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Rural, Suburban, and Urban Differences in Factors That Impact Physician Adherence to Clinical Preventive Service Guidelines

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Abstract

Purpose—Rural-urban disparities in provision of preventive services exist, but there is sparse research on how rural, suburban, or urban differences impact physician adherence to clinical preventive service guidelines. We aimed to identify factors that may cause differences in adherence to preventive service guidelines among rural, suburban, and urban primary care physicians.

Methods—This qualitative study involved in-depth semi-structured interviews with 29 purposively sampled primary care physicians (10 rural, 10 suburban, 9 urban) in Missouri. Physicians were asked to describe barriers and facilitators to clinical preventive service guideline adherence. Using techniques from grounded theory analysis, 2 coders first independently conducted content analysis then reconciled differences in coding to ensure agreement on intended meaning of transcripts.

Findings—Patient epidemiologic differences, distance to health care services, and care coordination were reported as prominent factors that produced differences in preventive service guideline adherence among rural, suburban, and urban physicians. Epidemiologic differences impacted all physicians, but rural physicians highlighted the importance of occupational risk factors in their patients. Greater distance to health care services reduced visit frequency and was a prominent barrier for rural physicians. Care coordination among health care providers was

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problematic for suburban and urban physicians. Patient resistance to medical care and inadequate access to resources and specialists were identified as barriers by some rural physicians.

Conclusions—The rural, suburban, or urban context impacts whether a physician will adhere to clinical preventive service guidelines. Efforts to increase guideline adherence should consider the barriers and facilitators unique to rural, suburban, or urban areas.

Keywords

guideline adherence; health disparities; preventive health services; rural

In response to growing emphasis on disease prevention, the United States Preventive Services Task Force was created in 1984 to develop evidence-based recommendations for preventive services in primary care settings.[1] Other organizations (eg, American Cancer Society, American Congress of Obstetricians and Gynecologists) also subsequently published clinical preventive services guidelines. Despite the potential for cost savings and improved outcomes, preventive services guideline adherence remains low with disparities across rural, suburban, and urban populations.[2-6]

Studies of guideline adherence and preventive services delivery have used multiple frameworks to classify and compare barriers to adherence.[7] Cabana et al focused on physician adherence and organized barriers into factors that impact the sequence of behavior change from knowledge to attitudes to behavior.[8] In this framework, guideline adherence begins with knowledge of guidelines. Even if knowledge is present, physician attitude may be another barrier to adherence. Attitudes associated with low guideline adherence include disagreement with guidelines, resistance to behavior change, low self-efficacy, and low outcome expectancy.[8-12] Despite adequate knowledge and appropriate attitude, physicians are often still unable to deliver adequate levels of preventive services. Contextual factors that create this gap between intentions and behavior include patient-specific traits, guideline factors, and environmental factors including time, resources, organizational constraints, reimbursement level, and medical legal issues.[5,13-16] Studies focusing on primary care physicians (PCPs) have expanded upon Cabana et al's framework.[17,18]

To address barriers to guideline adherence, numerous interventions have been suggested.[19-24] Nevertheless, current barriers remain nearly identical to those identified almost 2 decades ago,[25] leading some authors to suggest that current strategies may be poorly generalizable to diverse care settings. To be successful, strategies instead may need to be tailored to local needs.[12,26,27]

In particular, the impact of rural-suburban-urban context is seldom addressed in guideline adherence intervention studies, even though rural populations are less likely to receive preventive services.[28-35] Most often, studies have focused only on rural or urban populations.[36-39] Studies that included both rural and urban populations did not explicitly compare the 2 groups.[40,41] This qualitative study aimed to compare and contrast factors that affect physician adoption of clinical preventive services guidelines in rural, suburban, and urban outpatient settings. With this information, we suggest guideline development and adherence strategies that consider the unique barriers in each setting.

