Structures and performance characteristics of dermatology hospitals in Germany: current status and long term development

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Summary

Background: The objective of the study was to characterize the performance of German dermatology hospitals.

Methods: A structured survey questionnaire was sent out to all dermatology hospitals in October 2019 as part of a cross-sectional analysis based on health care research.

Results: Of the 115 hospitals, 95 (82.6 %) responded, including 34 (35.8 %) university hospitals (UC) and 61 (64.2 %) non-university hospitals (NUC), of which 78 % were urban (43 % UC, 57 % NUC) and 22 % rural (10 % UC, 90 % NUC). The dermatology departments comprised an average of 45 inpatient and 11 day-care beds (UC: 52/13, NUC: 40/9). An average of 2,302 inpatients were cared for in 2018 (UC: 2,874, NUC: 1,983), and the case mix index was 0.76 (UC: 0.74, NUC: 0.77, overall range: 0.40–0.96). Mean length of stay was 5.5 days for UC, relevantly lower than 2013 (5.9 days) and 2011 (7.1 days) data, and also significantly lower for NUC at 5.9 (2018) versus 5.1 days (2013).

Conclusions: German dermatology hospitals continue to have a high volume of inpatient care, with a comparison of the last six years again showing a compression with shorter length of stay and higher occupancy density. Dermatological hospitals represent an essential pillar of dermatological care.

Background

Medical specialist care is of great importance in Germany. In an international comparison, dermatological care is characterized by a wider range of care and an overall high quality [1]. Accordingly, the proportion of the population with prior experience and preferences for specialist dermatological care is high [2]. This is also true for inpatient care, for which Germany has more capacity than most member countries of the Organization for Economic Cooperation and Development (OECD) [3, 4].

In previous surveys on the performance situation of German dermatology clinics, a stable structure with largely constant bed numbers and occupancies was found at the university clinics over the course of 2011 to 2013 [5]. The clinics were predominantly in high-performance balance sheets within their clinics and were characterized by a wide range of dermatological indication areas. However, between 2011 and 2013, there was already a significant compression of inpatient care with a reduction in length of stay, increase in inpatient occupancy rates, and at the same time, a decline in the case mix index (CMI) [1]. The overall performance balances (case mix, CM) could thus only be achieved through an increased rate of care at the patient level. The determinants of an economically healthy positioning of the hospitals could not be determined at that time.

The present study was conducted for follow-up of both university and non-university dermatology hospitals and was also designed to address additional questions. The central research questions were:

1. What are the current structural characteristics of German dermatology hospitals?
2. What are the current performance data for these departments, as well as the performance data since 2011?
3. What determinants are found for these characteristics and their variance across clinics?

Methods

The study was conducted as a direct survey with a standardized questionnaire on 21 topics among all directors of a total of 115 bed-managing dermatology hospitals in the Federal Republic of Germany from October to December 2019, either paper-based or online with a one-time reminder. The basic part of the survey was oriented on the previous studies of 2011 by Beikert et al. and a survey in 2015, so that a long-term assessment of inpatient dermatological care was possible [5]. Structured questions on inpatient bed and case numbers, case mix, outpatient care, satisfaction with the inpatient care situation, potential hazards, job composition, proportion of women, applicant situation, care spectrum according to clinical areas, further training authorizations and open comments were collected.

Because the present study involved the collection of aggregated secondary data without reference to individuals, it was not necessary to obtain an ethics vote.

Descriptive analyses, subgroup analyses, and correlation analyses were performed. Categorical variables were expressed as percentages and the mean was calculated for continuous variables. For the subgroup analyses, these data were illustrated separately for university clinics (UC) and non-university clinics (NUC) as well as for urban and rural areas. In order to be able to evaluate the correlation of the individual questions, a correlation matrix was set up.

The results were compared on an aggregate level with those of the preliminary surveys of 2011 [5] and 2015 (unpublished). For data protection reasons, no comparisons of individual clinics were made. As data from 2011 were only available for university dermatology hospitals, reference was only made to these.

A p-value < 0.05 was considered statistically significant. Data analyses were performed using SPSS for Windows version 23 (IBM, Armonk, NY, U.S.).

Results

Participating facilities

Of the 115 German dermatology clinics contacted, 95 (82.5 %) returned evaluable data. These were 61 (64 %) NUC and 34 (35 %) UC. Of the 95 departments, 74 were located in urban areas and 21 in rural areas.

