The influence of patients' immigration background and residence permit status on treatment decisions in health care. Results of a factorial survey among general practitioners in Switzerland

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1. Introduction

Investigations of ethnic discrimination in health care have focused largely on patients' subjective perceptions in the medical encounter. Several studies surveying ethnic minorities themselves have demonstrated that these groups perceive high levels of racist behaviour by the health care personnel and that such felt discrimination is associated with ill health among those same patient groups (Hausmann et al., 2008; Paradies, 2006). It can be assumed that patients' subjective perceptions of discrimination may differ from the intention of the health care personnel. Nonetheless, it has been shown that patients' ethnic background can be a significant predictive factor for a number of treatment decisions and outcomes, and that diagnoses and treatment of ethnic minorities may be biased by unconscious stereotypes among physicians (Moskowitz et al., 2012; Smedley et al., 2003). One result of such subtle stereotypes is for example that ethnic minorities may be kept waiting longer for assessments or treatments and thus experience posteriorisation for other than medical reasons (Hall et al., 2015).

To posteriorise patients for non-medical reasons may happen while physicians are reluctant to admit that such a kind of rationing takes place (Ginsburg et al., 2000; Hurst et al., 2006, 2007; Strech et al., 2009; Strech et al., 2008). In his landmark study 'Passing On' David Sudnow described how health care staff made decisions in the process of dying based on the *social value* of patients (Sudnow, 1967). Follow-up studies on this so-called *social rationing* have shown that this effect has not weakened but instead increased over the time e.g. through policy changes that failed to address the broader societal foundations of social inequality (Timmermans and

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Sudnow, 1998; Timmermans, 1999).

Altogether, studies indicate that physicians' decision-making is influenced by a complex simultaneous interplay of social- and situational factors rather than in terms of overarching categories like ethnicity (Babitsch et al., 2008; van Ryn et al., 2006; Stepanikova, 2012).

This paper focuses on this interplay in the medical encounter with ethnic minorities and tries to shed light on possible posteriorisation of patients due to social factors such as immigration background or residence status. Prominently discussed additional or related social factors are socioeconomic status (SES), time pressure and language barriers. Their influence on medical decision making in ethnic minority patient groups can be summarized as follows:

1.1. Socioeconomic status

Van Ryn et al. (2006) reported an interconnected interplay of socio-demographic variables in physicians' perceptions of black and white candidates for coronary artery bypass graft surgery (CABG). Recommendations for CABG were significantly influenced by patients' ethnicity among male, but not female patients. Physicians' perceptions of patients' education level and physical activity preferences mediated the effects of ethnicity on CABG recommendations. Van Ryn and Burke (2000) reported similar findings regarding physicians' perceptions of social attributes. Their findings showed that physicians' perceptions of patients were influenced by patients' socio-demographic characteristics. Black patients (even after controlling for patient sex, age, income and education) and members of low and middle SES groups were more likely to be perceived negatively on a number of dimensions than white and upper SES patients. McKinlay et al. (2013) found significant influences of patients' ethnicity on the diagnosis of diabetes. According to their study patients with higher SES were more likely to receive essential foot exams and suggestions according to diabetes guidelines than patients with lower SES.

1.2. Time pressure

Stepanikova (2012) found significantly fewer specialist referrals and less serious diagnoses for black patients only in physicians under high time pressure. This finding corresponds to the assumption that heuristics such as stereotyping serve as simplifications for decision-making in complex environments. Such simplifications have been described to be cognitive shortcuts for the decision-maker, which may be particularly useful in the context of medical settings, characterised by time pressure, psychological stress, fatigue, or multitasking (Aberegg and Terry, 2004).

1.3. Language barriers

Several studies indicate that language barriers diminish physicians' ability to provide high-quality care (Vargas Bustamante and Chen, 2011) and complicate the medical encounter as patients may not possess the vocabulary to accurately describe their history, symptoms, and concerns, which renders diagnostic and treatment decision-making more uncertain (Jensen et al., 2011). The results of a survey study conducted in three gynaecology and internal medicine emergency departments in Germany demonstrated that physicians' satisfaction with the course of treatment was significantly lower for patients of Turkish origin. One stated main reason were problems with communication. When communication problems were addressed the relevance of Turkish origin disappeared (Babitsch et al., 2008).

