

# Analysis of gender distribution in Dutch oncology research

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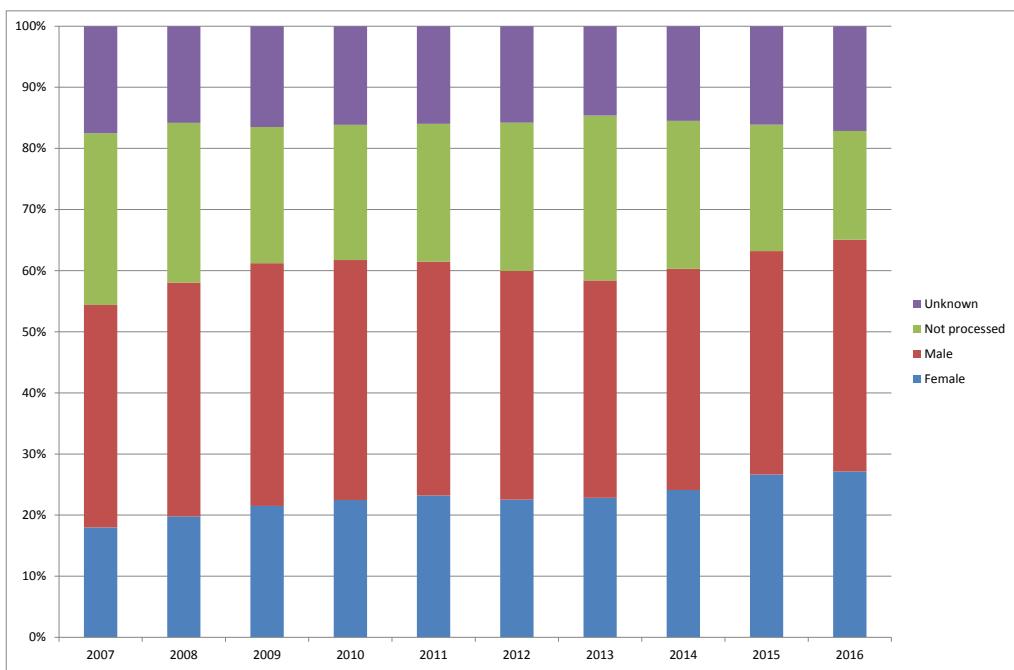
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The following is a report on the analysis of gender distribution in Dutch contributions to the field of oncology. We will give a short outline of the methodology, and then present some results of the study.

The study is based upon the Web of Science (WoS) database, more in particular the in-house version of CWTS. This is a database especially designed for bibliometric studies. The data come from three different subsets in the database. First, all publications with a Dutch address were selected. Next, all publications within the WoS Journal Subject Category '**Oncology**' were selected. The third set is the result of a study commissioned by the EU, which created a set of publications that contains gender labels. This is organized by comparing the names attached to publications to an online facility that links first names to gender. This procedure gives four possible results: the name is labelled as either *male* or *female*; the name is *unknown*; or the result is *not processed* (in case of infrequently occurring names). This results in a weighted gender label for each paper. The gender label is determined by the contributions from the four types to every single paper.

