Reviewer's report

Title: Ethnic differences in use of, reasons for referrals to and diagnosis in an internal medicine outpatient clinic

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Reviewer: Kevin Fiscella

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This paper explores ethnic differences in community referrals to an internal medicine clinic in the Netherlands. The authors make a good case for studying ethnic differences in health care referrals, particularly in the Netherlands, given the recent growth in the immigrant population there.

The authors argue that administrative data are preferable to survey data for examining ethnic differences in health care use given potential ethnic differences in bias, e.g. response rate, recall, and social desirability, in addition to ethnic differences language and health literacy barriers. While these represent potential barriers to survey assessment (warranting empirical confirmation), the authors minimize some of limitations of administrative data for this purpose. In fact, survey data (with interpretation when needed) would likely provide more reliable results than administrative data for this purpose.

If I am understanding the methods correctly, the findings show that first generation immigrants complete more first time internal medicine ambulatory clinic referrals at Erasmus, a tertiary care medical center in Rotterdam, Netherlands, than do non-immigrants (or second generation immigrants) based on the distribution of these groups in the surrounding population. The findings do not appear to be explained by differences in patient age, gender, or mean SES of Zip Code of residence. Referrals for gastrointestinal signs and symptoms largely explain higher than expected referrals for immigrants. This is further reflected by higher than expected rates of diagnosis of hepatitis. Conversely, immigrants have lower than expected referrals for non-specific symptoms and signs and analysis without diagnosis.

What do these findings mean? Are they significant? What are the implications of these findings? These key questions are not fully addressed by the paper largely because of the limitations of the data and methods. Taken at face value, the findings do not show evidence of inequities in referrals by immigration status (or ethnicity). The most likely explanation for the findings are that immigrants are seen more often for referrals because of higher rates of hepatitis. Previous studies of blood donors in the Netherlands show higher rates of Hepatitis C in the Netherlands (van de Laar et al, 2006). Children of Dutch immigrants are more likely to infected by Hepatitis A when they travel to Morocco or Turkey (Van der Eerdan et al, 2004) and the prevalence of Hepatitis B is so much lower among non-immigrants in the Netherlands that a Health Council advised the Ministry of
Health against universal vaccination of children of non-immigrants in the Netherlands (Galama, 2001).

The primary limitation of the findings is that it is not possible to determine whether differences in referrals are too low or too high given the absence of reliable data on rates of disease in the immigrant population. For example, it is conceivable (but not known) that rates of referral for treatment of chronic hepatitis among immigrants are actually too low given the apparent difference in prevalence. The same applies to other categories of disease. The lower than expected rates of referral for non-specific symptoms hints at potential bias. Studies from cognitive psychology (see review by Burgess et al, JGIM 2004) show that bias is most likely to be manifested in the presence of ambiguous signs and symptoms or uncertain indications. In the US, some of the largest disparities are seen for procedures whose rates vary widely by area such as coronary angiography, joint replacement and back surgery suggesting that ethnic differences are more likely to emerge when the procedure is discretionary. This might apply to referral for non-specific symptoms.

Comparison of referrals is further compounded by potential differences in use of primary care and duration of residence in the area.

In summary, this study provides some interesting preliminary data about ethnic differences in internal medicine referrals that warrant further exploration. This study does not adequately address the central question about potential inequities by ethnicity in the Netherlands or even Rotterdam.

TITLE
The title is descriptive but a bit awkward. I'd suggest something like Ethnic differences in Internal Medicine Referrals in the Netherlands (discretionary)

ABSTRACT
Background: While I agree with the premise regarding the need for health care planning to ensure equal access, it is doubtful that these types of data can reliably assess inequities in access or referrals. At best, they provide preliminary data and hypotheses requiring further study. This point warrants emphasis (compulsory)

Methods: The authors write in the first person to describe what they did, but need to be consistent throughout in doing so. Use of passive voice e.g. it was examined, should be avoided. (minor)

Conclusions: The conclusion is relatively weak and provides more of a summary of the data than a synthesis of the findings.

