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Talking about smoking in primary care medical practice – Results of experimental studies from the US, UK and Germany

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Abstract

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Objective

To analyze effects of patient and physician characteristics on questions and advice about smoking in primary care practice and to examine country differences.

Methods

We conducted a factorial experiment, employing filmed scenarios in which actors played the role of patients with symptoms of coronary heart disease (CHD) or type 2 diabetes. Versions were filmed with patient-actors of different gender, age, race, and socioeconomic status. The videotapes were presented to primary care physicians in the US, UK and Germany. Physicians were asked whether they would ask questions about smoking or give cessation advice.

Resultst

Female and older CHD patients are less likely to be asked or get advice about smoking in all three countries. Effects of physician attributes are weak and inconsistent. Compared to physicians in the US and the UK, German doctors are least likely to ask questions or give advice.

Conclusions

Although all physicians viewed the same cases their questioning and advice giving differed according to patient attributes and country. Due to the experimental design external validity of the study may be limited.

Practice implications

Findings have implications for medical education and professional training of physicians as well as for the organization and financing of health care.

Keywords: primary care physicians, questions about smoking, cessation advice, comparative study

1. Introduction

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Primary care physicians can substantially contribute to the promotion of smoking cessation among their patients. Brief simple advice from a physician increases the likelihood that someone who smokes will successfully quit and remain a non-smoker 12 months later; more intense advice results in slightly higher rates of quitting [1, 2]. Although systematic, generalizable analyses are scarce in most countries, studies indicate that engagement of primary care doctors in helping their patients to quit is often limited [3, 4]. There are several barriers to doctors' questioning and advice giving about smoking [3]. These barriers can be related to the organization and financing of health care (e.g. time constraints during consultation, lack of incentives), to physician characteristics (e.g. experience, perception that there is a lack of skills necessary to be effective in helping to quit), and to the patient (e.g. gender, socioeconomic status, low expectation of compliance). Thus, it is reasonable to expect variations in questioning and advice giving according to country/health care system, physician characteristics and patient attributes. However, systematic explorations of such variations are scarce and results of these investigations are fragmentary and inconsistent. Studies that examined the association between physician characteristics such as age or gender and smoking cessation assistance found mixed results [3, 5–7]. While one study indicates that female physicians are less active in terms of smoking cessation assistance than male physicians [3], others found that female and young physicians give smoking cessation advices more often [6, 7]. Moreover, studies show differences in smoking cessation advice in general and primary care practice according to patients' gender, age, socioeconomic status, and ethnicity. Here, results are also inconsistent [6, 8–12]. Although these studies come from different countries, comparative approaches to investigate the effects of different health care systems on smoking cessation activities in primary care are scarce.

Against this background, the first aim of this paper is to analyze the effects of patient attributes and physician characteristics on questions and advice about smoking in primary care medical practice. We focus on three countries, each of which has a different approach to the organization and financing of health care: the largely private insurance-based health care system in the United States, the government-supported, tax-based National Health Service in the United Kingdom, and a system characterized by decentralized care administered by social security agencies (Germany). Thus, the second aim is to explore country differences in questioning and advice giving. We focus on patients with symptoms of coronary heart disease and diabetes in our study because smoking is an established risk factor of both diseases [13, 14]. Furthermore, the two diseases were chosen because of their epidemiological relevance and because initial diagnosis and clinical management of both diseases in the 3 countries very often are undertaken by primary care providers. With this analysis, we want to contribute to the understanding of factors that may influence doctors' questioning and advice giving about smoking.

