

Augurzky, Boris; Krolop, Sebastian; Schmidt, Hartmut; Terkatz, Stefan

Research Report

Nursing insurance, ratings and demography: Challenges for German nursing homes

RWI Materialien, No. 27

Provided in Cooperation with:

RWI – Leibniz-Institut für Wirtschaftsforschung, Essen

Suggested Citation: Augurzky, Boris; Krolop, Sebastian; Schmidt, Hartmut; Terkatz, Stefan (2006) : Nursing insurance, ratings and demography: Challenges for German nursing homes, RWI Materialien, No. 27, ISBN 3936454698, Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI), Essen, <https://nbn-resolving.de/urn:nbn:de:101:1-2009100619>

This Version is available at:

<https://hdl.handle.net/10419/61145>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Boris Augurzky, Sebastian Krolop,
Hartmut Schmidt and Stefan Terkatz

Nursing Insurance, Ratings and Demography

Challenges for German Nursing Homes

Heft 27



Rheinisch-Westfälisches Institut für Wirtschaftsforschung

Board of Directors:

Prof. Dr. Christoph M. Schmidt, Ph.D. (President),

Prof. Dr. Thomas K. Bauer

Prof. Dr. Wim Kösters

Governing Board:

Dr. Eberhard Heinke (Chairman);

Dr. Dietmar Kuhnt, Dr. Henning Osthues-Albrecht, Reinhold Schulte
(Vice Chairmen);

Prof. Dr.-Ing. Dieter Ameling, Manfred Breuer, Christoph Dänzer-Vanotti,

Dr. Hans Georg Fabritius, Prof. Dr. Harald B. Giesel, Karl-Heinz Herlitschke,

Dr. Thomas Köster, Tillmann Neinhaus, Dr. Gerd Willamowski

Advisory Board:

Prof. David Card, Ph.D., Prof. Dr. Clemens Fuest, Prof. Dr. Walter Krämer,

Prof. Dr. Michael Lechner, Prof. Dr. Till Requate, Prof. Nina Smith, Ph.D.,

Prof. Dr. Harald Uhlig, Prof. Dr. Josef Zweimüller

Honorary Members of RWI Essen

Heinrich Frommknecht, Prof. Dr. Paul Klemmer †

RWI : Materialien Heft 27

Published by Rheinisch-Westfälisches Institut für Wirtschaftsforschung,
Hohenzollernstrasse 1/3, D-45128 Essen, Phone +49 (0) 201/81 49-0

All rights reserved. Essen, Germany, 2006

Editor: Prof. Dr. Christoph M. Schmidt, Ph.D.

Editorial Office: Joachim Schmidt

ISSN 1612-3573 – ISBN 3-936454-69-8

RWI : Materialien

Heft 27

Boris Augurzky, Sebastian Krolop,
Hartmut Schmidt and Stefan Terkatz

Nursing Insurance, Ratings and Demography

Challenges for German Nursing Homes



Bibliografische Information Der Deutschen Bibliothek

Die Deutsche Bibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.ddb.de> abrufbar.

Dr. Boris Augurzky, RWI Essen,
Dr. Sebastian Krolop, ADMED GmbH,
Hartmut Schmidt, HPS Research,
Dr. Stefan Terkatz, ADMED GmbH

We would like to thank Dr. Michaela Lemm, Burkhard Nauroth, Marc Gabelmann, Joachim Schmidt, Stefanie Schüler, Sabine Becker and Ralf Oberle for their valuable comments and suggestions, Karl-Heinz Herlitschke for his untiring support with questions relating to the data, and Annette Hermanowski, Dirk Huchtemann, Frank Jacob, Claudia Lohkamp, Heribert Sunderbrink and Marlies Tapaß for their organisational help. A very special word of thanks goes to BKK Bundesverband for providing the nursing database PAULA without which it would not have been possible to produce the Study on this scale in the first place, and to Hendrik Schmitz for his active assistance both with the structure of the data set and with the performance of analyses as well as for his constructive criticism. The authors are of course responsible for the Study's content and any errors. We welcome criticism and suggestions as these will help us to steadily improve and further develop the Study.

ISSN 1612-3573

ISBN 3-936454-69-8

Contents

	Executive Summary	7
1.	Introduction	11
2.	Nursing market and nursing insurance.	13
2.1	Overview.	13
2.2	Regional distribution	15
2.3	Reform requirement	21
3.	Rating of nursing homes	24
3.1	Overview of method applied	24
3.2	Data basis	27
4.	Current situation of nursing homes	28
4.1	Overview.	28
4.2	Analysis for subgroups	31
4.3	Further analyses.	33
5.	Impact on measures to stabilise the SNI	38
5.1	Introducing more stringent criteria for claiming SNI benefits and/or reducing the range of benefits	39
5.2	Raising contributions to the SNI	40
5.3	Reducing nursing rates, raising co-payments	42
5.4	Introducing greater competition between nursing homes	44
5.5	Changeover to a funded system	46
5.6	Mix of measures	47
6.	Conclusion.	47
7.	Appendix	50
7.1	Forecast of nursing demand	50
7.2	Forecast of financing situation of the SNI	52
7.3	Basel II and ratings	53
7.4	Rating method of this Study	54
7.5	Maps	56
	Literature	59

List of figures

Figure 1:	Market volume of professional nursing market	12
Figure 2:	Monthly benefits by SNI	14
Figure 3:	Estimated required inpatient nursing places compared to supply	14
Figure 4:	Market volume	15
Figure 5:	Estimated investment need to provide nursing places required (cumulated)	16
Figure 6:	Age structure of population by districts	17
Figure 7:	Expected change of demand for nursing places until 2020 by districts	18
Figure 8:	Current estimated occupancy rate of nursing homes by districts .	19
Figure 9:	Expected need for additional nursing places until 2020 by districts	20
Figure 10:	Financial gap of SNI	21
Figure 11:	Reserves of SNI	22
Figure 12:	Aim: Assessment of measures to stabilize SNI	23
Figure 13:	Rating categories and probabilities of default.	24
Figure 14:	Derivation of target P&L and target balance sheet	25
Figure 15:	Distribution of nursing homes in the data sets by federal states .	27
Figure 16:	Distribution of nursing homes in the data sets by size.	28
Figure 17:	Balance sheet of average nursing home in data set	29
Figure 18:	Distribution of equity ratio and return on revenues.	30
Figure 19:	Average PD of nursing homes in data set	30
Figure 20:	Distribution of rating by categories	31
Figure 21:	Current price level of nursing homes by districts	34
Figure 22:	Current average size of nursing homes by districts	35
Figure 23:	Current personnel intensity of nursing homes by districts	36

Figure 24:	Disposable annual income per inhabitant by districts.	37
Figure 25:	Multivariate analysis of price level and size of nursing home, personnel intensity and disposable income	38
Figure 26:	Distribution of nursing homes by the traffic light classification in the base case scenario.	39
Figure 27:	First assessment of the policy measures	40
Figure 28:	Distribution of nursing homes by the traffic light classification when more stringent criteria are introduced (measure 1)	41
Figure 29:	Raising contributions to the SNI (measure 2)	42
Figure 30:	Reduction of nursing rates (measure 3)	43
Figure 31:	Potential reduction of demand for nursing home places by reduced nursing rates.	43
Figure 32:	Current average price level of nursing homes	44
Figure 33:	Necessary price reduction to close the financial gap of the SNI (measure 4)	45
Figure 34:	Distribution of nursing homes by the traffic light classification when the price level falls (measure 4)	45
Figure 35:	Distribution of nursing homes by the traffic light classification when the price level falls partly (measure 4)	46
Figure 36:	Basis for forecast of the demand for nursing care	51
Figure 37:	Deviation of the demand for nursing care by age, gender and federal state	52
Figure 38:	Figures of the rating by ADMED and RWI Essen	55
Figure 39:	Current investment cost component for nursing homes by districts	56
Figure 40:	Average price level for nursing and costs of accomodation and meals by districts.	57
Figure 41:	Distribution of population at the age between 50 and 64 years by districts	58

List of tables

Table 1:	Probability of default by subgroup	32
----------	--	----

Nursing Insurance, Ratings and Demography – Challenges for German Nursing Homes

Executive Summary

The German healthcare system is heavily regulated, highly fragmented (among the various providers of nursing care services), and notoriously lacking in transparency. The objective of the present Study is to contribute to greater transparency in the area of inpatient nursing which after all accounts for over 70% of the professional nursing market. In particular we will look at the following aspects:

1. The current demand for, supply of and price level at nursing homes at the district level based on a full survey of all 10 000 inpatient nursing homes.
2. The future regional demand for nursing places taking into account the demographic changes.
3. The current credit standing of 500 nursing homes (116 annual reports).
4. Selected aspects of Germany's statutory nursing insurance fund (SNI) in general.

Re. 1: An analysis of the data of all 10 000 German nursing homes reveals a heterogeneous inpatient nursing sector in Germany. Nursing homes in western Germany are significantly more expensive than in eastern Germany. North Rhine-Westphalia stands out as a particularly dear region, followed by Hamburg, Bremen, the Rhine-Main region and parts of Baden-Wuerttemberg. For the most part the differences are accounted for by the size of the home, its personnel intensity as well as disposable income per inhabitant. That said, the (estimated) occupancy rate at the district level does not show any significant correlation with the price level. Currently occupancy averages 90%, which appears to vary regionally between 70% and 100%.

Re. 2: Looking to Germany as a whole, and based on the 10th Co-ordinated Population Projection of the German Federal Statistical Office (2003), we expect to see by 2020 about 30% more inpatient and 25% more outpatient nurs-

ing cases compared with 2005 – translating into nearly 600 000 additional nursing patients in absolute terms. These figures fluctuate considerably from one region to another. Particularly in eastern Germany, the Munich region and in the western parts of Lower Saxony and North Rhine-Westphalia, the number of inpatient nursing cases is likely to grow disproportionately by over 50%, while in the north of Hesse and the south of Lower Saxony the rise is likely to be moderate but still over 10%. The requirement for additional nursing places until 2020 is calculated from the growth in nursing cases and the current occupancy rate of the homes. For the period up to 2020 we put the volume of new investment at between roughly €15bn and €17bn.

Re. 3: As with the rating of hospitals in our *2006 Hospital Rating Report*, we conduct a balance sheet rating for 116 annual financial reports of 508 nursing homes. The average probability of default¹ of the nursing homes from the data set is about 1.9%, slightly higher than that of hospitals. Compared with other medium-sized companies in western Germany, the nursing homes from the data set score worse. About 16% of the nursing homes have a very high probability of default, which puts them in the “red zone” (homes that are especially at risk). 20% have a slightly elevated risk of insolvency (yellow zone). Large nursing homes have a much lower probability of default than small ones; high-priced homes do better than low-priced ones. Homes with current annual financial data have a lower probability of default than those with outdated data. We found no statistically significant differences between eastern and western Germany nor between stand-alone nursing homes and nursing home chains. However, the question of the extent to which the above factors are actually the cause of the differences observed could not be answered with the data available.

Re. 4: The troubled financing situation of Germany’s statutory health insurance (SHI) is a subject widely debated in the public. A further reform for 2006 is in the offing. So far little notice has been taken of the need to reform the country’s statutory nursing insurance fund (SNI) – doubtlessly on account of its smaller volume of contributions compared with SHI. Since 1999, though, expenditures have outstripped revenues in the SNI, which means that its remaining capital reserves will be exhausted in only a few years. So far no efforts for fundamental reform have been undertaken, although these are badly needed: the financing gap between is widening further with the increasing greying of the population. By 2009 at the latest the SNI in its present form will no longer be able to perform its tasks – and it is completely unclear today how the additional demand up to 2020 will be met. The present Study therefore discusses various measures for stabilising the finances of the SNI:

¹ The probability of default indicates the probability of a business being no longer able to meet its payment obligations within a period of one year, possibly requiring it to file for insolvency.