Structure of inpatient dermatology departments

As of Jan 01, 2019, the dermatology hospitals had an average of 45 inpatient and 11 day-care beds (UC: 52/13, NUC: 40/9) (Figure 1), and the number of inpatient beds ranged from 24 to 106 for the UC and 10 to 153 for the NUC. Compared to the previous year, no change was reported by 79.3 %, a decrease by 10.9 % and an increase by 9.8 % of hospitals (Table 1). An increase in the number of beds was planned by 28.3 % of the clinics; 65.2 % planned to maintain the current number of beds.

Over the longer term, the number of beds in the UC decreased from an average of 57 in 2011 to 52 at present, with no increase in the number of day-care beds (Table 2).

Care services of the inpatient dermatology departments

Inpatient cases averaged 2,302 in 2018 (UC: 2,874, NUC: 1,983) (Figure 1). The highest number of inpatient cases was 7,813, the lowest 104 (UC: 1,157–7,168, NUC: 104–7,813).
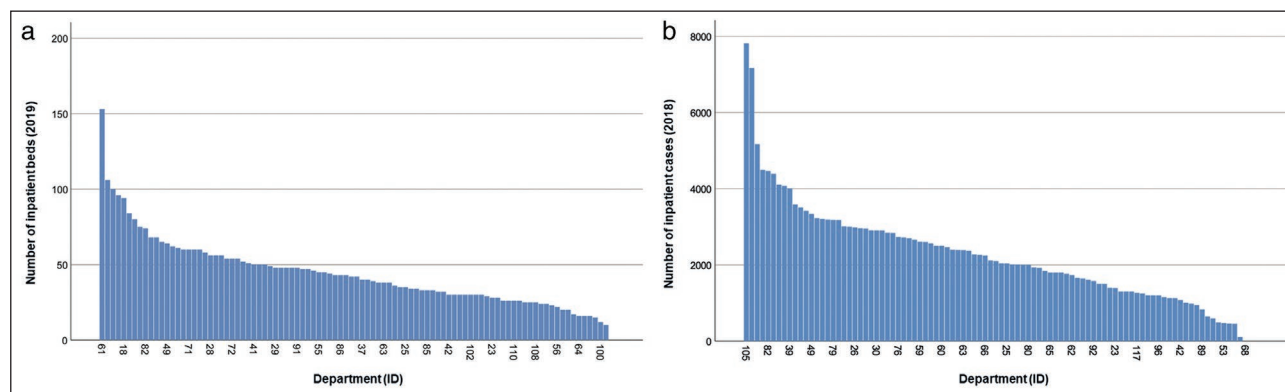
Figure 1 Distribution of the number of inpatient beds as of Jan 01, 2019 (a) and the number of inpatient cases in 2018 (b) in German dermatology departments in 2018 (n = 95).

Table 1 Change in the number of hospital beds in the survey year 2019 compared to the previous year.

	NUC		UC		Total	
	n	%	n	%	n	%
No change	49	81.7	24	75.0	73	79.3
Decrease	3	5.0	7	21.9	10	10.9
Increase	8	13.3	1	3.1	9	9.8
Total	60	100.0	32	100.0	92	100.0

Abbr.: n, number of beds; NUC, non-university hospital; UC, university hospital.

Table 2 Case numbers and performance data of the German dermatology hospitals 2011–2019 (k = number of clinics recorded; data on the performance refer to the previous year).

	2011	2015		2019	
	UC	UC	Total	UC	Total
	k = 32	k = 29	k = 76	k = 34	k = 95
Mean number of cases (n)					
Inpatient	2,538	2,760	2,126	2,874	2,302
Day-care	2,067	2,498	1,794	2,493	1,703
Outpatient	22,529	35,133	18,824	21,447	13,313
Average number of beds (%)					
Inpatient	57.0	56.1	44.4	52.0	45.0
Day-care	12.8	10.8	9.9	13.0	11.0
Case mix, dwell time					
Case mix	1,782.5	2,149.48	1,769.45	1,752.87	1,567.31
Case mix index	0.80	0.77	0.80	0.81	0.80
Length of stay (days)	6.20	5.82	6.00	5.60	5.79

Abbr.: n, number; NUC, non-university hospital; UC, university hospital.

Table 3 Change in inpatient cases in the German dermatology hospitals 2019 (n = 95) compared with the previous year.

	NUC		UC		Total	
	n	%	n	%	n	%
No change	14	23.0	5	16.1	19	20.7
Decrease	6	9.8	8	25.8	14	15.2
Increase	41	67.2	18	58.1	59	64.1
Total	61	100.0	31	100.0	92	100.0

Abbr.: n, number; NUC, non-university hospital; UC, university hospital.

Compared to the previous year, 64.1 % found an increase in inpatient cases, 20.7 % found no change, and 15.2 % found a decrease (Table 3).

Compared to 2011 and 2015, there was an increase in cases at university hospitals in 2018 from 2,538 to 2,760 to 2,874 cases (Table 4). Average occupancy in 2018 was 85.0 % with a variance of 65–110 % (Figure 2), including 85.2 % for UC and 84.5 % for NUC.

Outpatient care

An average of 13,313 outpatient cases were treated (UC: 21,447, NUC: 7,638). The number of outpatient cases differed greatly between university and non-university institutions: The UC reported a minimum of 111 and a maximum of 58,600 outpatient cases, while the NUC reported none to a maximum of 40,000 cases. Here, overall, 64.1 % reported an increase in cases compared to the previous year (UC: 58.1 %, NUC: 67.2 %).

Hospital economic data

The mean reported CM was 1,805.0 (UC: 2,021.1; NUC: 1,636.4) with a mean CMI of 0.76 (UC: 0.74; NUC: 0.77) and a mean length of stay of 5.79 days (UC: 5.50; NUC: 5.90) (Figures 3, 4; Table 2).

The median payment per case in outpatient clinics was 75.50 euros per quarter in 2018 and 95.60 euros in 2019. In the UC, there was an increase in the outpatient flat rate per case from €114.30 to €144.80 from 2018 to 2019 (2011: €67.30), but in the NUC there was a reduction from €31.90 to €29.20 in 2019.

Overall, however, the majority (38.1 % of hospitals) reported a large (38.1 %) or slight (41.7 %) performance surplus in 2018 (UC: 50.0 %/27.5 %, NUC: 30.8 %/44.2 %) (Figure 5). Rural areas had a significantly higher proportion of reported deficits (23.5 %) than urban areas (6.0 %).

Among all institutions of the local hospital group, the majority ranked in the top (67.9 %) or middle (21.0 %) third

in terms of clinical performance (UC: 66.7 %/16.7 %, NUC: 68.6 %/23.5 %).

Differentiation of the performance data

As expected, the number of inpatient beds and inpatient cases correlated significantly with CM (r = 0.68; p < 0.001 and r = 0.76; p < 0.001, respectively) (Table 4, Figure 6), but also with the number of outpatient cases. The CMI, on the other hand, showed no correlation with these but with length of stay. In particular, the latter was negatively associated with the proportion of dermatosurgical cases. Accordingly, the more dermatosurgical cases were treated, the shorter the average length of stay.

In contrast, there was no correlation between the volume of inpatient or outpatient services or other service parameters and bed utilization.

In the outpatient setting, the number of cases correlated with inpatient performance data (Figure 7, Table 4) and with the level of outpatient reimbursement. Higher outpatient reimbursement was also associated with a lower proportion of referrals by dermatologists. The latter were also lower at those hospitals that reported a higher rate of dermatosurgical patients.

Discussion

The objective of this health care research analysis was to characterize the dermatological hospitals in Germany on the basis of self-reported structural and process data. The analysis was based in part on previous surveys conducted in 2011 and 2015. Compared to these previous data, a slightly lower number of inpatient beds was apparent at some of the dermatology clinics. However, since 2011, there has been an increasing trend to expand the number of beds. Furthermore, there has been a decrease in the average length of stay and thus a slightly higher occupancy rate. The current average occupancy of inpatient beds of 85 % with predominantly reported increase in inpatient cases and the increasing partial

Table 4 Correlation between performance data of dermatology departments in inpatient and outpatient settings (n = 95).

	Number of inpatient beds	Occupancy inpatient	Number of inpatient cases	Number of cases outpatient	Case mix	Case mix index	Length of stay (days)	Outpatient remuneration 2018	Outpatient remuneration 2019	Proportion of oncological patients	Proportion of surgical patients	Proportion of female residents (%)	Proportion of female senior physicians (%)	Referral dermatologist (%)
Number of inpatient beds	1	−0.12	0.78**	0.49**	0.68**	0.00	0.06	0.14	0.11	0.06	−0.04	−0.17	−0.21*	0.10
Occupancy inpatient	−0.12	1	0.06	0.04	0.06	0.10	0.08	−0.08	−0.16	0.04	−0.03	0.02	−0.04	0.10
Number of inpatient cases	0.78**	0.06	1	0.66**	0.76**	−0.08	−0.24*	0.21	0.24	0.12	0.19	−0.11	−0.17	0.15
Number of cases outpatient	0.49**	0.04	0.66**	1	0.65**	−0.16	−0.20	0.36*	0.35*	0.16	0.06	−0.09	−0.11	0.06
Case mix	0.68**	0.06	0.76**	0.65**	1	0.04	−0.10	0.02	0.05	−0.02	0.22	−0.14	−0.10	0.18
Case mix index	0.00	0.10	−0.08	−0.16	0.04	1	0.40**	−0.28*	−0.37*	0.13	0.10	0.14	0.06	0.08
Length of stay (days)	0.06	0.08	−0.24*	−0.20	−0.10	0.40**	1	−0.06	−0.19	0.08	−0.45**	0.06	−0.18	−0.15
Outpatient remuneration 2018	0.14	−0.08	0.21	0.36*	0.02	−0.28*	−0.06	1	0.89**	0.11	−0.12	−0.19	−0.37**	−0.33*
Outpatient remuneration 2019	0.11	−0.16	0.24	0.35*	0.05	−0.37*	−0.19	0.89**	1	0.04	−0.07	−0.20	−0.33*	−0.45**
Proportion of oncological patients	0.06	0.04	0.12	0.16	−0.02	0.13	0.08	0.11	0.04	1	−0.30**	−0.03	−0.11	−0.07
Proportion of surgical patients	−0.04	−0.03	0.19	0.06	0.22	0.10	−0.45**	−0.12	−0.07	−0.30**	1	−0.07	0.23*	0.34**
Proportion of female residents (%)	−0.17	0.02	−0.11	−0.09	−0.14	0.14	0.06	−0.19	−0.20	−0.03	−0.07	1	0.26*	−0.05
Proportion of female senior physicians (%)	−0.21*	−0.04	−0.17	−0.11	−0.10	0.06	−0.18	−0.37**	−0.33*	−0.11	0.23*	0.26*	1	−0.08
Referral dermatologist (%)	0.10	0.10	0.15	0.06	0.18	0.08	−0.15	−0.332*	−0.45**	−0.07	0.34**	−0.05	−0.08	1

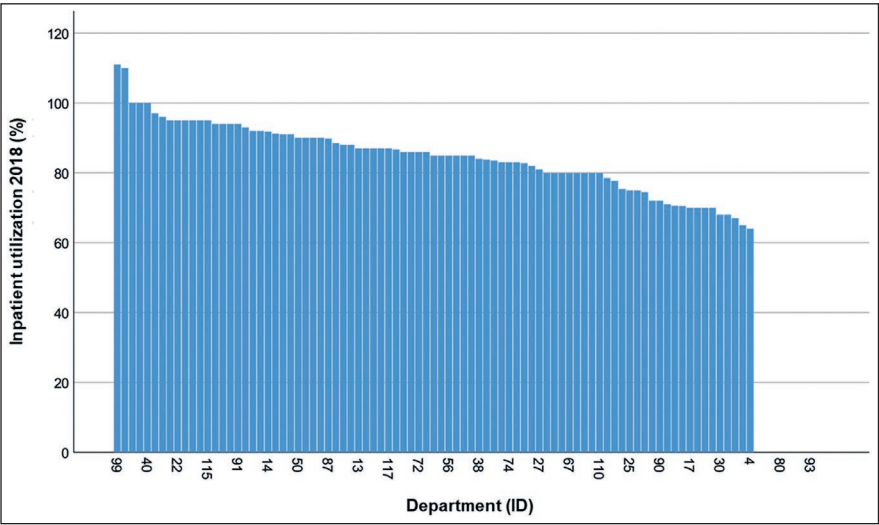*Abbr.:* Pat., patients.

*p < 0.05.