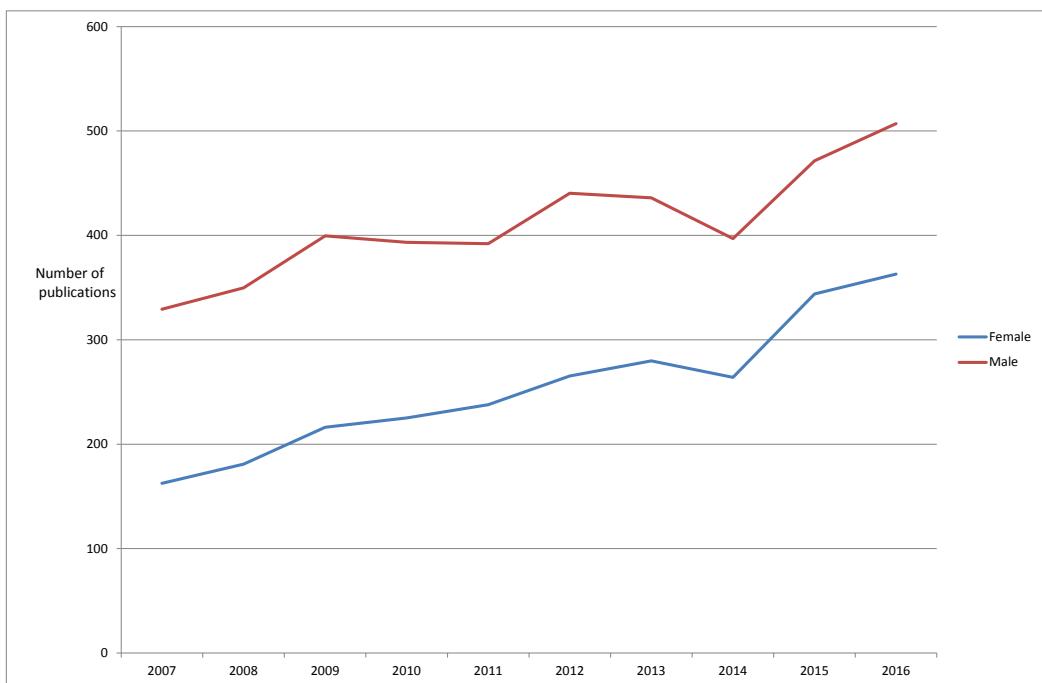
We conducted two analyses, one is a frequency distribution of the numbers of publications by males and females in Dutch oncology, from 2007 up until 2016, while the other analysis focuses on the impact related to this work. Figure 1 presents the four types described above.



*Figure 1: Distribution of gender labels in Dutch oncology research, 2007-2016*

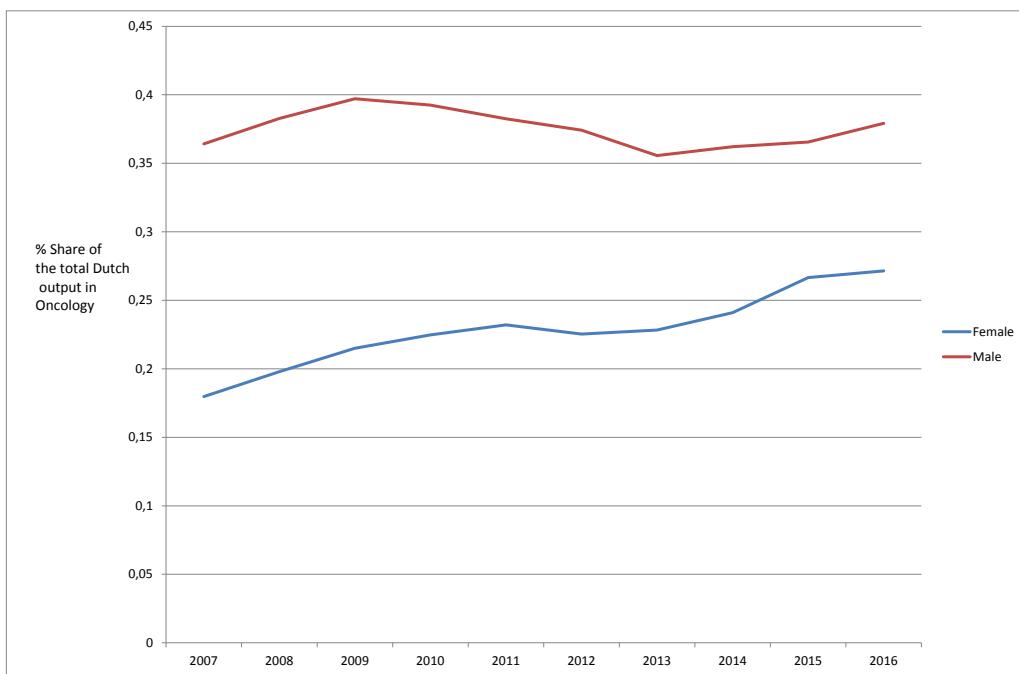
The unknown and not processed parts of the Dutch output in oncology is relative stable, in total is some 60% of the publications attributed to either male or female researchers. In this analysis we will focus on the parts of the output that is attributed to the males/females in Dutch oncology.