- Introducing more stringent criteria for claiming SNI benefits and a reduction in the range of benefits.
- Raising contributions to the SNI.
- Reducing nursing rates and/or raising co-payments.
- Bringing about lower prices at nursing homes through greater competition.
- Gradually switching the SNI from a pay-as-you-go to a funded scheme along the lines of the Häcker/Raffelhüschen model (2004).

With the rating it is in principle also possible to examine what impact these measures would have on the financial situation of the nursing homes. For example, the result of more stringent criteria being applied to claims on SNI benefits (the first measure) would be fewer recipients of benefits for the same budget. Assuming an unchanged incidence of persons in need of nursing, this would likely result in the exclusion of 250 000 inpatient and 400 000 outpatient cases by 2020. As a result, higher nursing costs would likely bring a slight rise in the probability of insolvency of nursing homes.

To maintain nursing care at current levels, the current contribution rate of 1.7% (or 1.95% for those without children) would have to rise to about 2.5% by 2020 and to over 6.0% by 2050 (second measure). This would place a heavy burden on the young as well as unborn generations. It would probably have a negative impact on the job market, too. Reducing the nursing rates of the SNI (the third measure) would result in higher co-payments and presumably lower demand. This would shift the burden to those in need of nursing, their relatives and the state. Passing on the entire financing burden of SNI to the nursing homes themselves through lower prices for nursing benefits (fourth measure) would push 60% of nursing homes into the red zone by 2020. Given the growing need for nursing, the question that this raises is one that touches society itself: How can sufficient nursing capacities be ensured in future in a situation where many nursing homes cannot be run efficiently and the additional burdens are to be shouldered by everyone?

None of the measures described can be implemented in isolation without having dramatic consequences in terms of either intergenerational justice, the job market, nursing recipients, their relatives, the state, the quality of nursing or nursing homes. The fifth measure is generally to be welcomed, but its implementation could founder on lack of political will and resistance from sundry lobby groups. We therefore recommend a mix of measures so that the additional burdens are shared equally by the older and younger generations as well as the nursing home facilities and the burden for unborn generations is reduced.

Although the hospital and nursing sectors both face considerable challenges and the future financing of their services is seen as uncertain, the impact on these sectors will differ substantially. In the hospital sector a market shake-out would be accompanied by the elimination of overcapacities and is in principle welcomed – the remaining market participants would be on a sounder footing after the consolidation. In the nursing sector, however, a market shake-out coupled with a reduction in capacities would give rise to huge bottlenecks due to the greying of the population.

This Study shows that the rising need for nursing can be covered neither on the basis of the SNI in its current form nor on the basis of the current structure of nursing homes. Many homes are inefficient and have little prospects of surviving very long into the future. A deregulation of nursing home planning could drive the consolidation of the sector led by large groups and chains of homes having the wherewithal to invest in large, modern and efficient facilities.

Since the financing of operating expenditure is currently not secured by the SNI, the question of “when and where” new capacities will be built depends not only on the regional requirement for nursing but also on the extent to which the regional environment will allow for an efficient nursing offering. Not only income but also regulatory restrictions, for example on the number of qualified staff or maximum home size, certainly have their part to play in this and will have to come under scrutiny. Whereas policymakers have to shape the framework conditions so as to enable nursing homes to operate efficiently, the nursing home will have to re-orient itself. It should strive to become part of an intersectoral system of integrated healthcare spanning hospitals, rehabilitation facilities, community-based doctors and the real estate industry. It should (be able to) segment its services according to the needs of nursing patients and to form groups or chains to improve efficiency through economies of scale.

1. Introduction

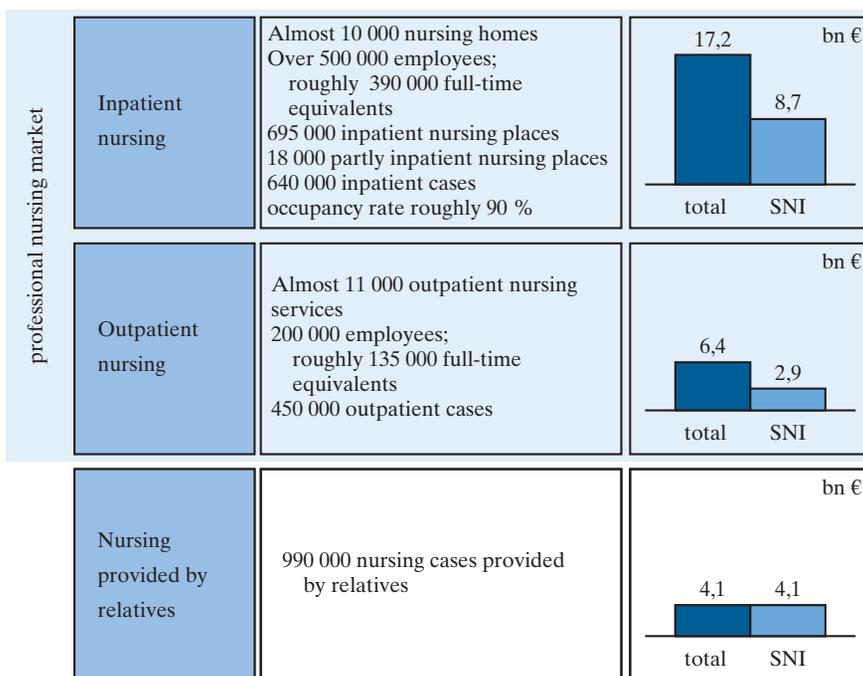
The troubled financing situation of Germany's statutory health insurance (SHI) is a subject widely debated in the public. A further reform for 2006 is now in the offing, only three years after the Act on the Modernisation of Statutory Health Insurance came into force. So far, though, little notice has been taken of the need to reform the country's statutory nursing insurance (SNI) – doubtlessly also on account of its smaller volume of contributions compared with SHI. But funding problems similar to those of SHI emerged already back in 1999, the year when expenditure first outstripped revenue. Right now the gap can only be closed with the capital reserve established with the inception of the SNI. But the reserve will be exhausted in only a few years. So it was against this background that a first, albeit modest, reform came in 2005 with the contribution rate being raised by 0.25 percentage points for persons without children.

However, no efforts for a lasting solution have been undertaken so far. This is something that is badly needed as the capital reserve of the SNI dwindles and as the gap between revenue and expenditure widens further with the greying of the population. The SNI moreover faces far greater burdens from the demographic trend than does SHI. Häcker/Raffelhüsch (2004) expect the contribution rate to go from 1.7% today to over 6.0% in 2050. As early as 2020 the rate is projected to reach about 2.5% – that is if the over 600 000 additional outpatient and inpatient nursing patients expected by that time have not already been excluded from nursing care. In this context action must be taken sufficiently in advance to prevent gross injustices from happening later on.

The present Study looks at various measures for stabilising the finances of Germany's SNI, with special attention being paid to the inpatient nursing market. In 2003 it accounted for €17.2bn or 72% of the professional nursing market (Federal Statistical Office 2005a). Broadly defined, the nursing market encompasses inpatient nursing in nursing homes, outpatient nursing services and nursing provided by relatives. In 2003 it reached a volume of €28bn; of this, the SNI covers about €17bn (including administrative costs and other minor expenditures). In this Study the term “nursing market” refers only to the area covered by professional providers, that is nursing homes and outpatient services. In 2003 it had a volume of roughly €24bn (Figure 1). The actual nursing market is probably even larger when it is considered that self-payers (“Nursing Level 0”), i.e. those not receiving any benefits from nursing insurance, are not included in the official statistics.

Of special interest is whether the inpatient nursing sector will at all be financially capable of coping with the demographic challenges ahead and the measures needed to stabilise the SNI given the considerable problems currently faced by many homes. It is for this reason that – based on the approach taken

Figure 1

Market volume of professional nursing market

Analysis by ADMED, HPS Research, and RWI Essen.

by the *2006 Hospital Rating Report* (Augurzky et al. 2005) – a financial rating is carried out for stand-alone nursing homes. This in principle also makes it possible to examine what impact these measures would have on the financial situation of the nursing homes.

Even though both the hospital and nursing sectors face enormous challenges and the future financing of their benefits is seen as uncertain, the impact of the expected changes will differ substantially for the two sectors. In the hospital sector a market shake-out would be accompanied the reduction of overcapacities and is in principle welcomed – after the consolidation the remaining market participants will be able to operate more efficiently with their new budgets. In the nursing sector, though, the result of a market shake-out coupled with a trimming of capacities would be increasing bottlenecks arising from a greying population.

A second important concern of this Study is to create greater transparency in the nursing market for politicians, nursing homes and their business partners. For this purpose we present the inpatient nursing market at the regional level as far as possible. Whereas significant growth in nursing demand will almost certainly be seen for Germany as a whole, the picture is more varied at the regional level.

2. Nursing market and nursing insurance

2.1 Overview

The professional nursing market, being the aggregate of expenditure for inpatient and outpatient nursing services, has grown by an average of 1.0% p.a. since 1997 and reached a volume of roughly €24bn in 2003 (Federal Statistical Office 2005a), with a total of 640 000 persons receiving nursing care in almost 10 000 nursing homes. Nearly 11 000 outpatient nursing providers cared for 450 000 persons at home, and a further 900 000 were provided nursing care primarily by members of their family. In 2003 over 500 000 persons worked in nursing homes and some 200 000 persons for providers of outpatient services.

Approximately half of inpatient nursing is financed by the SNI. A further 31% is paid for by the nursing recipients. About 16% is covered by public budgets, usually in the form of supplementary welfare benefits where the costs are not covered by the nursing rates of the SNI and co-payments. Outpatient nursing is financed to the tune of 64% by the SNI, 25% privately and just under 6% by public budgets. The remaining share is borne by private health insurance and employers (Federal Ministry of Health and Social Security 2005). These figures do not include professional hospital nursing which is financed by SHI.

The SNI was introduced in 1995 as a “fourth social insurance” to finance nursing in old age and relieve the municipalities from social welfare payments. The SNI assumes only part of the costs of both professional nursing and nursing provided by family members. Based on the nature and degree of nursing provided, nursing rates vary between 205 and 1 432 euros per month (Figure 2). For example, in 2004 the SNI paid an average of 1 268 euros for inpatient nursing, and thus about half of the nursing home costs of 2 400 to 2 500 euros.

