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Shortage of doctors in rural areas – measures to increase the number of doctors in Germany

Ivonne Honekamp

Professor of Management in the Healthcare Sector, Hochschule Stralsund, Ivonne.honekamp@hochschule-stralsund.de

Jannika Baumert

M.Sc. Gesundheitsökonomie, Hochschule Stralsund, jannika.baumert@gmail.com

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Abstract:

Despite an increasing number of physicians, the demand for medical care cannot be met in some regions of Germany. Therefore, this paper deals with the question which measures are taken to create incentives for contract physicians to settle in rural regions. The aim is to identify the measures that are being implemented at the level of the 17 associations of statutory health insurance physicians with the potential to counteract a shortage of physicians.

The measures were identified using the scoping review method. Measures were included that target medical students, physicians in further training, and physicians in contract medical care and that are implemented in the districts of the 17 associations of panel physicians in order to increase the attractiveness of the medical profession in rural regions. Also, all types of literature were included.

The review showed that for medical students and physicians in all regions predominantly financial, but also non-financial measures are offered. Most of the measures were identified in regions with imminent and already existing undersupply. It has also been shown that the measures address almost all of the physicians' wishes. Less attention is paid to the infrastructural wishes of the physicians, as well as childcare offers and job opportunities for the partner. Nevertheless, a shortage of physicians can still be observed and many measures show their effect only very late.

Measures to counteract a shortage of physicians are still necessary. Short-term measures should also be planned in order to achieve a more rapid effect. Since infrastructural wishes of physicians are less taken into account in the measures, it makes sense to introduce further measures here as well in order to promote the attractiveness of rural regions.

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1 Introduction

"Concern about physician shortage grows" (Ärzte Zeitung, 2019). The topic of physician shortage has accompanied the health care system for many years, although the term is controversial. With a look at the statistics of the German Medical Association (BÄK), it can be seen that the number of physicians is increasing annually (BÄK, 2020). Nevertheless, there is often talk of a shortage of physicians (BÄK, 2019).

The German Medical Association justifies the shortage of physicians by demographic change and an associated increase in the need for care. According to the German Medical Association, the increasing number of physicians is not sufficient to meet the demand for treatment (BÄK, 2019). The GKV-Spitzenverband (top association of the German Statutory Health Insurance), on the other hand, reports an uneven distribution of physicians within Germany. The number of physicians is increasing in the specialist area in urban regions. In contrast, undersupply can be observed in some rural regions (GKV Spitzenverband, 2021). A look into the future does not indicate any improvement. Instead, the demand for physicians is expected to rise. For the year 2030, the German Association of Statutory Health Insurance Physicians (KVB) assumes a decrease of about 4,800 physicians in outpatient care (KBV, 2016, p. 10). It is clear that action must be taken to counteract an emerging underprovision and to enable an equal provision of care.

The planning and implementation of measures to attract general practitioners and specialists in rural regions takes place at various levels, such as the federal states, the state and regional levels (KBV, 2021a). As early as 2011, measures were taken at the federal level as part of the GKV-Versorgungsstrukturgesetz (GKV-VStG / German Health Insurance Supply Structure Act) to be able to "ensure good and comprehensive care for the future" (BMG, 2015). With the enactment of the GKV-Versorgungsstärkungsgesetz (GKV-VSG / German Health Insurance Supply Strengthening Act) in July 2015, further measures were taken to ensure care (BMG, 2017).

Research question and objektive

Radaélli et al. (2020) identified factors speaking for or against settling down in rural areas from the perspective of prospective and already working physicians. Another study by Bien et al. (2019) examines students' attitudes and expectations toward becoming physicians. To date, however, there does not exist a summary of measures used to address undersupply in contract physician care in Germany. Current work in this area only refers to individual regions or specialist areas, such as primary care.

For this reason, the following work deals with the question of which measures are taken to create incentives for registered physicians to settle in rural regions. The aim is to conduct a scoping review to identify measures at the regional level of the 17 associations of Statutory Health Insurance Physicians (Kassenärztliche Vereinigungen - KVs) with the potential to counteract a shortage of physicians. The task

of the Associations of Statutory Health Insurance Physicians is to guarantee smoothly functioning outpatient medical care. They ensure that every patient can be treated by a registered physician or psychotherapist of his or her choice close to home and at a high level of quality - regardless of which statutory health insurance fund he or she is insured with. The Kassenärztliche Bundesvereinigung (KBV) is the umbrella organization at the federal level of the 17 regional associations.

In addition, it is to be analyzed to what extent the identified measures take into account the wishes of physicians with regard to their professional life and which measures thus have the potential to counteract a shortage of physicians. Therefore, the reasons for the physician shortage and the physicians' wishes are first discussed in more detail below. This is followed by a description of the methodology and the presentation of the results. Finally, the results are discussed, and a conclusion is drawn.

2 Reasons for the shortage of doctors

The shortage of physicians cannot be attributed to just one cause; rather, various factors contribute to it. The main factors include demographic change and infrastructural causes, but personal interests can also contribute. Individual factors are described in more detail below.