Methods

Physician Sample and Recruitment

We conducted semi-structured interviews with 29 PCPs (10 rural, 10 suburban, and 9 urban) in Missouri near the St. Louis metropolitan area. Physicians were purposively sampled to ensure adequate representation from 3 groups: rural, suburban, and urban settings. The location of a physician's primary clinic determined his or her rural, suburban, or urban designation. Rural clinics were those eligible for federal rural health grants from the Human Resources and Services Administration. Clinics located in St. Louis City were defined as urban; clinics located in St. Louis County were defined as suburban. A physician was eligible if he/she was: currently practicing as a PCP; board certified in family or internal medicine; and spent ≥ 50% of his/her time as a clinician in either a rural, suburban, or urban clinic. Between August 2011 and January 2012, we mailed recruitment letters to 332 physicians whose postal address was available via public sources. All initial contact consisted of a letter inviting participation and notifying physicians that the study would focus on adherence to clinical preventive services guidelines. Physicians for whom correct contact information was available received up to 2 follow-up phone calls and/or faxes within 1 month of recruitment letter mailings. Personal contacts of the study team were also used to contact 11 physicians and 14 administrators at hospitals or local health departments who were asked to refer any interested physicians. Follow-up occurred with 155 physicians to reach approximately 10 physicians per group, a number estimated to be sufficient to reach data saturation.[42] We believe that saturation was reached in the urban and suburban groups, as the last 2-3 interviews in each group did not contribute novel insights or themes. Saturation may not have been reached among rural physicians, but time limitations prohibited additional sampling to ensure complete saturation in the rural group. Each of the 29 participating physicians was offered a $50 gift card as compensation.

Physician Semi-structured Interview and Procedure

A medical student (EK), who was trained by a qualitative research expert at the sponsoring institution, conducted interviews from September 2011 to March 2012 and collected field notes. All interviews were one-on-one and completed in-person (at the physician's clinic, home, or local restaurant) except for one rural physician interview conducted over the phone due to logistical difficulties. A 12-question interview (available online) that ranged in duration from 30 to 85 minutes (mean interview length = 60 minutes) was developed based on a literature review.[8,9,25] Questions were designed to elicit information about use of preventive services guidelines, barriers and facilitators to adherence, adaptations made to deliver preventive services based on rural-suburban-urban context, and potential solutions to increase adherence. To ensure consideration of the full range of preventive services, barriers and facilitators to guideline adherence were explicitly elicited for 3 particularly cost-effective preventive services that require different actions from PCPs: colorectal cancer screening, aspirin prophylaxis, and tobacco screening and counseling.[4] Follow-up probes were used to obtain more complete responses to primary questions. The interview guide was reviewed with a core planning team (including 3 physicians) and pilot-tested with a physician. Demographic characteristics of physicians and self-assessment of guideline knowledge, attitude, and adherence on a 10-point Likert scale (10 being the highest) were

collected. This study was reviewed and approved by the sponsoring institution's Institutional Review Board.

Analysis

All interviews were audio recorded and transcribed verbatim. Transcriptions were imported into NVivo 9.0 (QSR International Pty Ltd, Doncaster, Victoria, Australia). Based on the semi-structured nature of the interview, some themes were identified in advance by 2 reviewers (WG and EK) who had been trained by qualitative research experts. In line with the principles of grounded theory analysis, where categories are identified as they emerge from the data, additional codes were added to the coding tree after review of the transcripts.[43] Using this coding tree, the 2 reviewers independently coded 1 transcript from each of the 3 groups. After coding each transcript, the reviewers met to discuss the addition or deletion of codes. This process was repeated for another set of 3 transcripts (1 from each group) until the reviewers felt the coding tree captured all the important themes. Using this coding tree, the 2 reviewers independently coded all transcripts, including those coded prior to finalization of the coding tree, and met to reconcile disagreements to reach agreement on a final coded version of each transcript. Agreement between the 2 reviewers prior to reconciliation was calculated for a subset of transcripts using Cohen's kappa and crude agreement (kappa = 0.684; crude agreement = 87.9%). After identification of themes, a summary of the findings was provided to all participants for participant checking and validation of findings.[44] After considering the interview findings and participant feedback, findings were classified as major or minor themes. Findings that resonated with all participants and were uniformly identified by the majority of physicians were designated as major themes. Minor themes were findings that found less resonance with all participants, but they were reported with considerable conviction by 3 or more physicians. Descriptive statistics were used to report demographic characteristics (sex, age, medical degree, board certification, and type of practice: solo, group, or salaried) and self-reported clinical preventive services guideline knowledge, attitude, or adherence of the participants.

Results

Study Participants

Demographic characteristics varied among the 3 groups (Table 1). Rural physicians were more likely to have a Doctor of Osteopathic Medicine (DO) degree or be certified in family medicine. Suburban physicians were more likely to be >50 years old, and most female and salaried physicians practiced in urban clinics. Self-reported knowledge of guidelines, attitude towards guidelines, and delivery of services as recommended by guidelines were comparable among all 3 groups of physicians (Table 2).

Factors That Impact Physician Adherence

Numerous factors were found to impact physician adherence. As in the Cabana et al framework, factors were organized according to their impact on physician knowledge, attitudes, and/or behaviors [8] (Table 3). Factors were classified as cross-cutting if they directly affected more than one category of knowledge, attitudes, or behaviors. In Table 3,

within the knowledge, attitude, behavior, and cross-cutting categories, factors were organized from highest frequency to lowest frequency.

Participants often described factors both as barriers and facilitators. For example, the same physician could have a positive opinion about one guideline developer, thus encouraging adherence, but have a negative opinion about another guideline developer, which would discourage adherence to that specific set of guidelines. Aside from 2 factors (misperception of adherence and patient dishonesty) that were discussed only as barriers, the factors in Table 3 are presented in neutral terms to reflect this barrier-facilitator duality.

As Table 3 shows, every factor was discussed by at least 1 physician in all 3 settings. There was substantial agreement about most factors, with a majority reported by >80% of physicians. Specifically, every participant endorsed guideline knowledge, agreement with a specific guideline, outcome expectancy, and patient factors as important determinants of adherence to preventive services guidelines. Furthermore, most factors were reported in all 3 settings at similar frequencies. The greatest range in reporting frequency was seen for whether resources or residency affected adherence. All 10 rural physicians but only 5 suburban physicians noted that either greater resource availability fostered guideline adherence or fewer resources inhibited guideline adherence. Similarly, 7 rural physicians but only 2 suburban physicians discussed how habits formed during residency training impacted adherence.

Differences Among Rural, Suburban, and Urban Participants

Despite similarities among groups, meaningful differences were identified. These differences are not reflected in the number of physicians that endorse these factors, but instead arise from qualitative differences in how a factor impacted physician adherence. Focusing on the qualitative differences in how factors affect physician decision-making in different settings allowed us to identify and recommend strategies for improvement that might not have been identified through quantitative analysis. Most of these identified differences affect the latter stages (physician attitude and behavior) of the knowledge-attitude-behavior sequence of change.

This study identified 3 major differences. For these factors, a majority of physicians described differences in how the factor affects their adherence to guidelines. Epidemiological differences (eg, patient demographic characteristics, disease prevalence) in an area resulted in different practice patterns among the 3 groups of physicians. Increased distance from health care access resulting in reduced frequency of physician visits strongly inhibited only rural physicians from adhering to guidelines. Difficulty in coordinating care across multiple health care systems and health care providers was a substantial barrier to guideline adherence noted by urban and suburban physicians.

In addition, 2 minor differences, or factors whose different effects were clearly described by a substantial minority of physicians, were identified. Rural physicians were most likely to note patient resistance to any type of medical or preventive care as a barrier to guideline adherence. Furthermore, rural physicians had greatest difficulty accessing resources to

provide care, especially mental and behavioral health services, that they felt to be outside their area of comfort.

Major Differences

Descriptive Epidemiology—As a cross-cutting factor, descriptive epidemiology impacts both physician knowledge and attitude. Due to demographic differences across the 3 settings, physician knowledge of specific guidelines varied. Physicians were most familiar with guidelines relevant to their typical patient. In response to a question asking the physician to identify guidelines that were difficult to adhere to, an urban physician stated:

> Osteoporosis screening…I would say that I'm probably not the greatest at recommending that because I'm typically seeing a younger population.

Epidemiology and local context also impact physician attitude by altering assessment of a guideline's value or applicability. When asked to identify preventive services most often emphasized and delivered, an urban physician reported:

> Even though it's not recommended I check everybody here for hepatitis C and diabetes because it's so common…I just see it all the time.

One prominent epidemiologic difference is that occupational risk is greater for rural residents than suburban and urban patients. In rural areas, counseling for prevention of unintentional injury, skin cancer screening, or other occupation-related preventive services may be prioritized or delivered more often than recommended. When asked how her preventive medicine practices had been adapted to a rural setting, a rural physician noted:

> Accident prevention [is more important] because farming is the number one cause of accidental deaths in the United States occupationally.

Visit Frequency Due to Distance Barriers—Travel distance was a barrier to patient adherence noted by nearly every rural physician. Rural patients were seen as less likely to visit their physicians and to return for preventive care. A rural physician who was asked to identify barriers to delivery of preventive services stated:

> Being in a rural location and for people to come to the doctor can be a big problem as far as like location, and being far away from physicians.

Another rural physician reported a similar sentiment in response to a question about adapting provision of preventive services in a rural setting:

> Transportation is a real problem, which is another barrier to access to care, whether it be preventative or acute care.

Care Coordination—Coordinating and tracking care received by a patient was much more difficult in urban and suburban settings. Uncertainty about when a recurring service had been most recently delivered negatively impacted physician adherence. An urban physician explained how practicing in his location had impacted preventive medicine practices:

> It's more difficult to find out if people have been screened or get records from other physicians because it's an urban center… you've got multiple competing health care systems … people with multiple medical problems have multiple doctors in multiple systems, and it falls on me, the primary care doctor, to be the repository of health maintenance stuff.

Minor Differences

Patient Willingness to Receive Any Medical Care—Physicians reported that patient willingness is one of the most important factors impacting delivery of care. In some rural areas, patients resist all medical care and/or preventive services. To explain his low adherence to guidelines, one rural physician noted:

> I've got a lot of people who are not in tune to getting medical care, or don't believe a lot in medicine in general.

While some urban physicians reported resistance, it was specific to a service or due to cost or time and different from the general resistance rural physicians encountered. Suburban physicians generally reported the lowest patient resistance to preventive services.

Resources

Referred Services: All physicians noted that underinsured, low-income patients face difficulties accessing referred services that are beyond the scope of the PCP. In rural areas, these access issues are not limited to low-income patients. For certain services, notably follow-up care for mental health disorders, there are gaps in resources for all patients. These gaps may make rural physicians less likely to provide recommended services. When asked to identify guidelines that were difficult to adhere to, a rural physician stated:

> Do we really have the staff to assist with depression care supports in place? In rural areas? No. And that is definitely an access issue. We don't have access to good psychiatric and psychology resources in rural areas.

Access to Specialists: Some rural physicians reported inadequate access to some specialists, thereby inhibiting the PCP from more aggressively providing preventive services such as mental health or substance use screening, which may require follow-up care. One rural physician reported this as a barrier to guideline adherence:

> That's kind of a rural kind of thing where people just feel like they don't have as many options… or maybe the people that are here aren't people who have a good reputation.

Discussion

In agreement with previous literature, this study identified many factors that influenced all physicians regardless of the rural, suburban, or urban context.[7,8,17] By focusing on adherence to preventive services, this study also identified adherence factors that were more specific to the delivery of preventive services. For example, the impact of visit type

(wellness check vs acute vs chronic disease management) on physician guideline adherence has not often been discussed in guideline adherence literature.

In addition, this study suggests some opportunities to improve adherence by conceptualizing guideline adherence factors as both barriers and facilitators. Guideline adherence literature often focuses on barriers, but this fails to recognize the opportunities inherent in modifying barriers to become facilitators. Incentivizing physicians to adhere to a certain guideline can be a barrier or facilitator depending on whether the incentive structure aligns with guidelines.

Furthermore, while the guideline adherence factors identified in this study impacted all physicians, several key factors were meaningfully different across rural, suburban, and urban contexts. These included epidemiologic differences of the patient population, care coordination, the importance of distance, patient attitudes towards health care, and access to resources and specialty care. Although all these factors have been previously identified,[39,45-54] this study highlights their importance in contributing to differences among guideline adherence in rural, suburban, and urban areas. For example, while epidemiologic differences impacted all physicians, consideration of occupational risk factors had a particularly large impact on guideline adherence among rural physicians. Care coordination had the largest impact on suburban and urban physicians practicing in areas with multiple health care systems. Distance to health care access, patient resistance, and access to resources and specialty care remain important barriers that lower adherence in rural settings despite efforts to address these factors.

Implications

Health care stakeholders, including guideline developers, payers, providers, and policy makers may be able to consider setting-specific factors to improve guideline adherence. In their efforts, groups should be sure to consider the barrier-facilitator duality of factors to increase adherence.

The uniform agreement on the impact of descriptive patient epidemiology on guideline adherence suggests that guideline developers need to consider these differences in the development of their guidelines. Although some guidelines (eg, sexually transmitted disease screenings[55]) provide risk information for determining guideline applicability, guideline developers could expand risk information to explicitly consider differences between populations. In particular, background risks, such as occupational exposures, should be considered. Complexity is also a barrier to guideline adherence[56] ; therefore strategies will be needed to ensure that complex guidelines, which consider patient population differences, are practical to use. One approach would be to develop guidelines that an electronic medical record (EMR) can navigate to find a succinct statement that is relevant and practical for the patient and setting.[57] Guidelines that neglect epidemiologic differences may cause resource misallocation, low guideline adherence, or both.[58,59]

Policy makers should continue to seek new ways to address guideline adherence. One factor contributing to difficulties coordinating care is that the current medical record infrastructure is not conducive to information sharing among different paper and EMR systems.[60]

"Meaningful use" of EMR could involve electronic infrastructure that facilitates care coordination. Furthermore, policies to increase the supply of physicians in specialty fields, such as psychiatry, in rural areas may help with addressing difficulties accessing specialty care. Strategies that have successfully increased physician supply in underserved areas include scholarships, loan forgiveness, and government recruitment programs, such as the National Health Service Corps and the Southern Rural Access Program.[61-63] Creating programs aimed at increasing the supply of certain health care workers, such as mental health providers, may be worth considering.

Suburban and urban health care systems and providers can take action to address difficulties in care coordination. As care becomes increasingly specialized, this may become a larger concern. Physicians should be cognizant of their obligation to share information with other providers. Furthermore, as EMR changes are implemented to adhere to "meaningful use" legislative requirements, health care systems that provide care in the same region should ensure that medical record information can be easily shared among all health care providers. The Indiana Health Information Exchange and other Beacon Community programs are models of how information sharing can be achieved in a metropolis.[64-66]

Rural health care systems and providers play an important role in increasing guideline adherence in rural areas. To decrease distance barriers, health care systems and providers could increase services provided on-site (including mental health, substance abuse, and diet counseling) so that physicians can provide services immediately, taking advantage of patients' infrequent visits.[67-69] For services difficult to provide in every primary care setting, such as a colonoscopy, mammogram, or abdominal aortic aneurysm screening, health care systems could work with local health departments to centralize the location of these services so that patients need only visit one location to receive all additional preventive services. In this study, rural physicians who worked in larger organizations were less likely to report difficulties accessing quality specialty care, suggesting larger physician organizations increase access to quality specialists and services.

Health care payers can take several actions to improve preventive services guideline adherence in rural areas. Payers can decrease the impact of distance by subsidizing or providing transportation for non-emergency visits. Investment in this type of service can improve patient health. Moreover, research has shown that carefully designed transportation programs to acquire preventive services most supported by evidence can be cost-effective and cost-saving in some settings.[70] Payers can also improve the supply of and access to resources for mental health, substance abuse, and obesity counseling services by increasing reimbursement for these services.[71] Another option is expanding reimbursement for services effectively delivered via telemedicine, such as telephone-based cognitive behavioral therapy, which are reimbursed infrequently at present.[72]

Strengths and Limitations

This study has several strengths that increase the credibility and value of the findings. The results agree with previous literature on several of the topics covered; participant checking confirms that results are consistent with participants' experiences. Furthermore, there was an explicit focus on reasons for differences in physician adherence to preventive services

guidelines among rural, urban, and suburban settings; this focus has infrequently been present in previous studies on preventive services guidelines. Lastly, by focusing on both barriers and facilitators to guideline adherence, this study more fully explores how differences manifest.

There are also several limitations in this study. Study participants are from one region of one state, so generalizability is uncertain, although concordance with previous literature is reassuring. The participants are also a self-selected group who agreed to discuss guideline adherence. Participants may have reported socially desirable answers, although admissions of non-adherence suggest some transparency. In some cases, it was difficult to ascertain how much factors that impacted patient adherence (eg, cost, convenience, distance) also affected physician adherence. Furthermore, the rural, suburban, and urban definitions used in this study could be further refined; greater diversity among rural participants may explain why complete saturation was not reached in the rural group.[73-75] Despite these limitations, the authors believe the identified differences are worthy of further exploration.

Conclusion

This study identified barriers and facilitators that impact physician adherence to preventive services guidelines. As suggested by the Cabana et al framework, these factors impact physician knowledge, attitudes, and behaviors. Differences that cause rural-urban disparities in physician adherence to preventive services guidelines manifest primarily in physician attitude and behavior.

Most of these differences suggest solutions that should be explored by guideline developers, health care systems, health care providers, and policy makers. Future studies should attempt to further understand and quantify the impact of the identified differences. Furthermore, researchers should explore the effectiveness (beyond efficacy) and implementation of strategies to address rural-urban differences.

Future research should continue to refine and tailor guideline adherence strategies and studies to specific settings. It may be necessary to adapt guidelines for each local setting.[26] This should be done while also considering general contextual factors that may impact adherence (eg, rural-urban context, solo vs group vs salaried clinic structure). Potential tools for assessing local barriers and facilitators (eg, Barrier Identification and Mitigation Tool) currently exist and should continue to be developed and used.[76,77] As medicine becomes increasingly individualized to improve patient outcomes, health care service delivery may also need to become increasingly localized.

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Table 1
Demographic Characteristics of Study Participants

	Rural (n=10)	Suburban (n=10)	Urban (n=9)
Women	2	2	5
Age (≥ 50 years)	4	7	1
DO Degree[a]	4	1	0
Family Medicine Certified	8	1	4
Practice: Solo, Group, Salaried	1, 8, 1	2, 8, 0	0, 3, 6

[a]DO: Doctor of Osteopathic Medicine

Table 2

Median Self-reported Clinical Preventive Service Guideline Knowledge, Attitude, and Adherence Among Study Participants[a]

	Rural (n=10)	Suburban (n=10)	Urban (n=9)
Knowledge	6.75	7.75	7.0
Attitude	8.0	8.5	9.0
Adherence	8.0	8.75	7.0

[a]Based on a 10-point Likert scale with 10 = highest knowledge, most positive attitude, and complete adherence to guidelines.

Table 3
Factors That Affect Physician Adherence to Preventive Service Guidelines

Factor	Number of Participants Reporting Each Factor		
	Rural (n=10)	Suburban (n=10)	Urban (n=9)
Knowledge			
Familiarity and awareness	10	10	9
Attitude			
Agreement with specific guidelines	10	10	9
Cost-benefit analysis	9	10	8
Physician clinical and personal experiences[c]	8	6	7
Evidence interpretation	6	8	5
Opinion on guideline developer	6	4	6
Societal priorities and norms[c]	5	6	3
Patient applicability	3	2	1
Outcome expectancy	10	10	9
Anticipated patient adherence[c]	10	10	9
Physician persistence	10	7	9
Motivation or inertia of previous practice	9	10	9
Habit or routine	8	10	9
Desire and ability to adapt[c]	8	7	8
Self-efficacy	6	4	7
Agreement with guidelines in general	5	3	2
Misperception about adherence[c,d]	5	3	5
Behavior			
Patient factors	10	10	9
Patient willingness	10	10	8
Visit frequency[c]	10	9	9
Patient knowledge[c]	10	7	8
Patient health status[c]	9	8	9
Patient-physician relationship[c]	8	7	4
Patient dishonesty[c,d]	2	3	2
Environmental factors			
Time	10	9	9
Workload division[c]	3	3	3
Work flow: reliability and efficiency[c]	10	9	9
Visit type[c]	10	9	9
Resources: in-house and external	10	5	8
Data: management and access[c]	8	8	9
Reimbursement or payment	8	5	5
Care coordination[c]	5	8	6

Factor	Number of Participants Reporting Each Factor		
	Rural (n=10)	Suburban (n=10)	Urban (n=9)
Medical legal	4	3	2
Peer pressure[a]	3	5	2
Guideline factors	7	7	9
Guideline complexity[b]	6	5	8
Agreement between guideline developers	4	7	8
Cross-cutting			
Descriptive epidemiology[c]	10	7	8
Performance feedback and public reporting[c]	7	7	5
Residency and training[c]	7	2	4
Media and information campaigns[c]	3	3	5

[a] Factors are classified according to the framework created by Cabana et al[8] with additional sub-categories from Espeland,[17]

[b] Lugtenberg,[18]

[c] and this study.

[d] Factors were discussed as both barriers and facilitators except for misperception of adherence and patient dishonesty, which were discussed only as barriers.