Since 1999 the number of nursing cases overall has grown each year by an average of 0.7% (Federal Statistical Office 2005a) and even 2.8% for inpatient nursing cases. Documented nursing by relatives has been on the decline. In future, too, further growth in nursing cases can be expected as the German population greys. Assuming that the probability of nursing per age group for men and women remains constant at the level of 2003 (Appendix), the number of nursing cases – on the basis of the demographic trend presented by the 10th Co-ordinated Population Projection (V5) of the Federal Statistical Office

Figure 2

Monthly benefits by SNI

	Home care non-cash benefits	Home care cash benefits	Partly inpatient nursing	Inpatient nursing
Nursing level I	€ 384	€ 205	€ 384	€ 1 023
Nursing level II	€ 921	€ 410	€ 921	€ 1 279
Nursing level III	€ 1 432 ^a	€ 665	€ 1 432	€ 1 432 ^b
Legal Basis	SGB XI § 36	SGB XI § 37	SGB XI § 41	SGB XI § 43
Average expenditures per beneficiary 2004 in €	€ 1 116	€ 354	€ 932	€ 1 268

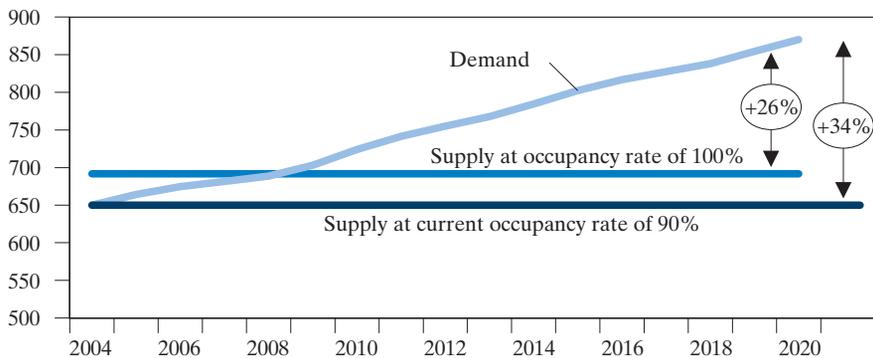
Analysis by ADMED, HPS Research, and RWI Essen. – ¹Outpatient nursing. – ²Patient organizes nursing him/herself. – ^aIn special cases up to € 1 918. – ^b In special cases up to € 1 688.

from 2003 – is likely to see a nearly 30% increase by 2020, or 1.6% p.a., compared with the level of 2004. On the above assumptions the growth in inpatient nursing cases will even be 34% or 1.8% p.a. Growth in the requirement for additional inpatient nursing places will probably be situated in the range of 26% to 34% depending on the maximum possible occupancy rate (Figure 3). That said, this forecast probably represents a ceiling because of the observed de-

Figure 3

Estimated required inpatient nursing places compared to supply

2004 to 2020; 1000

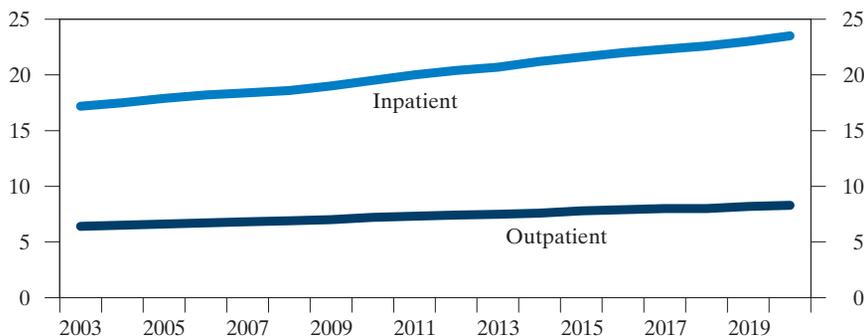


Analysis by ADMED, HPS Research, and RWI Essen. – Forecast based on past data and German Federal Statistical Office 2003, 2005a.

Figure 4

Market volume

2003 to 2020; bn €



Analysis by ADMED, HPS Research, and RWI Essen. – Forecast based on past data and German Federal Statistical Office 2003, 2005a.

clining durations of stay at nursing homes and a postponement in the age when nursing is required.

Based on these projections, the market volume of the aggregate professional nursing sector would rise to over €30bn by 2020 (Figure 4). After 2020, when the baby boomers reach the age of nursing, the pace of growth is expected to pick up even further. If it is further assumed that it takes an estimated € 70 000 to € 80 000 in construction costs to provide one nursing place, this means that under the above assumptions some €15bn to €17bn in additional investment would have to be made until 2020 (Figure 5). Again, this figure probably represents a ceiling, but it does not include the investment backlog to be made up due to the fact that many nursing homes no longer meet minimum requirements. As a result, the estimate on investment requirement is even likely to be on the conservative side.

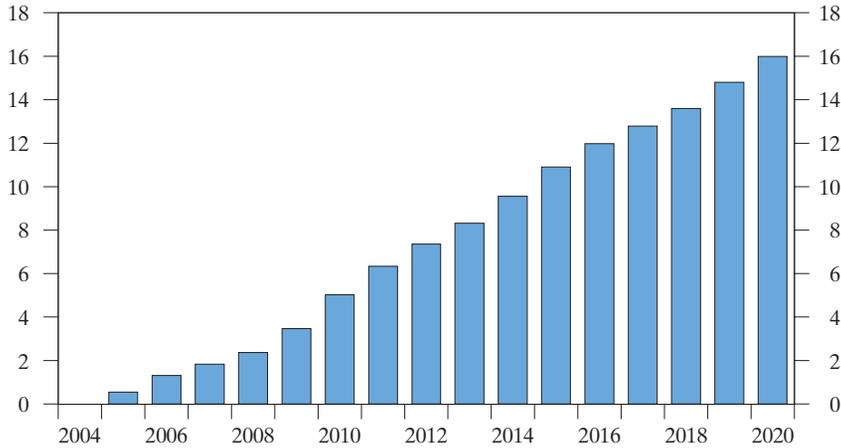
2.2 Regional distribution

The change in nursing cases and the requirement for additional nursing places until 2020 varies widely at the regional level. A big role is played by migrations on the one hand and the regional differentiation in demographics already seen today on the other. Nursing incidence increases disproportionately with age (Federal Statistical Office 2005a). Figure 6 shows that in some regions the

Figure 5

Estimated investment need to provide nursing places required (cumulated)

2004 to 2020; bn €



Analysis by ADMED, HPS Research, and RWI Essen. – Source: German Federal Statistical Office 2003, 2005a. Assumptions: construction costs per nursing place € 75 000, maximum capacity 95%.

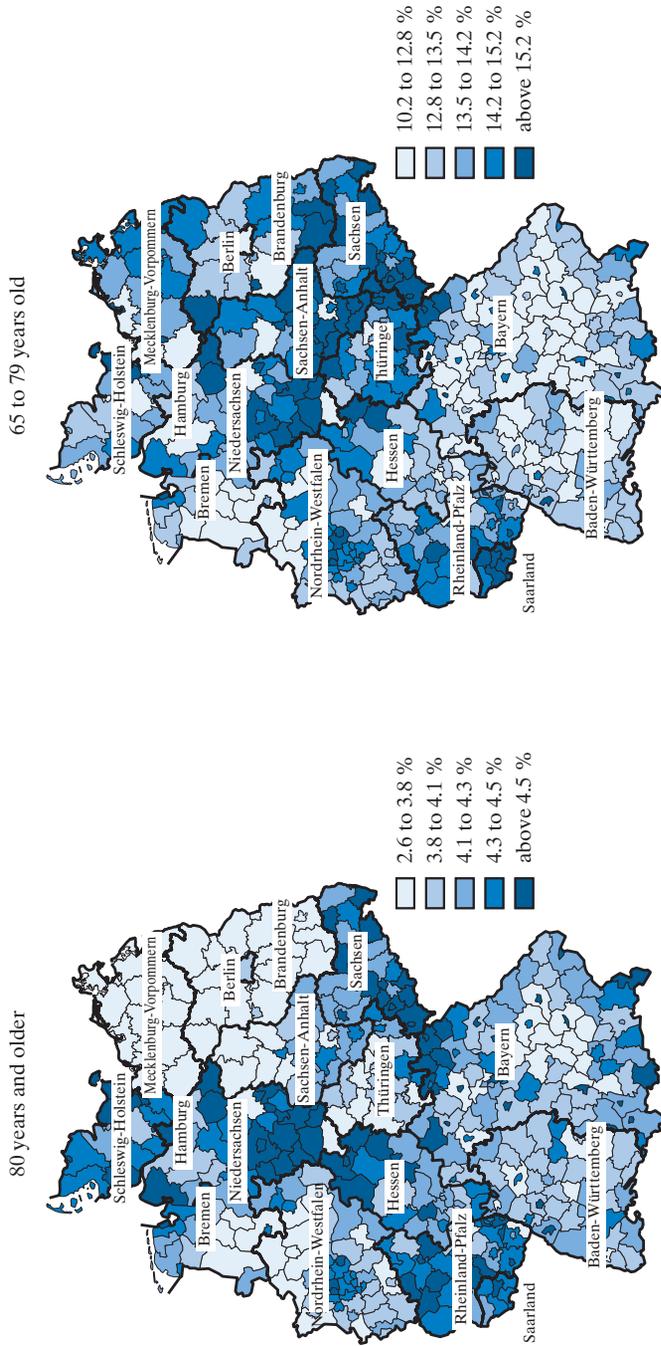
share of elderly persons (80 or older) is over 4%, as e.g. in the Ruhrgebiet, Saarland, the north of Hesse, eastern Lower Saxony and Saxony.²

More important when it comes to forecasting nursing cases is the proportion of people that will reach this age by 2020; it is very high particularly in eastern Germany (Figure 6; for the proportion of 50 to 64-year-olds, see Appendix). Consistent with this, our calculations show a disproportionate growth in inpatient nursing cases there by 2020 (Figure 7). A similar picture emerges for the regions around Munich, parts of Baden-Wuerttemberg and the western part of Lower Saxony and North Rhine-Westphalia.

In addition to the growth in nursing cases, the regional requirement for additional nursing places will also depend on the current occupancy rate of the nursing homes. The occupancy rate of the homes currently appears to range between 70% and 100% depending on the region (Figure 8); exact statements are not possible as the number of cases at the district level is not available. We therefore estimate the current number of nursing cases on the basis of the demographic structure of the district and the incidence of nursing per age group for men and women at the federal state level. Since in a given district persons in need of nursing may also turn to homes in neighbouring districts, the actual

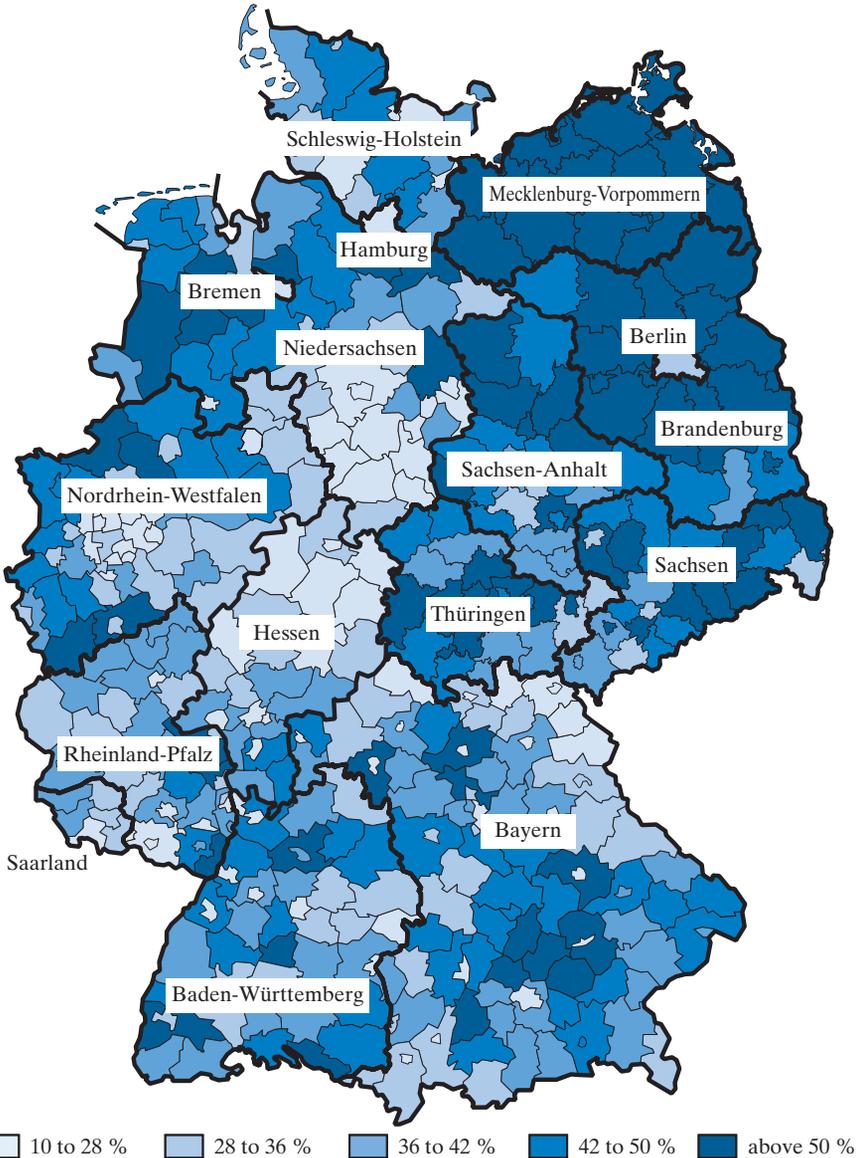
² The forecasts at the district level are based on the ongoing observations of the Bundesamt für Bauwesen und Raumordnung (Federal Office for Building and Regional Planning; BBR 2004).

