

Map of University Medicine (Landkarte Hochschulmedizin)

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Fraunhofer Institute for Systems and
Innovation Research (ISI)
Breslauer Straße 48
76139 Karlsruhe

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Preface

Research, teaching and patient care in university medicine have great significance for the quality of human life. Simultaneously, university medicine is an especially dynamic field of economic innovation. The ageing of society, continuous medical progress as well as the increasing demand for health-care and related services offer considerable opportunities for the future. University medicine must meet these challenges and also the high quality requirements. Transparency of performance in research, teaching and patient care is one means to contribute towards improving quality through (increased) competition.

The Federal Ministry for Education and Research (BMBF) and the Medical Faculty Day (MFT) therefore already published a Map of University Medicine in 2002. For the present, second edition of the Map of University Medicine, comprehensive data on teaching and patient health care were also collected and processed, in addition to the research data. This Map now makes the capacities, structures, substantive focuses and results of university medical research transparent.

With this Map of University Medicine, the BMBF and MFT have implemented the recommendations of various committees concerned with health-care research, such as the Health Research Council (*Gesundheitsforschungsrat* or GFR), the Science Council (*Wissenschaftsrat*) and the responsible Standing Committee of the Culture Conference (KMK). The Map of University Medicine is thus a good example of how a joint goal can be successfully advanced by means of constructive collaboration on various levels, in particular between the federal government and the federal states (*Länder*). This Map is a significant milestone on the way to more transparency in research, teaching and patient care in university medicine.

The Map of University Medicine is a monitoring instrument for which the university institutions themselves are responsible and it therefore presents significant characteristics and indicators for university medicine. It refrains from unilateral judgements and rankings. At the same time, the readily accessible Internet database provides multiple utilisation possibilities. Thus, for instance, the doubling of the third-party income from the European Union between the years 2003 and 2005 shows that the medical faculties were able to clearly improve their position in the Europe-wide competition. We wish at this point to express our thanks to the medical faculties for their willingness to transparency, their intensive cooperation in compiling the data and their constructive support

in further developing this instrument. Our thanks also go to the working group "Map of University Medicine" of the Health Research Council (GFR), in which representatives of the KMK, the Science Council, the Association of German University Clinics (*Verband der Universitätsklinika Deutschland*, VUD), the German Research Association (DFG) and scientists from medical faculties worked with great commitment on elaborating the Map of University Medicine.

The continuation of the Map of University Medicine will further improve the quality and comparability of the data and makes the further development of university medicine visible. It will clearly contribute towards providing a solid data basis for the discussions about (necessary) equipment for and direction of university medicine.

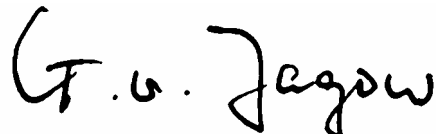
Dr. Annette Schavan



Federal Minister

for Education and Research

Professor G. von Jagow



President of the

MFT (Medical Faculty Day)

Preliminary Remarks

In the spring of 2006, the study "Updating and Continuation of the Research Map University Medicine", which was financed by the Federal Ministry for Education and Research (BMBF), was started. After the data mining was concluded in summer 2007 and the subsequent data quality control carried out, a final report is available. The chronological period referred to in the Map of University Medicine is from 2003 until 2005.

The goal of the updating and extension of the Map of University Medicine is to contribute to an improved transparency and comparability with regard to the activities, priority-setting and capacities of university medicine in research, teaching and patient care. It has been primarily conceived as an Internet-based database and overview (<http://www.landkarte-hochschulmedizin.de>). For this reason, the present report concentrates only on a few selected data which provide a comprehensive overview.

Target groups are, besides the expert public (medical faculties, university clinics, science policy-makers and administration), also scientists, students and representatives of industry.

All medical faculties in Germany participated in the survey, so that in the following a comprehensive overview of the activities and performance of German university clinics can be presented.

1 Legal and Organisational Structure

The legal-organisational framework between faculty and clinic in the year 2005 was as follows:

- Separate organisations for the areas of responsibility research and teaching on the one hand and patient care on the other hand ("cooperation model") are found in the following federal states (*Länder*): Baden-Württemberg, Bavaria, Hesse, Mecklenburg-West Pomerania, North Rhine-Westphalia, Rhineland-Palatinate, Saarland, Saxony, Saxony-Anhalt and Schleswig-Holstein;
- The joint responsibility of a board for the areas of responsibility research, teaching and patient care ("integration model") is characteristic for the following *Länder*: Berlin, Hamburg, Lower Saxony and Thuringia.

In 2005 the majority of the university clinics in Germany were organised as legal entities of public law (Baden-Württemberg, Bayern, Hessen, Mecklenburg-Vorpommern, Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Sachsen, Sachsen-Anhalt, Schleswig-Holstein) University clinics which can be classified under the integration model are as a rule public corporations (Berlin, Hamburg, Jena); in addition, there are the legal foundations with independent legal existence (Göttingen), respectively, a legally dependent federal company (Hanover). Further special cases are medical faculties without their own university clinic (Bochum, Witten-Herdecke and Mannheim), a privatised university clinic (Gießen/Marburg), a private university (Witten-Herdecke) as well as a medical faculty which additionally integrates two natural science faculties as well as four further hospital operators in research, teaching and patient care (Wissenschaftsrat 2007, p. 43).

The demand repeatedly voiced in numerous publications since the end of the 1990s for more professionalism in the deans' offices, aimed at creating an appropriate counterbalance to the administrations of the university hospitals, led to perceptible changes by the year 2005. Not only in the deans' terms of office, the addition of vice deans for special tasks (e.g. research vice deans) as well as providing the deans' offices with scientific and non-scientific staff, point to a change of direction in the sense of increased professionalism on the part of the administrative units involved.

If in 2000 the majority of deans served a two-year term of office, by 2005 this term had been extended in most cases to four years. In Lower Saxony, the term of office of the board member in charge of Research and Teaching is five years, in Göttingen six years¹. In 2005 the office of dean was a secondary job for the majority of deans. Ex-

¹ For the latest status, see Wissenschaftsrat 2007.

ceptions are Berlin, Göttingen, Hanover and the private university Witten-Herdecke. In Bavaria, Hesse, the Saarland and Saxony there is an option to work full-time.

There appear to be signs that the deans' offices have become increasingly professional, in particular the number of scientific staff has increased greatly, indeed on an average from 1.9 scientific staff members in 2000 up to 3.4 scientific staff in 2005. An increase in the number of non-scientific staff can also be determined; the rate of increase is however lower here: in 2000 on average 7.5 persons were employed in the deans' offices, in 2005 ca. 9.4 persons.

2 Financing

2.1 Financing University Medicine

Three sources can be primarily differentiated for financing university medicine in Germany:

- (1) federal state funding of the operative, day-to-day costs in research and teaching (amount of federal state allocation, consumption funds),
- (2) investment funds from the federal government and the federal states (*Länder*),
- (3) third-party funds acquired by the university clinic institutions (mainly from industry, foundations etc.).

On average, in 2005 the medical faculties in Germany received ca. € 82.5 m per year in basic funding from the ministries responsible for financing in the federal states, whereby the degree of fluctuation among the faculties is very high. University medicine in Berlin (Charité) and the LMU Munich clearly stand out due to the sheer financial volume. By contrast, a number of faculties receive only a very small federal state allocation per annum: these are either locations in the "new" federal states (Dresden, Greifswald, Halle-Wittenberg, Jena, Leipzig, Magdeburg, Rostock) or organisational special cases such as Bochum, Gießen/ Marburg, Mannheim, Regensburg as well as Kiel and Lübeck.

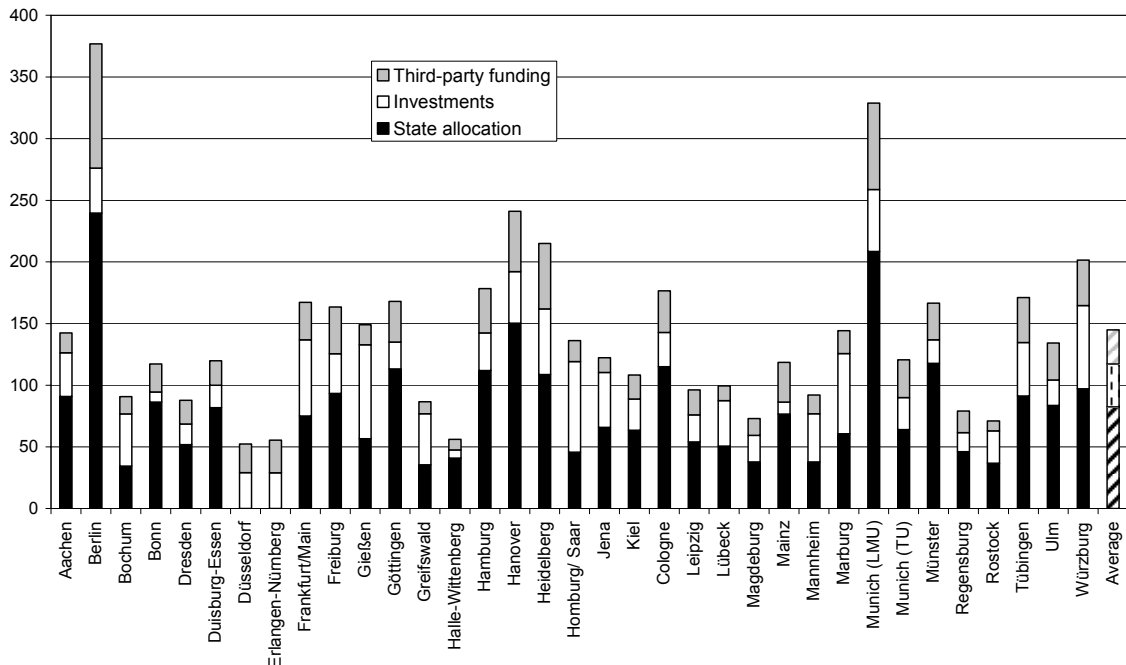
Besides investment and consumptive "basic funding", the university medical institutions have spent considerable amounts of third-party funds in the past years². The quota of third-party funds compared with the federal state allocation for research and teaching varies in the year 2005 between 18 % and 49 %.