2. Theoretical explanations for the influence of ethnic background on medical decision-making

In social psychology, there is a substantial body of literature focusing on how physicians manage the massive amount of complex information and stimuli which they are exposed to, including how prejudice, stereotyping and clinical uncertainty can affect assessments of patients and treatment decisions (Balsa and McGuire, 2001; Balsa et al., 2005; van Ryn, 2002). Van Ryn (2002) suggests that ethnicity related disparities in health care may stem from providers' beliefs about these patient groups as a result of negative stereotyping. Like all other members of society, medical professionals also share internalized social stereotypes of groups and these stereotyping beliefs or attitudes are triggered unconsciously (Moskowitz et al., 2012). Sabin et al. (2009) measured implicit and explicit attitudes regarding race among medical doctors and compared the results with a large and diverse sample. The study reported that the majority of medical doctors held implicit preferences for white over black patients. This finding is in line with general patterns that can be observed in large, heterogeneous public samples. By contrast, Balsa and McGuire (2001) suggest that discrimination may be the result of the application of conditional probability assumptions due to clinical uncertainty. The so-called statistical discrimination model assumes that in cases of uncertainty about patients' underlying conditions physicians may use patients' ethnicity as one determining factor in order to formulate a diagnosis. In cases of clinical uncertainty, plausible presumptions about epidemiological patterns of diseases can lead to justified differences in the diagnoses of, for example, hypertension or diabetes (Balsa and McGuire, 2001). In addition, empirical research indicates that physicians' certainty about their own diagnosis affects subsequent diagnostic and therapeutic actions, like test ordering and writing prescriptions, and that these vary according to patients' non-medical characteristics (Lutfey et al., 2009). The theory of statistical discrimination constitutes another possible cause of discrimination in the medical encounter: "Discrimination stemming from prejudice is of a very different character than discrimination stemming from the application of rules of conditional probability as a response to clinical uncertainty. While in the former case, doctors are not acting in the best interests of their patients, in the latter, they are doing the best they can, given the information available" (Balsa et al., 2005).

2.1. Objectives of the study

The objective of this study was to examine how patients' immigration background and associated social (language barriers/ necessary translation, economic status of the patient, and residence permit status) and contextual factors (high time pressure of the physician, uncovered treatment costs) influence judgments of physicians on prioritisation or posteriorisation of patients with severe (e.g. chest pain) or less severe (e.g. back pain) medical symptoms. We presupposed that the physicians know the indicated methods and that all patients will be treated.

It is well known that physicians are reluctant to admit that rationing by posteriorisation of patients takes place although it is also known that rationing is a regular feature of medical care (Ginsburg et al., 2000; Hurst et al. 2006, 2007; Strech et al., 2009; Strech et al. 2008). Therefore, we expected a negatively-skewed distribution of the physicians' judgments, meaning that the judgments are generally expected to cluster toward prioritisation of the patients.

We hypothesized that professional judgments of physicians related to the prioritisation or posteriorisation of patients are mainly guided by patients' medical condition, i.e. that the most immediate treatment should and would be provided for patients

with chest pain and the least immediate one for patients suffering from back pain compared to patients with flesh wounds as reference. In addition to clinical parameters and based on the abovementioned empirical findings we hypothesized that contextual and social factors also exert an independent influence on decision-making and may lead to *social rationing* (Timmermans and Sudnow, 1998). Furthermore, we hypothesized that social factors will affect decision-making more strongly if physicians are under time pressure.

3. Data and methods

3.1. Ethical approval and informed consent

The study was presented to the cantonal research ethics committee and was assessed as not requiring a standard review process. Based on this assessment, the Swiss Medical Society of the Canton endorsed this study. Potential participants were informed about the objectives of the study, anonymisation of data, and contact details of the research team in a cover letter. Those who consented to participate answered the questionnaires and sent them back.

3.2. Experimental setting

In the present study a factorial survey (FS) design was used. In FS the respondents are confronted with hypothetical situations, so-called vignettes (Auspurg and Hinz, 2015). In these descriptions the factors (dimensions) are systematically varied in their levels. FS can be utilized in studies that evaluate complex social situations and normative attitudes (Auspurg and Abraham, 2007; Hermkens and Boerman, 1989; Jasso and Opp, 1997; Rossi, 1979; Rossi and Anderson, 1982), and have also been successfully applied to study clinical judgments (Bogart, 2001; Mion et al., 2010; Müller-Engelmann et al., 2013; Schwappach and Koeck, 2004).

In this study the vignettes described situations with fictitious patients that varied in their medical conditions and with regard to non-medical factors. We employed a FS design because studies of attitudes towards immigrants can be seriously affected by social desirability. Currently, in most countries and cultures, an explicit expression of racist attitudes is socially unaccepted and thus surveys may lead to nonresponse or socially expected answers. In medical settings, the social desirability bias is further exacerbated by providers' fear of professional and legal repercussions (Dovidio et al., 2002). FS are advantageous in this respect. Since participants are not fully aware which effect different elements of the complex vignettes will show in the statistical analysis, judgments may be less subject to a social desirability bias than those attained using conventional survey items (Auspurg et al., 2015). Furthermore, the design allows us to vary all level combinations experimentally. Thus, this approach is methodologically better suited for studying complex contexts and conditions affecting judgments (Wallander, 2009).

3.3. Vignette construction

In our study a three-stage process was followed to design the vignettes. First, relevant factors were identified based on a review of the literature on disparities in health care (see above) and according to results from team discussions with physicians, bioethicists and sociologists. In the second stage of the vignette construction, the survey was pretested with a convenience sample of physicians, which were not part of the surveyed population. The pretest participants reviewed the vignettes for coherence and plausibility. Categories and wording of the vignettes were refined based on their feedback. During the third stage, the revised vignettes were assessed once more by another physician sample and revised accordingly.

The process led to the construction of vignettes which contained seven characteristics for some of which studies have shown that they have the potential to influence physicians' medical decisions: origin of the patient, medical urgency, residence status, economic position of the patient, language barriers, time pressure of the physician, and treatment costs. Each of these factors was attributed with 2–4 possible levels (see Table 1).

In FS all possible factors and levels are combined with each other. This approach can automatically result in illogical cases. The level "Switzerland" cannot be combined with any level of the "residence status" factor without producing illogical cases. Therefore, instead of combining patients from Switzerland with the level naturalized, in the written form of the vignettes the level "Switzerland" occurred with a blank field that is not noticed by the study participants. This means that the level naturalized was simply named differently for the origin level "Switzerland".

To assess the self-rating (SR) of the participants we used the statement, "I would treat this patient …". Respondents applied a 7-point Likert-scale to rate the likelihood of quick treatment from "… under no circumstances quickly with the medically indicated method" (−3) to "… under all circumstances quickly with the medically indicated method" (3). Research indicates that health care personnel tends to believe that the quality of care delivered is generally affected by patients' immigration status, but that such discrimination is absent in their own offices and practices (Mallinger and Lamberti, 2010; Richardson et al., 2006). Hence, we decided not only to sample the own expressed behaviour but also the expected colleague-rating (CR). The ordering of these two rating perspectives was rotated at random to control possible ordering effects (see Fig. 1).

From the total population of N = 576 vignettes a random sample of n = 72 (12.5%) was drawn. The repeated rating of vignettes may lead to fatigue effects, potentially resulting in lower processing motivation and capacity. Such fatigue effects may increase response errors and inconsistencies in the course of the rating (Sauer et al., 2011). Research indicates that the rating of up to 20 vignettes is feasible without evoking fatigue effects and inconsistent responses (Sauer et al., 2011). Therefore, in a next step the vignettes were partitioned in 6 sets of 12. Each respondent was randomly assigned to 1 of the 6 sets. The order of the vignettes within each set was the same for every participant. As can be seen in the following table we could realize very low correlations of the vignette factors, meaning that the weight of each single factor can be estimated accurately. Except for the required connection of "Origin" and "Residence Status" all correlations between the vignette factors are below a value of 0.07 (See Table 2).

3.4. Study participants

The participants of this study were all eligible general practitioners with a background in internal medicine and with a practice in a specific region in Switzerland (Zurich) and who are registered in the Swiss Medical Society of the Canton. Switzerland is a federal parliamentary republic with a population of approximately 8 million people. The country consists of four main linguistic regions: German, French, Italian, and Romansh-speaking regions. The Canton of Zurich has 1,463,459 inhabitants in total. Around 25% of the population is of foreign nationality from a total of 166 different countries, including 56,057 (3.82%) immigrants from the Yugoslavian successor states (Slovenia, Croatia, Bosnia-Herzegovina, Serbia, Montenegro, Macedonia, Kosovo) and 8208 (0.55%) immigrants from Sub-Saharan Africa (Staatssekretariat für Migration SEM, 2014).

Table 1
Description of the vignette information.

Dimensions	Levels
Origin	Switzerland/Serbia/Ghana
Urgency	Flesh wound/Back pain/Chest pain
Residence status	Naturalized (blank field in combination with Switzerland)/Residence permit/No residence permit
Economic condition	Good condition/Bad condition
Language	No translation/Translation
Time pressure	No time pressure/Under time pressure
Treatment Costs	Costs covered/Costs not covered

A pen and paper version questionnaire and a short non-responder form were sent out together with a self-addressed and stamped envelope to all N = 1240 general practitioners with a background in internal medicine and who are members of the Swiss Medical Society of the Canton. The FMH statistics of physicians, which is one of the most important data sources for the physicians' population, reports 1554 general practitioners in the Canton of Zurich in 2014 (FMH Generalsekretariat, 2015), and hence our coverage rate amounted to approximately 80%. The participants were informed that the purpose of the study was to investigate the potential influence of social and structural factors on health care. A lottery incentive was used to increase the response rate. Every participant who responded and stated one's address on a separate form entered into a drawing for a book token worth of 50,- CHF or a tablet computer worth of approximately 300,- CHF.

Beside the vignettes, the questionnaire comprised socio-demographic data such as sex, age, educational level of the parents, job experience and information about whether the participants had lived abroad for an extended period of time. Even though FS are considered to be effective in reducing social-desirability biases it was still expected that some of the judgments would be subject to socially expected answer tendencies. Therefore, the short version of a validated scale was included in the questionnaire to identify socially desirable answer tendencies (SEA-K) (Satow, 2012).

3.5. Statistical analysis

Due to the fact that the participants as well as the vignettes are sampled, FS have a hierarchical data structure. The measurements for all respondents are then no longer independent from each other, which entails correlated error terms (Hox et al., 1991). Therefore, we analysed the influence of the hypothetical patient factors on the vignette judgments using random-effects models with the respondents' ID as panel variable. All vignette covariates were included in the analysis as dummy variables. The "blank field"/"naturalized" level was labelled as "citizens".

Model 1a (SR) and 1b (CR) include only the vignette variables as independent variables. Model 2a (SR) and 2b (CR) include the vignette variables and in addition respondents' characteristics.

We conducted several robustness analyses. It was checked whether results differed when treating the judgments as non-linear (negative binomial regression, ordered logistic regression). The models do only slightly differ from each other, and all estimated coefficients point in the same direction. In this article we

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Example Case 4:

Mr. Alempijević from Serbia enters the ER with acute first-time back pain. He does not have a residence permit. He seems to be in a good economic position. A translation of the physician-patient communication is necessary. The physician on duty has no time pressure. The treatment costs are covered.

My colleagues would treat this patient…

…under *no* circumstances quickly with the medically indicated method			undecided		…under *all* circumstances quickly with the medically indicated method	
☐	☐	☐	☐	☐	☐	☐
-3	-2	-1	0	1	2	3

I would treat this patient...

…under *no* circumstances quickly with the medically indicated method			undecided		…under *all* circumstances quickly with the medically indicated method	
☐	☐	☐	☐	☐	☐	☐
-3	-2	-1	0	1	2	3

Fig. 1. Example of a vignette.

Table 2
Correlations of the vignette factors.

	Origin	Urgency	Residence status	Economic condition	Language	Time pressure	Treatment costs
Origin	1.0000						
Urgency	−0.0062	1.0000					
Residence Status	0.3908	0.0390	1.0000				
Economic Condition	−0.0409	−0.0064	−0.0023	1.0000			
Language	0.0195	0.0568	0.0045	0.0720	1.0000		
Time Pressure	0.0111	0.0000	0.0427	0.0128	0.0582	1.0000	
Treatment Costs	−0.0050	0.0104	−0.0068	0.0085	−0.0369	0.0478	1.0000

present the results of the linear regression model due to simplicity of interpretation. The models were calculated with the software Stata in Version 13.

4. Results

4.1. Descriptive statistics

In total n = 352 surveys were completed. We received 165 (46.9%) surveys with the order SR followed by CR and 187 (53%) with the order CR followed by SR. In addition, there were 8 neutral nonresponses (address unknown, retired, psychotherapeutic office, questionnaire received after data analysis). This corresponds to a response rate of 29%. There were no striking differences between the vignette distribution within the surveys that were sent out and the surveys we received back. Additionally, n = 62 non-responder forms were sent back. The stated reasons for non-participation were a lack of interest in the topic (n = 10), a lack of time (n = 33), and other reasons (n = 35). Multiple selection of reasons was possible. The distribution of non-responders' age was with an average of 56 years similar to the average age of the participants. The mean age of the participants was 55 years (SD = 8.9; Min. = 35; Max. = 79). The gender proportion was 31.3% female and 68.8% male. In comparison to all registered general practitioners with a background in internal medicine in the Swiss Medical Society of the Canton of Zurich the mean age (53.7 years) and the gender distribution (34.5% female; 65.4% male) are similar to our sample (FMH, personal communication, 25. April 2016). The mean years of experience as resident physicians was 17.5 (SD = 9.8; Min. = 0; Max. = 46). 81.2% of the respondents stated that they were born in Switzerland and 79.9% had at least one parent born in Switzerland. 42.9% of the respondents stated that they had spent at least 6 months abroad.

The units of analysis in FS are the vignettes, not the respondents. In total we collected n = 3423 SR of the vignettes and n = 3411 CR. The non-responses on the vignette level were n = 26 (0.8%) for SR and n = 38 (1%) for CR. Fig. 2 shows the distribution on a percentage basis for SR as well as for CR. In both assessments a generally immediate treatment by all means was stated.

5. Multivariate analysis

5.1. Clinical factors

As expected the chest pain factor had the strongest effect on physicians' judgments. Chest pain increased SR by 0.328 (p < 0.001) scale points and 0.347 (p < 0.001) scale points for CR. Fictitious patients with back pain were associated with a decreasing SR, and hence a less quick treatment, by −0.551 (p < 0.001) and −0.611 (p < 0.001) for CR.

5.2. Contextual factors

Physicians' time pressure was associated with lower SR by −0.175 (p < 0.001) units, respectively −0.149 (p < 0.001) for CR. Those situations where treatment costs were not covered reduced SR by −0.232 (p < 0.001) and −0.291 (p < 0.001) scale points for CR.

5.3. Social factors

Turning to the social characteristics of the patients, a bad economic condition was a factor that slightly decreased SR. Patients in a bad economic position corresponded to a decreasing SR of −0.084 (p < 0.001). In comparison to SR the effect of being in a bad economic position was more marked among CR (−0.161, p < 0.001). A necessary translation of the patient-physician communication showed a non-significant increase of SR by 0.036 (p = 0.140) units but a significant effect in CR by 0.060 units (p = 0.027). However, corresponding to our hypothesis we found a significant interaction effect in SR and CR for a necessary translation under time pressure (SR: −0.103, p = 0.049; CR: −0.115, p = 0.040; not shown in table).

Serbian vignette patients showed a decreasing SR of −0.108 (p = 0.008) units and −0.190 (p < 0.001) units for CR. Among patients from Ghana SR decreased slightly by −0.046 (p = 0.257) scale points, but the effect was not significant. However, patients from Ghana significantly affected CR (−0.160, p < 0.001). Our data showed no significant difference for vignette patients with a residence permit neither in SR (−0.048, p = 0.170) nor in CR (−0.034, p = 0.337) compared to vignette patients with citizen status. However, the effect of patients without residence permit significantly decreased SR (−0.074, p = 0.032) as well as CR (−0.105, p = 0.004). An interaction effect between uncovered treatment costs and patients without residence permit showed an increase of SR by 0.172 (p = 0.008) and of CR by 0.145 (p = 0.036) (See Table 3).

5.4. Respondent and study design factors

The results of the random effects model including physicians' demographics showed no significant effects of respondents' gender on SR or on CR. Likewise, respondents' own immigration background, experience abroad, and respondents' tendency to socially desirable answers had no significant effect on SR and on CR. Furthermore, there were no significant differences regarding which of the six different vignette decks were presented to the respondents. However, a significant order effect of the rating-scales was found. SR significantly decreased by −0.212 (p < 0.001) units if respondents were confronted initially with CR (See Table 4).

6. Discussion

In our FS we examined to what extent certain factors influence physicians' assessments of the experimentally constructed patient vignettes. The results showed that the medical factors (chest pain and back pain) had the strongest effect on physicians' judgments.
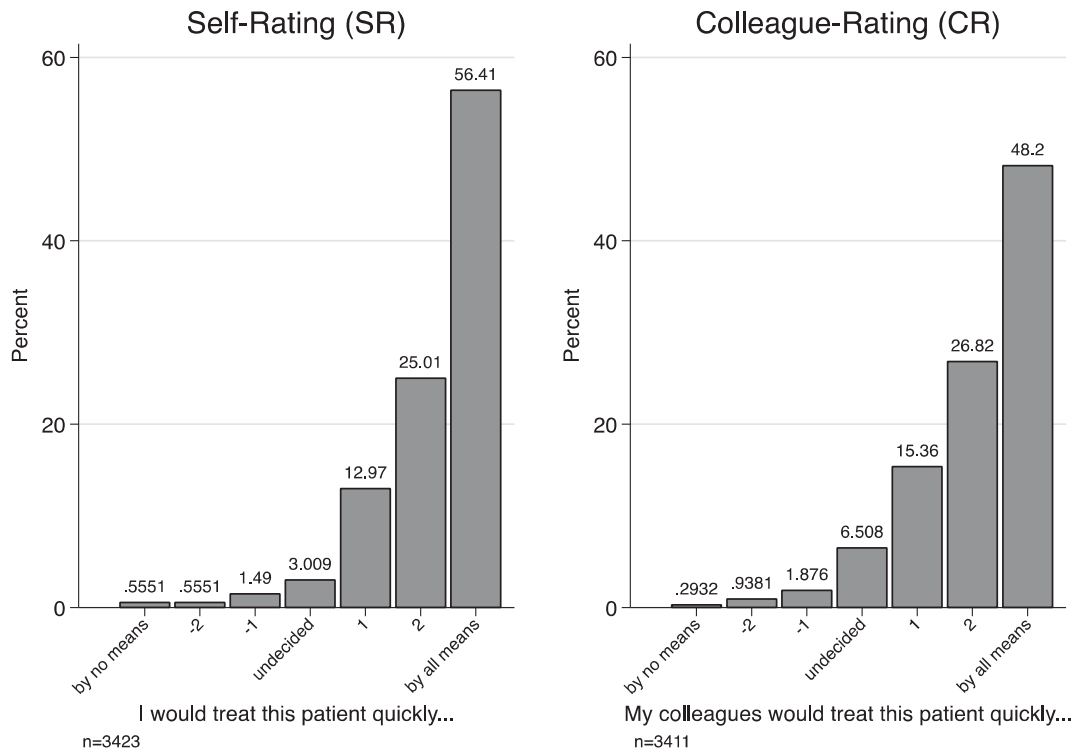
Fig. 2. Distribution of vignette judgments.

Physicians' time pressure and uncovered treatment costs also significantly decreased SR as well as CR. Patients' bad economic position led to a slight decrease in SR and a more marked effect among CR. A necessary translation of the patient-physician communication was only significant in CR but significant in SR and CR in interaction with time pressure. Serbian vignette patients decreased SR as well as CR. However, among patients from Ghana we found a significant decrease only in CR. No significant differences for vignette patients with a residence permit were found in SR and in CR, but the effect of patients without residence permit significantly decreases SR as well as CR. An interaction effect between uncovered treatment costs and patients without residence permit shows an increase of SR and of CR.

Taken as a whole, our results are in line with findings from earlier research indicating the importance of social categories for physicians' judgments (Cox et al., 2012; Moskowitz et al., 2012; Sabin et al., 2009; Sabin and Greenwald, 2012; Stepanikova, 2012). In our study patients' characteristics such as origin, residence, or economic status alter the willingness to treat patients immediately, independent of medical urgency, physicians' time pressure, or the question of covered treatment costs. These findings were revealed for SR and to an even stronger degree for CR. This is an important general finding as it shows that the ethically demanded neutrality of physicians towards social characteristics of patients may not be given in every situation.

The first specific finding worth discussing is the importance of the patients' country of origin. We detected a significant general difference in treatment between patients from Switzerland and patients from abroad which stands in contrast to the professional ethos of the Declaration of Geneva that requires medical decisions to be independent from a patients' country of origin (Declaration of Geneva, (1948)). More specifically patients from Serbia were judged to be treated less quickly in comparison to patients from Ghana. This is an interesting finding, given that in other studies patients'

skin colour has been identified as one reason for discrimination (Moskowitz et al., 2012; van Ryn and Burke, 2000; Sabin and Greenwald, 2012; Stepanikova, 2012). However, research indicates that migrants from former Yugoslavia are confronted with discrimination in many contexts in Switzerland. A field experiment conducted by Diekmann et al. (2014) found evidence that applicants from former Yugoslavia are disadvantaged on the labour market in Switzerland despite being naturalized citizens. Another study by Fibbi et al. (2006) also provides evidence for massive discrimination of migrants from former Yugoslavia and Turkey in entering the labour market in Switzerland. The results of our study might thus be related to a possible existence of specific "contextual stereotypes" present in Switzerland. It can be speculated that such contextual stereotypes become stronger the greater the specific immigration population is. This points to the necessity of examining the health care situation not only of "immigrants" or "undocumented inhabitants", but also of specific groups in any given society. This could help to develop more nuanced medical education material, which takes the specific local context into account. Are there groups that might face special discrimination in the society? How could and should medical practitioners be trained in order to ensure adequate behaviour in relation to these "contextual stereotypes" without perpetuating or even manifesting them?

The second finding deserving a closer look concerns the residence status of the vignette patients. We found that people in Switzerland who did not have a legal residence permit had significantly higher chances to be indicated with a lower willingness to be treated in due time. This finding suggests that not possessing legal residence papers has the potential of being a risk factor for experiencing disparities in health care regardless of other factors such as insurance status or ethnicity. Further studies are needed to investigate the underlying mechanisms. Is this, for example, due to an additional workload for the physician or indicating expectations of cultural differences and associated conflicts in the medical

Table 3
Random-effects models including vignette factors only.

	Model 1a	Model 1b
	Self-rating (SR)	Colleague-rating (CR)
Origin		
Switzerland	Ref.	Ref.
Serbia	−0.108***	−0.200***
	(0.0406)	(0.0430)
Ghana	−0.150	−0.348***
	(0.0594)	(0.0644)
Urgency		
Flesh wound	Ref.	Ref.
Back pain	−0.551***	−0.611***
	(0.0309)	(0.0327)
Chest pain	0.328***	0.347***
	(0.0309)	(0.0327)
Economic condition		
Good condition	Ref.	Ref.
Bad condition	−0.0851***	−0.162***
	(0.0253)	(0.0268)
Language		
No translation	Ref.	Ref.
Translation	0.0374	0.0594**
	(0.0253)	(0.0268)
Time pressure		
No time pressure	Ref.	Ref.
Under time pressure	−0.175***	−0.149***
	(0.0254)	(0.0269)
Treatment costs		
Costs covered	Ref.	Ref.
Costs not covered	−0.232***	−0.291***
	(0.0252)	(0.0267)
Residence status		
Citizens	Ref.	Ref.
Residence permit	−0.0477	−0.0354
	(0.0348)	(0.0368)
No residence permit	−0.0750**	−0.106***
	(0.0349)	(0.0369)
Constant	2.675***	2.631***
	(0.0565)	(0.0369)
Observations	3423	3411
Wald chi2	1009.73***	1139.37***
R2 overall	0.1470	0.1591

Standard errors in parentheses.
***p < 0.01, **p < 0.05.

Table 4
Random-effects models including vignette factors and respondent characteristics.

	Model 2a	Model 2b
	Self-rating (SR)	Colleague-rating (CR)
Respondent characteristics		
Gender		
Female	Ref.	Ref.
Male	−0.0658	0.0148
	(0.0863)	(0.0957)
Origin		
Born abroad	Ref.	Ref.
Born in Switzerland	0.0429	0.0572
	(0.118)	(0.131)
Experience abroad		
No	Ref.	Ref.
At least six months abroad	0.146	0.0811
	(0.0962)	(0.107)
SEA-K	0.00623	0.0381
	(0.0401)	(0.0445)
Order		
SR first	Ref.	Ref.
CR first	−0.212***	−0.0479
	(0.0798)	(0.0886)
Vignette deck		
Deck 1	Ref.	Ref.
Deck 2	−0.108	−0.0519
	(0.145)	(0.161)
Deck 3	0.0114	0.0310
	(0.136)	(0.151)
Deck 4	0.158	0.248
	(0.136)	(0.151)
Deck 5	−0.0791	0.0165
	(0.146)	(0.162)
Deck 6	0.0914	0.191
	(0.138)	(0.153)
Origin		
Switzerland	Ref.	Ref.
Serbia	−0.105**	−0.198***
	(0.0412)	(0.0431)
Ghana	−0.0436	−0.161***
	(0.0412)	(0.0431)
Urgency		
Flesh wound	Ref.	Ref.
Back pain	−0.554***	−0.600***
	(0.0314)	(0.0328)
Chest pain	0.328***	0.350***
	(0.0314)	(0.0328)
Economic condition		
Good condition	Ref.	Ref.
Bad condition	−0.0844***	−0.164***
	(0.0258)	(0.0269)
Language		
No translation	Ref.	Ref.
Translation	0.0372	0.0622**
	(0.0258)	(0.0269)
Time pressure		
No time pressure	Ref.	Ref.
Under time pressure	−0.177***	−0.144***
	(0.0259)	(0.0270)
Treatment Costs		
Costs covered	Ref.	Ref.
Costs not covered	−0.232***	−0.288***
	(0.0256)	(0.0268)
Residence Status		
Citizens	Ref.	Ref.
Residence permit	−0.0511	−0.0298
	(0.0353)	(0.0369)
No residence permit	−0.0842**	−0.112***
	(0.0355)	(0.0371)
Constant	2.677***	2.287***
	(0.269)	(0.299)
Observations	3376	3364
Wald chi2	1024.60***	1143.44***
R2 overall	0.1729	0.1732

Standard errors in parentheses.
***p < 0.01, **p < 0.05.

encounter? Or could there be some resentment toward people without a certain formal citizenship or passport which should be uncovered and discussed? However, we also detected an increase of SR and CR in patients without residence permit and without the ability to pay the treatment costs. This finding might support findings from other studies on health care delivery to irregular migrants. Research indicates that health care professionals might seek ways around access related barriers in order to provide better care. Participants from other studies reported full access to their services to irregular migrants, even in countries where health care is legally inaccessible for irregular migrants (Dauvrin et al., 2012).

The third specific result concerns the fact that CR was in general more negative than SR. The vignette dimensions origin, residence status, and economic condition of the patient showed a higher impact of *social* factors on the assessment of the colleagues' judgments. Such "elsewhere effects" (Livingston, 2015) between what exists in theory and in the physicians' own practice settings is a common phenomenon (Mallinger and Lamberti, 2010; Taylor et al., 2006). For example, 13% of surgeons have reported that they believe racial/ethnic disparities in cardiac care occur often or somewhat often in general, while only 3% of these surgeons thought they were likely in their own practice setting (Taylor et al., 2006). In line with e.g. Mallinger and Lamberti (2010) we assume that this pattern reflects a natural discomfort that results when physicians are asked

to consider their own contributions to health care disparities. Although it is distressing to state the colleagues' contributions to disparities, it is more difficult to consider their own discriminatory behaviour.

Fourth, it is interesting to examine the results of the factor "language". Our analysis showed that the necessity of translation did not have an effect on attitudes on presumed patient-physician interaction. The factor was included because difficulties in communicating with patients are considered as one problem in providing high-quality care to patients from diverse ethnic backgrounds (Vargas Bustamante and Chen, 2011). Studies emphasize that professional interpreters improve clinical care for patients with limited language proficiency (Karliner et al., 2007). Our findings are not confirming our hypothesis, in which we assumed that language difficulties might also negatively influence the willingness to treat immediately. However, in our vignettes we merely stated that a translation of the patient-physician communication is necessary or not; we did not formulate any problems concerning whether an interpreter is available or not. An alternative wording that would have pointed to actually existing language problems between provider and patient or to the necessity to organize an interpreter first might have produced different results. However, language barriers were shown to have a significant effect if physicians were under time pressure. This points to the importance of focusing not only on psychological explanations that appeal to attitudes, mental processes, and implicit biases. Contemporary ethnic disparities might be not so much based on individual stereotypes or prejudice, but rather be a result of structures, institutions or policies. Such sociological explanations are phrased as "institutional theories of racism" (Machery et al., 2010). As long as there are potentially discriminating instances like a lack of medical interpreters or inadequately short time slots for the individual patient ethnic discrimination can be sustained without any influence of individual racism.

Fifth, our analysis showed an effect of the economic condition of the patient. Even though we have not found a significant interaction effect between ethnicity or the residence status, the single effect of this factor highlights the multifactorial sources of ethnic disparities in health care. Other studies indicate that ethnical disparities are influenced by socioeconomic status (Cox et al., 2012). Even if medical education aims at training health professionals for the treatment of migrant patients, effective teaching methods should therefore also focus beyond ethnicity and involve the discussion of other factors, e.g. related to the socioeconomic situation of the patient.

6.1. Strengths and limitations

This study has several limitations. First, the FS design measures *expressed* behaviour. A commonly discussed aspect of the FS approach is the potential risk for low external validity (Samuelsson and Wallander, 2013). The question is whether it is possible to draw any general conclusions on the judgments made in real-life actions from expressed behaviour in a survey. Vignettes represent simplified medical situations. In real life, physicians have opportunities to ask patients follow-up questions or to perform additional tests and examinations. When information on patient characteristics is presented in hypothetical cases such opportunities are lacking (Stepanikova, 2012). Furthermore, it is conceivable that individuals behave more rationally in hypothetic situations in comparison to real life situations. However, FS avoid a severe problem of conventional attitude measurements. The analysis of single items cannot cope with the complex structure of judgments. Professional judgments which are simultaneously influenced by several relevant dimensions cannot be captured by single items. Furthermore, in

comparison to item-based scales vignette measurements are less affected by social desirability (Alexander and Becker, 1978).

Second, we surveyed only medical specialists in just one canton of Switzerland. Thus, it is possible that the results would differ if we had surveyed the same study population in another region. However, data on physician's judgments on migrant patients are limited, so this study can be regarded as one pilot attempt that could lead to the development of more surveys with higher representativeness or more specific samples.

Third, FS show advantages in dealing with social desirability answer tendencies. However, the results are still potentially biased by the so-called Hawthorne effect (McCarney et al., 2007) in which the participants tend to answer in a socially or professionally expected way or in which the participants modify their answers on the basis of their perceptions of the purpose of the study. Additionally, we cannot rule out that a non-white skin colour is associated with greater social desirability answer tendencies. In order to control this influence we included a scale that identifies social-desirable answer tendencies (SEA-K), showing no significant effect in our statistical models.

Fourth, because of the cross-sectional design of FS, results cannot demonstrate a potential time sequence of causal effects existing in the real world or learning effects, e.g. interim changes via medical education and training on participants' behaviour.

Fifth, survey research among physicians is different from conducting surveys among the general population. Physicians' time is scarce, which results in high opportunity costs to them. Furthermore, physicians are a frequently surveyed population, which potentially affects their willingness to participate in a negative way (Flanigan et al., 2008). The same reasons were often mentioned in our non-responder questionnaire. As a result response rates of physician surveys are 14 percentage points lower than of the non-physicians, on average (Asch et al., 1997). There is no gold standard for acceptable response rates. In the literature the suggested response rates vary between 50% and 80% (Cummings et al., 2001). The value of the response rate in this study is 29%. However, there is emerging evidence, that non-response rates are only indirectly linked to nonresponse biases. The connection between nonresponse rates and nonresponse bias is rather determined by the extent to which the survey variable of interest is correlated with the likelihood of responding (Groves, 2006). As the nonresponse questionnaire indicates it can be assumed that refusal due to a lack of time and refusal due an increasing demand for participating in surveys represent two components of nonresponse. Furthermore, the topic of this study was highly sensitive. Even though several steps were taken to handle the social unacceptability, we can not rule out for sure that there are systematic differences between the response behaviour of respondents and non-respondents. In this case there would be a bias in our results, and it can be assumed that we would rather under- than overestimate the effects of the vignette factors on SR and CR.

Another limitation is that the assertions of the study can only be related to the dimensions and levels chosen for this study. For instance, although we can show that physicians' judgments are influenced by the ascribed economic condition of hypothetical patients, we do not know whether the judgment would vary according to patient's educational status, gender, or age. The problem with factorial design methods — although integration of complexity is possible in general — is that the amount of the complexity is still limited. The inclusion of more information in vignettes increases the risk of "information overload" (Malhotra, 1982), which can cause a focusing on only few selected characteristics and answer patterns may become inconsistent (Gigerenzer and Goldstein, 1996; Green and Srinivasan, 1990). We therefore decided to limit factors to seven and levels to a maximum of four, and thereby to

prioritize these factors according to our literature review, pretests and group discussions.

7. Conclusion

The present study used the FS design that combines large sample sizes with the advantages of experimental designs to measure the independent effect of immigration history of the patient or his residence permit status on physicians' perceptions on treatment decisions. This study provides some evidence about the influence of the patients' origin on physicians' professional judgments. A significant difference between Swiss patients and patients from abroad was found. Beside the origin of the patient we found that patients without legal residence permit were judged with a significant, lower willingness to treat these patients immediately. Furthermore, the economic position, the patients' ability to pay for treatment, and the physicians' time pressure had an independent, significant impact on judgments.

Our work on migration and health care disparities is motivated by the effort to reduce possibly existing disparities. In general, far more research is needed in order to better understand the origins, mechanisms and effects of justified and unjustified patient discrimination or social rationing. However, based on the findings of this study, we conclude that it seems useful to consider approaches that target sources of disparities based on individual behaviour and structural conditions, more precisely, the perceptions and attitudes of physicians related to migration and residence status permit. Adequate materials for education of medical students and for further education for physicians are necessary to target the health personnel's sensitivity on this issue. Educational interventions should consequently aim to raise the awareness of the possible existence of such disparities and of ways how to cope with them without creating or perpetuating stereotypes. Further interventions should target the awareness of patients' social characteristics and their impact on decisions in health care. Physicians and patients may benefit from the awareness that especially in situations of high workload and time pressure health care workers are at danger for an unjustified discrimination of patients.

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