Figure 6
Age structure by districts
 2003; share in %



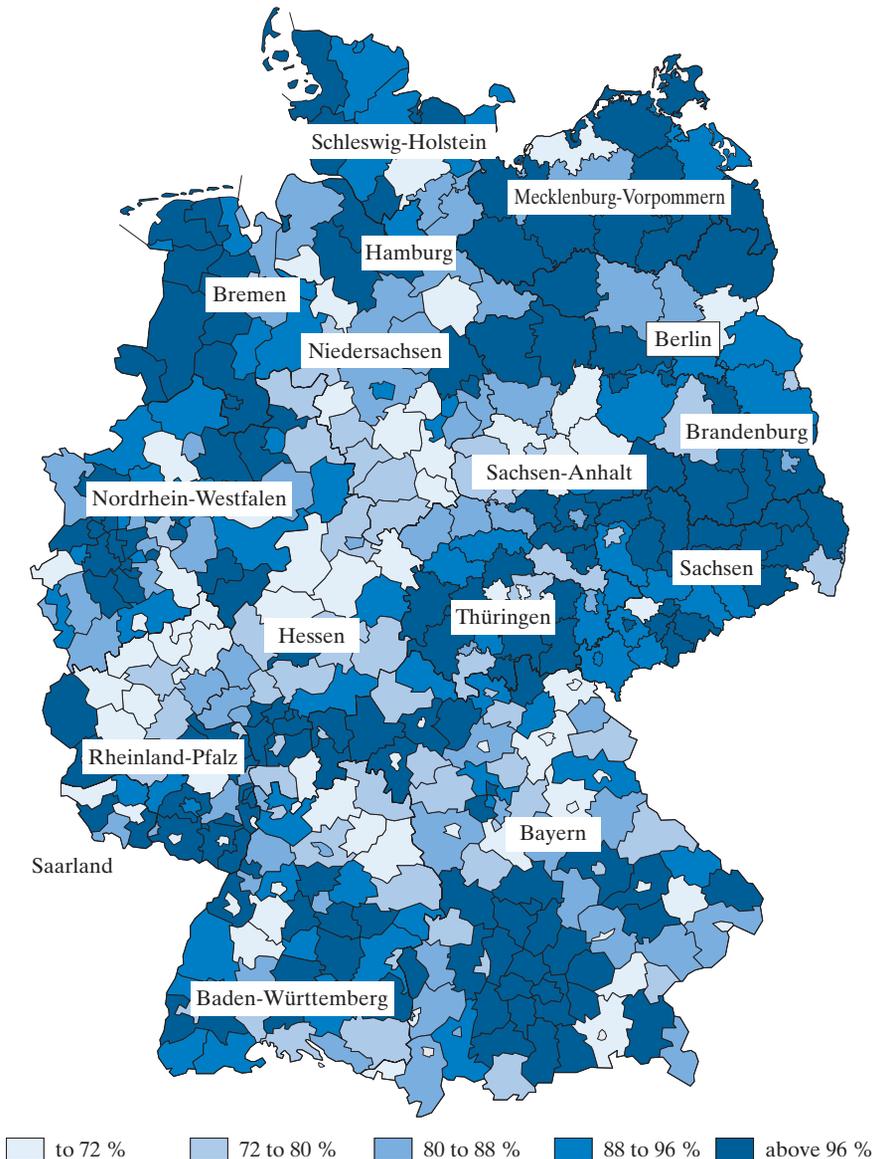
Analysis by ADMED, HPS Research, and RWI Essen. – Source: German Federal Statistical Office 2003.

Figure 7

Expected change of demand for nursing places until 2020 by districts

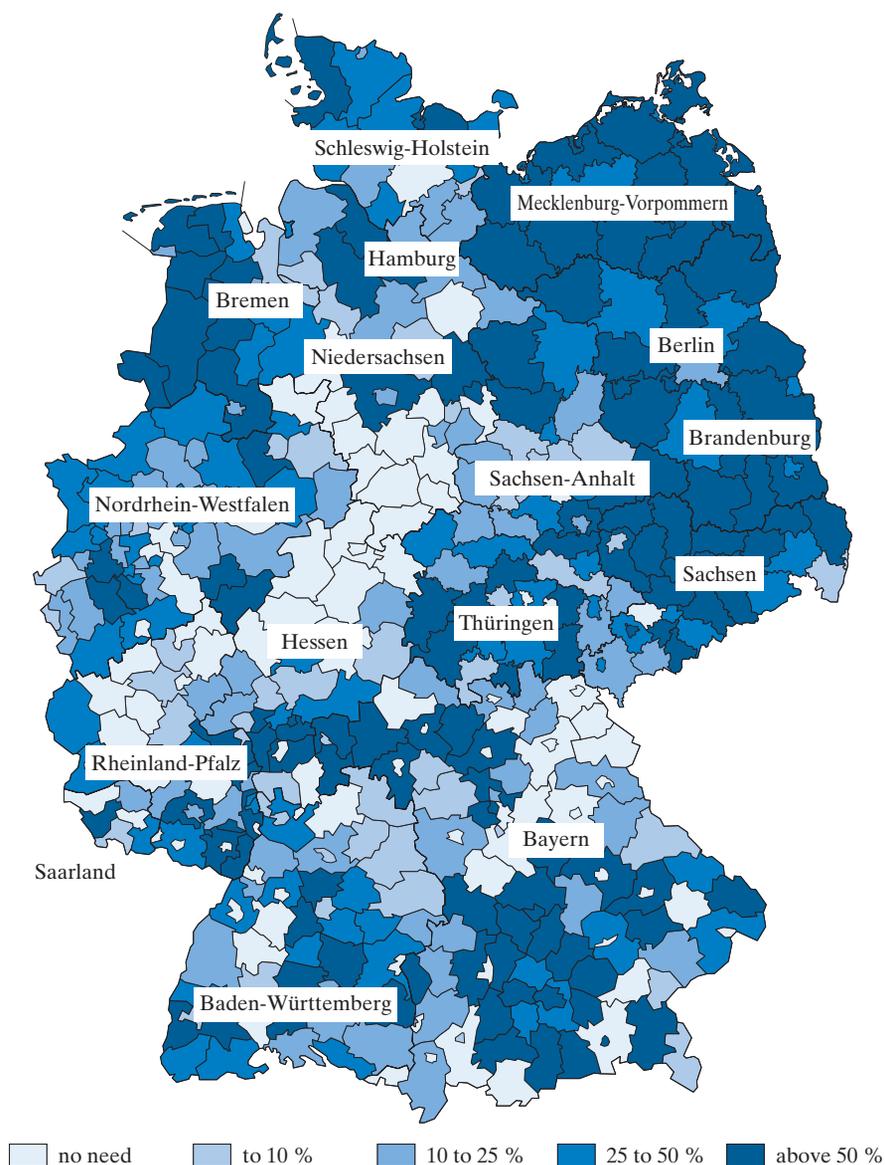
Analysis by ADMED, HPS Research, and RWI Essen. – Source: German Federal Statistical Office 2003, 2005a. German federal states (Bundesländer): Baden-Württemberg; Bavaria (Bayern); Berlin; Brandenburg; Bremen; Hamburg; Hesse (Hessen); Lower Saxony (Niedersachsen); Mecklenburg-Western Pomerania (Mecklenburg-Vorpommern); North Rhine-Westphalia (Nordrhein-Westfalen); Rhineland-Palatinate (Rheinland-Pfalz); Saarland; Saxony (Sachsen); Saxony-Anhalt (Sachsen-Anhalt); Schleswig-Holstein; Thuringia (Thüringen).

Figure 8

Current estimated occupancy rate of nursing homes by districts

Analysis by ADMED, HPS Research, and RWI Essen. – Source: German Federal Statistical Office 2003, 2005a.

Figure 9

Expected need for additional nursing places until 2020 by districts

Analysis by ADMED, HPS Research, and RWI Essen. – Source: German Federal Statistical Office 2003, 2005a.

occupancy rate need not correspond to the estimated rate. Nonetheless, Figure 8 should provide indications on the occupancy rate and capacity shortages.

Based on the estimated current occupancy rate, the expected number of nursing cases by 2020 and an assumed maximum occupancy rate 95%, we estimate the requirement for additional places in many regions of eastern Germany at over 50%, whereas some regions in the north of Hesse and southern Lower Saxony will probably have no additional requirement. In the Munich region and in the west of Lower Saxony the additional requirement will probably be disproportionately high (Figure 9).

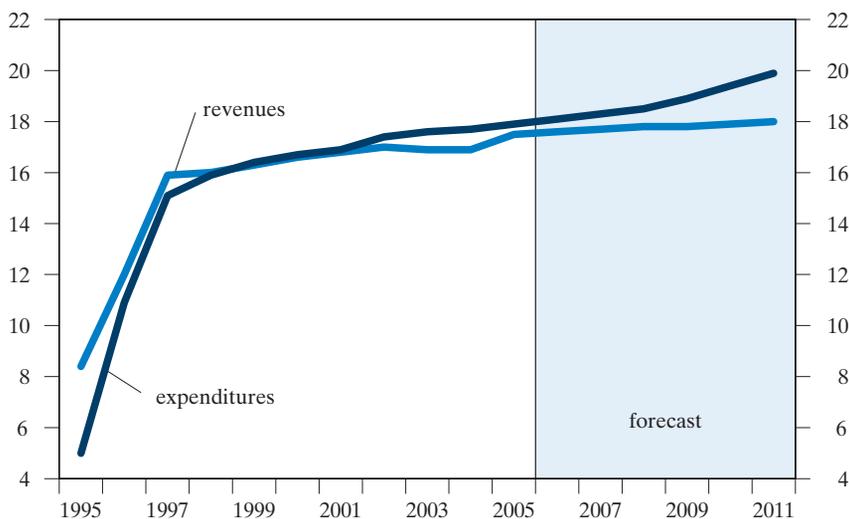
2.3 Reform requirement

While the financing requirement of the SNI will increase significantly, its revenue flows will tend to decline or at best stagnate. The demographic trend also means that there will be fewer young contribution payers in future. By 2020 the number of people aged 21 to 55 will decline by over 8% or an average of

Figure 10

Financial gap of SNI

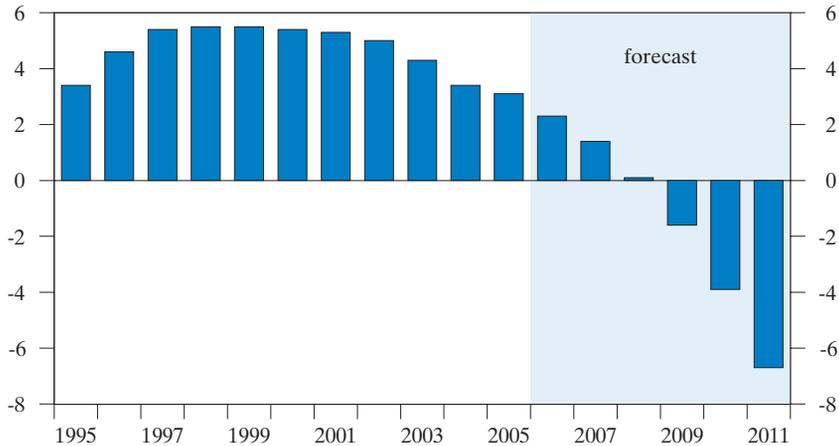
1995 bis 2011; bn €



Analysis by ADMED, HPS Research, and RWI Essen. – Source: Federal Ministry of Health and Social Security 2005. See Appendix for assumptions.