Figure 2-1 summarises how university medicine is financed at the level of the individual institutions in the year 2005. Besides the extreme differences in amounts – the range is from total expenditures of over € 380 m for the location Berlin down to € 56 m for Halle – above all, the greatly differing share of individual financing sources can be seen.

The investment funds played an important role in 2005, with a financing share in parts above 50 % (Gießen, Homburg/Saar).

2 Those shares are defined as 'third-party funds' which do not stem from the budget of the ministry responsible for the basic funding. In the data presented here, third-party funds from the German Research Association (DFG), the federal government, the *Länder*, the European Union, industry, from foundations and other third-party donors are included. Only the third-party funds spent in each respective year are quoted.

Figure 2-1: Financing for University Medicine according to Source
(Reference period: year 2005, in € m)



* No calculations were possible for Witten-Herdecke due to lack of data.

The funds for day-to-day operation (federal state allocation for research and teaching) constitute a particularly high share of the total financing in 2005 for the following locations: Göttingen, Münster, Duisburg-Essen, Halle-Wittenberg, Bonn (share of total financing 66% and more). The locations Mainz, Berlin, München (TU) and Heidelberg exhibited a particularly high "external financing share" in 2005.

2.2 Principles and Procedures of Performance-oriented Fund Allocation (LOM)

The call for accountability regarding performance, quality and benefit of state-promoted science and research has become louder in the past years. Growing areas of autonomy in the universities as a result of the introduction of block budgets went hand in hand with new, performance-oriented modes of distributing research funds. Medicine played a leading role in this process, as at the end of the 1990s systems to allocate funds increasingly according to performance were already being implemented (ex post, ex ante) (Bührer et al. 2001, Menrad et al. 2001).

In 2005 most of the (ex post) LOM procedures established in the medical faculties concentrated on research performance/ results, whereby as a rule the acquisition of third-party funds and publications were cited to calculate the LOM shares. Differences exist

primarily with regard to the weighting of the two factors. In the teaching area, which in 18 faculties is an additional subject of the internal LOM, very heterogeneous criteria are applied which however almost always include evaluations by students. Further performance areas are seldom recorded at the medical faculty level.

With reference to the ex ante procedure in the performance-based allocation of funds, it can be seen that after the establishment of the first internal research and teaching promotional programmes at the end of the 1990s, every medical faculty in Germany has internal research promoting programmes in the meantime. Typical instruments of research promotion policy are the starting support for junior scientists, male and female, initiation of priority programmes and financing for research programmes up to application maturity with external third-party donors. The targeted promotion of teaching however is still in its infancy.

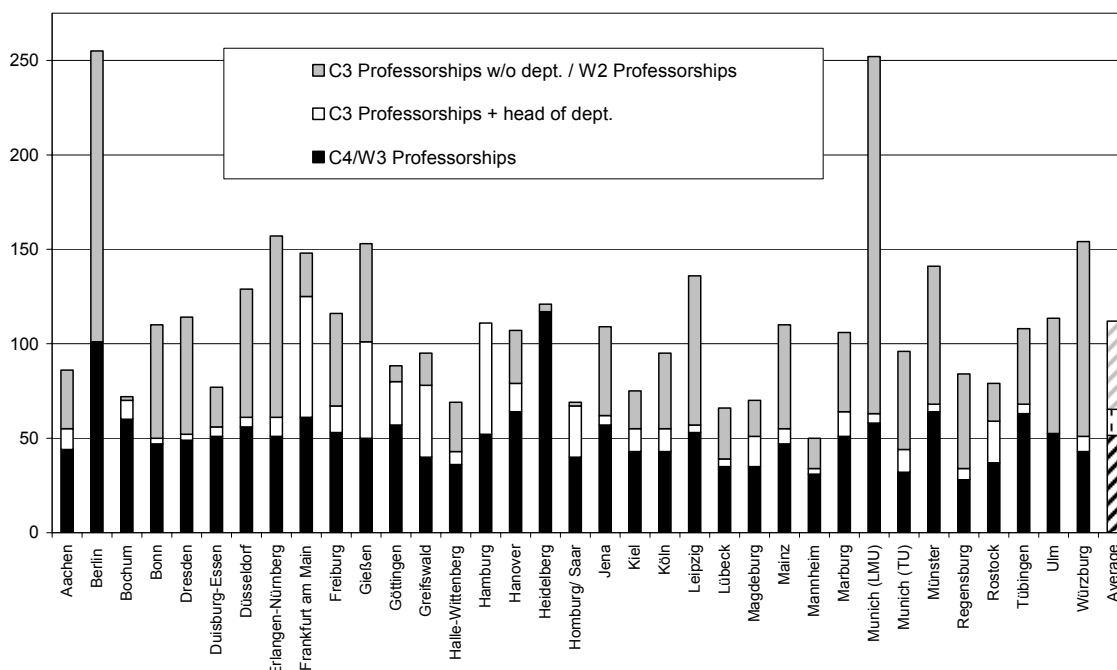
3 Personnel

3.1 Personnel: Numbers and Qualifications

A comparison of the employees between the medical faculties is very difficult because the faculties differ greatly, for instance, as regards the number of students and hospital beds, the fact that some faculties include dentistry or other courses of study and some not, that in several faculties no preclinical training is on the syllabus, that no own clinic exists or one clinic is utilised by two faculties, etc. In addition, the composition of the scientific personnel in the faculties varies to a very great degree, as can be shown in the following figures.

Figure 3-1, in which the entire personnel situation of the medical faculties at the university professorship level is depicted, shows that in the year 2005 the following locations had 70 and less professorships: Halle-Wittenberg, Homburg/Saar, Lübeck, Mannheim and Magdeburg. Berlin and the LMU Munich with over 250 professorships stand out clearly above the average.

Figure 3-1: Number of Professorships in the Year 2005

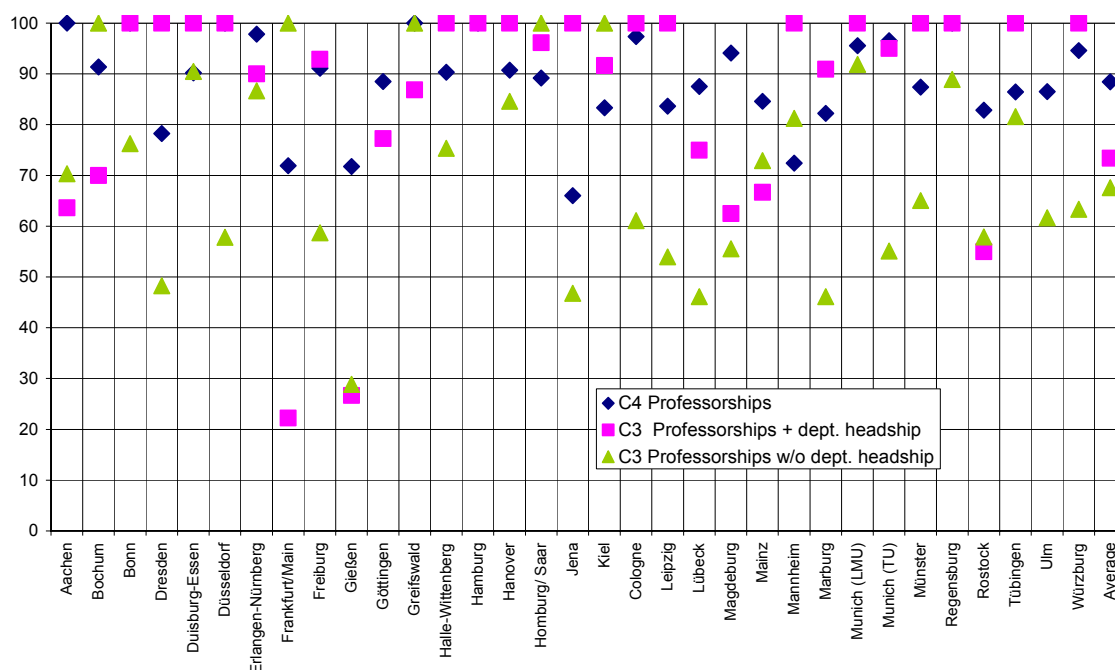


* No data on the professorships are available for Witten-Herdecke.