2. Methods

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2.1 Study design

We employed a complete factorial experimental design (with clinically authentic filmed vignettes) to estimate the influence of physician characteristics (gender and years of clinical experience), patient attributes (age, gender, race/ethnicity, socio-economic status) and the effect of the country (US, UK and Germany) on diagnostic and treatment decisions when primary care providers encounter patients that have identical signs and symptoms strongly suggestive of either coronary heart disease (CHD) or type 2 diabetes. A factorial experiment is a method to investigate the effects of two or more factors on an outcome variable [15]. Professional actors played the role of patients in the two clinical scenarios. Patients in the first video-vignette presented several symptoms that are typical for CHD, including chest pressure; pressure worsened with exertion, stress and eating; relief after resting; discomfort for more than three months; pain between the shoulder blades; and elevated blood pressure. Additionally a non-verbal cue was incorporated, demonstrated by the 'Levine fist' (clenched fist to the sternum) [16]. In the second scenario a patient presented clear signs and symptoms suggesting diabetes, including feeling sluggish with increased fatigue, weight loss for more than three months without diet or increased exercise, increased thirst, and frequent urination, particularly at night. Moreover, the patient in this vignette was moderately overweight. Both vignettes were developed with the input of experienced clinicians from each country. Each filmed encounter simulated an interview with a primary care doctor and lasted about 7 minutes, reflecting the average length of a consultation with a primary care physician (not including a physical exam).

The symptoms for each scenario were embedded in a script which was used for filming. The actors portraying American patients had American accents, whilst the patients in the UK had English accents. For the German part of the study the scripts were translated into German and then back into English to identify discrepancies between the original and the back-translated version. This forward-backward process was repeated until satisfactory agreement was attained. To ensure clinical accuracy and comparability with the other two countries the German speaker was asked to adhere to the translated script, instead of giving priority to synchrony. Care was taken to construct a culturally neutral medical practice setting for the shooting.

The vignettes were presented on DVD to primary care physicians in their own practice rooms. While the patients were all presented with exactly the same signs and symptoms, they differed in age (55 vs. 75 years in the CHD vignette, 35 vs. 65 years in the diabetes vignette), gender (male vs. female) and socio-economic status (low vs. high, depicted by their current/former occupation as a janitor/cleaner or school teacher (CHD experiment)/lawyer (diabetes experiment)). In addition, race (black vs. white) was varied in the US and the UK. As black patients in Germany are very rare, only white patients were included in the German component of the study. For similar reasons, Hispanic patients were presented in the diabetes study in the US only. One video of each of the clinical scenarios was presented to each physician.

2.2 Questionnaire

After viewing the vignettes the physicians were asked a range of questions concerning patient management by using a questionnaire with both standardized and open-ended questions. In terms of information seeking behavior, the question was whether the physicians would ask the patient any additional questions (yes/no) and if so, what kind of question(s) they would ask (open ended). As for advice giving, physicians were asked if they would recommend any lifestyle advice or change of behavior (yes/no) and if so, what kind of advice they would give (open ended). For the open-ended questions, coding frames were developed and answers were summarized into categories. For the present analyses questions and advice about smoking are considered.

2.3 Physician samples

The study was conducted in the US (Massachusetts, New Jersey, New York and Pennsylvania), in the UK (Manchester, the West Midlands, Southeast London and Surrey) and in Germany (North Rhine-Westphalia). Physicians were randomly selected from lists provided by local health care organizations. Selection was made within four strata, defined by combinations of the physicians' gender and length of clinical experience. To obtain a clear separation by level of experience only physicians with less than 5 years or more than 15 years of clinical experience were considered eligible for selection. Moreover, physicians had to be internists or family practitioners in the US and in Germany or general practitioners in the UK.

Randomly selected physicians were sent a letter of invitation. They were informed that the purpose of the study was to analyse their clinical decision making in a comparative perspective. Physicians were screened over the phone so that eligible doctors could be identified. An appointment was scheduled for the personal one hour semi-structured interview in the physician's practice. Sample sizes were determined by the factorial design, i.e. we have identical case numbers in each stratum in each country. In the CHD experiment 128 interviews were conducted in each country. In the US, 192 interviews were conducted in the diabetes experiment. The British (N=128) and German (N=64) samples were smaller in the diabetes study because not all race/ethnic categories of patients could be included in the factorial design (Black, White, and Hispanic). Due to the factorial design, 50% of the physicians in each sample were female and the samples were divided into halves according to length of clinical experience (less than 5 years vs. more than 15 years of clinical experience). The participation rates were 65% (Germany), 59.6% (UK), and 64.9% (US) in the CHD study, and 78% (Germany), 12.6% (UK) and 14.8% (US) in the diabetes study. Informed consent was signed by all participating physicians. This consent form was approved as required by the US Institutional Review Board and is conform to requirements of UK and German ethics committees. The overall study was approved by the New England Research Institutes Institutional Review Board.