The second result that we show is the absolute number of female and male researchers in Dutch oncology. Although fluctuating both groups of researchers show an increase in output.



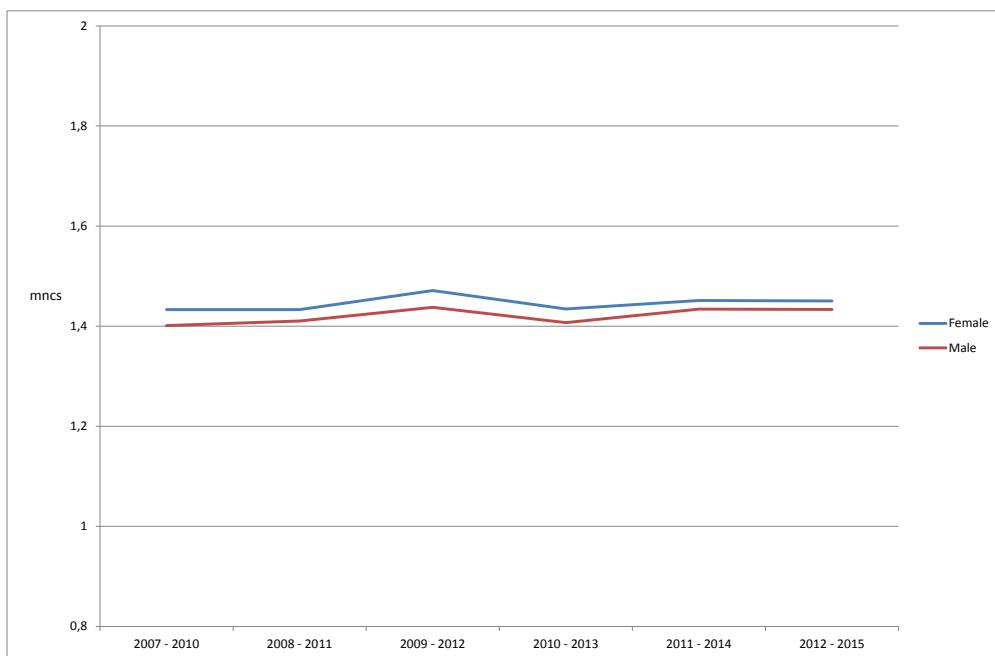
*Figure 2: Number of publications by female and male researchers  
in Dutch oncology research, 2007-2016*

In Figure 3, the relative shares of the male and female parts of Dutch oncology in comparison to the total of all publications created by the Netherlands are shown. Here we clearly observe a strong increase of female contributions to the Dutch output in oncology, in comparison to the male contribution to the output from the Netherlands to the field of oncology. The male contribution to the field fluctuates between 35-40% of the total output, while the female contribution increases from 17% to 27%.