** A professor on the salary scale C4 or W3 is as a rule the holder of a chair. He has several positions for scientific staff and his own budget, while professors in the salary group C2/C3 or W2 have far fewer staff and lower budget funds at their disposal. The switch in salary scale from C to W for professorships took place from the year 2004 onwards.

One main result of the first research map of university medicine was the striking discrepancy between filled and unfilled professorial positions, which principally concerned locations in the new federal states. For this reason, in the present survey we also asked how many of the professorships were actually filled in each survey year. The following figure shows the results for the year 2005. The depiction is limited to human medicine as the problems are particularly evident here.

Figure 3-2: Share of Filled C Professorship Positions in the Year 2005 in Human Medicine (in per cent)



* For Berlin and Hamburg only data on the filled professorships was available, but not for the professorships generally; for Heidelberg the data on the C professorships in 2005 were missing, for Witten-Herdecke all personnel information was missing.

Figure 3-2 shows that the problematical situation with unfilled positions occurs particularly often in the area of C3 professorships which do not include department headships: on average, only 68 % of these chairs are actually filled, while this is the case for 88 % of all C4 professorships.

Approximately one quarter of all C4 professorships in the year 2005, however, remained unfilled in the locations Gießen, Frankfurt/Main, Jena and Mannheim.

In the area of the C3 chairs with department headships the quotas for Gießen and Frankfurt/Main are striking: here more than two-thirds of the chairs were not filled in 2005. In the case of the C3 professorships without department headships, in the year

2005 approx. half and more of the positions remained unfilled in the locations Dresden, Gießen, Jena, Lübeck and Marburg.

3.2 Women in University Medicine

In principle, the results of numerous studies on the discrimination against women in the German science system can also be demonstrated for medicine, i. e. the higher the position in the hierarchy, the lower the share of women (cf. Wissenschaftsrat 2006, BLK 2004, Kommission Klinika 2007). The drastic reduction of the proportion of women begins in the post-doctoral phase.

Figure 3-3: Share of Women on the Career Ladder in University Medicine³

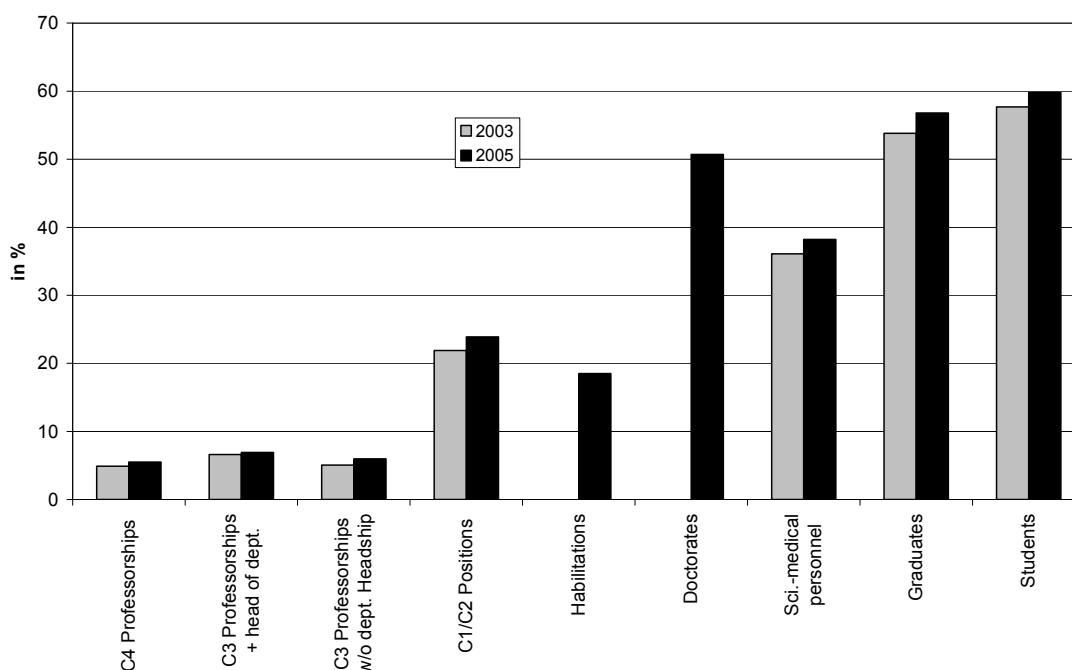


Figure 3-3 shows how the individual positions are filled over time, beginning with the students and progressing up to the C4 chairs; the average values across all faculties are represented.

The share of women among the students (human medicine, dentistry and other courses of study in the faculty of medicine) amounts in 2005 to 59.8 %, the share of women among the graduates 57 %; the share of women among doctoral candidates rose to an average of 50.7 %, while this rate was only 46% in 2002, according to the BLK study

³ Only data for the year 2005 only are available for the doctorates and habilitation theses.

dated 2004. However, a clear decline is seen in the transition to habilitation (post-doctoral thesis written to qualify as a university lecturer) – here the proportion of women amounts to only 18.5 % on average. The women's share of the C4 and C3 professorships in the past years amounts to ca. 5 % for the C4 chairs and 7 % for the C3 professorships with department headships attached.

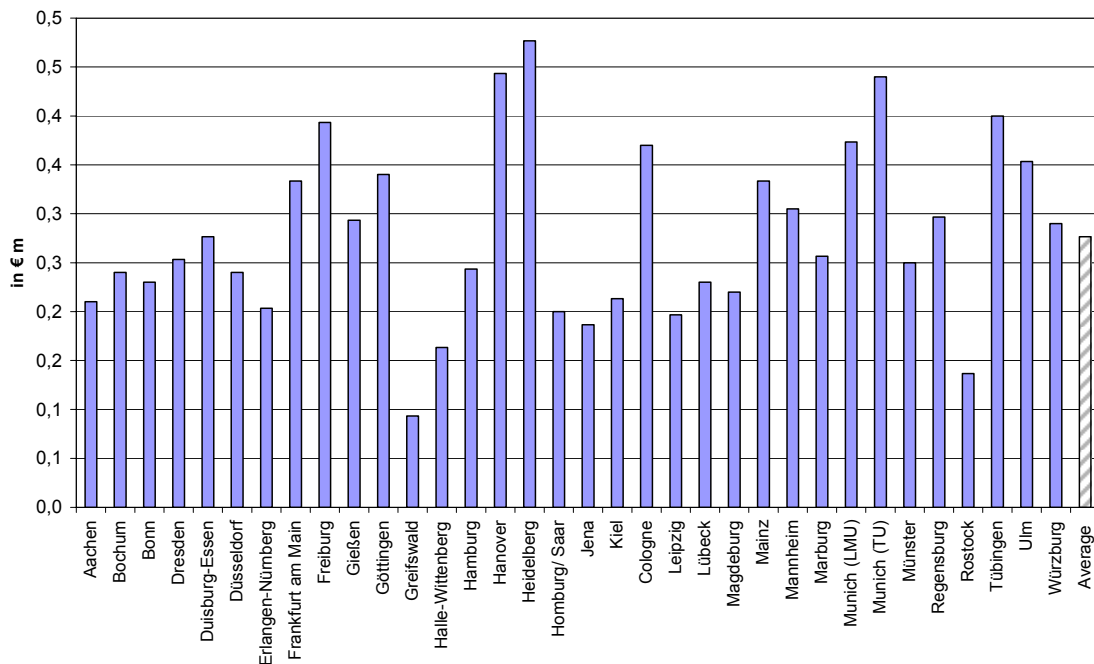
4 Research

In the field of research the following thematic areas are dealt with: research performance (third-party funds, publications and patents), promoting junior staff, research focuses as well as cooperations with non-university research institutions.

4.1 Third-party Funds

As already discussed in Chapter 2, there are considerable differences among the medical faculties with regard to the amount of the third-party funds spent annually. In order to relativise the different sizes of the faculties, in the following the amount of third-party funds acquired is depicted per filled professorial position.

Figure 4-1: Average Third-party Funds spent per Filled Professorship⁴ and Year in the Period 2003-2005 (in € m)



* For Witten-Herdecke and Berlin calculations were not possible due to lack of data.

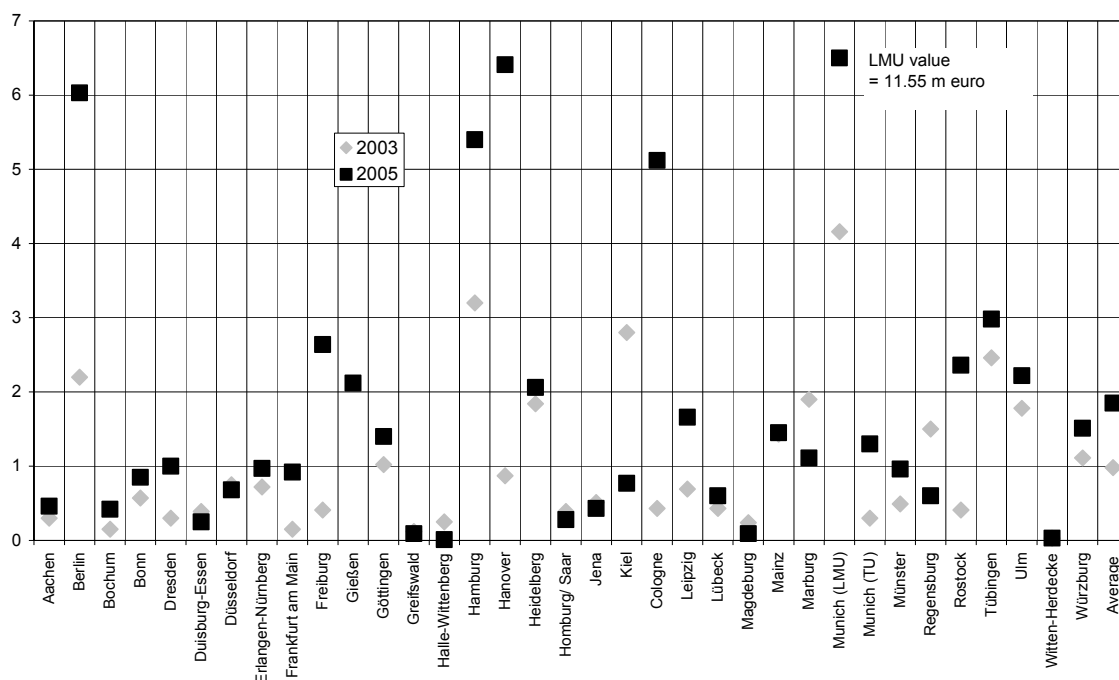
⁴ 'Professorships' contain all filled C4, C3, W3 and W2 chairs as well as endowed professorships in human medicine, dentistry and the other courses of study. In the questionnaire no differentiation into filled/ vacant was made, thus all cited positions are taken into account.

The following results can be ascertained: on average, each professor in university medical circles was responsible for an average amount of ca. € 270,000 expenditure in third-party funds in the period 2003-2005. The following groups can be differentiated:

- one group with more than € 400,000 third-party funds expenditure per year and professorship (TU München, Tübingen, Hanover, Heidelberg)
- one group with more than € 300,000, but less than € 400,000 third-party funds expenditure per year and professorship (LMU Munich, Frankfurt/Main, Freiburg, Göttingen, Köln, Mainz, Regensburg, Ulm)
- one group whose third-party funds expenditure per annum and professorship lies between € 200,000 and € 300,000 (Aachen, Bochum, Bonn, Dresden, Duisburg-Essen, Düsseldorf, Erlangen-Nürnberg, Gießen Hamburg, Homburg/Saar, Kiel, Leipzig, Lübeck, Magdeburg, Marburg, Münster, Würzburg)
- one group with less than € 200,000 third-party funds expenditure per professorship (Greifswald, Rostock, Halle-Wittenberg, Jena)

In view of the increasing significance of internationalisation for the German research landscape (Edler et al., 2007) the participation of university medical institutions in the EU Framework Programme was investigated in more depth.

Figure 4-2: EU Third-party Funds spent in 2003 and 2005 (in € m per year)



* No data is available for Mannheim on third-party funds from the EU. For the LMU Munich only a part of the EU funds in 2005 are represented by a column.

With reference to the total third-party funds from the European Union, the following can be seen:

- European Union third-party funds were almost doubled from 2003 until 2005, from an average of € 1 m per faculty in 2003 to € 1.9 m in 2005.
- faculties with above-average high EU funds in the period 2003-2005 are the LMU Munich, Hamburg, Berlin, Köln, Hanover and Tübingen, which each spent over € 8 m in EU funds as the sum of the years 2003-2005.

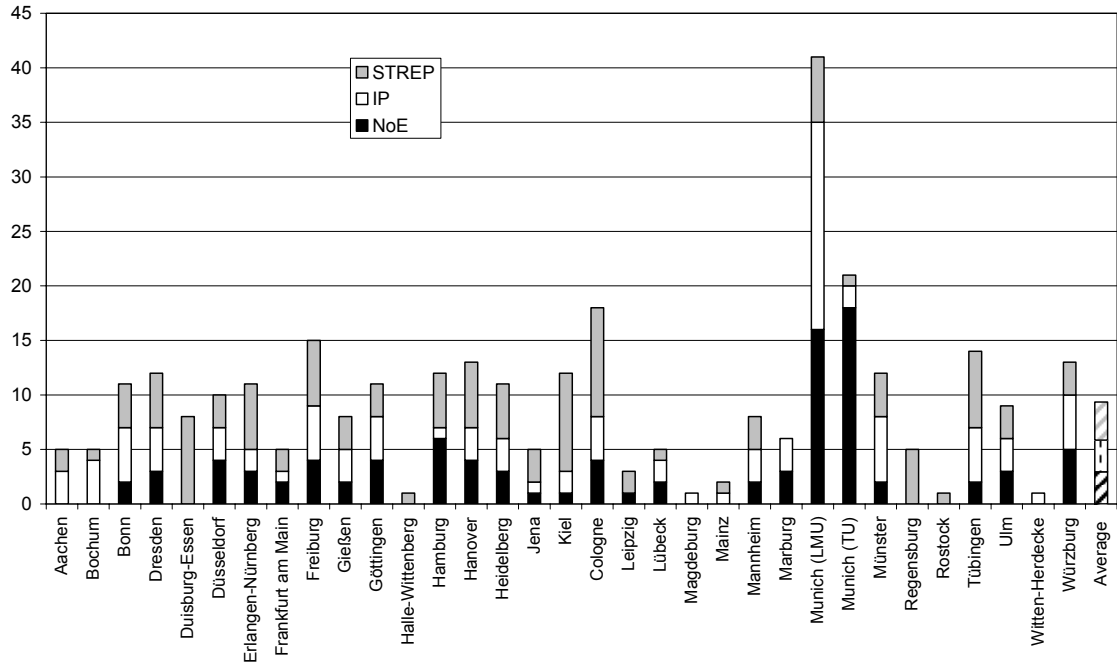
If one considers the number of projects managed, respectively participations in the promotional instruments "Networks of Excellence" (NoE)⁵, "Integrated Projects" (IP)⁶ and "STREPs"⁷, then both the Munich faculties are outstanding in the NoE area. But also Hamburg, Würzburg, Freiburg, Köln, Hanover, Göttingen and Düsseldorf participate between 4 and 6 times in the Networks of Excellence. The LMU Munich, Münster, Würzburg, Freiburg, Tübingen and Bonn are particularly involved in the field of Integrated Projects.

⁵ Networks of excellence strengthen European cutting-edge research by means of a long-term and sustainable interlinking of outstanding research institutions or departments in the sense of a virtual "centre of excellence" (http://cordis.europa.eu/fp6/instr_noe.htm).

⁶ Integrated Projects besides their core research can also encompass technological developments, demonstration objects or training components. The participation of at least three partners from three European Member States is required. They run for between three and five years. They must provide proof of an own management structure (http://cordis.europa.eu/fp6/instr_ip.htm).

⁷ STREPs (Specific Targeted Research Projects) designed to achieve concrete results or to meet certain needs at the European level. The participation of at least three partners from three European Member States respectively associated countries is mandatory. As a rule, they run between two and three years (http://cordis.europa.eu/fp6/instr_strp.htm).

Figure 4-3: Number of Participations in Specific EU Promotional Instruments in the Year 2005

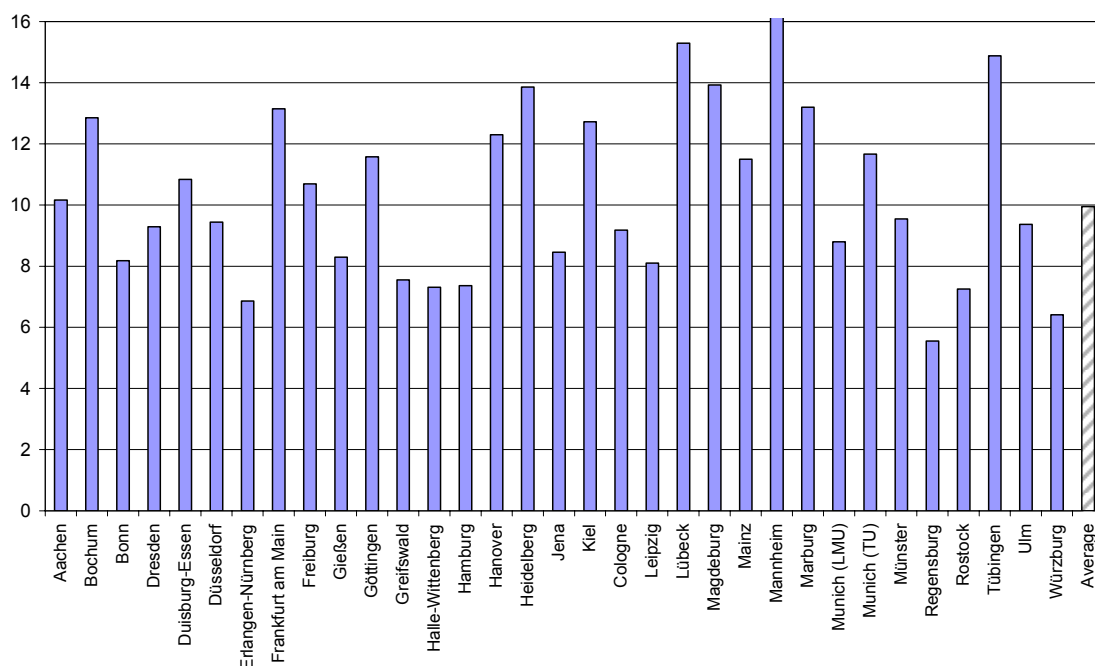


* No data are available for Berlin and Homburg/Saar on specific EU promotional instruments. Greifswald has no participation to show.

4.2 Publications and Patents

If the information from the medical faculties on their publication activities is considered, then the following results can be ascertained: the medical faculties were able to increase the number of their publications in the course of time, as a rule. The number of publications fluctuates among the locations (cf. Figure 4-4).

Figure 4-4: Average Number of Publications⁸ per Filled Professorship⁹ per Year in the Period from 2003 until 2005



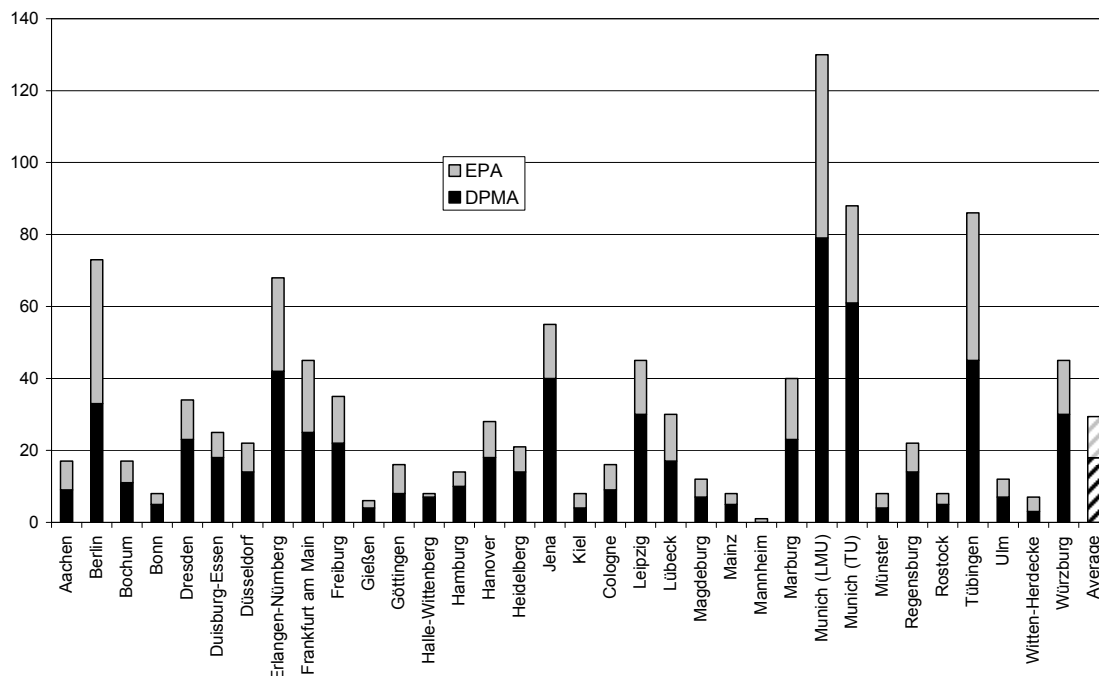
* No data are available for Berlin, Homburg/Saar and Witten-Herdecke.

The consideration too of the number of patent applications reveals clear differences among the faculties: of the 5 faculties with the most patent applications, three are located in Bavaria (LMU and TU Munich, Erlangen-Nürnberg).

⁸ Quoted are only original publications in international scientific journals with a peer-review procedure, only articles by (co-)authors, who are employed full-time in the relevant faculty, only already published work, no forthcoming articles (being printed), no abstracts and congress contributions/ papers, without specialist evaluation (see too DFG 2004; Wissenschaftsrat 2005, p. 54/55).

⁹ All filled C4, C3, W3 and W2 professorships as well as endowed chairs in human medicine, dentistry and the other courses of study are taken into account. No differentiation was made in the questionnaire for the W positions into filled / vacant, thus all positions are considered.

Figure 4-5: Patent Applications to the German Patent and Trade Mark Office (DPMA) and the European Patent Office (EPA) in the Years 2003 and 2004



* For Greifswald and Homburg/Saar the searches did not find a hit.

4.3 Promoting Junior Staff

The activities and results in the area of promoting up-and-coming scientists can be determined as follows, using the data available in the Map of University Medicine:

- 1) successfully obtaining funds to promote junior staff from external sponsors (e. g. for research training groups of the DFG, Marie Curie scholarships, junior research groups, Heisenberg scholarships),
- 2) successfully completed doctorates and habilitation theses.

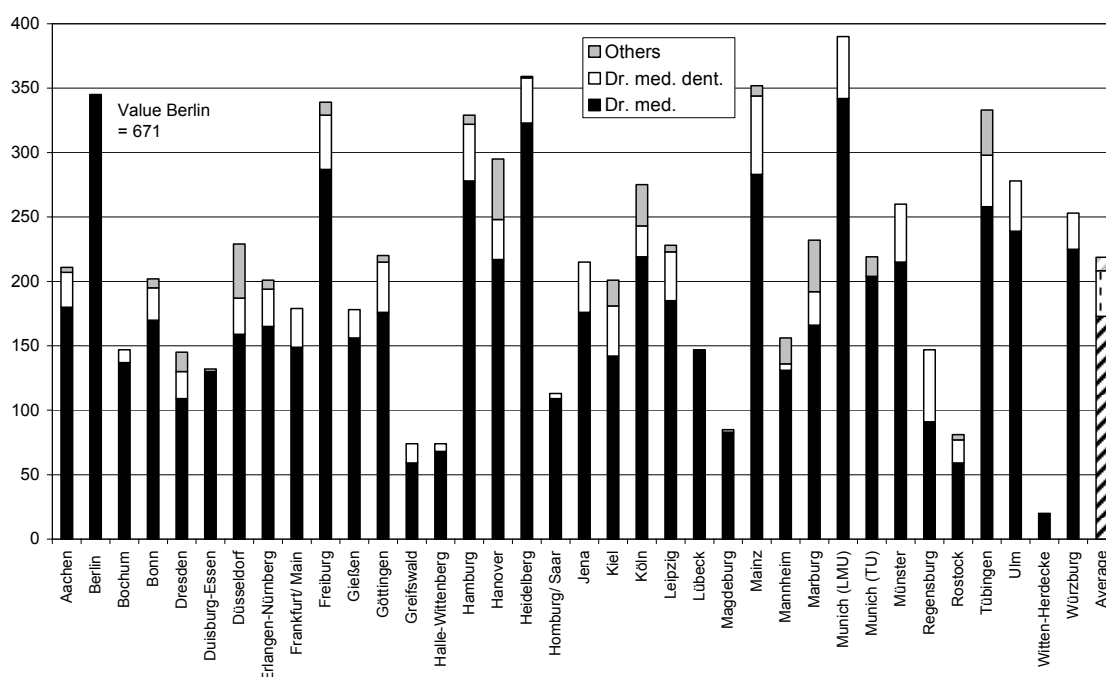
The following locations are particularly successful in acquiring external funding for measures to promote junior staff/ the next generation of medical researchers:

- DFG research training groups: Berlin, LMU Munich, Göttingen, Tübingen, Heidelberg, Erlangen-Nürnberg and Würzburg had at least 5 graduate research training groups per location in the year 2005.

- Externally financed junior staff groups¹⁰: Göttingen, Würzburg, Bonn, LMU Munich, Freiburg, Halle-Wittenberg, Rostock and Dresden in 2005 had at least 5 groups of this kind per location.
- Locations with Heisenberg scholarships¹¹ are Münster, Ulm, Bonn, LMU and TU Munich, Freiburg and Magdeburg.

On considering the activities in the area of doctorates, it must be emphasised that the majority of university medical institutions in 2005 offer other possible doctorates besides the titles Dr. med. and Dr. med. dent.

Figure 4-6: Number of Doctorates in University Medicine in the Year 2005



* For Berlin only data on doctorates as a whole was available, which include the titles Dr. med., Dr. med. dent., and Dr. rer. medic. Only approx. half of the actual number of doctorates is represented for Berlin by one column.