Figure 11

Reserves of SNI
1995 to 2011; bn €



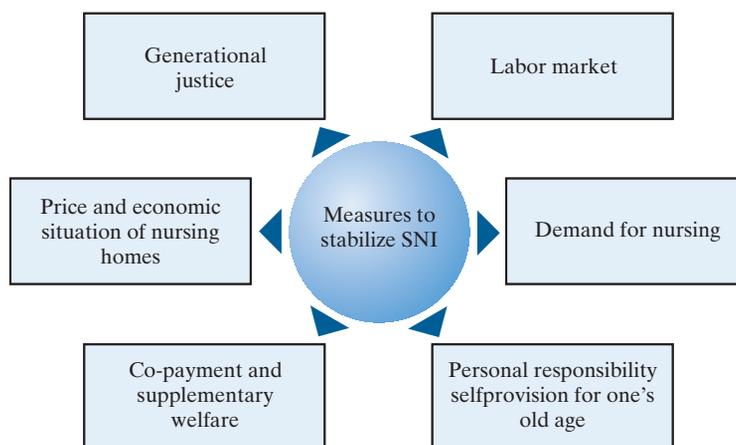
Analysis by ADMED, HPS Research, and RWI Essen. – Source: Federal Ministry of Health and Social Security 2005, own estimations. See Appendix for assumptions.

over 0.5% p.a. (Federal Statistical Office 2003)³. This means that the current financing gap in the SNI will widen still further in future (Figure 10). Right now it still has capital reserves of about €3bn. With the existing financing gap, these reserves are likely to be exhausted by about 2008 (Figure 11). This means that from 2009 the financing of nursing costs will no longer be fully ensured.

Policymakers must therefore take measures now if they want to stabilise the financing basis of the SNI. These measures will result in additional burdens for various social groups and institutions (Figure 12). For example, an increase in contributions to the SNI will put a charge on the young and unborn generations and will have negative effects on the job market. An increase in co-payments will put an additional burden on nursing recipients and make them to look for alternative solutions, possibly involving greater nursing by relatives which in turn would lead to lower demand for nursing home places. Higher co-payments would likely raise the rate of self-provision among the younger generations, but would expand claims on social welfare and thereby put a strain on public finances. Greater deregulation and an increase in competitive

³ It is true that per capita wages and salaries, which serve as the assessment basis contributions to the SNI, may see a further rise in real terms. However, we do not take into account this growth because it will more likely than not result in an automatic increase in the – very personnel-intensive – nursing costs by nearly the same amount. Our forecast is thus calculated along the same lines as that of Häcker/Raffelhüschchen (2003: scenario without cost pressure).

Figure 12

Aim: Assessment of measures to stabilize SNI

Analysis by ADMED, HPS Research, and RWI Essen.

pressure could eventually lead to declining prices at nursing homes, which however would not be without consequences for their economic situation.

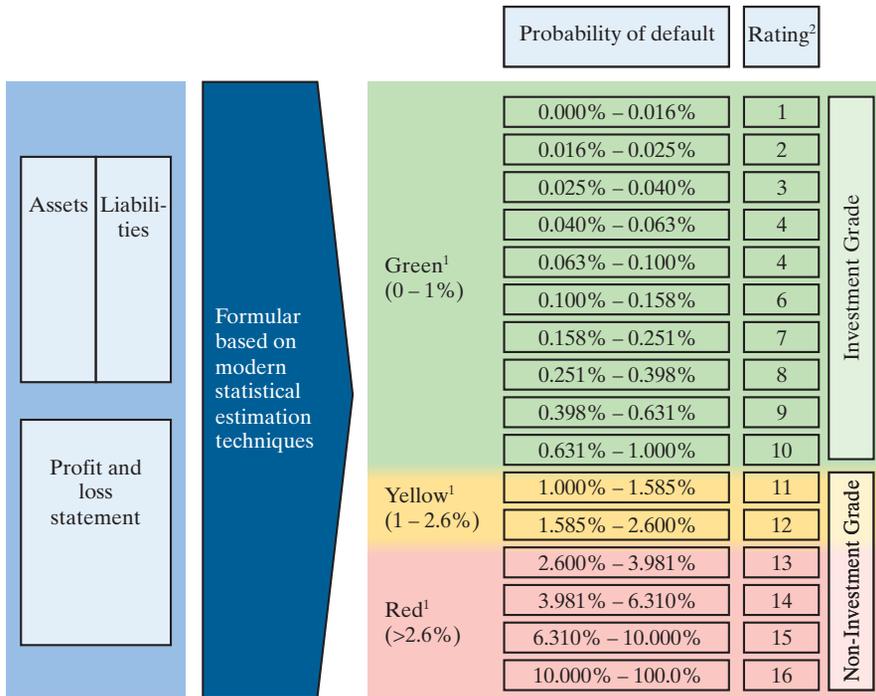
In Section 5 we outline how each of the following five measures would have to be designed so as to secure financing for nursing insurance until 2020.

- Introducing more stringent criteria for claiming SNI benefits and/or reducing the range of benefits.
- Raising contributions to the SNI.
- Reducing the nursing rates of the SNI and/or raising co-payments.
- Bringing about lower prices at nursing homes through greater competition.
- Gradually switching the SNI from a pay-as-you-go to a funded scheme along the lines of the Häcker/Raffelhüschen model (2004).

In the following section we conduct a rating of nursing homes – along the lines of the rating method applied in the *2006 Hospital Rating Report* – to analyse the current and expected financial position of nursing homes. This approach also allows an examination of the effects of policy measures on the nursing homes. We will confine ourselves to the inpatient nursing area as it dominates the nursing market and because of the better available data.

Figure 13

Rating categories and probabilities of default



Analysis by ADMED, HPS Research, and RWI Essen. – ¹Similar classifications are often applied by banks. – ²Rating categories by ADMED and RWI Essen.

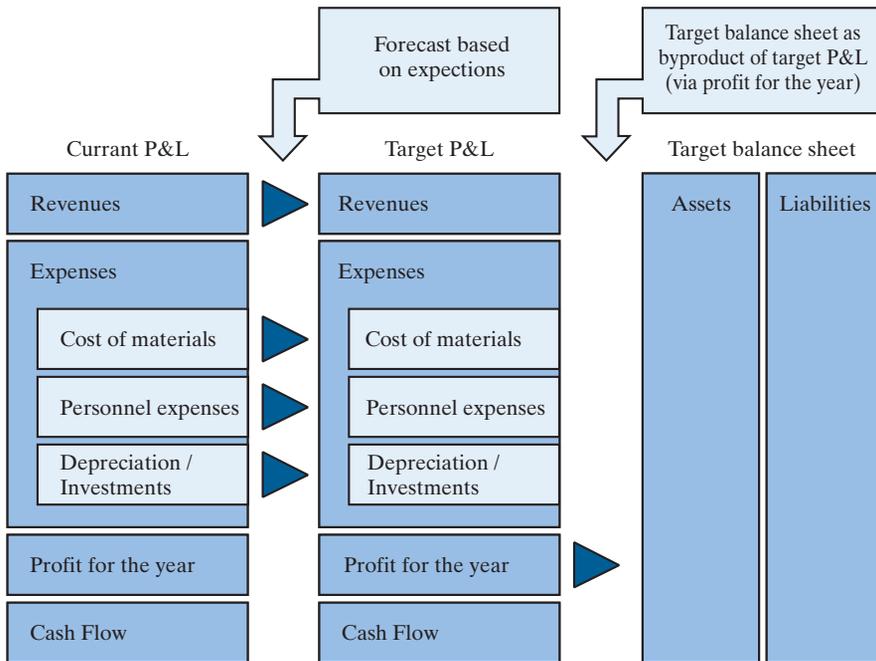
3. Rating of nursing homes

3.1 Overview of method applied

Using balance sheet ratings we calculate the current PD (probability of default) of nursing homes based on data taken from their annual reports. It is based on Engelmann et al. (2003) and was modified for the present Study by GENO Consult GmbH and adapted by RWI Essen and ADMED GmbH. Financial key figures included in the calculation of the PD are listed in the Appendix. The PD indicates the probability of a company being no longer able to meet its payment obligations – within a period of one year –, possibly requiring it to file for insolvency. In practice it usually ranges between 0% and about 5% and is assigned to a rating category – in this case 16 (Figure 13).

To illustrate this, the PDs are additionally assigned to a rough “traffic light” system. Values between 0.0% and 1.0% are given a low to moderate risk and

Figure 14

Derivation of target P&L and target balance sheet

Analysis by ADMED, HPS Research, and RWI Essen.

are marked in green. A rating within this range is typically referred to on the capital market as being investment grade. Companies within this range should have no difficulty borrowing from banks. When the PD is worse than 1.0% (non-investment grade or speculative investment), we apply a further subdivision into a yellow zone and a red zone. Values between 1.0% and 2.6% are highlighted in yellow, values over 2.6% in red. Banks frequently apply a similar classification. In the yellow zone they are quite restrictive in their lending or at least apply a premium, and in the red zone usually refrain from lending altogether.

A nursing home's profit and loss statement (P&L) and balance sheet are extrapolated to 2020 based on external influences such as the aforementioned policy measures. The external influences have an impact on the nursing home's revenues and costs and are reflected in the P&L accordingly. The equity item in the balance sheet is adjusted on an ongoing basis through the net annual profit or, as the case may be, net loss for the year (Figure 14). This results in the target P&L and balance sheets which we use to extrapolate the rating to 2020.

Box 1

Late assignment of nursing recipients and occupancy of nursing homes

Independent of future financing bottlenecks, the inpatient nursing market has to contend with current difficulties. Despite the increasing singularisation of society (Mädig 2004; Bähr 1997), empirical reports show that more and more persons in need of nursing are choosing to enter professional nursing homes later with a correspondingly higher nursing intensity. This shortens the duration of stay and increases the cost of nursing for the same revenue. Revenue may even turn out to be lower because the nursing recipient, when admitted to the home, is assigned to a provisional nursing level before being assigned retroactively to the correct level only after a certain time. In the case of a short duration of stay, however, the nursing recipient dies earlier and in some cases no retroactive assignment to the correct – usually higher – nursing level takes place. It is then frequently the case that relatives do not agree to a subsequent assignment to a higher nursing level because they would then have to bear the additional costs. The declining duration of stay moreover leads to greater turnover rate among nursing patients and thus also to additional costs.

There are many possible reasons for a later admission: in addition to more stringent reviews by the Medical Review Board of the Statutory Health Insurance Funds (Medizinisch-technischer Dienst der Krankenkassen, MDK), a growing trend towards nursing by relatives can be observed in structurally weak regions. Although positive in one sense, this development is also to be viewed critically in cases where relatives are primarily interested in generating an additional source of income while neglecting the actual nursing they are supposed to provide. Moreover, an increasing trend can be observed towards nursing at the home provided by foreign personnel for whom no social insurance contributions are paid.

In a base case scenario we assume that the strong growth in nursing demand will lead to full occupancy of the existing nursing homes and that there will be an oversupply of places with the construction of new homes. Currently the occupancy rate is running at around 90% (Federal Statistical Office 2005a). In practice it is normally not possible to reach 100% occupancy due to occupant turnover during the year. In our base case scenario we choose 95% as the maximum possible occupancy rate. Box 1 discusses the possible special aspect of late admission to homes, but this will hardly be able to offset the increase in occupancy until 2020. We assume that the higher occupancy rate will lead to a proportionate growth in revenue, but at the same time will also entail additional personnel and material costs. Helped by economies of scale, growth in costs will probably be less than growth in revenue. In this scenario we assume that the rise in costs will be only two thirds of the rise in revenues, so that return on revenues will improve on the back of a higher occupancy rate. The purpose of the base case scenario is to provide a comparison basis for the other scenarios such as the abovementioned policy measures.

We therefore examine the question of which features of a nursing home correlate with its rating. Admittedly, this rating is clearly defined from a pool of balance sheet figures (Appendix). However, certain factors specific to the nursing home, such as its size or location, may correlate with the key balance sheet figures and thus with the rating. This still does not allow for causal relationships to be established. Nevertheless, correlations show what kinds of nursing homes are currently in good or bad shape.

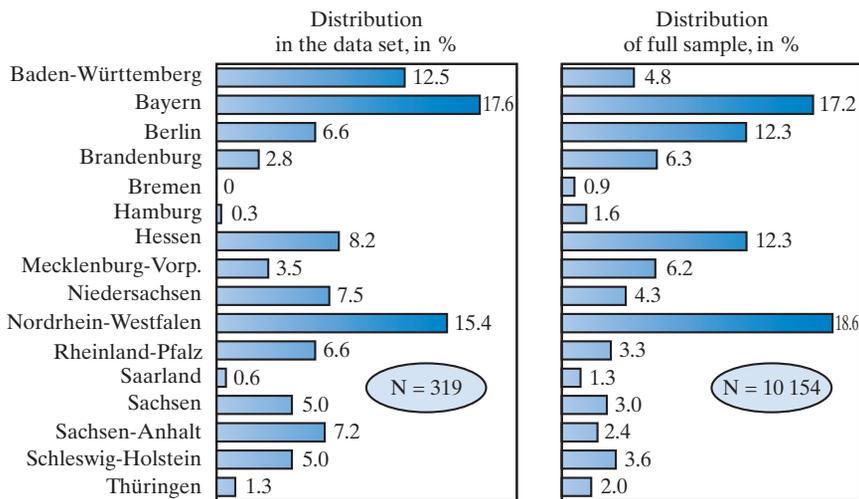
3.2 Data basis

The present Study is based on two data sets. The first consists of a sampling of 116 annual financial statements of nursing homes. Since some of these are nursing home chains, these annual financial statements comprise a total of 508 stand-alone homes. Over 50% of the annual financial statements are from 2003, the rest from previous years. Since we believe that the situation of nursing homes has probably seen no improvement in the past two years, we assume that the ratings based on these data do not provide a too negative view.

The second data set contains a full survey of all inpatient and outpatient nursing homes in Germany, including some 10 000 nursing homes with details on their address, number of nursing places, prices for the cost of nursing per nursing level, prices for accommodation and meals, as well as the investment cost portion. This data set PAULA was kindly provided by the federal association of company health insurance funds, the BKK Bundesverband (BKK 2005). Combined with the demographic data, the data from PAULA for example allow for an examination at the district level of the occupancy of nursing homes and of price levels. 246 nursing homes from the first data set were combined with the data from PAULA, in some cases allowing for a relationship to be established between the rating and the price level as well as nursing home size.

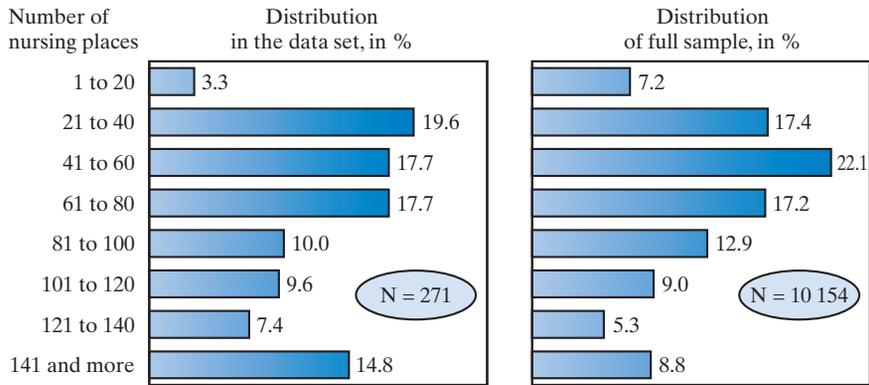
Figure 15

Distribution of nursing homes in the data sets by federal states



Analysis by ADMED, HPS Research, and RWI Essen. – Source: BKK 2005. Only for 319 nursing homes addresses were available. For the federal states see Figure 7.

Figure 16

Distribution of nursing homes in the data sets by size

Analysis by ADMED, HPS Research, and RWI Essen. – Source: BKK 2005. Only for 271 nursing homes data on the number of nursing places were available. For the federal states see Figure 7.

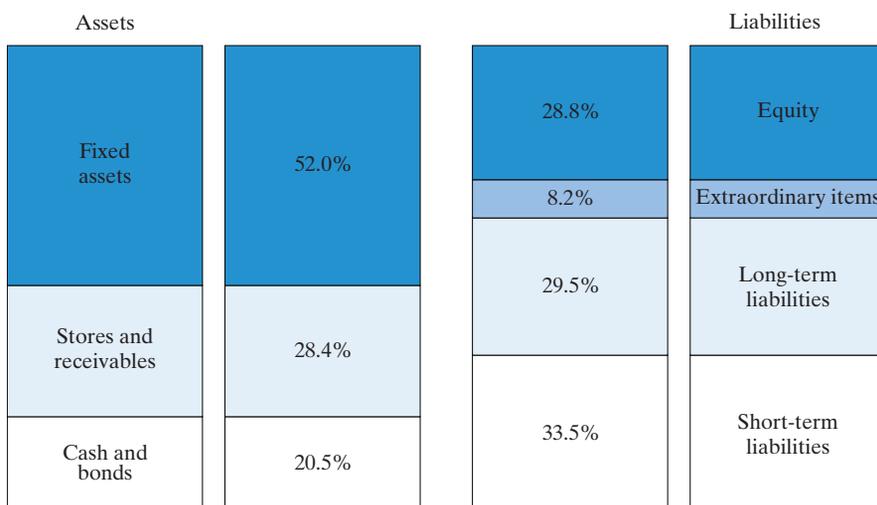
Figure 15 shows the distribution of nursing homes from both data sets among the federal states, Figure 16 compares the size of the nursing homes. A total of 91 nursing home (chain) annual financial statements with 72 nursing places or more (hereinafter referred to as homes of an above-average size) and 25 annual financial statement of homes with fewer than 72 places are available. 51 annual financial statements are from chains, of which 49 from chains with large homes. It turns out that the data set with information from the annual financial statements is not representative for the overall aggregate. It would probably be difficult to establish a comprehensive, representative data set since it is only in the case of a few homes that data from their annual financial statements are accessible to the public. We assume particularly large homes and chains publish their annual financial statements. However, our objective is to gradually establish a more representative data set. The ratings calculated in Section 4 for the time being can therefore be seen only with reference to the currently available data set but not the overall aggregate. But they are capable of showing the impact of the aforementioned policy measures (Section 5).

4. Current situation of nursing homes

4.1 Overview

Based on the data taken from annual financial statements, Figure 17 shows the balance sheet of an average nursing home from the data set. Fixed assets account for nearly 52% of total assets. This small share could be the result of sale-and-lease-back transactions. Case studies instead indicate a ratio closer to 85%. The equity ratio averages approximately 29%, extraordinary items (pre-

Figure 17

Balance sheet of average nursing home in data set

Analysis by ADMED, HPS Research, and RWI Essen. – ¹Unweighted averages.

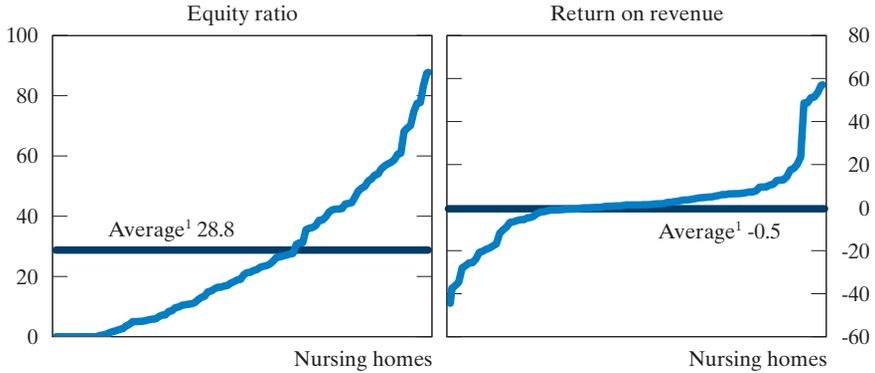
sumably largely cumulative government grants) make up 8% of the balance sheet total. Liabilities, particularly short-term ones, account for a significant share. Only 70% of fixed assets are covered by equity capital and extraordinary items. It is only when these are combined with long-term liabilities that the average nursing home of our sampling reaches an asset coverage of well over 100%.

The personnel expense item averages about two thirds, the cost of material 25%, of revenues. The average return on revenue is slightly negative at -0.5%.⁴ However, the nursing homes of the sampling vary widely in terms of equity ratio and return on revenue (Figure 18). Particularly noteworthy is the apparently smaller equity ratio and return on revenue of small homes.

The average probability of default of the nursing homes from the data set is about 1.9%, slightly higher than that of hospitals (1.7%; Augurzky et al. 2005). Compared with other medium-sized companies in western Germany, the nursing homes from the data set score worse (Figure 19; Bindewald et al. 2004). Figure 20 shows the distribution of the ratings in the traffic light classification

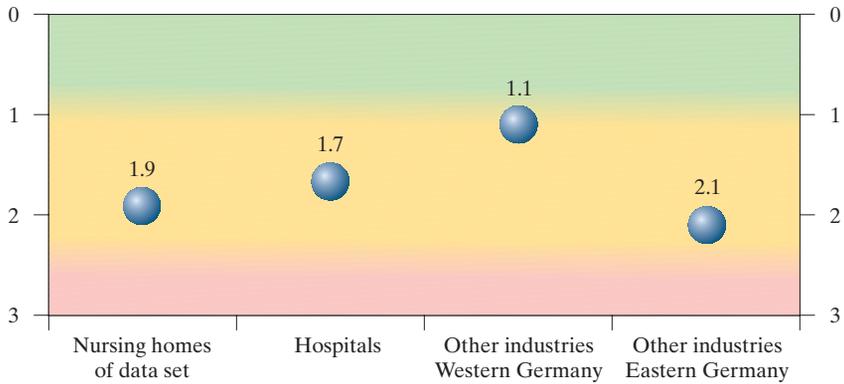
⁴ For calculating the specified mean values, outlying values were omitted. Homes within the lowest and highest 5% quantile were not included. Incidentally, the negative return on revenue does not mean that this applies for the majority of the nursing homes from our data set. The median return on revenue is 1.3%, i.e. 50% of the homes have a return on revenue of over 1.3%.

Figure 18
Distribution of equity ratio and return on revenues
 %



Analysis by ADMED, HPS Research, and RWI Essen. – Outlying values were omitted.

