A. Rainer Jordan

Needs-based care: Illusion or reality?

Abstract:
Dental care in Germany is in the midst of transitioning. This includes a changed epidemiological baseline situation and with that different treatment needs. Additionally, the supply side (dentists) is undergoing a structural change. To ensure appropriate care under these altered conditions, measures of different strategies can be applied. This article is aimed to clarify (a) what evidence is available today to answer this question, (b) how we are going to assess future demand and (c) what essential parameters of future development need to be taken into consideration in order to adjust dental health care so that optimal health can be achieved on a population level. An approach to answering this question in the current state of needs-based dental care in Germany should be made with three key statements. Thesis 1: Currently, it can be assumed that restorative care on a population level is needs-based. However, periodontal care does not seem to meet the needs. Thesis 2: Due to the demographic change, a high treatment demand can furthermore be expected, despite a declining burden of disease in dentistry. Thesis 3: International educational measures, financial intervention, regulatory strategies and/or personal and professional offers of support are discussed as possible control elements to ensure appropriate care in the future.

Keywords: care research; dentistry; demand; epidemiology; demand planning

Institute of German Dentists (IDZ), Cologne: Prof. Dr. A. Rainer Jordan
Translation: Yasmin Schmidt-Park
Citation: Jordan AR: Needs-based care: Illusion or reality? Dtsch Zahnärztl Z Int 2019; 1: 118–123
Peer-reviewed article: submitted: 05.03.2019, revised version accepted: 03.04.2019
DOI.org/10.3238/dzz-int.2019.0118–0123

Introduction

In 2010, almost 23 billion Euros were spent on oral health in Germany [12]. Two thirds fell into the dentists' service sector, about a quarter fell into the dental technicians' sector and the rest referred to retail products of the general oral health economy. It is assumed, that the total revenue will increase to 27 billion Euros in the year 2030. Even though the dentists' service sector merely makes up 6,5 % of the total expenditures under the conditions of statutory health insurance [10], there is a lot of money available for dental health care. Even when Germany's supply system compensates tooth loss with a low threshold for artificial teeth in cases of social hardship, it has to be recognized that the prevalence of diseases is a significant social gradient [8], as shown in most chronic and lifestyle-related diseases. These sociomedical aspects of unequal living and health conditions are not specific to dentistry but rather of fundamental nature and need a broad-based approach. To this effect, public health approaches such as group prophylaxis are discussed and applied in preventive dentistry. They center around so-called upstream measures, intended to be achieved by people in their social environment. This article, however, deals with dental care and thus the dental practice, which is referred to as the last aspect of the healthcare system concerning healthcare research. Key objectives of healthcare research is a learning system of continuous improvement of patient orientation, quality and economic efficiency. These three goals can also be considered as the triad of healthcare research. The main characteristic is described as the efficacy of health relevant products and services under everyday conditions. It is termed relative effectiveness. This is contrasted with clinical research, which determines the efficacy under ideal conditions, and its target is referred to as absolute efficacy. The resulting gap between achievable (relative) effectiveness under everyday conditions and achievable (absolute) effectiveness under artificial experimental conditions is described as the effectiveness gap in treatment research. This is the core when it comes to researching why therapies in everyday care at times show different effects than in clinical research [9]. It is part of the analysis of appropriate care to take into account the effectiveness gap, which has been identified using methods of care research. This article goes on to discuss further contributing aspects.

What is needs-based?

A characterizing feature of democratic societies is a general egalitarian approach. In Germany, this principle of equal living conditions is rooted in the constitution (Article 72, Paragraph 2). With this in mind, the topic of dental and medical needs-based justice, or rather the deviations such as over-, under- and misdirected supply, gain health political and social relevance; such as in some rural regions, when the aspired equal living conditions can not be guaranteed because of inadequate health care. In order to counter this, planning guidelines for medical and dental care are determined. In Germany, the guidelines for planning demand-driven dental care are set by the Joint National Committee (G-BA). It is the supreme decision-making body of the conjoint self-administration of physicians, dentists, psychotherapists, hospitals and health care funds.

According to the demand-planning dentist guideline from 2016, the term of needs-based care is operationalized as a ratio: in metropolitan areas of the old states, the ratio of one dentist to 1280 residents represents the general standard (100 %), whereas in other areas in Germany, the ratio is at a general standard with 1:1680. The guidelines do not specify how these ratios were determined. Criteria for under- and over supply are derived from a specific target/actual comparison. Undersupply in dentistry is assumed, when the need exceeds the level of dental treatment by more than 100 v. H., and the general needs-based degree of care is exceeded by 10 v. H. This regulation is obligatory for contracted dental care in Germany, however, these reference values are not the only possibility to identify the needs and this process can be critically questioned from the perspective of epidemiologic supply. It appears necessary to consider different expectations on dental health care demands in regions with a younger demographic structure (e.g. Freiburg im Breisgrau, with an average age of 39,8 years) compared to regions with an older population structure (e.g. Dessau, with an average age of 49,5 years). This then raises the question of how the mere ratio comparison of available dentists per population is sufficient without considering the (regional) morbidities in the future.

The German Council of Experts defines needs-based justice in the report "Needs-based care – perspectives for rural regions and selective performance areas" as follows: "Needs-based justice forms a normative concept and consequently, every policy holder or citizen receives health care with qualitative and quantitative regard to his needs, according to the most objective criteria possible" [16]. Needs-based justice includes medical indication, and goes even beyond. In health care research a distinction is made between demand-induced ("need-dentistry") and wish-fulfilling dentistry ("want-dentistry"). This focuses in on the issue of needs-based justice in relation to sociological discourse.

According to Bradshaw [2], 4 types of social demands are distinguished (Fig. 1):

- Normative demand: This demand is defined by experts and therefore dependent on their respective position.
- Perceived demand: It is characterized by the individual and is based on an expression of intention.
- Expressed demand: It is the executed perceived demand and depends on the actual supply.
- Comparative demand: It can be used to show comparisons between different populations. The treatment of different regional morbidities can therefore be determined with comparative demand.

Aim of the article

Needs-based justice can therefore be looked at under vastly different premises. This article is aimed to clarify (a) what evidence (data) is avail-

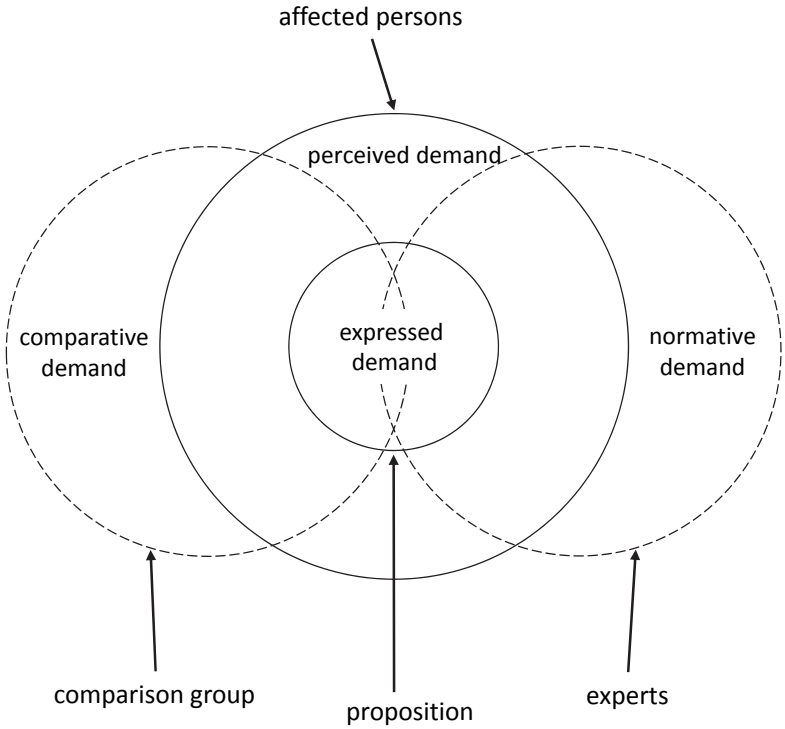

Figure 1 Taxonomy of social demands (according to [2])

able today to answer this question, (b) how we are going to assess future demand and (c) what essential parameters of future development need to be taken into consideration in order to adjust dental health care so that optimal health can be achieved on a population level. It should be noted that this article argues on a meta level and that the pooled health data used does not allow any conclusions on a micro-level, or individual health care.

Main theses

According to the current state of appropriate dental health care in Germany, an approach to this question is laid out using the following three theses. This analysis includes the two main diseases, caries and periodontitis.

– Thesis 1: Currently, it can be assumed that restorative care on a population level is needs-based. However, periodontal care does not seem to meet the needs.

Treatment demand relating to caries is regularly determined epidemiologically within the German Oral Health Studies. The current treatment demand results from the decayed component of the DMF index and includes teeth with established caries lesions. These are shown epidemiologically as primary lesions or caries on restoration margins.

Furthermore, the level of refurbishment can be determined from the data, by calculating the ratio of filled teeth to decayed teeth plus filled teeth (FT/[DT+FT] x 100). The level of refurbishment is 100 % at maximum and therefore suitable to detect deficiency.

However, it must be said that it cannot depict oversupply (e.g. level of refurbishment of > 100 %), although one can argue that a level of refurbishment of < 100 % per se should not indicate an oversupply on a macroscopic level. In permanent teeth a current treatment demand of DT = 0,5 teeth is shown across all age groups. The level of refurbishment is different for each respective age group: In children (12-year-olds) it is at 74,6 %, which is a low value compared to other age groups. This is surprising because children undergo regular dental check-ups in schools as part of group prophylaxis so that treatment can be initiated even in children that are not monitored regularly and only have complaint-based dental check-ups. The level of refurbishment is 93,7 % in young adults (35- to 44-year olds), which is essentially the age group of these children's parents, and 90,6 % in young senior citizens (65- to 74-year olds). In older senior citizens (75- to 100-year olds), it is lower at 83,0 %. This group, however, includes people requiring long-term care whose (oral) health is generally worse in comparison to people of the same age who are capable of caring for themselves. The level of refurbishment in older senior citizens requiring long-term care is 69,2 % [8]. The assessment was more difficult for periodontitis, which is partly due to the fact that neither diagnostic criteria of periodontal health nor criteria evaluating the success of a treated periodontitis existed in the classification of periodontal diseases from 1999 [1]. This changed with the current classification of 2018 [6], however, so far no epidemiological studies have been conducted using this classification. Based on the DMS data, it was extrapolated that 11 million people in Germany suffer from severe periodontitis [4]. In total, 1.1 million periodontitis treatment cases were charged to statutory health insurance in 2017 [10]. However, it is not clear how high the percentage of people with severe periodontitis, who have already undergone a successful systematic periodontitis treatment, really is. Therefore, an accurate statement on needs-based periodontitis treatment cannot be made. It can probably be assumed that there is no oversupply. The Barmer Zahnreport from 2017 gives more information [13]: On average, a quarter of policy holders make use of periodontal diagnostic services and 1,8 % of policy holders make use of therapeutic services. The question arises if epidemiology and treatment are currently well coordinated. Currently, in restorative and prosthetic dental treatments at system level (data not shown), the treatments correspond to the epidemiological findings to a large extent, which is why this discrepancy in periodontal treatment is surprising. From the viewpoint of treatment research, it should be

noted that the periodontal treatment line is defined scientifically, however, the statutory health insurance catalogue of services only contains the central treatment phase. Especially the lifelong, supportive periodontal therapy can only be made use of in private dental care. It can be assumed that this therapeutic inconsistency contributes to the discrepancy of periodontal epidemiology and treatment.

– Thesis 2: Due to the demographic change, a high treatment demand can furthermore be expected despite a declining burden of disease in dentistry.

The epidemiological trend monitoring of DMS studies from the past 2 decades allows further morbidity prognosis. When considering the demographic development, it can then be estimated what treatment needs are to be expected in the year of 2030, for instance [7]: A decline of up to 50 % in burden of disease is to be expected in all age groups for dental caries. This can generally lead to a further decline of restorative treatment needs, however, the effect will not be as pronounced as the epidemiological morbidity dynamic appears, because caries cumulates as a chronic disease at an older age and its effect accounts for so called morbidity compression. The number of DMFT-teeth in Germany will presumably decline from 870 million in 2014 to 740 million in 2030 (Fig. 2). Additionally, population-wide there are about 100 million root surfaces that have had caries, but the morbidity dynamic can be evaluated as relatively stable [14]. This trend, however, is different in periodontitis: Generally, we expect a further decline in periodontitis. Due to the demographic change and the increase in tooth conservation, a rise in periodontium needing treatment will arise. In 2014 around 365 million teeth were affected by periodontitis in Germany and we assume this number will rise to 100 million teeth by 2030 [15] (Fig. 3).

– Thesis 3: International educational measures, financial intervention, regulatory strategies and/or personal and professional offers of support are discussed as possible control elements to ensure appropriate care in the future.

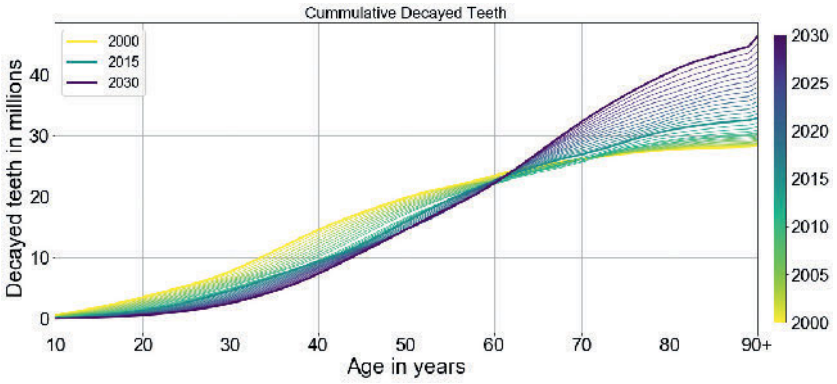

Figure 2 Prognosis of teeth needing cariological treatment in Germany until 2030. The depiction shows a prevalence turnover at about 60 years; prior to that, less cariously damaged teeth are expected until 2030, after that, an increase can be expected that accumulates in all age groups in 2030 and will account for around 464 million carious teeth in Germany (according to [7]).

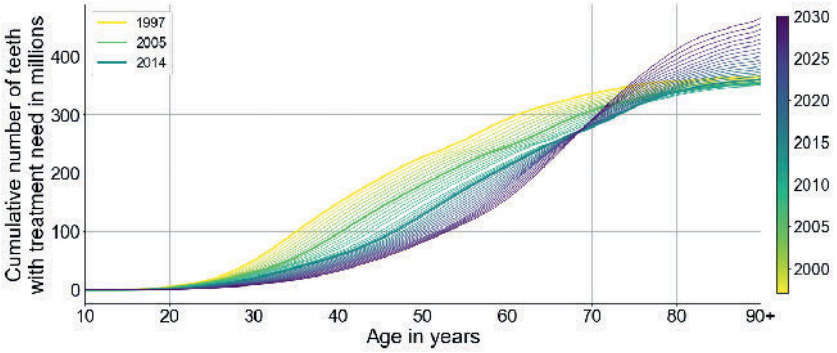

Figure 3 Prognosis of teeth needing periodontal treatment in Germany until 2030. The depiction shows a prevalence turnover at about 70 years; prior to that, less periodontally damaged teeth are expected until 2030, after that, an increase can be expected that accumulates in all age groups in 2030 and will account for around 464 million carious teeth in Germany (according to [15]).

Just as we have shown, the morbidity dynamic in combination with double dynamization of age (people are living longer and the proportion of older people in the total population continuous to rise steadily) does not automatically mean that the dental supply needs will decline substantially. Therefore, sustainable financing is necessary in this sector in order to ensure the level of service in the future. It seems appropriate to contemplate control mechanisms. The population projection of the Federal Office of Statistics showed regional differences in age composition of the population for 2030. Oral diseases exhibit age-specific characteristics. Thus, treatment planning based solely on ratios of dentists per population is not ideal long-term in order to plan appropriate regional care. In addition to morbidity-related risk structure compensation determined by the patients, it seems worth discussing to bear in mind the supply side and consider the dentists' ages. The average age of actively working dentists in Germany is 48,6 years and in some states, such as Brandenburg, Sachsen-Anhalt and Thüringen, it is 50 years, which indicates that a generational change can be expected on the supply side in the years to come [11]. This will come into effect especially in the new states, because of the unprecedented wave of dentists who set up their practices during Germany's unification 30 years ago,

Strategy	Measures
Educational measures	Preferential admission of students of rural regions
	Relocate education packages to rural regions
	Relocate training institutions to rural regions
Financial interventions	Discounted student loans tied to the obligation to practice in rural areas
	Specific reward and budgets
Regulatory strategy	Quota licensing (needs of admission)
	Increased admission and/or foreign recruitment of dentists to meet demand
	Mobile supply
Personal and professional support	Financial and infrastructural incentive in practice relocation to rural regions
	Assistance with recruitment and career planning
	Familiar services, involving local communities, offering of suitable practice space

Table 1 Global strategies and examples of motivational measures by dentists to become involved also in rural regions (from: [5])

which means that many of the dentists will give up their occupation around the same time. Thus, the planning of future care can not only be oriented on headcount of dentists, but also the actual offer and their working hours. This would also take into consideration the growing number of dentists working part-time.

In this context it should be noted, that even though dental practices also open up in rural regions, metropolitan areas are extremely appealing in establishing a practice. Rural communities, smaller and medium-size towns who have a lower resident population are at a disadvantage regarding the establishment of new dental practices [11]. The control capabilities of the dentists' association, however, are limited ever since the SHI Competition Re-enforcement Law from 2007 lifted the admission of needs for dentists and introduced the freedom of establishment. Nevertheless, the report "Needs-based control of healthcare by the Council of Experts" came to the conclusion, that in order to ensure comprehensive, high quality outpatient care, the establishment of contracted dentists has to be facilitated in areas, where the upcoming retirement of many contracted dentists becomes apparent, to successfully ease the transition period [16]. Furthermore, it is debated if financial incentive, such as a "surcharge for rural dentists" could possibly improve the situation further. Ultimately, morbidity-oriented compensation is discussed, to set incentive for high treatment quality. Besides regulation strategies, there are other possible measures already being tested. This can be classified in three categories [5]: Educational measures, financial intervention, and personal and professional support strategies. An overview of the strategies used so far is listed in Table 1. Due to the individual societal conditions or the organisation of the health care systems, not all of the mentioned measures are transferable to other countries. However, they demonstrate that their efficacy has been reviewed alio loco, or at the very least first experiences concerning the desired efficacy.

Conclusions

Dental care in Germany is in the process of transitioning. This is a result of the morbidity dynamic, which is unusual for chronic diseases and indicates that considerable potential for preventive measures was raised in the past. As a result of the chronic-cumulative character, the burden of disease extends to a more advanced age. This will change the supply needs further. Through different legislature procedures in health care, a transition in practice structures is also noticeable on the supply side. Additionally, regional generation changes among dentists is expected. After all, it will be closely monitored to see if dental health care develops similarly to general medicine, which affects the security of supply in rural regions. Various measures and strategies can be used to ensure appropriate care under these altered conditions. These include educational-, financial-, regulatory-, personal- and professional support measures.