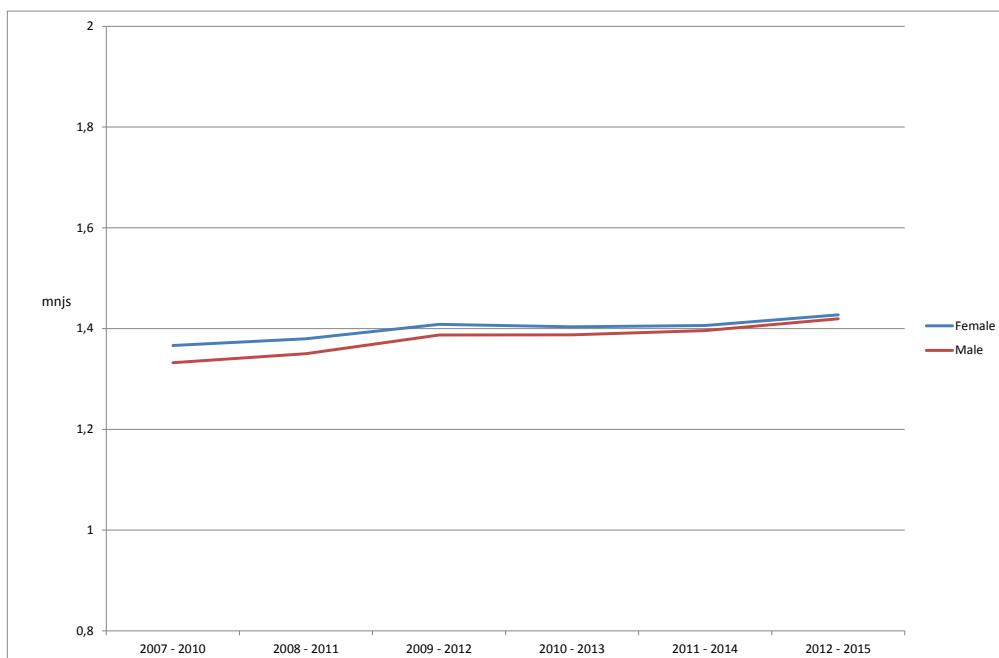


*Figure 3: Relative shares of male/female contributions to Dutch oncology research, 2007-2016*

We have also analyzed the trend in impact scores, in particular the two central normalized impact scores created by CWTS. The first is the MNCS, the mean normalized citation score, taking into consideration the field and age of the publications, thereby comparing like with like. The other indicator is the MNJS, which is the mean normalized journal score, a normalized form of the journal impact factor, taking into account the field and age of the publications. In Figure 4, the trend of the impact related of both female and male contributions to the Dutch output is shown. The value of 1 is the worldwide average impact level in oncology. So a first conclusion is that the Dutch do very well in this field. Second, the differences are small, but the impact generated by female researchers in oncology research is slightly higher in comparison to their male colleagues. When we shift towards the journals of choice for publishing their results of research, which is shown in Figure 5, we notice that both parts of the Dutch output are nearly equal. Again, the value of 1 indicates worldwide average impact level. Both males and females in Dutch oncology publish their work in high impact journals, some 40% above the field average in the later stages of the period of analysis.



*Figure 4: Development of impact scores (mncts) of male/female contributions to Dutch oncology research, 2007-2016*



*Figure 5: Development of impact scores (mnjs) of male/female contributions to Dutch oncology research, 2007-2016*

Some conclusions of these analyses:

- 1) Although female researchers contribute less to the total Dutch output in oncology, their contribution to the field is rapidly increasing, with some 10%, up to 27% in 2016.
- 2) In terms of impact, we do not observe meaningful differences between male and female researchers. Female researchers in the field of oncology perform even slightly better than their male colleagues, as the MNCS of their output is somewhat higher compared to their male colleagues.
- 3) Female as well as male researchers in Dutch oncology choose high impact journals as outlet for their research results, as MNJS is some 40% above worldwide average impact level.
- 4) Impact levels as observed are in itself no reason not to promote women over men.
- 5) If one maintains the claim that females do not work as hard as their male colleagues<sup>1</sup>, one must conclude that they tend to do their work either more effectively or more efficiently since their impact levels are somewhat higher compared to their male colleagues.

Some limitations of this part of the analysis:

- 1) Not all names were attributed, so this is a conservative assessment. However, there is no reason to think that either male or female first names would be more severely touched by the exclusion from the labelling of publications with a gender label.
- 2) Researchers that work on oncology, can also publish in other fields, and this is not made visible in this analysis. We only analyzed the activity in one field, irrespective of the institutional and/or cognitive orientation of the people involved.

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<sup>1</sup> See Hans Clevers cited in <http://inbabystatmode.scientopia.org/2018/02/12/prestigious-scientist-says-dutch-women-don-t-work-hard/>. We note that this report does not study work hours in the field of oncology.