¹⁰ The junior groups promoted with external funds are among others those promoted under the DFG Emmy Noether Programme or in the framework of special research areas (more information under <http://www.dfg.de>).

¹¹ The Heisenberg programme intends to retain outstanding young scientists, who have already qualified as lecturers, for science/ for a scientific career (see on this also <http://www.dfg.de/>).

With regard to doctorates, the figure reveals considerable differences in activity among the faculties: besides one group which consists primarily of the especially large faculties such as Berlin, LMU Munich and Heidelberg, there is a group of faculties in which over 300 doctorates were gained in 2005 (Freiburg, Hamburg, Mainz, Tübingen and Ulm). Low numbers of doctorates are observed particularly in several faculties in the new federal states (Greifswald, Halle-Wittenberg, Magdeburg and Rostock).

A similar picture emerges for the habilitation processes: besides three faculties with ca. 50 and more habilitations each (Berlin, LMU Munich and Heidelberg), there is an intermediate group, in which between 20 and 40 habilitations were accepted in 2005, amongst them also smaller faculties such as Regensburg, Kiel and Ulm. In a third group, between 14 and 19 habilitation titles were awarded in 2005. An above-average number of faculties in the new federal states belong in this group (Magdeburg, Jena, Leipzig, Dresden), but also Marburg, Gießen, Düsseldorf, Bochum, Mannheim, and Lübeck. The group with less than 10 habilitations in 2005 consists of the two faculties in Mecklenburg-West Pomerania (Greifswald and Rostock), Halle-Wittenberg, Homburg/Saar and Witten-Herdecke.

4.4 Research Focuses

A research focus was defined in the survey as follows: it is characterised by scientific excellence, by thematic focusing with the participation of several institutions and working groups as well as by the acquisition of instruments to specifically promote research groups. The coordinated programmes of the DFG or the BMBF can typically be reckoned among these promotional instruments. General features of such instruments are the participation of various institutions and the structural target which exceeds the achievement of purely scientific results, e. g. strengthening or constructing research profiles, interdisciplinary networking etc. (e. g. special research areas, DFG research groups, clinical researcher groups).

If this definition is taken as a basis, then the medical faculties had an average of 3.6 of these research focuses in 2005. Thematic focuses lie above all in the neurosciences, cardio-vascular research as well as oncology or tumour research. Furthermore, an orientation is apparent towards basic-research-oriented subjects, e. g. molecular medicine. Compared with the year 2000, on the one hand, a tendency towards change, and on the other hand towards a concentration of the focuses on fewer areas on the whole becomes evident (cf. www.landkarte-hochschulmedizin.de).

4.5 Cooperation Structures

On account of the general significance of this subject, some core information on cooperation with non-university research organisations was gathered within the Map of University Medicine project. The following forms of cooperation were differentiated:

- joint participation in coordinated programmes of the DFG, associated projects of the BMBF, associated projects of other ministries, respectively third-party donors or EU projects
- programmes to promote doctoral students, e. g. joint research schools
- jointly financed junior scientist groups
- joint appointments by universities and non-university institutions
- jointly operated institutions, e. g. centres for translational research etc.
- joint financing and/ or contractually regulated utilisation of infrastructure equipment, e. g. large equipment

The type of non-university research facility involved was to be given for each of these forms of cooperation. The following were possible: institutions of the Max Planck Society (MPG), the Helmholtz Association (HGF), the Fraunhofer Society (FhG), the Leibniz Association (WGL), or cooperation agreements with federal government/ federal state research bodies.

Basically, joint participation in the coordinated programmes of the various sponsors appear to be the most important cooperation form, merely six faculties named no such cooperation. Further forms of cooperation are:

- joint appointments (cited by 22 faculties, preferred cooperation partners: institutions of the Helmholtz and the Leibniz Associations, as well as the Max Planck Society)
- jointly operated institutions (significant for 18 faculties, preferred cooperation partners: institutions of the Helmholtz Association and the Max Planck Society)
- joint support for doctoral candidates/ students (relevant for 17 faculties, preferred cooperation partners: institutes of the Max Planck Society)
- joint junior scientist research groups (cited by 13 faculties, preferred cooperation partners: institutions of the Helmholtz Association and the Max Planck Society)
- jointly utilised large equipment (significant for 12 faculties, preferred cooperation partners: institutions of the Leibniz Association and the Max Planck Society).

5 Teaching

The tuition offered in the medical faculties is widely diversified. Besides human medicine, dentistry is also on the syllabus in most locations¹². In addition, in the medical faculties in 2005 various "other courses of study"¹³ are on offer, which do not lead to the professional goal of doctor of medicine, partly in a minor subject or as a cross-faculty course, and as Bachelor, Master's, PhD or Diploma course of study, in Witten-Herdecke also as a correspondence course (Open University). In Kiel and Lübeck the joint training in human medicine of the students from two faculties takes place in one university clinic; at the TU Munich and in Mannheim in the observed period 2003-2005 there was no independent pre-clinical training. According to the German Licensing Rules for Doctors, the faculties can establish model study courses. These have partly replaced the regular courses of study. In 2005 the following faculties set up such model courses of study in human medicine: Aachen, Berlin, Bochum, Hanover, Köln, Witten-Herdecke.

Against the background of these special features, the largest faculties by far, measured in the total number of students (in human medicine, in dentistry and in the other courses of study) are in 2005 Hamburg with 5,497 students and LMU Munich with 5,081 students, followed by Göttingen with 4,052 and Freiburg with 3,957 students.

Figure 5-1 depicts how the amount of federal state allocation is distributed according to the total number of students (taking human medicine, dentistry and other courses of study together), and how the statistical ratio of students to professors and scientific-medical personnel was in 2005.

In Leipzig about 61 students had to be provided for with € 1 m from the federal state allocation, followed by Gießen (52.9) and Hamburg (49.1). The ratio was most favourable in the TU Munich (19.7 students per € 1 m), closely followed by Hanover (19.8), Duisburg-Essen (19.9), after a gap by Münster (22.9) and by the LMU Munich (24.4). The average was 33.43 students per € 1 m from the federal state allocation of funds.

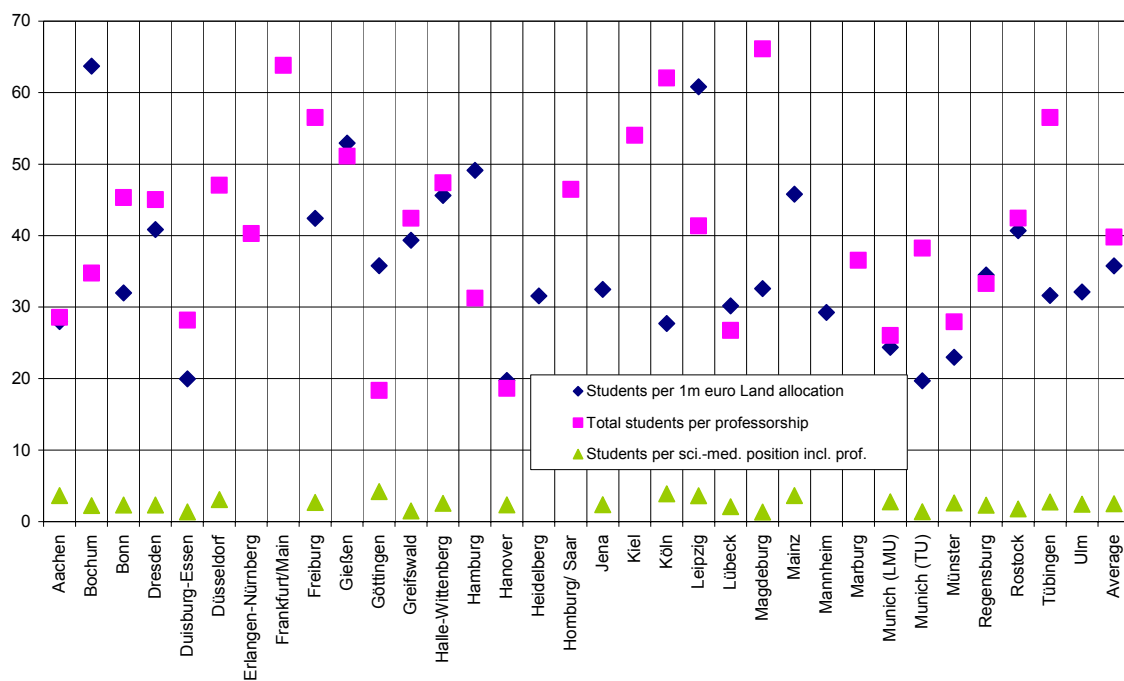
The comparison of the indicators produces the following: with a large number of students per € 1 m federal state allocation, the ratio of students to professors for supervisory purposes lies in midfield (e. g. Hamburg, Leipzig), conversely, a more favourable financial situation can also be accompanied by a more unfavourable supervisory ratio

¹² The medical faculties Bochum, Duisburg-Essen, Lübeck, Magdeburg, Mannheim, Munich (TU) do not offer dentistry on the syllabus.

¹³ No 'other courses of study' are offered in 2005 in: Duisburg-Essen, Frankfurt/M., Gießen, Jena, Lübeck, Magdeburg, Münster and Regensburg.

(e. g. Köln, Magdeburg, Tübingen). These indicators differ in their information content and must therefore be considered separately.

Figure 5-1: Indicators of the Total Number of Students (Reference Year: 2005)

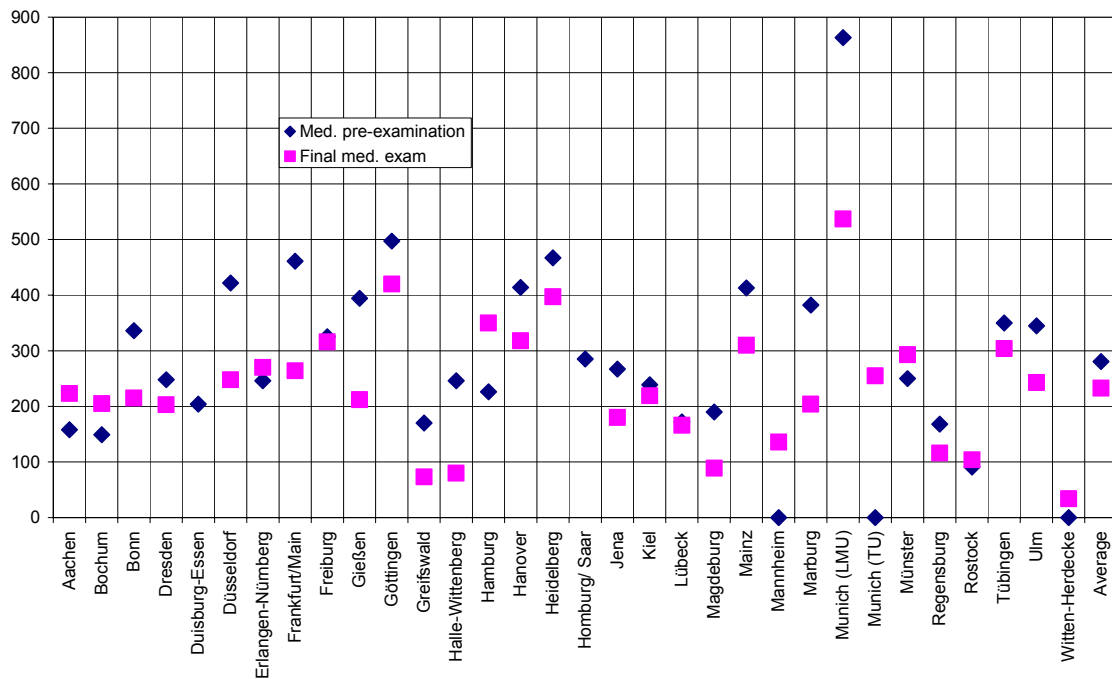


* No respectively incomplete information is available for Würzburg and Berlin.

Further information is available for human medicine studies, number of students etc. The following figure conveys an impression of the size of the faculties according to the numbers of examination candidates; the ranking/ order according to this criterion corresponds largely to the admission capacities.

In the year 2005, an average of 232.8 candidates per faculty sat the final examination in human medicine, ranging from 34 in Witten-Herdecke, respectively 73 in Greifswald, up to 573 at the LMU Munich. The share of female candidates was 54.6 % on average and thus lower than that of applicants for university places (59%), for students in pre-clinical human medicine (60,3%) and for students in the clinical phase (59,2%).

Figure 5-2: Number of Examination Candidates in Human Medicine (Reference Year: 2005)



* No information is available for the area teaching for Würzburg and Berlin. Statistics on participants for both examinations are missing from Cologne and Leipzig, for candidates in the medical examination from Duisburg-Essen and Homburg-Saar. Mannheim and TU Munich have no preclinics.

The duration of the study course for first-time candidates in the medical examination which concludes the course of study in human medicine was lowest in Jena with 12.9 semesters, closely followed by Dresden and Regensburg, and in Düsseldorf, Witten-Herdecke and Frankfurt/ Main with 14.4 respectively 14.5 semesters as the longest. The average time was 13.7 semesters.

Performances in the written examinations are comparable among the faculties, as they are based on the centrally held IMPP tests (Institute for Medical and Pharmaceutical Examination Questions = IMPP). With less than 55 %, the faculties in Hanover, Kiel, Marburg, Düsseldorf and Jena have the lowest share of correctly answered questions of all questions in the medical pre-examination in human medicine, Tübingen, LMU Munich and Erlangen-Nürnberg perform best, with slightly more than 60 %.

In the second section of the medical examination the share of correct answers to all questions in Regensburg, Heidelberg, Freiburg, Erlangen-Nürnberg and Magdeburg is just below 80 % in all cases. All faculties have a quota of over 73 %. In Heidelberg, Erlangen-Nürnberg and Regensburg three of these faculties also have a particularly

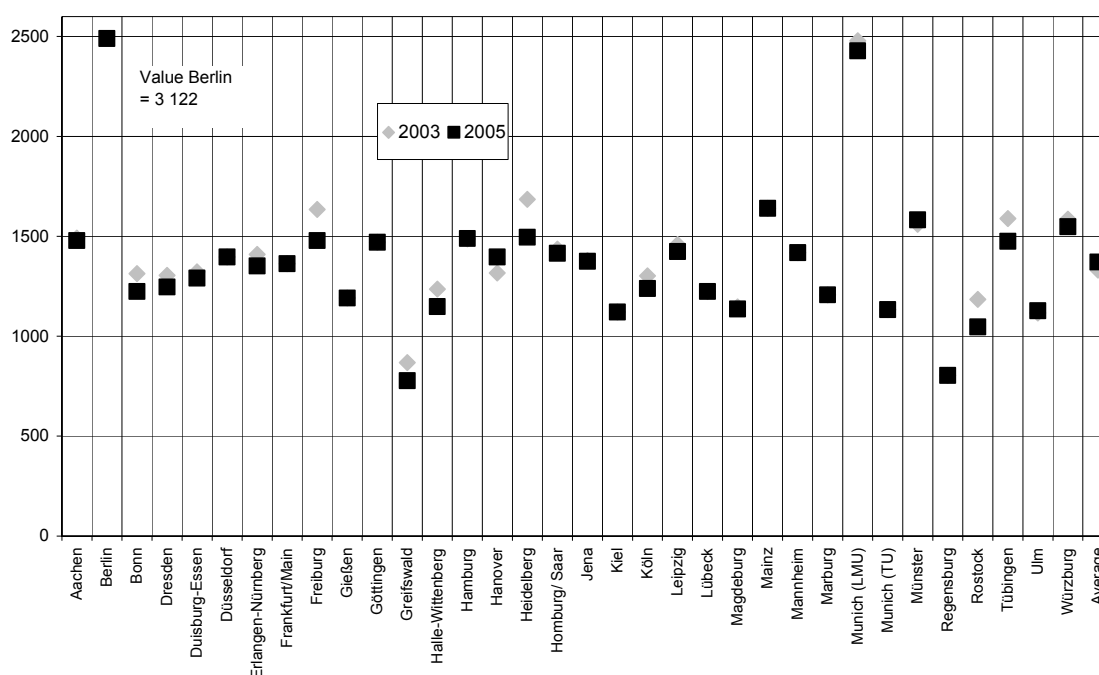
favourable supervisory relationship in the ratio between the number of students and professorships. On the other hand, Freiburg with a relatively unfavourable and Magdeburg with a scarcely above-average ratio both achieve good examination results.

The share of failed examinations in the medical pre-examinations in human medicine lies in Aachen, Duisburg-Essen, Bochum, Gießen, Frankfurt/ Main and Münster at over 20 %, in Ulm, Homburg/ Saar, Freiburg, Greifswald and Regensburg at under 10 %. In the second section of the medical examination, the share of examinations failed out of the total number of examinations taken amounted to max. 7 % (Ulm).

6 Patient Care

The data on patient care show once again the differences in size of the university medicine locations. Besides the above-averagely large locations Berlin and LMU Munich, there is one group of locations which averages between 1,400 and 1,600 maximum permitted number of regular beds¹⁴ (Münster, Würzburg, Heidelberg, Hamburg, Aachen, Freiburg, Tübingen, Göttingen, Leipzig, Mannheim and Homburg/Saar).

Figure 6-1: Number of Regular Beds in the Years 2003 and 2005



* No data is available for Witten-Herdecke, for Berlin only for the year 2005. For Berlin only part of the actual volume is represented as a column. Bochum was excluded from the figure because they have no independent university clinic.

The Science Council recommendations of a minimum of at least 850 planned beds (Wissenschaftsrat 2005, p. 34) were undercut in the year 2005 by only two faculties: Regensburg and Greifswald.

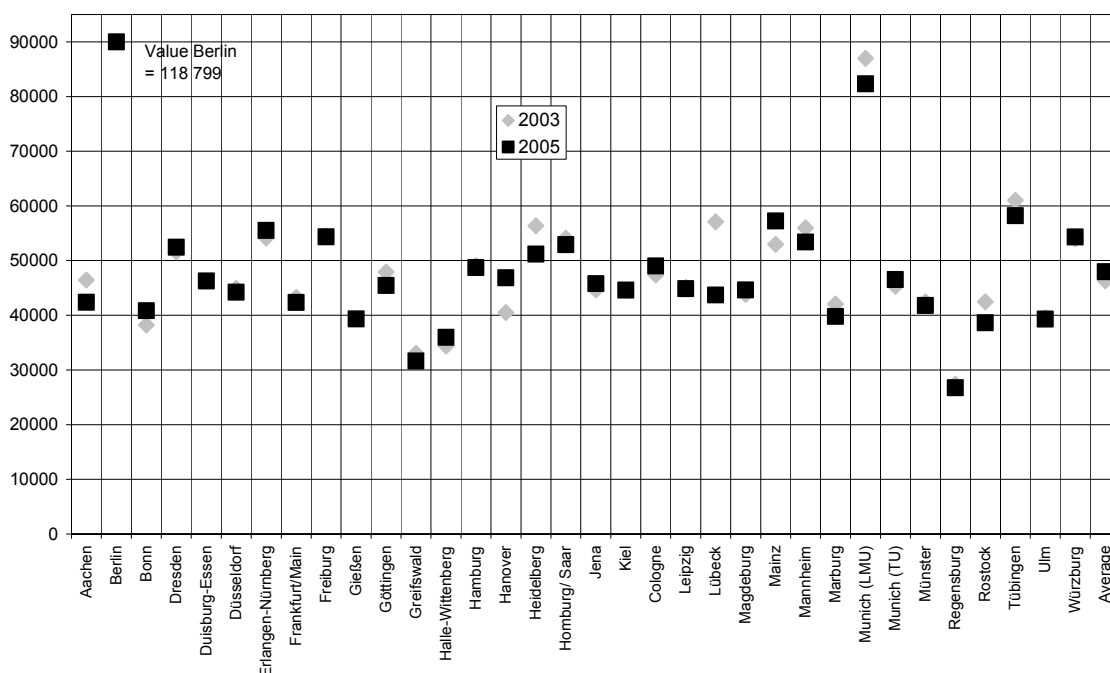
In some places, considerable decreases in the number of beds permitted can be ascertained when the years 2003 and 2005 are compared: a reduction in the number of beds

¹⁴ In our survey, plan beds were defined as follows: "HBFG-financed regular beds in university clinics are the beds in the university clinics which are actually or permanently set up, acc. to public order regulations as well as all beds registered in official statistics or the beds recognised as plan beds by the regional authorities. In-patient beds, including beds in intensive care wards, are registered" (Wissenschaftsrat 2005, p. 94).

by ca. 10 % is noted in Greifswald, Heidelberg, Rostock and Freiburg, a reduction by ca. 7 % in Bonn, Halle-Wittenberg and Tübingen. An increase in the number of regular beds within the observation period from 2003-2005 was recorded in Hanover, Münster and Ulm.

A decline can also be observed in the number of cases treated in hospitals¹⁵ when the years 2003 and 2005 are compared. On average, the decline in the number of in-patients was 700 cases per year.

Figure 6-2: In-patient Cases in the Years 2003 and 2005



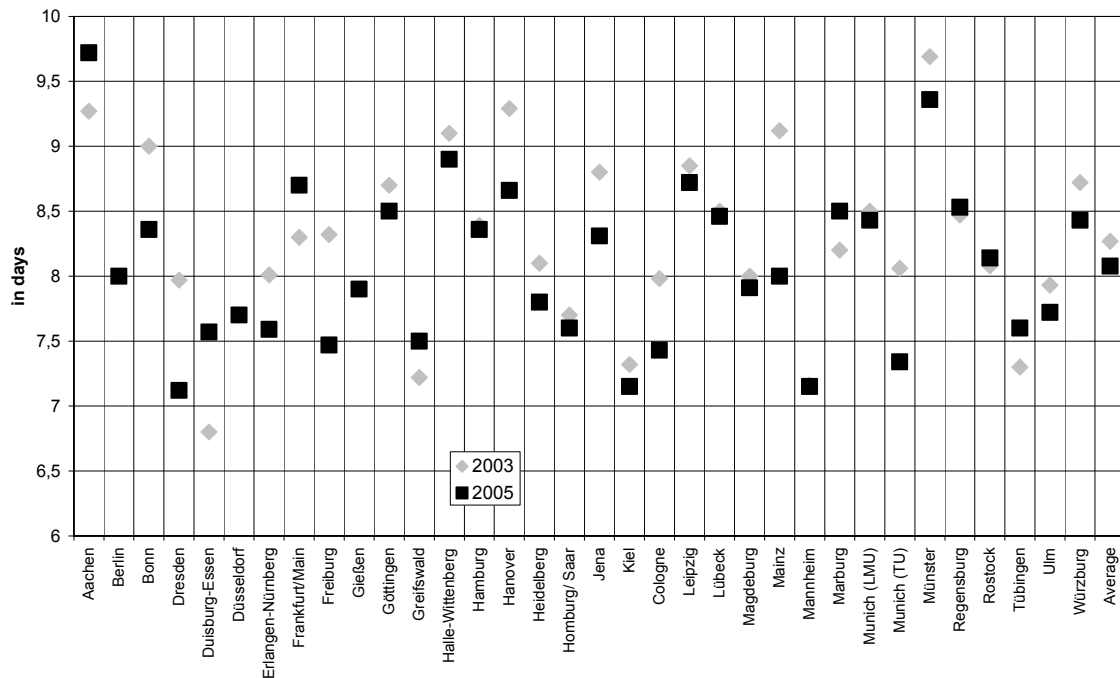
* No data is available for Witten-Herdecke, for Berlin only for the year 2005. For Berlin only part of the actual volume is represented as a column. Bochum was excluded from the figure because they have no independent university clinic.

An especially striking decline in the number of in-patient cases within the observation period was seen in Göttingen, LMU Munich, Marburg, Aachen, Rostock and Heidelberg; here the decrease lies between 5 % and 10 % when the years 2003 and 2005 are compared, in Lübeck at 30%.

If a definite decline in the average length of stay was determined at the beginning of the year 2000¹⁶, then this process again increased dynamically in the years 2003-

2005: if the average length of stay in hospital for 2001 was still 8.7 days, this decreased in 2003 to only 8.3 days and in 2005 to a mere 8.1 days.

Figure 6-3: Average Length of Stay (in Days) in the Years 2003 and 2005



* No data available for Bochum and Witten-Herdecke

15 In establishing the number of in-patient cases, deaths were also included (acc. to Wissenschaftsrat 2005, p. 97).

16 The average length of stay in days gives the number of days which an in-patient spent in hospital on average (acc. to Wissenschaftsrat 2005, p. 95).

7 **Literature**

Bührer, Susanne; Menard, Klaus; Peter, Viola; Braun, Dietmar; Kuhlmann, Stefan (2001): Modelle der Finanzierung interdisziplinärer Forschung an Hochschulkliniken. Stuttgart.

Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung BLK (2004): Frauen in der Medizin. Ausbildung und berufliche Situation von Medizinerinnen. Bericht der BLK vom 5. Juli 2004. Materialien zur Bildungsplanung und zur Forschungsförderung. Bonn.

Daniel, Hans-Dieter; Fisch, R. (eds.) (1988): Evaluation von Forschung. Konstanz.

Deutsche Forschungsgemeinschaft (2004): Empfehlungen zu einer „Leistungsorientierten Mittelvergabe“ (LOM) an den Medizinischen Fakultäten. Stellungnahme der Senatskommission für Klinische Forschung der Deutschen Forschungsgemeinschaft. Bonn.

Edler, Jakob (ed.): (2007): Internationalisierung der deutschen Forschungs- und Wissenschaftslandschaft. ISI-Schriftenreihe. Stuttgart: Fraunhofer IRB-Verlag.

Kommission Klinika der Bundeskonferenz der Frauen- und Gleichstellungsbeauftragten an Hochschulen (2007): Chancengleichheit an Medizinischen Fakultäten und Universitätsklinika in Deutschland 2001/2005. Berlin.

Menrad, Klaus; Bührer, Susanne; Peter, Viola (2001): Etablierung von Forschungspools an den Medizinischen Fakultäten des Landes Nordrhein-Westfalen. Vergleichende Analyse. Stuttgart.

Wissenschaftsrat (2005): Stellungnahme zu Leistungsfähigkeit, Ressourcen und Größe universitätsmedizinischer Einrichtungen. Köln.

Wissenschaftsrat (ed.) (2006): Exzellenz in Wissenschaft und Forschung – Neue Wege in der Gleichstellungspolitik. Köln.

Wissenschaftsrat (2007): Allgemeine Empfehlungen zur Universitätsmedizin. Köln.