Conflict of interest

The author A. Rainer Jordan states, that he is employed by the National Association of Statutory Health Insurance Dentists. He is unrestricted in the processing of research projects and scientific reporting and states that there is no conflict of interest.

Literature

1. Armitage GC: Development of a classification system for periodontal diseases and conditions. Ann Periodontol 1999; 4: 1–6

2. Bradshaw J: A taxonomy of social need. In: McLachlan G (ed.): Problems and progress in medical care: essays on

current research. 7th ed., Oxford University Press, London 1972

3. Bundeszahnärztekammer. Statistisches Jahrbuch 2017/2018. Berlin 2018

4. Eickholz P: Wie häufig sind schwere Parodontalerkrankungen in Deutschland? Parodontol 2016; 27: 111–112

5. Jäger R, Berg v. d. N, Schwendicke F: Interventions for enhancing the distribution of dental professionals: a concise systematic review. Int Dent J 2017; 67: 263–274

6. Jepsen S: Neue Klassifikation vorgestellt. Parodontale und peri-implantäre Erkrankungen. Zahnarztl Mitt 2018; 108: 76–82

7. Jordan RA, Krois J, Schiffner U, Micheelis W, Schwendicke F: Trends in c aries experience in the permanent dentition in Germany 1997–2030, and projection to 2030: Morbidity shifts in an aging society. Sci Rep 2019: in press. Die Fünfte Deutsche Mundgesundheitsstudie (DMS V). prophylaxe impuls 2018; 22: 72–75

8. Jordan AR, Micheelis W: Fünfte Deutsche Mundgesundheitsstudie (DMS V). Deutscher Zahnärzte Verlag DÄV, Köln 2016

9. Jordan AR: Zahnmedizinische Versorgungsforschung in Deutschland – eine Standortbestimmung. Forum für Zahnheilkunde 2014; 33: 12–14

10. Kassenzahnärztliche Bundesvereinigung. Jahrbuch 2017. Statistische Basisdaten zur vertragszahnärztlichen Versorgung. KZBV, Köln 2017

11. Klingenberger D: Die zahnärztliche Niederlassung. Stand der Forschung zur Praxisgründung. Deutscher Zahnärzte Verlag DÄV, Köln 2018

12. Klingenberger D, Ostwald DA, Daume P, Petri M, Micheelis W: Wachstums- und Beschäftigungseffekte der Mundgesundheitswirtschaft. Ergebnisse einer gesundheitsökonomischen Trendanalyse bis 2030. Deutscher Zahnärzte Verlag DÄV, Köln 2012

13. Rädel M, Walter M, Bohm S, Priess H-W: Zahnreport 2017. Asgard Verlag, Siegburg 2017

14. Schwendicke F, Krois J, Schiffner U, Micheelis W, Jordan AR: Root caries experience in Germany 1997 to 2014: Analysis of trends and identification of risk factors. J Dent 2018; 78: 100–105

15. Schwendicke F, Krois J, Kocher T, Hoffmann T, Micheelis W, Jordan AR: More teeth in more elderly: Periodontal treatment needs in Germany 1997–2030. J Clin Periodontol 2018; 45: 1400–1407

16. SVR (Sachverständigenrat im Gesundheitswesen). Bedarfsgerechte Versorgung – Perspektiven für ländliche Regionen und ausgewählte Leistungsbereiche. Gutachten 2014. Bonn/Berlin 2014

(Photo: private)

PROF. DR. MED. DENT.
A. RAINER JORDAN, MSC.
Scientific director
Institute of German Dentists
Universitätsstraße 73
50931 Cologne
r.jordan@idz.institute