**p < 0.01.

Figure 2 Mean inpatient utilization of beds of German dermatology departments 2018 (n = 95).
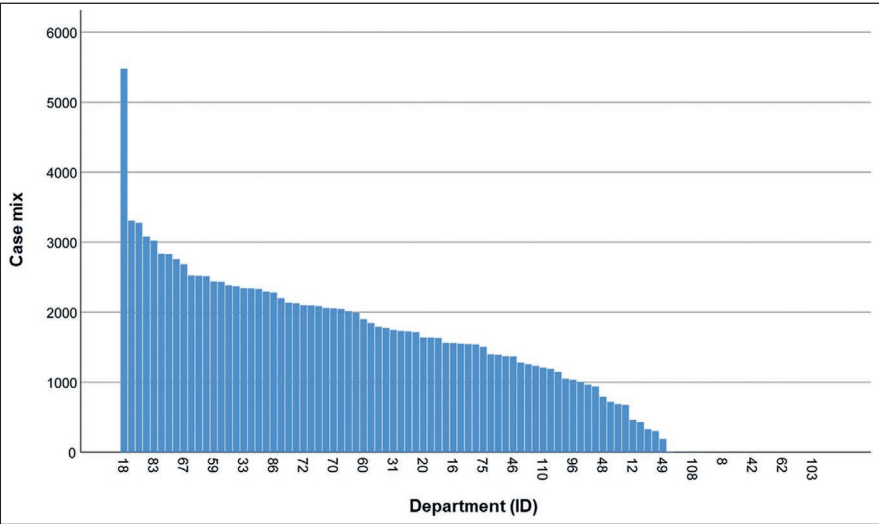

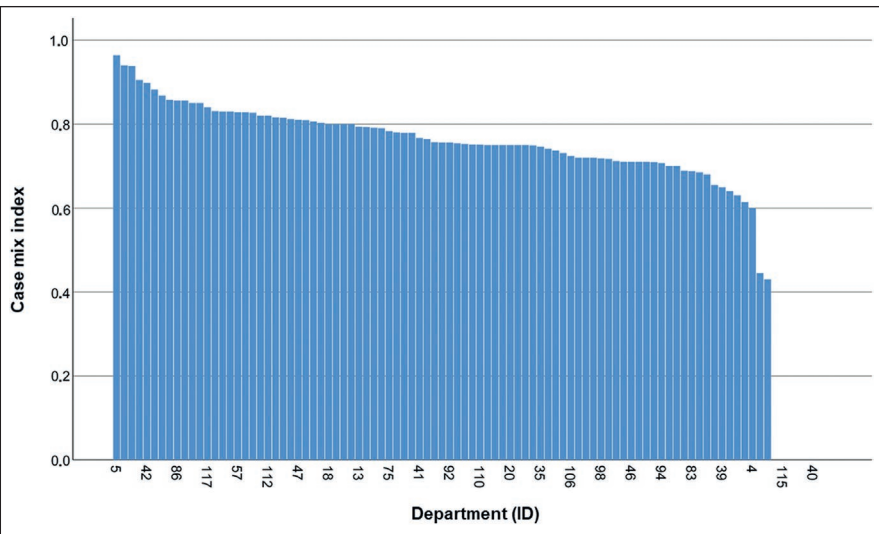**Figure 3** Distribution of case mix of inpatient dermatology departments 2018 (n = 95).

Figure 4 Distribution of case mix index of inpatient dermatology departments 2018 (n = 95).
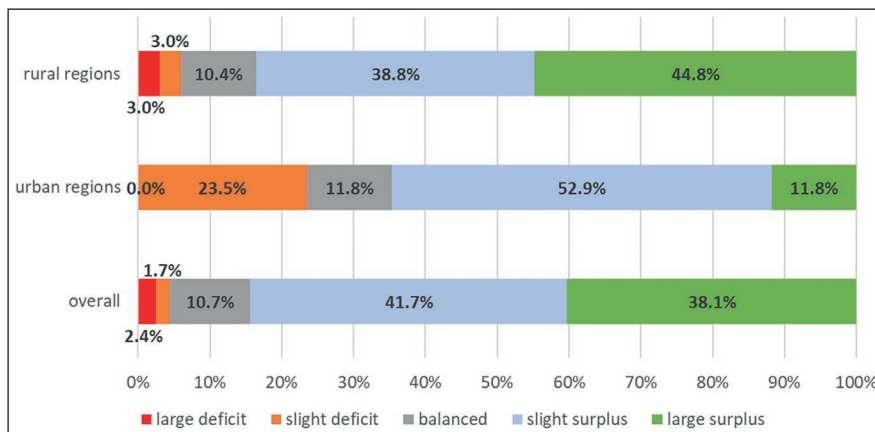
Figure 5 Distribution of 2018 performance balances overall and for urban versus rural regions (n = 95).

inpatient occupancy since 2011 of currently 90 % for both UC and NUC underpin the continuing high or even increasing need for inpatient dermatological care, though the general trend in healthcare is moving from inpatient to outpatient care [6–8]. The reason for this could be the chronicity of skin diseases as well as demographic change, which has a particular impact on malignant skin tumors with their high age peaks. For these, it is true that both the outpatient and inpatient sectors currently have, and will recognizably continue to have, an increasing need for care in the future. However, there is still a clear heterogeneity in the structures of care, which was already stated in the publication of Fürstenberg et al. (2014) for the clinics of the DRG (Diagnosis Related Groups) benchmark and in Beikert et al. (2013) for all dermatological UC and which concerned the clinic size as well as the service focus and the output (CM, CMI) [9]. However, all clinics had in common that compared to the periods of these publications, in the current period (2019), a significant reduction
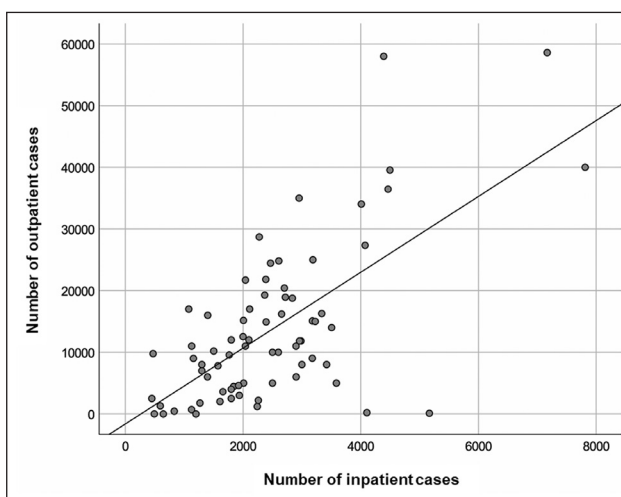

Figure 7 Correlation between number of inpatient and outpatient cases (n = 95).
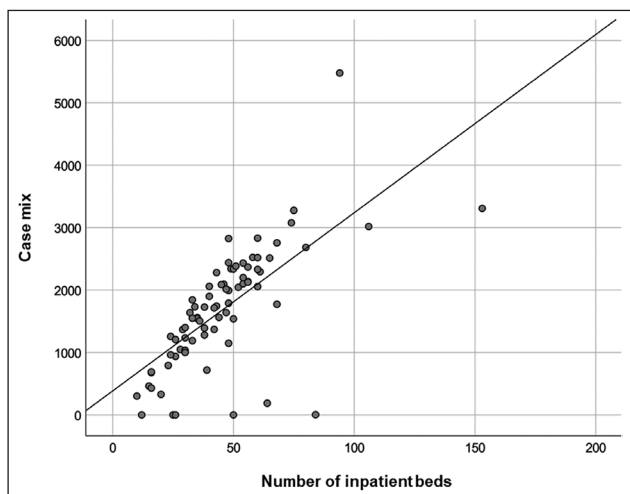
of the mean inpatient treatment time as well as a once again higher number of cases was found in the university facilities.

These findings should be seen in the light of the nationwide trends toward a reduction in bed capacities and treatment days in almost all areas of care. In an international comparison, it should be noted that Germany has a relatively high number of hospital beds in relation to the population. There are marked differences in German dermatological inpatient care compared to the other departments in those areas of care that show an increase in the number of cases treated due to demographics. This applies in particular to malignant skin diseases and autoimmune diseases. The increase in inpatient cases is so strikingly high here that the question of an increased incidence of the disease arises.

The implementation of this study as a pure questionnaire survey can be seen as a limitation, since an examination of the primary data was not possible and the survey was carried

Figure 6 Correlation between case mix and number of inpatient beds (n = 95).

out under assurance of confidentiality. Nevertheless, the data were deliberately collected from the perspective of the clinics or the medical management. However, the consistency of the longitudinal data provides a hint of the validity of the results. It is also to be expected that the performance data are reliable and compliant with regulations due to legal requirements and the self-interest of all providing facilities.

The available data on the range of services and structures of German dermatology clinics demonstrate in summary the high volume of inpatient care provided by German dermatology clinics, which in a comparison of the last six years again showed a compression with shorter length of stay and higher occupancy density. They thus reflect the high demand for inpatient dermatological care in Germany. In view of the demographic change and the resulting increase in the prevalence of severe dermatological diseases, it can be assumed that dermatology will continue to provide a high level of care. For this purpose, the framework conditions in the inpatient area should also be efficient and quality-assuring.

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