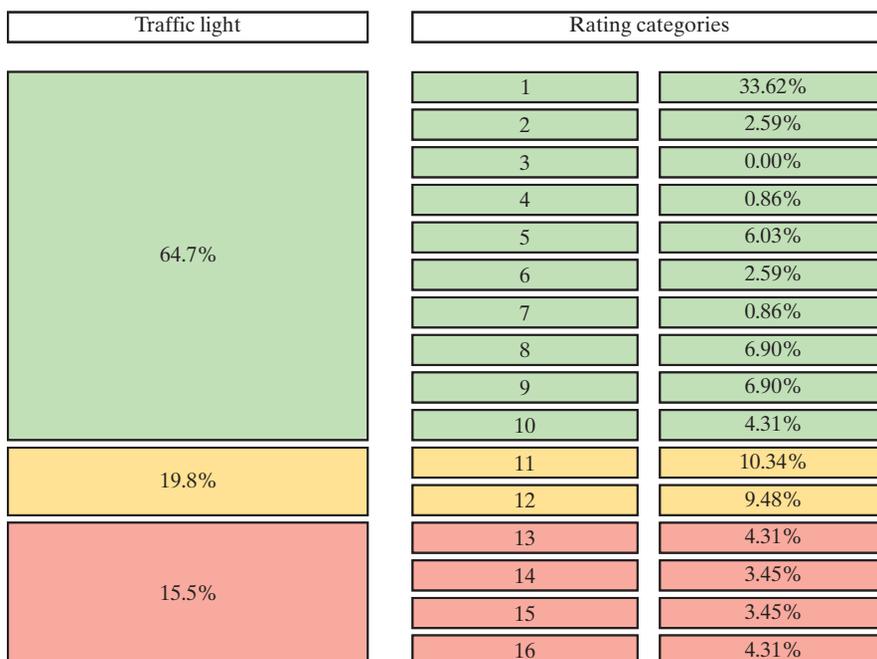
Figure 19
Average PD of nursing homes in data set
 %



Analysis by ADMED, HPS Research, and RWI Essen.

and rating categories. From this it becomes clear that 15.5% of the homes are in the red zone and nearly 20% in the yellow zone.

Figure 20

Distribution of ratings by categories

Analysis by ADMED, HPS Research, and RWI Essen.

4.2 Analysis for subgroups

The present data make it possible to calculate the average probability of default for various subgroups:

- large versus small homes,
- chains in comparison with stand-alone nursing homes,
- eastern versus western Germany, and northern versus southern Germany,
- major population centres versus rural areas,
- high-priced versus low-priced homes,
- homes with versus those without up-to-date annual financial statements.

Table 1 summarises the average PDs of the subgroups. It is always the case that any two subgroups will have different PDs, but differences may stem from chance fluctuations. Given the small size of the data set, the significance of chance fluctuations is amplified and it takes only a few differences – between

Table 1

Probability of default by subgroup			
Group	Number of annual financial statements ¹	PD, %	Difference between two subgroups ²
All nursing homes	116	1,9	–
Homes with 72 places and more	91	1,2	highly significant
Homes with fewer than 72 places	25	4,7	
Stand-alone homes	65	2,1	not significant
Nursing home chains	51	1,7	
Small stand-alone homes	23	3,6	not significant
Large stand-alone homes	42	1,2	
Western Germany	77	1,6	not significant
Eastern Germany	38	2,3	
Northern Germany	62	1,9	not significant
Southern Germany	53	1,7	
Price level of over €81.50 /day	48	0,9	slightly significant
Price level of below €81.50 /day	36	2,7	
Homes with up-to-date data	62	1,3	slightly significant
Homes without up-to-date data	54	2,7	

Analysis by ADMED, HPS Research, and RWI Essen. – ¹Some nursing homes could not be assigned to certain subgroups due to missing data. – ²Highly significant: significance level 1%, slightly significant: 10%.

small and large homes, high-priced and low-priced homes, as well as between homes with and without up-to-date data – to attain statistical significance.

Large homes have a much lower PD than small ones. This is presumably linked to advantages from economies of scale. However, it is not possible to answer the question of the extent to which size is actually the cause of the difference. This may also reflect the fact that larger homes have a higher price level compared with smaller ones. High-priced homes appear to have a better rating than low-priced ones. At first glance this is not surprising: these may include a great number of private homes which do not receive any public grants and therefore have to charge higher prices, and generally have to pay greater attention to profitability.

As with hospitals, nursing homes with up-to-date annual financial statements have a better rating than those without up-to-date data. The reason for this remains unclear. Presumably, homes with transparent external data also have greater internal transparency, thus making them better able to manage their internal business operations. We found no statistically significant differences between eastern and western Germany, northern and southern Germany, or between stand-alone nursing homes and nursing home chains.

The results presented stem from bivariate analyses in which only one factor, such as home size, is singled out with reference to which PD is then examined. A bivariate analysis does not allow for any causal interpretation. As already

mentioned, then, home size need not be the cause for a good PD; instead high prices may be decisive in this case. A multivariate analysis takes account of all known and observed factors simultaneously, and in this way makes it possible to isolate the effects of the individual factors on the PD. Such an analysis on the basis of 79 usable annual financial statements has shown that no single factor has a significant explanation power for the degree of default probability. This does not mean that such correlations may not exist. A definitive statement can only be made when the sampling of nursing homes with annual financial statements is enlarged significantly.

4.3 Further analyses

With the PAULA nursing database we are able to perform analyses at the level of German districts. The price level of a nursing home is of special interest. It appears to correlate with probability of default and thus with a home's financial strength. This makes price level one of the key criteria when it comes to deciding whether to build or purchase a home. The state also takes an interest in the level of prices since with nationally uniform nursing rates of the SNI the subsidy of nursing costs in the form of social welfare payments depends on prices.

At the district level we examine how the price level correlates with the estimated occupancy rate, disposable income per inhabitant (Arbeitskreis VGR of the Federal States 2006) and with personnel intensity (number of employees per nursing case; Federal Statistical Office 2005b). Figure 21 provides an overview of the price level of the homes in the nearly 440 districts. Nursing homes in western Germany are more expensive than in eastern Germany. North Rhine-Westphalia stands out as being particularly dear, followed by Hamburg, Bremen, the Rhine-Main region and parts of Baden-Wuerttemberg. The estimated occupancy rate was already provided in Figure 8; the average home size of a district is shown in Figure 22 and the personnel intensity in Figure 23. Disposable income per inhabitant is provided in Figure 24.⁵

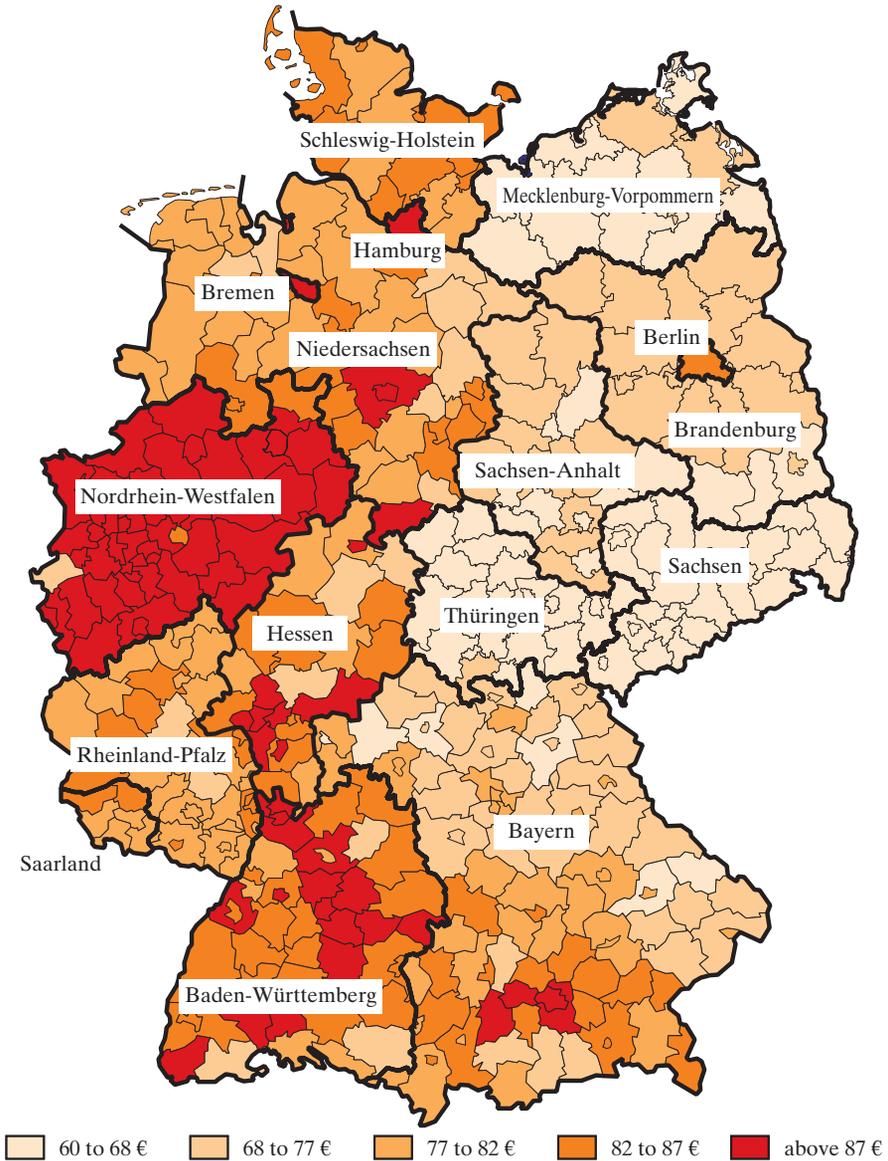
On first glance there appears to be a relationship between price level and average home size, personnel intensity and income per inhabitant. And as it turns out, this presumption is confirmed by a multivariate analysis (Figure 25). Differences in the price level of the homes of various districts for the most part are accounted for by differences in home size, personnel intensity as well as disposable income. In each case there is a highly significant positive correlation. However, the estimated occupancy rate at the district level does not reveal any significant correlation with the regional price level. On the one hand a high occupancy rate may drive up prices if supply is short, and conversely, low

⁵ An overview of the investment cost ratio and the average price for nursing services as well as for accommodation and meals is given in the Appendix.

Figure 21

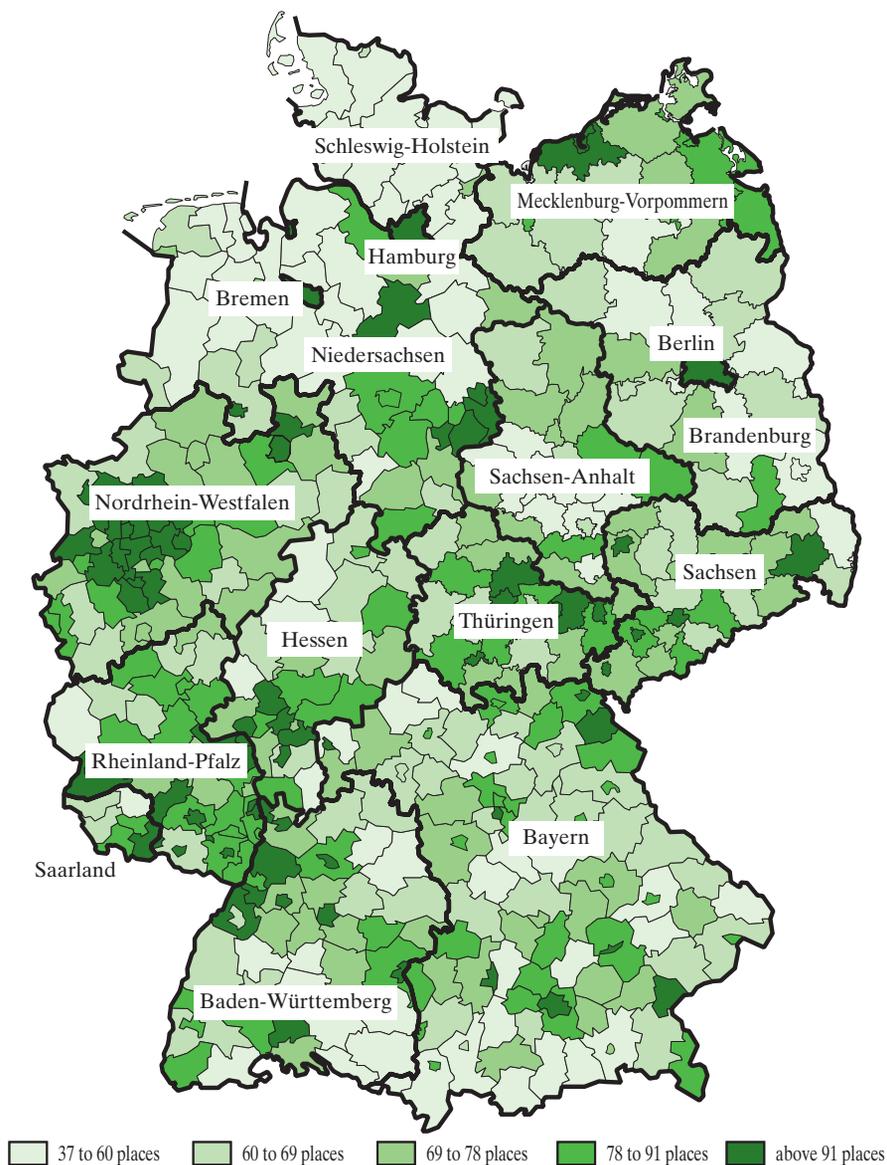
Current price level of nursing homes by districts

