Reviewer’s report

Title: Incidence and Prevalence of Rheumatoid Arthritis in Saskatchewan, Canada: 2001-2014

Version: 0 Date: 11 Mar 2019

Reviewer: Carl Turesson

Reviewer's report:

In this study, the authors use the Provincial Administrative Health Databases to identify patients with a registered diagnosis of RA. A validated case-definition is used. Prevalence and incidence rates are estimated. The authors conclude that there has been a steady rise in prevalence, whereas the incidence of RA has peaked recently.

The study methodology is relatively straightforward. There are some issues with how the data are presented and discussed.

In the abstract and the Conclusions, the authors state that there was no difference between age adjusted trends in prevalence and incidence for men and women. However, no data on such a comparison are presented. In Figure 2, it looks like the increase in prevalence was greater in women compared to men.

The authors should consider calculating prevalence rate ratios and incidence rate ratios, using FY0102 as reference, with 95 % CIs, for women and men separately.

There was an extreme incidence peak in FY1213. Could this be artificial, and due to factors related to reporting to the database? It is difficult to imagine a biologic reason for this pattern. I would be very hesitant to list a "recent peak in the incidence" as a major conclusion of the study.

The authors suggest that the increasing prevalence may be expected in an aging population. However, if the prevalence rates were adjusted for age, how could increased longevity overall be the explanation?

By contrast, a reduced rate of premature mortality related to RA could explain the pattern. This should be discussed.

It is not obvious how changes in treatment strategies for RA would contribute to an increasing prevalence. Do the authors mean that RA is more likely to be recognized and registered in the Health Databases because efficient interventions are available? This should be clarified.

It is not clear to this reviewer how limited access to health care in remote areas would explain the observed patterns, unless access may have improved recently, contributing to increased incidence and prevalence.
Furthermore, it is unclear how vitamin D deficiency is relevant, unless there are data indicating temporal trends in such deficiency.

Minor points

The population of Saskatchewan is reported twice - avoid repetition

Incidence rates in the abstract should be presented per person-years at risk, rather than as %

Incident cases and prevalent cases are preferred expressions, rather than "incidence cases"

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.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?
2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal.