Author’s response to reviews

Title: Compliance with referrals to medical specialist care: patient and general practice determinants: a cross-sectional study

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Reviewer 3

- The research question has been stated clearly, but is not clear why "In order to better understand and improve the referral process, it is necessary to increase knowledge about referral compliance outside the United States." This should be explained. Further explanation on the impact of this study on Dutch health system should be made in the introduction section.

Response: In the first paragraph of the introduction, we have mentioned the preconditions for an effective gatekeeper system. We state that non-compliance could lead to delays in diagnosis and treatment and to poorer health outcomes. This is true for all health systems with a gatekeeper. We have changed the first sentence of the third paragraph:

“As referral compliance is important for an effective gatekeeper system, it is necessary to increase knowledge about referral compliance outside the United States.”
- Material method section needs to be simplified. It is difficult to follow the methodology. Specific terms like claim data, referral data, DRG or compulsory deductible need to be explained in the text. Material methods section need to be re-written with clarifications.

Response: We have explained the terms claims, DRG, referral data and compulsory deductible in the revised manuscript:

“Claims data of medical specialist care (administrative data, diagnosis related groups (DRGs)) were available from the center for information of Dutch health insurers, Vektis. Vektis collects, among others, DRGs claimed to all health insurers in the Netherlands. A DRG comprises a more or less fixed set of secondary care services, related to a specific diagnosis, at a certain price that may or may not vary between hospitals. Medical specialists submit claims for DRGs to health insurance companies. This claims data is made available for research through Vektis.”

“For basic health insurance, a compulsory deductible (amount of expenses that must be paid out of-pocket before an insurer will pay any expenses) of €150-€165 (2008-2010) is in operation for all individuals aged 18 or older.”

“Referral data includes among others information about referrals from GPs to medical specialist care, with for each referral the date, the medical specialty and the diagnosis for which the patient was referred to the medical specialist.”

Reviewer 4

- Methods: please provide a reference showing that the NIVEL-GPs are representative of all Dutch GPs regarding age, gender, etc. (p.5, l. 31-35).

Response: We included a reference in the revised manuscript. This reference is only available in Dutch.

- Methods: The sentence p. 6, l. 15-19 is misunderstanding: You are saying in line 9 that VEKTIS collects DRGs claimed at all health insurers. Then you continue: „medical specialists can claim
their services to the patient's health insurer". Does this mean that the specialist can claim also directly to the health insurer without using vektis? If this is the case, you will miss referrals and underestimate referral compliance.

Response: We changed the sentence in order to make it more clear. Medical specialists send claims to health insurers and Vektis collects this data from all health insurers. We revised the sentence:

“Vektis collects data from all health insurers which included, among others, DRGs claimed to all health insurers in the Netherlands”

-Methods: P. 6, l. 40/41: The inserted phrase is not understandable to me. Do you mean that for less than 50% of the patient-physician encounters a diagnosis was provided? I suggest that the examples given are expressed negatively - corresponding to the reason for exclusion (e.g. less than 46 weeks of contact data instead of minimum of 46 weeks of contact data).

Response: In the revised manuscript we expressed the exclusion criteria negatively:

“Reasons for excluding practices (n=140) for a specific year (non-exclusive) were (1) incomplete data on care episodes (e.g. in less than 50% of morbidity record a diagnosis; 25% of excluded practice years), (2) incomplete data on contact (e.g. less than 46 weeks of contact data; 30%), (3) incomplete data on prescriptions (e.g. Anatomical Therapeutic Chemical (ATC) code in less than 85% of the prescription; 30%) and/or (4) incomplete data on referrals (e.g. less than one referral per week; 50%).

-Methods: P. 6, l. 48/49: How do you know that referral data are incomplete, if a GP refers less than one patient per week to a specialist? Or the question put the other way around: How do you know that referral data are complete if there is at least one referral per week? Is this methodology valid?

Response: It is difficult to assess completeness. However, we have referral data of several years, which gave us the opportunity to compare referrals within and between general practices. It also
gave us the opportunity to look into the differences in referrals to various medical specialists. Based on this data at least one referral per week was found to be a good criteria.

-Methods: P. 6, L. 52/53. Please insert the reason you provided in your response letter in the manuscript as it is not known to the reader that capitation fees in the Netherlands differ between regions according to degree of deprivation.

Response: We included the following sentences in the revised manuscript:

“Whether patients lived in a deprived urban area was based on claimed capitation fees. In the Netherlands, GPs receive higher capitation fees for patients living in an deprived urban area. GPs can claim the capitation to the patient’s health insurer, with different claim codes for patients in deprived urban areas.”

-Methods: P. 7, L. 9-16. I am still not convinced. The reference given (12) was not accessible to me or at least I didn't find it. Instead I found the "Cijfers uit de registratie van huisartsen - peiling 2010" which probably resembles reference 12, only for 2010 instead of 2009. It describes the practice characteristics of the NIVEL-practices. I couldn't find a comparison of NIVEL practices with all GP practices in the NL. Please provide the website or access to reference 12. (This also applies to the other NIVEL-references).

Methods: The authors should show that their sample of practices is representative of the NIVEL practices and that NIVEL-practices are representative of all NL-practices. If these data are not available, the assumptions and conclusions presented in the paper cannot be made and this should be discussed as a limitation.

Response: We included the comparison between the included practices and Dutch general practices in the revised manuscript.

-Results: p. 10, L. 25. Please provide the total number of referrals analyzed, otherwise the percentages are meaningless. I assume it is the sum of all referrals depicted in table 1?

p. 10, L. Please provide the absolute numbers of referrals for symptoms and referrals for diseases.
Response: We included the number of referrals in the results section of the manuscript.

-Discussion: p. 11, l. 31ff. I still believe that the uncertainty regarding the question whether the study sample is representative of all Dutch GPs is unsettled. This should be discussed in the strengths and limitations section, not only the difference in practice type, but also other possibly not measured characteristics. Also, the limitation that quite a large number of practice years had to be excluded due to incomplete data, needs to be mentioned.

Response: We included the following sentences in the discussion:

“A large number of practices did not meet the inclusion criteria. Although based on known characteristics of general practices we have no indication that included general practices differed from excluded general practices, included practices could differ on other factors. This could have affected our results.”

- Discussion: P. 13, l. 10-15: The increased odds ratios for referral compliance in patients with one or more chronic conditions is a result and should be provided in the results section, if the authors consider this result to be relevant. 95% CIs of these odds ratios should be provided. It should then be discussed, though, why the authors consider this important inspite of the fact that these odds ratios are nonsignificant in the multivariate models that include age (table 3). From the results presented in table 3 there appears to be no age-independent association between referral compliance and the number of chronic conditions. As there is a known correlation between number of chronic conditions and age, an independent association between chronic conditions and referral compliance does not seem to be necessary to support the hypothesis that older people may comply more because they don't have to pay the deductible.

Response: In the discussion section, we compare our results with previous studies and try to explain differences. We are familiar with the association between chronic conditions and age, and therefore we mention the associations without including age. In this way, we can compare studies. Therefore, we believe these results should be part of the discussion.