INTRODUCTION
Pg 3, para 1. The use of the term consumption can be omitted when referring to rates, e.g. Some studies reported higher [consumption] rates by various ethnic minority groups(Minor)
Pg, para 2. The second paragraph of the introduction discusses potential causes of ethnic differences in health care use. This section should be expanded beyond differences in incidence/prevalence to include ethnic differences related to symptom severity and expression, recognition and meaning, expectation for allopathic treatment, communication of symptoms to the physician and physician interpretation, treatment, and referral and patient acceptance of treatment and referral (minor).

METHODS

Contextual information

Pg 4, para 2.

Many international readers will not be familiar with the organization of health care in the Netherlands, much less in Rotterdam. The authors should provide more contextual information including costs associated with referrals, the percentage of population in Rotterdam and the surrounding referral area served by the clinic and reasons why patients and their physicians might choose one source of internal medicine care over another, e.g. transportation, language translation services, location of pharmacy, ethnicity of staff, payments etc. (minor) These data if available would facilitate more meaningful interpretation of the results.

I would like to see a clearer explanation of referrals in the context of this paper. I assume the authors mean patients who are referred by community general practitioners for evaluation by internists at the Rotterdam clinic. Are all patients seen in the Erasmus medical clinic referred by general practitioners or can patients residing in the municipality of Rotterdam self refer? By inference, it appears that all patients in the sample were specifically referred by a general practitioner to Erasmus MC. This critical point requires clarification (compulsory).

Population

Pg 4, para 3. I would suggest listing inclusion and exclusion criteria for the study (minor) e.g. inclusion criteria

1) New patient visit to clinic between March (add day of month) 2002 and March (add day of month) 2003 (need to determine how "new" patients are identified. Is a patient who had no prior visit for 5 years a new patient?)

2) Age 15 years and older (provide a rationale for starting at age 15)

3) Resident of the municipality of Rotterdam

4) Dutch or one of six ethnic groups

The actual description of the population should be moved to the results section (minor).

Exclusion criteria should include key missing data and any other exclusions (minor)

Data
The authors should reference validation data (if available) from the Netherlands on use of Zip Codes as proxies for socioeconomic status (major). The validation of these measures is heavily dependent on the extent to which neighborhoods are residentially segregated by SES and the amount of heterogeneity by SES within Zip Codes. This limitation should be acknowledged in the discussion section.

The authors indicate that the patient population was divided into two groups. How is this possible if only residents of the Municipality were included in the original sample? This requires clarification (minor).

Exactly how were medical reports scrutinized? Was this done manually or using electronic data (minor)?

**Analysis**

Even after reading this section several times, I am not confident fully understand what the authors did.

Did the authors only examine new patient visits (major)? If so, they should provide a rationale for doing so and discuss the advantages and limitations of this approach in the discussion (minor). If all referred patients are only seen one time this should be so stated though I assume that in some cases that internists assume management of the problem.

The Poisson regression analysis for research question 1 requires further details (major). Please specify the dependent and each of the independent variables in the model. I am not sure what the authors mean by "base group." The explanation is confusing.

The analysis for research question 2 should be clearly described (major). Again, please specify the dependent and independent variables in the logistic regression model.

**RESULTS**

Begin with a description of the population then describe results in order of the research questions.

**DISCUSSION**

The first sentence of the discussion indicates that members of these ethnic groups living in the referral area made greater use of outpatient care. Do the authors mean that members of these groups were more likely to be referred for evaluation at the clinic (major)? If so, this should be clearly stated since it is not clear that other measures of outpatient care were examined.

The authors should be clearer in what they mean by use of outpatient care. As I understand their methods, the authors only examined new patient referral visits, but not the number of subsequent visits for these patients at Erasmus MC. That is, relative to their distribution in the referral area, ethnic minorities were more likely to make a new patient visit to the clinic (assuming no
Pg 8, para 1. The limitation section requires expansion (major). Isn't it possible that one reason why first generation immigrants are more likely to have new patient visits is that they are more likely to be new to the area (and the country)? Persons who have resided in the Rotterdam area (including second generation immigrants) are less likely to become new patients during a specified period of time because of their much longer period of residence. This issue requires some discussion and reference to any data on how long members of different groups have resided in the area.