2.4 Statistical analyses

Analysis of variance was used to assess the effects of physicians' and patients' attributes as well as country on doctors' questions and advice about smoking. Given the balanced factorial design, the main effects are orthogonal

to (independent of) the other design effects. Tukey's Studentized range multiple comparisons were performed to test statistical significance of differences between the three countries. Precise p-values are reported in the tables. $P < .05$ was considered to be an indication that the differences noted were statistically significant. Moreover, two-way interactions are shown when the effects are significant ($p < .05$) in at least two countries.

3. Results

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3.1 Country differences

[Table 1](#) shows significant country differences in terms of questions and advice about smoking. In the US, 57% of the primary care physicians would ask about smoking when they see a patient with symptoms of CHD, in the UK 48% and in Germany 20% of the physicians would do so ($p < .001$). Moreover, US physicians would be more likely to ask about smoking in case of signs and symptoms of type 2 diabetes ($p = .003$). Large and significant country differences are evident for the recommendation to stop smoking (US 32% vs. UK 55% vs. Germany 9%) in case of a CHD patient. Only 6% of the German physicians would offer advice about smoking when they see a patient presenting symptoms of diabetes, while 17% of the US and 27% of the UK physicians would offer such advice ($p = .007$).

Question	Country		
	US	UK	Germany
Ask about smoking (CHD)	57%	48%	20%
Ask about smoking (Diabetes)	57%	27%	6%
Advise about smoking (CHD)	32%	55%	9%
Advise about smoking (Diabetes)	17%	27%	6%

[Table 1](#)

Percentage of primary care doctors that would ask questions and give advice about smoking by country

3.2 The effect of patient attributes

[Table 2](#) shows the percentages of primary care doctors that would ask questions and give advice about smoking by patient attributes. Significantly more physicians would ask male patients with symptoms of CHD about smoking in all three countries ($p = .004$ in the US, $p < .001$ in the UK and $p = .013$ in Germany). Age differences are significant among patients with symptoms of CHD in the UK ($p = .002$) and in Germany ($p = .013$), with younger patients being asked more often about their smoking habits in both countries. Moreover, more US physicians would ask about smoking when they see a low social status ($p = .031$) and non-white CHD patient ($p = .012$). Among patients with symptoms of type 2 diabetes, US and German physicians would ask about smoking significantly more often when they see a patient with a low social status. In terms of advice about smoking US physicians would give significantly more advice to younger CHD patients ($p = .038$) and to diabetes patients with a lower social status ($p = .037$).

Patient Attribute	Country		
	US	UK	Germany
Gender (CHD)	57%	48%	20%
Age (CHD)	57%	48%	20%
Social Status (CHD)	57%	48%	20%
Race (CHD)	57%	48%	20%
Gender (Diabetes)	57%	27%	6%
Age (Diabetes)	57%	27%	6%
Social Status (Diabetes)	57%	27%	6%
Race (Diabetes)	57%	27%	6%

[Table 2](#)

Percentage of primary care doctors that would ask questions and give advice about smoking by patient attributes

3.3 The effect of physician attributes

[Table 3](#) shows the percentages of primary care doctors that would ask questions and give advice about smoking by physician attributes. Female physicians would significantly more often ask about smoking than male physicians in the UK ($p = .017$) and in Germany ($p = .013$) in case of patients presenting symptoms of CHD. Moreover, UK physicians with more experience would give less advice in case of CHD patients ($p = .013$). In terms of patients with symptoms of diabetes, no significant effects of physician attributes on questions and advice about smoking can be observed.

Physician Attribute	Country		
	US	UK	Germany
Gender (CHD)	57%	48%	20%
Experience (CHD)	57%	48%	20%
Gender (Diabetes)	57%	27%	6%
Experience (Diabetes)	57%	27%	6%

[Table 3](#)

Percentage of primary care doctors that would ask questions and give advice about smoking by physician attributes

3.4 Interaction effects

In [tables 4](#), [5](#) and [6](#) significant ($p < .05$) two-way interactions are presented. All of the significant two-way interactions which we present were observed in the CHD experiment. There is an interaction between physician's

experience and country. Country differences in questions about smoking are more pronounced among physicians who are more experienced ($p=.039$, [table 4](#)). 64% of the US physicians with more experience would ask about smoking, in Germany 16% of these physicians would do so. In contrast, country differences in advice giving are more pronounced among less experienced physicians ($p=.034$). In Germany 6% of the primary care physicians with less experience would recommend to quit smoking, in the UK 66% of these physicians would give such advice. Interactions between patient's age and physician's gender are significant regarding questions about smoking in all three countries ([table 5](#)). In Germany and the US, female physicians are more likely to ask about smoking when they see a comparatively young patient with CHD symptoms ($p=.013$, $p=.031$). In the UK, male physicians are less likely to ask about smoking in case of an old patient with CHD symptoms ($p=.006$). Finally, there are significant interactions between gender and age of the patient in the UK and in Germany ([table 6](#)). In both countries young, male CHD patients are the most likely to be asked about smoking ($p=.045$, $p=.013$).

Country	Physicians with more experience		Physicians with less experience	
	Ask	Give advice	Ask	Give advice
Germany	16	6	64	66
UK	64	66	16	6
US	64	66	16	6

[Table 4](#)

Percentage of primary care doctors that would ask questions and give advice about smoking by physician's experience and country (patients with symptoms of CHD*)

Country	Young patient		Old patient	
	Female	Male	Female	Male
Germany	13	13	13	13
UK	13	13	13	13
US	13	13	13	13

[Table 5](#)

Percentage of primary care doctors that would ask questions about smoking by patient age and physician gender in 3 countries (patients with symptoms of CHD*)

Country	Young patient		Old patient	
	Male	Female	Male	Female
Germany	13	13	13	13
UK	13	13	13	13

[Table 6](#)

Percentage of primary care doctors that would ask questions about smoking by patient gender and patient age in 2 countries* (patients with symptoms of CHD**)

4. Discussion and Conclusion

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4.1 Discussion

Although primary care doctors can be effective in helping patients to quit smoking [[1](#), [2](#)], their smoking cessation activities are marginal in many countries. This paper examined the effects of patient attributes and physician characteristics on questions and advice about smoking in primary care medical practice. Moreover, country differences in questioning and advice giving were examined. We conducted factorial experiments using clinically authentic vignettes depicting “patients” presenting symptoms suggestive of either CHD or diabetes in three countries with different health care systems (US, UK and Germany). This experimental design has been used successfully in previous studies to estimate the effects of non-medical factors on clinical decision making [[15](#), [17](#), [18](#)]. Even though the primary care physicians viewed exactly the same cases we found significant differences between the three countries. Compared to US and UK primary care physicians, German doctors are least likely to ask or give advice about smoking when they see patients presenting symptoms of CHD and diabetes. Furthermore, results indicate that country differences are moderated by physician's experience.

There are several possible explanations for the observed country differences. Characteristics of the health care systems in each country provide different financial incentives for smoking cessation counseling. In the UK, National Service Frameworks have been established by the government to enhance the quality and efficiency of health care and financial incentives have been used to reward primary care physicians for specific diagnostic and therapeutic behavior (e.g. recording smoking status and offering smoking cessation advice) [[12](#), [19](#), [20](#)]. Similar financial incentives can be found in the United States, where most of the private as well as the Medicare insurances have managed care programs which reward smoking cessation counseling. Such incentives have been shown to improve smoking cessation practices [[21](#)]. In contrast, the regular doctors' fee scale in Germany does not offer financial reward for the advice to stop smoking [[22](#)]. Such differing structures of health care financing and reimbursement are likely to influence doctors' questioning and advice giving. Country differences found in our study may also reflect variations in the content of medical education or the level of tobacco control in the three

countries. Another explanation for the country variations is the differences in the average time allocated for appointments. According to a recent comparative study, 5.5 minutes were allocated for a routine appointment in Germany compared to 9.7 minutes in the UK and 18.1 minutes in the US [23], i.e. German physicians allocate the least time for patient consultations compared with UK and especially with the US physicians. These different time restrictions might cause differences in questioning and advice giving. Thus, characteristics of the health care system may be a major explanation for the observed country differences.

In terms of patient attributes, in general, effects are clearer and more consistent in case of CHD patients than in case of diabetes patients. Female and older CHD patients are less likely than their male and younger counterparts to be asked or get advice about smoking from primary care physicians in the US, the UK and in Germany. The effect of patients' age varies depending on gender of the primary care physician in all three countries. Moreover, patients with a low social status (depicted by their current/former occupation) are more likely to be asked or get advice about smoking. Physicians' knowledge about the prevalence of smoking might be one explanation for these differences according to patient attributes. Social inequalities and age differences in smoking behavior have been found in many countries [24, 25]. However, sex differences in smoking habits have narrowed over the last years and are minor among people over the age of 60, at least in the UK [10]. Thus, primary care doctors may hold stereotypical views about what types of patients are more likely to smoke and these stereotypical views influence their smoking cessation activities.

Effects of physician attributes in general are weaker and less consistent than effects of patient attributes under study. We found that female physicians would significantly more often ask about smoking than male physicians, especially in case of patients presenting symptoms of CHD. No consistent effects of physicians' clinical experience on questioning and advice giving were observed. Results of previous studies on the association between general practitioners' characteristics and smoking cessation assistance are also inconsistent [3, 5–7]. However, comparability with our findings is limited due to differing study designs. Some methodological limitations should be considered when interpreting our findings. Whilst the experimental design assures internal validity, external validity is threatened. As the patients in the study were actors, we cannot rule out that physicians behave differently under these experimental conditions compared with real patients. Thus, it is unclear to what extent the method reflects real world behavior and results should be interpreted with caution. However, in a prospective validation study in which three methods for measuring quality of outpatient primary care (vignettes, standardized patients and chart abstraction) were compared, it was found that vignettes are a valid way to measure physician practice [26]. Several steps were taken to enhance the external validity of our study and to increase the clinical realism of the vignettes. To ensure the clinical authenticity of the filmed presentations, the scripts were co-written with and verified by experienced clinicians from each country. Experienced physicians were also present at the shooting and only professional actors were engaged. At the beginning of each interview during the fieldwork, physicians were specifically asked how typical the patient on the video vignette was, compared to patients they encounter in everyday practice. 94% of the interviewed US physicians considered the diabetes case either very typical or reasonably typical, in the UK and Germany the rate was 86%. Respective figures for the CHD vignette were 91% (US and UK) and 81% (Germany). Additionally, all physicians saw the vignettes in the context of their own practice during normal practice hours so that it was likely they encountered real patients before and after they participated in the study. Prior to the interview, all physicians were asked to respond and behave as they would do normally. Nevertheless they may have viewed the interview as a test situation producing answers that are socially acceptable. Finally, generalizability of the results may be influenced by low participation rates in some cases. These rates were 65% (Germany), 59.6% (UK), and 64.9% (US) in the CHD study, and 78% (Germany), 12.6% (UK) and 14.8% (US) in the diabetes study. Non-response must be considered a methodological limitation, especially in the latter two cases. Further analyses (not shown in detail) reveal that these rates do not vary according to physicians' gender and experience in the US, whereas in the UK, participation rates are significantly lower among female and more experienced physicians. These methodological aspects should be kept in mind when conclusions or practical implications are considered.

4.2 Conclusions

Based on our data from filmed vignettes, doctors' questioning and advice giving about smoking differed according to patient attributes and country even though all primary care physicians viewed exactly the same cases. In terms of

the effects of patient attributes, physicians' knowledge about the prevalence of smoking might be one explanation. Primary care doctors may hold stereotypical views about what types of patients are more likely to smoke and these stereotypical views influence their smoking cessation activities. With regard to the country differences, characteristics of the health care system, i.e. differences in the organization and financing of health care may be one major explanation.

4.3 Practice implications

Our findings have implications for the medical education and continued professional training of primary care doctors. It should emphasize possible adverse consequences of doctors viewing particular groups of patients as more likely to smoke, and that doctors should consider how stereotypical views influence their information seeking and advice giving strategies. The observed country differences have implications for the organization and financing of health care. Financial incentives for smoking cessation counseling as well as a reimbursement system that allows doctors to have more consultation time might improve questioning and advice giving about smoking.

Acknowledgement

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Footnotes

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Conflict of interest The authors report no conflicts of interest.

The authors confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.

References

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- [1] Stead LF, Bergson G, Lancaster T. Physician advice for smoking cessation. *Cochrane Database of Systematic Reviews*. 2008;(Issue 2) Art.No.CD000165.DOI: 10.1002/14651858.CD 000165.pub3. [[PubMed](#)]
- [2] West R, McNeill A, Raw M. Smoking cessation guidelines for health professionals: an update. *Thorax*. 2000;55:987–99. [[PMC free article](#)] [[PubMed](#)]
- [3] Twardella D, Brenner H. Lack of training as a central barrier to the promotion of smoking cessation: a survey among general practitioners in Germany. *Eur J Public Health*. 2005;15:140–5. [[PubMed](#)]
- [4] McIvor A, Kayser J, Assaad JM, Brosky G, Demarest P, Desmarais P, Hampson C, Khara M, Pathammavong R, Weinberg R. Best practice for smoking cessation interventions in primary care. *Can Respir J*. 2009;16:129–34. [[PMC free article](#)] [[PubMed](#)]
- [5] McEwen A, West R. Smoking cessation activities by general practitioners and practice nurses. *Tob Control*. 2001;10:27–32. [[PMC free article](#)] [[PubMed](#)]
- [6] Ellerbeck EF, Ahluwalia JS, Jolicoeur DG, Gladden J, Mosier MC. Direct observation of smoking cessation activities in primary care practice. *J Fam Pract*. 2001;50:688–93. [[PubMed](#)]
- [7] Pipe A, Sorensen M, Reid R. Physician smoking status, attitudes toward smoking, and cessation advice to patients: an international survey. *Patient Educ Couns*. 2009;74:118–23. [[PubMed](#)]
- [8] Young JM, Ward JE. Influence of physician and patient gender on provision of smoking cessation advice in general practice. *Tob Control*. 1998;7:360–3. [[PMC free article](#)] [[PubMed](#)]
- [9] Doescher MP, Saver BG. Physicians' advice to quit smoking. *J Fam Pract*. 2000;49:543–7. [[PubMed](#)]
- [10] Arber S, McKinlay J, Adams A, Marceau L, Link C, O'Donnell A. Influence of patient characteristics on doctors' questioning and lifestyle advice for coronary heart disease: a UK/US video experiment. *Br J Gen Pract*.

2004;54:673–8. [[PMC free article](#)] [[PubMed](#)]

[11] Schnoll RA, Rukstalis M, Wileyto EP, Shields AE. Smoking cessation treatment by primary care physicians. *Am J Prev Med.* 2006;31:233–9. [[PubMed](#)]

[12] Millett C, Gray J, Saxena S, Netuveli G, Majeed A. Impact of a pay-for-performance incentive on support for smoking cessation and on smoking prevalence among people with diabetes. *CMAJ.* 2007;176:1705–10. [[PMC free article](#)] [[PubMed](#)]

[13] Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, McQueen M, Budaj A, Pais P, Varigos J, Lisheng L, INTERHEART study investigators Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. *Lancet.* 2004;364:937–52. [[PubMed](#)]

[14] Kowall B, Rathmann W, Strassburger K, Heier M, Holle R, Thorant B, Giani G, Peters A, Meisinger C. Association of passive and active smoking with incident type 2 diabetes mellitus in the elderly population: the KORA S4/F4 cohort study. *Eur J Epidemiol.* 2010;25:393–402. [[PubMed](#)]

[15] Feldman HA, McKinlay JB, Potter DA, Freund KM, Burns RB, Moskowitz MA, Kasten LE. Nonmedical influences on medical decision making: an experimental technique using videotapes, factorial design, and survey sampling. *Health Serv Res.* 1997;32:343–66. [[PMC free article](#)] [[PubMed](#)]

[16] Marcus GM, Cohen J, Varosy PD, Vessey J, Rose E, Massie BM, Chatterie K, Waters D. The utility of gestures in patients with chest discomfort. *Am J Med.* 2007;120:83–90. [[PubMed](#)]

[17] McKinlay JB, Potter DA, Feldman HA. Non-medical influences on medical decision making. *Soc Sci Med.* 1996;42:769–76. [[PubMed](#)]

[18] Knesebeck Ovd, Gerstenberger E, Link C, Marceau L, Roland M, Campbell S, Siegrist J, de Cruppe W, McKinlay J. Differences in the diagnosis and management of type 2 diabetes in three countries (US, UK and Germany): results from a factorial experiment. *Med Care.* 2010;48:321–6. [[PMC free article](#)] [[PubMed](#)]

[19] Campbell SM, Reeves D, Kontopantelis E, Middleton E, Sibbald B, Roland M. Quality of primary care in England with the introduction of pay for performance. *New Eng J Med.* 2007;357:181–90. [[PubMed](#)]

[20] Coleman T, Lewis S, Hubbard R, Smith C. Impact of contractual financial incentives on the ascertainment and management of smoking in primary care. *Addiction.* 2007;102:803–8. [[PubMed](#)]

[21] Roski J, Jeddloh R, An L, Lando H, Hannan P, Hall C, Zhu SH. The impact of financial incentives and a patient registry on preventive care quality: increasing provider adherence to evidence-based smoking cessation practice guidelines. *Prev Med.* 2003;36:291–9. [[PubMed](#)]

[22] Arztgruppen EBM. [Physicians' valuation standards] Hausarzt. KBV; Berlin: 2006. Kassenaerztliche Bundesvereinigung.

[23] Konrad TR, Link CL, Shackelton RJ, Marceau L, Knesebeck Ovd, Siegrist J, Arber S, Adams A, McKinlay JB. It's about time: physicians' perceptions of time constraints in primary care medical practice in three national healthcare systems. *Med Care.* 2010;48:95–100. [[PMC free article](#)] [[PubMed](#)]

[24] Mackenbach J. An independent expert report commissioned by the UK presidency of the EU. Department of Health; London: 2006. Health inequalities: Europe in profile.

[25] Boersch-Supan A, Brugiavini A, Juerges H, Kapteyn A, Mackenbach J, Siegrist J, Weber G. Starting the Longitudinal Dimension. Mannheim Research Institute for Economics of Aging; Mannheim: 2008. Health, Ageing and Retirement in Europe (2004–2007)

[26] Peabody JW, Luck J, Glassman P, Dresselhaus TR, Lee M. Comparisons of vignettes, standardized patients, and chart abstraction. A prospective validation study of 3 methods for measuring quality. *JAMA.* 2000;283:1715–1722. [[PubMed](#)]