Demographic change means that not only is the population getting older and the need for care is increasing due to the rise in chronic diseases in old age (KBV, 2019a, p. 9). Working physicians are also getting older, so that over time they will reach retirement age and need to backfill their practices (KBV, 2019a, p. 11). This is offset by a lower birth rate (RKI, 2015, p. 439).

Furthermore, it is apparent that interest in establishing a practice in rural regions in particular is weaker (KBV, 2021d). Long commuting times and poor infrastructure have been shown to have a negative impact on interest in establishing a practice in a rural region (Groth, et al., 2019, pp. 510-514). Schools, kindergartens, and shopping facilities are not always located in the immediate vicinity in rural regions. Residents are usually dependent on a car, as local transport services such as bus and rail connections are limited (BMEL, 2020, p. 22). In general, education, higher education and training opportunities, as well as cultural and leisure activities, are less available in rural regions than in urban regions (BMEL, 2020, p. 26).

Western and southern German states and city-states are considered particularly attractive, as are urban regions (KBV, 2019a, pp. 69-71). These also include medium-sized cities and large towns (KBV, 2019a, p. 83). Less attractive, on the other hand, are the eastern German states and rural regions (KBV, 2019a, pp. 69-71), including small rural communities (KBV, 2019a, p. 83). However, the choice of location also

tends to fall on proximity to home as well as to the universities attended (KBV, 2019a, pp. 69-71).

The following diagram depicts the attractiveness of the individual federal states from the perspective of students, based on a survey conducted as part of the KBV's Berufsmonitoring (2019a).

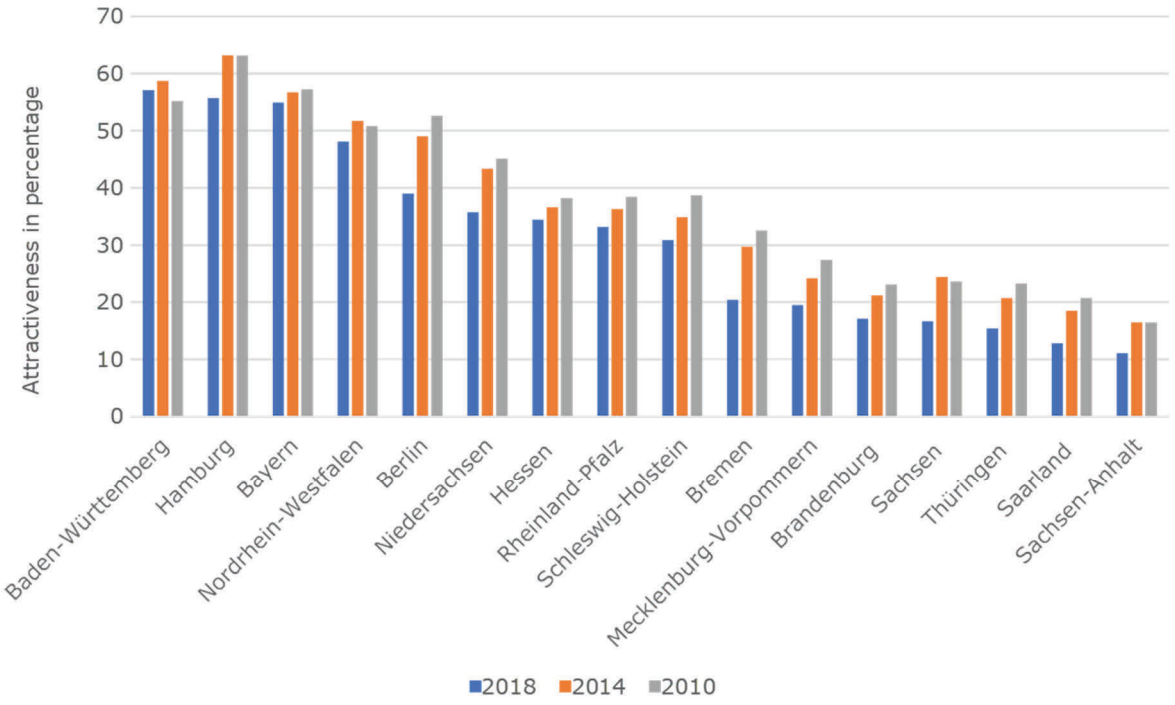

Figure 1: Attractiveness of the Federal States of Germany in Percentage
(Own representation based on KBV, 2019a, S. 72)

Figure 1 indicates that eastern German states in particular are rated as less attractive. In addition to demographic and infrastructural reasons, the financial factor also plays a role. High investment costs reduce interest in setting up a practice (KVN, 2020). In an analysis by the Deutsche Apotheker- und Ärztebank (German Pharmacists' and Doctors' Bank) and the Zentralinstitut (Zi), an average value of 159,700 euros was determined for a practice takeover. In addition to the purchase price, all equipment and modernization costs were also included. These average out at 57,000 euros. Compared with the past six years, an upward trend can be seen. In 2015, for example, the cost of a takeover including further investment costs was 25,000 euros below the current price. However, it should be noted that these are average values and there can already be strong fluctuations between the specialist groups as well as the practice location (Deutsche Apotheker- und Ärztebank, 2018).

It can also be observed that the field of general medicine is becoming more attractive for women as well as for parents during further training (van den Bussche, et al., 2016, p. 314). A reason for the increasing interest in working in general medicine

compared to working in the hospital setting might result from a higher degree of self-determination with regard to the hours worked (van den Bussche, et al., 2016, p. 317 f.). Nevertheless, the subsequent interest in further training in the field of general medicine, especially further training for becoming a family physician, is not sufficient to meet the need for re-staffing (KBV, 2019a, p. 38). Residency training in internal medicine was at the very top in 2018 (KBV, 2019a, p. 40). However, there are differences depending on gender. Women are predominantly interested in the fields of general medicine, gynecology, obstetrics, pediatrics and adolescent medicine, psychosomatic medicine and psychotherapy. Men, on the other hand, are predominantly interested in the fields of anesthesiology, surgery, internal medicine, radiology, orthopedics, trauma surgery, and urology (KBV, 2019a, p. 42 f.). A loss of attractiveness in the course of training in the field of surgery was already observed in the occupational monitoring of 2010 and 2014. The reasons for this are not a lack of interest, but rather because of poor working conditions and an occupation traditionally practiced by men, which makes it more difficult for women to join the field, than a lack of interest. Likewise, it appears to be a less family-friendly environment (KBV, 2019a, p. 47 f.).

It has also been shown that the general interest in setting up a practice decreases during studies (KBV, 2019a, p. 54 f.). At the same time, physicians are showing increasing interest in a part-time work model and in working as salaried employees (KBV, 2021b). Particularly among women, an increased interest in a salaried employment relationship and in working as a family doctor could be observed (van den Bussche, et al., 2016, pp. 314-317). Different forms of cooperations such as medical care centers or group practices are gain popularity (KBV, 2019a, p. 57). This development, away from full-time working and a branch office in the form of a single practice, toward new and more flexible working models has the consequence that medical services are offered at fewer locations and due to shorter working hours, more physicians are needed to meet the demand (KBV, 2021a).

The establishment of a doctor's practice is perceived as negative due to the bureaucratic effort (KBV, 2019a, p. 98). The KBV regularly publishes information on the bureaucracy index. In this context, the time expenditure is considered, which arises due to the information obligation of the physician. Activities requiring information include the issuance of referrals, certificates of employment and occupational disability, or the initial explanation of IGeL services to a patient, although these are only a few examples (KBV, 2020, p. 14 ff.). IGeL are health services which are not paid for by the statutory health insurance, instead the patient decides whether to take advantage of the services and accordingly pays out of his/her own pocket. According to the KBV, 61 days were spent in 2020 on fulfilling the duty to inform in a single practice. Overall, there has been an increase from the previous year of 715,000 hours in total (KBV, 2020, pp. 2-7).

In addition to the factors mentioned above, a negative view toward physician practice in rural areas is also emerging. Factors such as limited privacy, a predominantly elderly population and an associated high proportion of patients with chronic diseases, as well as a higher workload combined with lower pay are associated with this (Groth, et al., 2019, pp. 510-514). Further reasons such as a lack of support with bureaucratic issues, regression requirements of health insurance companies, lower income, lack of professional exchange with other physicians, and a too high a financial risk speak against a branch office (KBV, 2019a, p. 61 f.). Not only high investment costs are associated with a branch office, but also the fear of the uncertainty of income and the complexity of the billing system (Zwierlein, et al., 2020, p. 530). Participation in on-call duty as well as the rights and obligations to be observed as a contract physician also speak against establishing a practice (Redaèlli, et al., 2020, p. 50).

3 Wishes of the doctors

In order to be able to take measures that promote the attractiveness of the medical profession, especially in underserved regions, it is important to recognize which wishes are expressed by physicians and which factors have a positive effect on a settlement and the choice of location. In recent years, studies have been conducted on a regular basis to determine the incentives for physicians to settle down. These include the study "Professional and private location factors for the establishment of family physicians in rural areas" by Küpper and Mettenberger (2018) as well as the professional monitoring of the KBV (2019a).

With regard to site selection, it is evident that the infrastructure of the region is important. Factors such as travel distance and accessibility, but also the partner's job opportunities, childcare options such as kindergartens and schools seem to be important (KBV, 2019a, p. 38). A child-friendly environment as well as qualitatively and quantitatively good childcare options are thus advantageous. The possibility of an inexpensive and large plot of land also serves to make a rural settlement attractive (Küpper & Mettenberger, 2018, p. 235).

Factors such as family and leisure time also play an essential role, including the compatibility of family and the medical profession (KBV, 2019a, p. 27 ff.). Also important are possible career opportunities, varied medical work, income, (KBV, 2019a, p. 27 ff.) and financial compensation for overtime or compensation in the form of more free time. In addition, professional demands, a high degree of independence, and the working atmosphere are important influencing factors (Kasch, et al., 2015, pp. 190-195). A varied job is understood to include not only a broad spectrum of different clinical pictures, but also communication and professional exchange with other physicians (KBV, 2019a, p. 27 ff.). There is also a desire for more intensive education and support in various areas such as establishment, legal advice and practice management (KBV, 2019a, p. 61 f.).

There are gender-specific differences with regard to some preferences. Women in particular attach greater importance to a professional standard (Kasch, et al., 2015, pp. 190-195). Likewise, they place greater value on the factors of family and leisure already mentioned above, whereas men place greater value on career and science orientation (KBV, 2019a, p. 30). The career factor refers to opportunities for further education and training, earning potential, and opportunities for promotion (Kasch, et al., 2015, pp. 190-195). Physicians with the goal of professional success tend increasingly toward residency training (KBV, 2019a, p. 30 f.). Respondents who consider family and leisure time to be very important tend to work more in the outpatient sector (KBV, 2019a, p. 30 f.). Married couples in particular, both with and without children, attach importance to regulated working hours, to a balanced relationship between work and leisure time, and to the already frequently mentioned desire for a part-time working hours model (Kasch, et al., 2015, pp. 190-195). The possibility of practicing medicine as an employee also represents an interesting and desirable work model for physicians (Groth, et al., 2019, p. 512). In a recent study published in 2020, it is stated that the offer of training, support opportunities through associations and the provision of consultants positively reinforce the reasons for setting up a practice (Zwierlein, et al., 2020, p. 530).

Students are more inclined to settle in rural regions later if they grew up in rural regions. Women in particular would be more likely to settle in a rural region compared to men (KBV, 2019a, p. 83 f.). Thus, an earlier reference to a rural region due to personal origin or due to a reference during studies through an internship can be conducive to settling in the countryside (Groth, et al., 2019, pp. 510-514). Other conducive reasons can be seen in the fact that there is less competition in rural regions and that a fixed patient base and a close doctor-patient relationship are usually formed (Küpper & Mettenberger, 2018, p. 234). In addition, setting up a practice eliminates the need to participate in hospital services and provides the opportunity to bypass strong hierarchies (Redaèlli, et al., 2020, p. 50). There is dissatisfaction with clinical work due to the hierarchies and the limited freedom of decision-making, as well as the difficulty of reconciling family and career. The branch office, on the other hand, offers a higher degree of independence and a more flexible work arrangement. A positive aspect compared with a salaried employment relationship is the higher earning potential (Zwierlein, et al., 2020, p. 530). It is also considered positive that the establishment in a rural region can offer the possibility of deceleration from a stressful everyday life (Kreiser, et al., 2014).

It can be summarized that several factors contribute to the shortage of physicians and no improvement is assumed based on forecasts regarding the future development of the population and physicians. Demographic change as well as infrastructural and personal factors contribute to the cause. The wishes expressed by medical students

and physicians have shown that family and leisure time as well as flexible working models, including the part-time model and the possibility of salaried employment, are important criteria with regard to the medical profession as well as the choice of location and establishment. Family-friendly regions with a good infrastructure as well as childcare facilities and job opportunities, also for the partner, are an advantage. Factors such as high financial risks, bureaucratic effort and a high workload are negatively associated with a settlement.

4 Method

The aim of this work is to identify measures and to create a clear presentation of the measures that are implemented and that have the potential to counteract a shortage of physicians. This overview is intended for high school graduates interested in studying human medicine, medical students, physicians in training as well as physicians and KVs to gain a comprehensive overview of which measures are offered in the individual regions of the KVs and in which KV regions intensive efforts are made to ensure the provision of contract physicians. The scoping review method was used for this purpose.

A scoping review is an overview of existing literature, which can be used to provide a current overview. In a classic systematic review, the literature search is limited due to qualitative specifications (Ritschl, et al., 2016, p. 209 f.). A scoping review differs from other methods in that no qualitative assessment of the literature takes place, and the literature does not have to be subject to qualitative standards. Thus, gray or unpublished literature can also be considered (von Elm, et al., 2019, p. 1). A scoping review is particularly suitable when an overview of existing literature with a low level of studies and evidence is to be compiled (Ritschl, et al., 2016, p. 209 f.).

To be able to answer the question and the aim of this thesis, the method of the scoping review is useful, as the current status of the measures should be presented. Likewise, it is a suitable method because most of the measures have not been elaborated scientifically and content that has not been elaborated scientifically is included for the presentation of the measures. The implementation of the scoping review is based on methodological guidelines of the Joanna Briggs Institute (JBI).

4.1 Inclusion and exclusion criteria

The search includes literature on measures of any kind aimed at medical students, physicians in further training, and physicians working as contract physicians in Germany. A limitation of age and gender did not take place in order to identify as many measures as possible.

Furthermore, measures, also in the form of subsidies, models and projects, were included as inclusion criteria, which are implemented in the regions of the individual KV with the aim of increasing the attractiveness of the medical profession in rural regions.

The area to be considered is the outpatient medical care on the level of the individual KV in Germany. A limitation regarding the responsible persons for measures did not take place, in order to include also measures, which are not only promoted by the KV.

Every kind of English- and German-language literature with complete access was included. It was also important to include a description of the content of the measures, which should include at least a brief description of the measure as well as information regarding the target group and responsibilities.

Literature, which possessed the above mentioned inclusion criteria, was further used for the work. Literature that did not refer to the outpatient care sector and did not consider the care provided by SHI-accredited physicians in Germany was excluded from the work in the further course, as were measures to ensure psychotherapeutic and inpatient care. Measures that are no longer currently taking place or have not yet been implemented were also excluded, as were measures to increase the quality of treatment. If a measure was merely mentioned without further description, this was a further exclusion criterion. Based on these criteria, search strings were created for the different databases and sources (the detailed description of the literature search in German can be found in http://dx.doi.org/10.13140/RG.2.2.17076.42883). The selection process of the literature found is shown in Figure 2 with the help of a flow diagram.

4.2 Data extraction

Information was extracted from the included sources and presented in tabular form. The complete tables (1-58) in German can be downloaded in an extra document (http://dx.doi.org/10.13140/RG.2.2.17076.42883). The tabular presentation was divided into financial measures and non-monetary measures. Financial measures were divided into three subgroups: study, continuing education and practice. The subdivision of the financial measures reflects which target groups are considered here. In the area of studies, medical students are addressed as the target group, in the area of continuing education, physicians in continuing education are addressed, and in the area

of practice, physicians are addressed as the target group. In the area of non-monetary measures, no further subdivision took place, since the measures in this area cannot be assigned to any individual group but refer to all target groups. From the literature included, information was extracted on the form of the measure (measure), the target group to which the measure is directed (target group), who is responsible for the measure (sponsor) and the content of the sponsorship (content). Addtionally the source were enclosed.

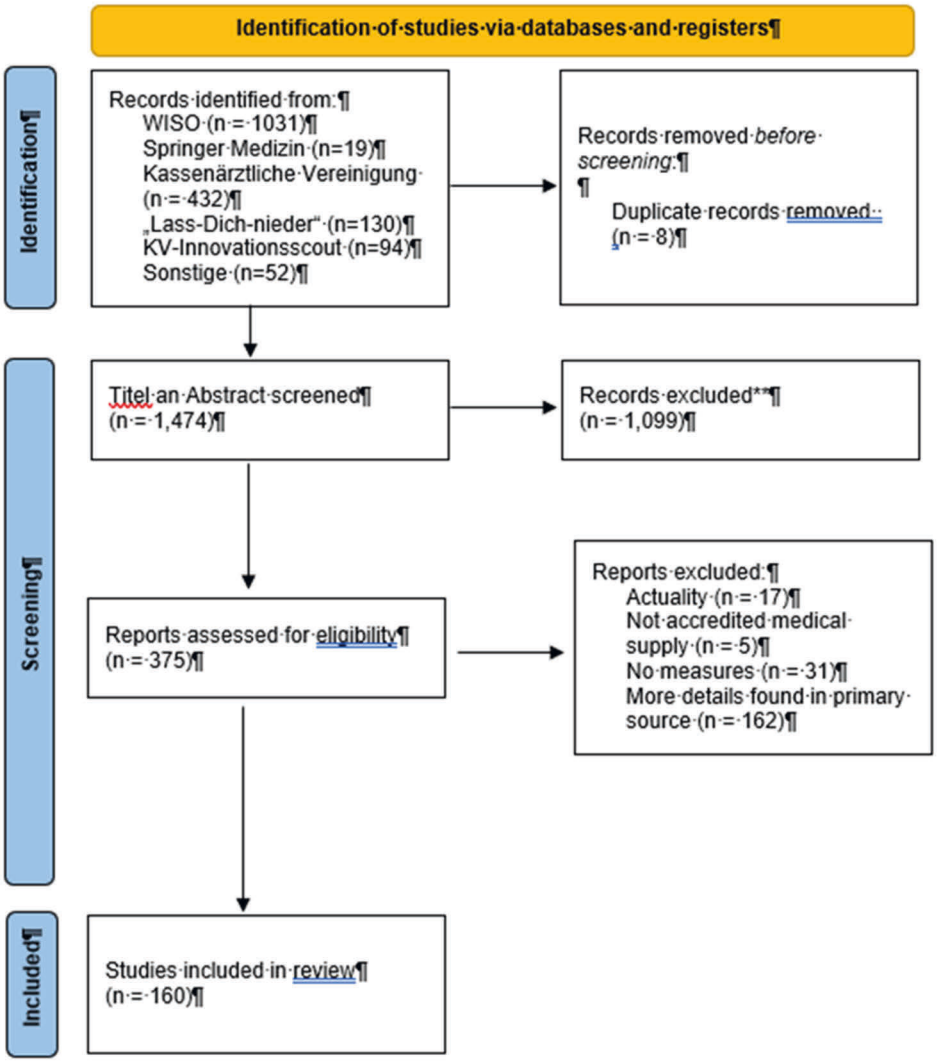

Figure 2: PRISMA flow diagram (PRISMA 2020)

The following is an abbreviated form of the tabular presentation of the measures (Tables 1-3). The tables show the individual KV regions, as well as the number of measures that were identified during the research. A distinction is made between financial and non-monetary measures. In the category financial measures, a further distinction hat been made between measures during medical studies or further education and measures addressing physicians after medical studies in general. These tables show the extent to which different kinds of measures are taken in the individual regions.

Financial Measures							
Medical Studies & Further Education							
KV Region	Famulatur / Clerkship	Practical Year	Block Internship	Scholaship	Further Education	Ohters
Baden-Württemberg	1	1			1	
Bavaria	2	1	1	3	2	
Berlin	1				1	
Brandenburg	1	1	1	2	1	1
Bremen	1				1	
Hamburg	1				1	
Hesse	1	1			1	
Mecklenburg Western Pomeria	1	1	1	1	2	
Lower Saxony	1	1		1	2	
Northrhine-Westphalia	1	1			1	
Rhineland-Palatinate	1	1			2	
Saarland	1	1	1	1	1	1
Saxony	1	1		2	1	2
Saxony-Anhalt	1	1	1	2	1	1
Schleswig-Holstein	1	1	1	1	1	
Thuringia	1	1	1		2	
Westfalen-Lippe	1			1	1	

Table 1: Financial measures within the category Medical studies and further education

Financial Measures												
After Medical Studies												
KV Region	Establishment of Practice / Practice takeover / Branch practice (Zweigpraxis)	Dependent Employment	Employment of a supply or training assistant	Internship / Hospitation	Relocation Expenses Reimbursementg	Childcare	Illness/ Praxisausfall	Lateral Entry	Delayed Exit from practice	Others
Baden-Württemberg	2	1								1
Bavaria	2	1	1							2
Berlin										
Brandenburg	2	1								
Bremen	3	1								
Hamburg										
Hesse	3	1			1	1			1	1
Mecklenburg Western Pomeria	1	2	1	1	1	1	1			1
Lower Saxony	2	1								
Northrhine-Westphalia	2	2	1	1				1		2
Rhineland-Palatinate	2	2								
Saarland	3	1		1						
Saxony	2	2		1				1	1	
Saxony-Anhalt	3	1			1		1			
Schleswig-Holstein	2	1			1	1	1			3
Thuringia	2		1						1	
Westfalen-Lippe	3	2						1		2

Table 2: Financial Measures after Medical Studies

Non Monetaray Measures								
KV Region	Elective Subjects & Seminars	Quota for Country Doctors	Coordination office Competence center further education network	Advice & Support	Mobility	Telemedicine	Others
Baden-Württemberg	1	1	2	1	1		2
Bavaria	1	1	3				
Berlin	1		2				
Brandenburg			2	1			
Bremen			1				
Hamburg			2				
Hesse	1		3	3	2		2
Mecklenburg Western Pomeria		1	2	1			1
Lower Saxony			2	3		3	2
Northrhine-Westphalia			1				1
Rhineland-Palatinate		1	3	3		1	1
Saarland		1	2	1			
Saxony	1		2	1			3
Saxony-Anhalt		1	2	1			2
Schleswig-Holstein			1	3			
Thuringia			2	2		1	2
Westfalen-Lippe		1	3				

Table 3: Non Monetary Measures

5 Discussion

The aim of this work is to identify and provide an overview of measures at the level of the KVs that are used to increase the number of physicians settling in rural regions and that have the potential to counteract a shortage of physicians in rural regions. Influencing factors and wishes of junior physicians and physicians could be worked out, which were expressed regarding the medical activity and choice of location. It was found that particularly personal, family, job-related and infrastructural factors seem to influence the decision to settle in rural areas.

Based on the scoping review, a variety of support measures, predominantly financial measures, were identified. Particularly in those KV regions where an imminent or already existing undersupply could be identified, such as Hesse, Saxony, Mecklenburg-Western Pomerania, Bavaria and Saxony-Anhalt, a large number of measures against (imminent) undersupply have been identified. Almost all of the physicians' expressed wishes have been taken into account.

In the context of support for medical students, there is increasing interest in financial support. This is made clear by an increasing take-up of scholarships and other financial support offers (Lower Saxony Ministry of Social Affairs, Health and Equality, 2019, p. 11 f.). There is also an increasing take-up of financial support for physicians in further training. This is reflected in the evaluation report of the National Association of Statutory Health Insurance Physicians from 2019 (KBV 2019 b).

The newly introduced rural doctor quota is also intended to make its contribution to ensuring outpatient care and is showing increasing interest due to high numbers of applicants (ZFA, 2020). This offers high school graduates who do not meet the requirements for studying in the regular way the opportunity to study medicine (Lower Saxony Ministry of Social Affairs, Health and Equality, 2019, p. 11 f.). Whether the introduction of a rural physician quota can secure the supply in areas to be promoted or whether this measure can contribute a part to securing the supply, only becomes apparent when the physician starts working (ZFA, 2020). However, the duration of training and continuing education to become a physician is usually more than 10 years (BÄK, n.d.). Thus, an effect may only become apparent in a few years. The Federal Representation of Medical Students in Germany (bvmd) criticizes the measure on the grounds that the rural doctor quota will result in doctors going to rural regions who have no other opportunity to study medicine due to a poor school leaving certificate. It is also criticized that the interest of physicians to work as a doctor in a rural region is not in the foreground (Barkewitz, 2018).

Likewise, with the rural physician quota, students enter into an obligation to settle in rural regions after completing their studies and further training. Failure to comply with this agreement results in a penalty payment of 250,000 euros (Bayrischer

Hausärzteverband, n.d.). In addition, it should be considered that applicants are usually at a very young age when they start their studies and that it takes several years before they can settle down. Thus, at the time of the agreement, applicants may not yet be aware of their decision to choose the rural region as their future place of residence and practice, the extent of this decision, and the amount of the penalty for non-compliance. The interests and life plans of medical students can also change again during the course of their studies. (van den Bussche, et al., 2016, p. 314).

The measure is also critically questioned by other stakeholders in the healthcare sector, including the head of the KV Schleswig-Holstein, Dr. Monika Schliffke, who has not yet been convinced by this measure. Rather, the focus should be on measures that arouse the interest of students and motivate them to take up chairs in all-general medicine, for example (Schnack, 2019). Permanently satisfied physicians should be the primary goal, rather than addressing underuse with long-term commitments and coercion. Thus, the introduction of the rural physician quota can be viewed critically, despite great interest, starting from students (ZFA, 2020).

Financial support, on the other hand, which focuses on short study periods in rural regions or on individual specialist areas, such as the block internship or practical year, offers the possibility of gaining an insight into the medical activity of the corresponding areas without having to enter into a multi-year commitment. Negative prejudices, which were listed above, could also be reduced. Likewise, electives and seminars offer the opportunity for students to become more intensively involved with possible fields of activity during their studies (Staatsministerium Baden-Württemberg, 2020).

Mentoring programs, discussions with physicians, including physicians from rural regions, can provide an early insight into the possible specialties and activities in rural regions. Similarly, young physicians can gain insight into the work of contract physicians and, in particular, the work of physicians in rural regions through events such as practice days and the Summer and Winter School (Stiftung Perspektive Hausarzt, 2014b). Thus, in this context, factors of influence that speak against a settlement in rural regions, such as a negative view towards a medical activity in the countryside, could be reduced. It was not possible to show whether information events and seminars can promote interest in establishing a practice in rural regions and to what extent these provide incentives to work in rural regions.

In addition to financial support for study sections and further training, students receive advice and support in competence centers regarding the organization of further training in the field of general medicine. The establishment of coordination centers also serves as a suitable point of contact for physicians in continuing education. This has also been shown in the evaluation report of the KBV from 2019, by an increasing

utilization and participation of the offers in competence centers (KBV, 2019b, p. 18 f.).

In order to be mobile as a student even in regions with poorer infrastructure, a few regions provide free cars for students for a limited duration of the internship (Stiftung Perspektive Hausarzt, 2014b). Similarly, subsidies for travel and accommodation costs are offered (guideline of the KV Saarland, KVS 2021 p. 13). To what extent these offers promote the attractiveness of a rural region and what effects they have on a later settlement has not yet been researched. However, there is a temporarily higher mobility due to the availability of a car (Stiftung Perspektive Hausarzt, 2014a), which could increase the attractiveness of the subsidized region for some students.

Financial subsidies are also used among physicians as a common fiscal instrument against underuse. Among them, grants are offered for starting and taking over a practice as well as for hiring a physician. These subsidies are increasingly being used by physicians. This was shown in the evaluation report of the Lower Saxony Ministry for Social Affairs, Health and Equality (Niedersächsisches Ministerium für Soziales, Gesundheit und Gleichstellung, 2019, p. 8 f.). It has been shown that an establishment is also associated with an uncertain income as well as a high financial risk. Support in the form of subsidies, including the guarantee of turnover, provides the opportunity to reduce the financial risk as well as the fear of an uncertain income for physicians, especially in the start-up phase.

It has also been shown that physicians increasingly prefer a salaried employment relationship as well as a part-time position (KBV, 2021a). Financial support for the employment of physicians can provide an incentive to offer flexible working models. With the establishment of own facilities by the KV, but also through job shadowing, physicians also have the opportunity to gain an insight into the practice process and to get to know it better. In-house facilities can even be taken over at a later point in time (KVH security guideline, KVH b p. 33). The advantage of this is that there are no high financial costs and risks that would be incurred if a practice were founded (SAVTH, n.d.). At the same time, the establishment of private practices, as well as the promotion of the employment of a physician, can support the desire of physicians for more flexible working models and more free time, as well as the compatibility of family and career. With increasing numbers of physicians working part-time, however, it must be taken into account that in order to cover a full physician position, there is a greater need for physicians. The reason for this is that a physician in part-time employment does not fill a full job and thus the demand for physicians increases (Höhl, 2018). On the other hand, there is an increasing need for care due to an aging population (BMBF, n.d.). More physicians are therefore needed to meet the demand for care (SVR Gesundheit, 2018, p. 81). This can already be addressed by expanding the number of medical study places.

However, it is not only the high financial risk that speaks against establishing a practice in rural areas, but also the fact that working as a physician in a rural region is often associated with a higher workload (Groth, et al., 2019, pp. 510-514). New regulations on on-call duty, opportunities for further training of non-physician staff, as well as delegation by the physician and financial subsidies in the event of childbirth or illness, meet these demands. The further development of telemedicine and digitalization can also provide relief for physicians in rural regions, as home visits can be taken over by non-physician staff (Zentralinstitut für die kassenärztliche Versorgung, n.d.-g). Thanks to technological advances, physicians can be added via video when needed. Through the possibility to resort to video consultation hours (KVRLP, n.d.) but also through the possibility of delegation to non-physician staff, physicians can be relieved of their workload (Mergenthal, et al., 2016). Furthermore, additional travel time could be saved. However, there is still a slight skepticism on the part of physicians regarding the treatment of patients for whom no initial personal contact has taken place (Albrecht, et al., 2020, p. 33).

In the meantime, extensive counseling options and care models are also offered. This has already been expressed as a wish by physicians (KBV, 2019a, p. 61 f.). The KV Westfalen-Lippe also comments on this and is of the opinion that purely financial measures are not sufficient to counteract underuse. Further measures are necessary, including consultation and the design of the easiest possible path to establishment (Schlingensiepen, 2018). Through support services, physicians have the opportunity to receive comprehensive advice on possible working models and settlement options. In addition, they can also be accompanied during the establishment of the practice (KVBW, 2020). Thus, bureaucratic tasks will not be eliminated, but physicians will always have a contact point to receive support.

The promotion of practice networks enables physicians to exchange professional information with each other. Not only doctors and junior doctors benefit from teamwork and communicative cooperation. The establishment of practice networks can also have a positive effect on the medical care of patients through intensive cooperation between physicians (KBV, 2015, p. 9).

Measures to counter a regional shortage of general practitioners were already presented in a paper written in 2015 (Drescher, 2015). Since then, further changes have occurred at the federal level with the enactment of the GKV-VSG and TSVG. The number of available training positions was increased by 2,500 to 7,500. Financial support for continuing education has since been increased to 5,000 euros per month (KBV, 2021c). Furthermore, competence centers were founded at the state level in most KV regions with the aim of supporting and advising physicians during their further training and enabling an exchange among them (KWT, n.d.). The rolling physician practice project in Wolfenbüttel County mentioned in the paper has since been

terminated (Beneker, 2014), but the "Medibus" project (KVH, 2021a) has been implemented in Hesse since 2018. This project also supports physicians in the context of patient care. Thus, the high workload of physicians should also be reduced (KVH, 2021a).

Despite the fact that the search was limited to the period from 2018 to 2021, the scoping review identified a large number of measures that were intended to create incentives to recruit physicians in underserved regions and thus to counteract (impending) undersupply. In this context, no targeted search has taken place at the federal level or at the municipal level. Thus, further support measures can be offered in this area, which have not been listed here. Due to the limits set, it is possible that individual measures already implemented before 2018 have not been included. In addition, the focus of the research was on measures used to attract physicians in underserved regions. There may be other measures in place that are specifically used to address undersupply.

It has been shown that the identified measures consinder almost all wishes of the physicians, but a significantly lower consideration of infrastructural wishes and support measures could be observed. It has also been shown that only few evaluations of the implemented measures are known and no prognosis can be made about the effectiveness of the measures. Thus, a further research approach would be to specifically test the measures for their effectiveness.

6 Conclusion

Taking into account the fact that in some regions there is already a known threat of under-supply and that this will not improve in the foreseeable future on the basis of the forecast, further financial, but also non-monetary measures are needed to counteract the shortage of physicians in the short term, but also in the long term. In order to ensure the long-term supply of accredited physicians, support measures should continue to be offered to medical students. This can begin with an increase in the number of study places as well as measures to promote interest in medicine. Internships, electives and seminars could be offered at universities, but these should not force future physicians to settle in underserved regions at an early stage. Rather, the goal should be that physicians decide to settle later based on the interest they have gained in the specialty and the region. Thus, targeted information events could also be used to promote individual rural regions and supporting specialties while students are still at university. Due to the long duration of studies, an effect will possibly only become apparent in a few years. However, it is necessary to recruit more medical students now in order to meet the need for additional staff in the long term.

Overall, the attractiveness of underserved regions as well as regions where undersupply will occur in the foreseeable future should be promoted. It has been shown that

young physicians are increasingly attaching importance to family life. Thus, incentives should also be created here to make rural regions more attractive for the whole family.

Although many of the measures identified address the wishes expressed by physicians, infrastructural measures to promote the attractiveness of rural regions are hardly considered. It would therefore make sense to also consider this area and to take measures with the aim of increasing the attractiveness of rural regions. This could be done, for example, by expanding public transport or by increasing childcare facilities and job opportunities for partners. A start-up-friendly environment, but also the reduction of bureaucratic requirements compared to the establishment of a practice could be considered as a measure. A certain degree of planning security with regard to remuneration could also give physicians a sense of security with regard to setting up a practice in rural regions. It is important to create incentives so that young physicians as well as physicians in general settle in rural regions and ensure that they are satisfied with this decision in the long term.

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