A related issue is the question of pent-up demand. Immigrants may not had access to care for treatment of Hepatitis B or C in past, so they are more likely to be referred once they immigrate. This could happen in the absence of any difference in the prevalence of these conditions by ethnicity in the Netherlands.

Pg 8, para 1. Another limitation is failure to account for ethnic differences in health use among patient seen by general practitioners (major). Differences in visit frequency by ethnicity at the level of the general practitioner could drive differences in referrals (referral opportunity bias). Similarly, ethnic differences in diagnostic testing at this level could drive ethnic differences in referrals (work-up bias).

Pg 8, para 1. The issue of aggregation of codes for diagnosis and reasons for referral requires further discussion. Specifically, what is the empirical basis for this aggregation? What was the level of agreement between diagnosis and referral reasons and did this agreement differ by ethnicity?

Pg 8, para 3. What proportion of the Rotterdam population is served by Erasmus MC and does it differ by ethnicity?

Pg 8, para 3. The authors argue that a 5% difference in referrals among immigrants is not sufficient to explain 80% higher use of Rotterdam by immigrants. This statement requires further elaboration. Exactly what does 5% refer to (major)? How was this difference derived? Is it a relative or absolute difference? In addition, it is possible that general practitioners are more likely to refer to certain conditions to different hospitals. So while the overall difference in referrals might be small there might considerable differences based on diagnosis.

Pg 9, para 2. While I agree that language barriers could conceivably result in more referrals, it also plausible that language barriers reduce referrals because less information is collected. The authors should discuss the availability of language translation services both in general practice and at Erasmus (minor). Also, what percent of different ethnic groups (by generation status) are fluent in Dutch (minor)?

Pg 9, para 2. I also agree that the presence of ambiguous signs and symptoms might prompt referrals, but I can imagine that this issue is likely to be dependent on other contextual issues such as level of patient distress and demand. So while lower rates of referral for non-specific symptoms could represent lower rates of
somatization among immigrants, it could also represent potential bias in referral
for more discretionary conditions either based on differences in physician
threshold by patient immigration status or based differences in patient demand
by ethnicities. These explanations warrant acknowledgement (major).

Pg 9, para 3. Regarding ethnic differences in disease incidence/prevalence, I am
surprised that there are more national data for the Netherlands. Certainly,
available data about Hepatitis should be cited. Data from other countries,
particularly the US, are less relevant in this context.

A key difference between first and second generation immigrants is exposure to
disease. It is likely that the prevalence of hepatitis is much lower in second
compared to first generation immigrants thus potentially accounting for
differences in referrals (minor).

Pg 9, para 3. I agree that higher referral rates may reflect higher incidence and
prevalence of disease, particularly chronic hepatitis. Given the potential for
higher rates of infections, hypertension, circulatory disease, and diabetes in
some of these groups, it quite possible that referral rates are inappropriately low
and inequitable. The study findings do not exclude this possibility. This points
warrants emphasis (major).

TABLES
Table 1.
Label table “Characteristics of Patient Sample” (discretionary)
Include percent for each ethnic group and a corresponding table that describes
the demographics of the population of residents of the area (discretionary)

Table 2A.
Label table “Referrals to Internal Medicine by Ethnicity” (discretionary)

Table 2B.
Omit table and indicate in the text the relative risk for 1st vs 2nd generation
immigrants and indicate that there was no significant difference between 2nd
generation and immigrants and Dutch (minor).

Table 3.
Include reference group in footnote instead of in title (minor)

Table 4.
Include reference group in footnote instead of in title (minor)

What next?: Unable to decide on acceptance or rejection until the authors have
responded to the major compulsory revisions

Level of interest: An article of limited interest
Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests