helpful to know the population size of the control region, # of practices/GPs in it, and how/why it was chosen to be the comparator region.

* Intervention - was training for GPs and physiotherapists mandatory or voluntary or incentivized in any way (eg continuing medical education credits)?
  
  o Is there any way to check what was the penetration or reach of the intervention? For example, an estimate of the percentage of GPs exposed to the intervention?

  o are all GPs required to use the ZorgDomain referral application? Is this application also used to make referrals to other relevant allied health providers such as dieticians, psychologists, and physiotherapists? It would be interesting to compare the referral rates to these specialties between the intervention and control region in the context of the present study.

* Figure 1 provides a very helpful visual display of the pathway

* Outcome measures - how does claim data make it possible to distinguish the initial consultations from all other types of orthopaedic consultations?
* The description of how the cost estimations were calculated is not clear (page 8, line 23-25): "...the average tariffs for a maximum of two hip- or knee-related consultations from 2012 to 2016..."

* Analysis - page 8, line 35: what exactly was averaged for the characteristics of the intervention and control region in terms of the numbers of insured persons reported later in table 1? The analysis specifies total counts whereas the table specifies an average number of insured persons.

* Discussion - raises some good points (for example, that implementation of the pathway went beyond awareness of requesting hip/knee diagnostics to influence requesting other diagnostics in general, and the importance of raising patient awareness and educating patients), but the authors did not sufficiently address the observed increase in initial orthopaedic consultations in both regions post-implementation. What may have happened to cause this increase in both regions?

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

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