€/day



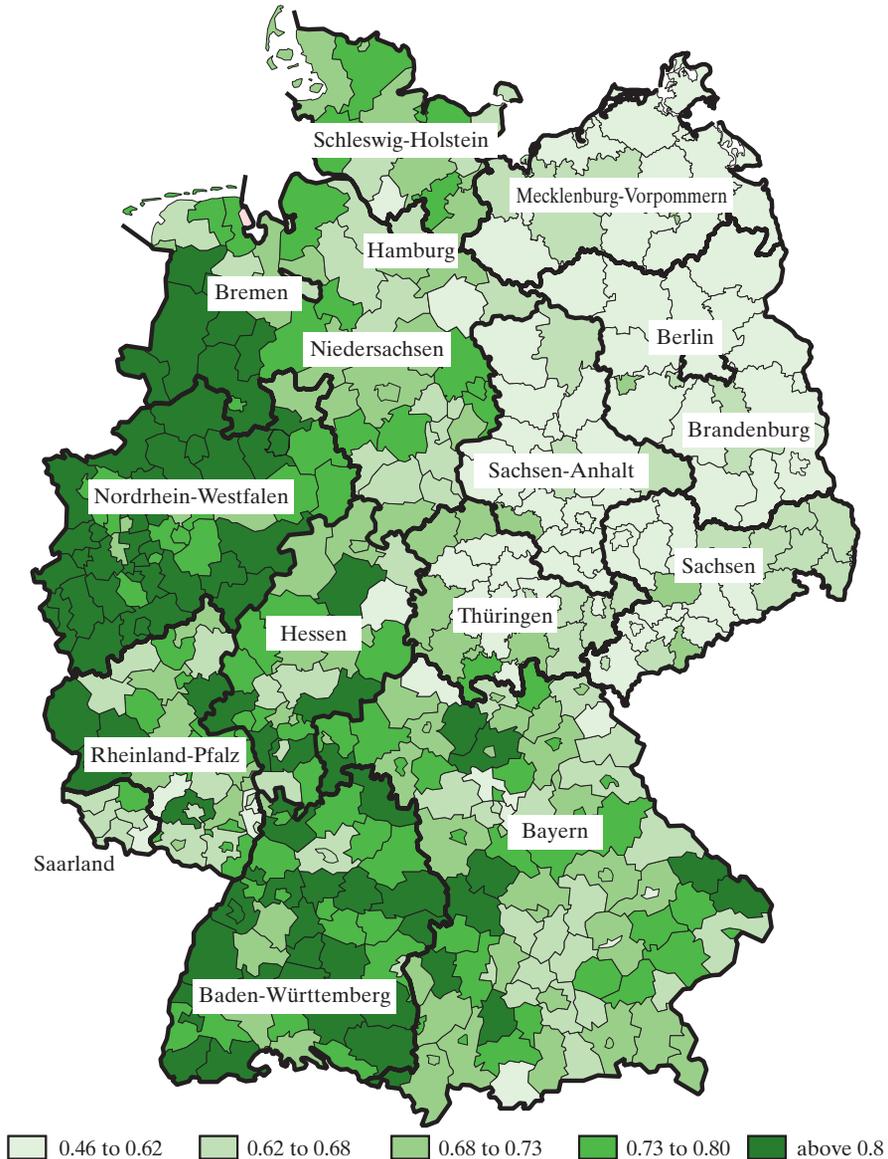
Analysis by ADMED, HPS Research, and RWI Essen. – Source: BKK 2005. For the federal states see Figure 7.

Figure 22

Current average size of nursing homes by districts

Analysis by ADMED, HPS Research, and RWI Essen. – Source: BKK 2005. For the federal states see Figure 7.

Figure 23

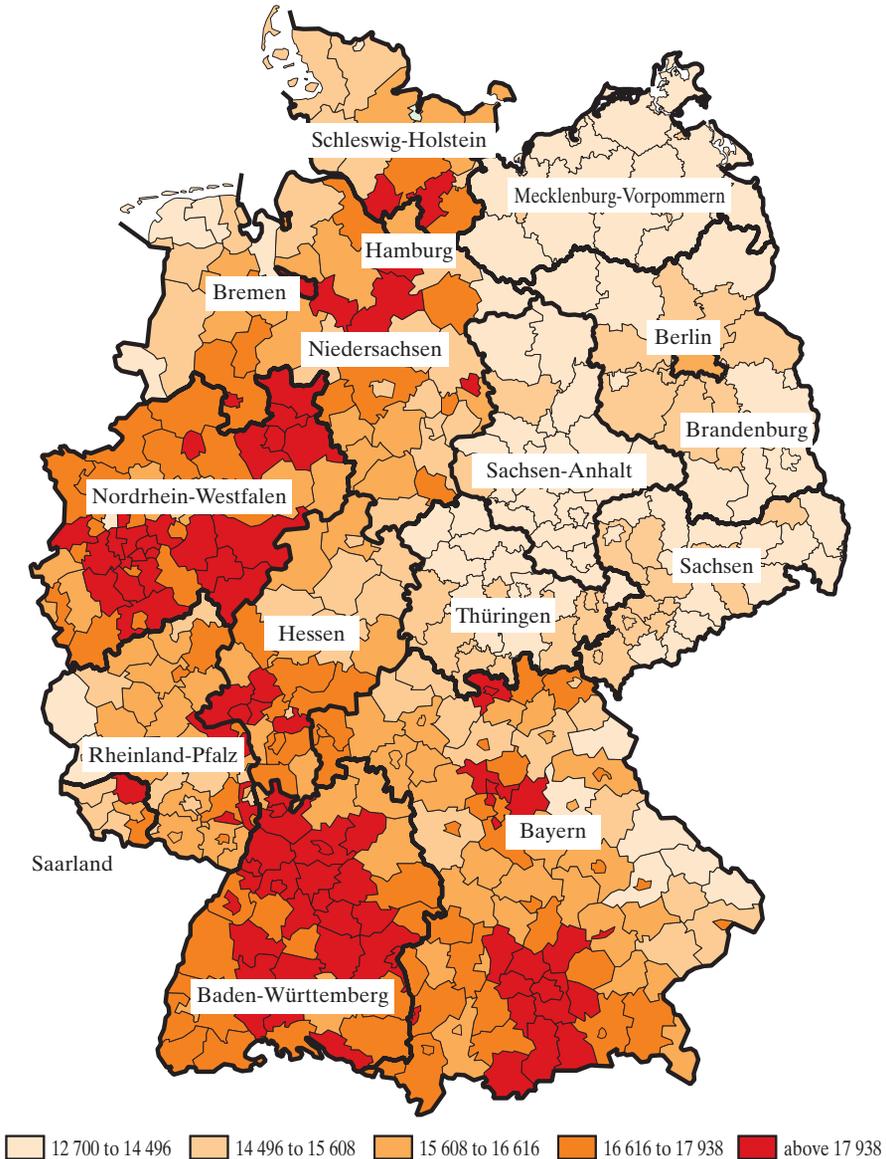
Current personnel intensity of nursing homes by districtsPersons¹/nursing places

Analysis by ADMED, HPS Research, and RWI Essen. – Source: German Federal Statistical Office 2005b. – ¹Full-time equivalents. For the federal states see Figure 7.

Figure 24

Disposable annual income per inhabitant by districts

2005; €



Analysis by ADMED, HPS Research, and RWI Essen. – Source: Arbeitskreis VGR of the Federal States 2006. For the federal states see Figure 7.

Figure 25

Multivariate analysis of price level and size of nursing home, personnel intensity, and disposable income

Informationen on district level

Price level	No correlation	Occupancy rate
	Highly significantly positive	Average size of nursing home
	Highly significantly positive	Personnel intensity
	Highly significantly positive	Disposable income per inhabitant

Analysis by ADMED, HPS Research, and RWI Essen.

prices may give rise to higher demand and a higher occupancy rate. It is plausible that there is a relationship between high personnel intensity and high prices, as well as between high disposable income and high prices. What is less easy to understand is the clearly positive correlation with the home size in a district. It may be the case that larger homes are more successful than their smaller counterparts in negotiating higher prices with the payers.

5. Impact on measures to stabilise the SNI

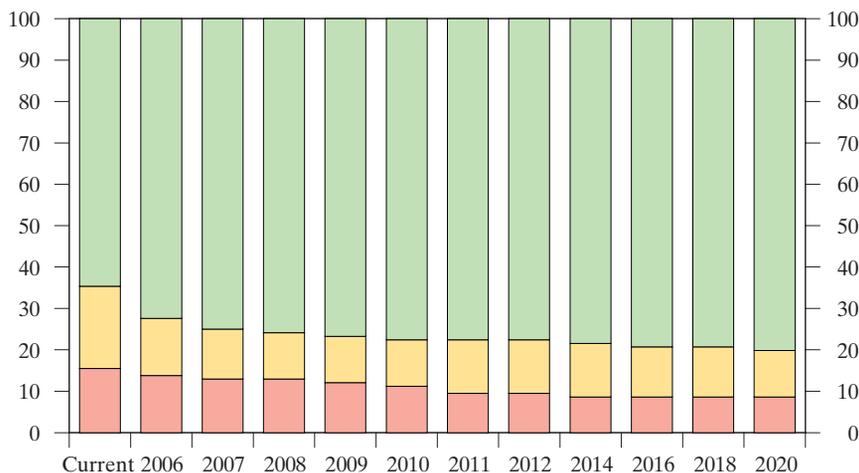
The following section takes a look at the measures mentioned for stabilising the financing of the SNI and their effects. The measures are calibrated in such a way that the capital reserve of the SNI does not become negative by 2020. It will be shown to what extent a measure would have to be applied for the growing nursing requirement to be financed by the SNI. The aim is to show the rough values involved, not to produce an exact forecast. The effects of measures on the rating of the nursing homes are compared with the base case scenario presented in Section 3.1. Figure 26 shows the change in the traffic light classification in the base case scenario.

Figure 27 enables a quantitative estimate of the possible effects of the measures. A minus sign signifies that the measure in question is expected to produce a negative effect on the target value, and a plus sign signifies that an opposite effect is expected.

Figure 26

Distribution of nursing homes by the traffic light classification in the base case scenario

2005 to 2020; share in %



Analysis by ADMED, HPS Research, and RWI Essen.

5.1 Introducing more stringent criteria for claiming SNI benefits and/or reducing the range of benefits

Based on the projections presented, roughly 870 000 inpatient nursing cases have to be expected for 2020 and 720 000 for 2010. In 2004 the figure was 650,000, in 1999 about 620 000. In the SNI, revenues last matched expenditures in 1999. This means that, if no corrective measures are taken, about 100 000 persons in need of nursing would not be able to receive any inpatient care by 2010 and 250 000 persons by 2020.⁶

In order to achieve a break-even finances, the criteria for claiming benefits from the SNI would have to be tightened to the point that these additional nursing cases no longer qualify as nursing cases. Alternatively, the range of benefits could be reduced. This would enhance intergenerational justice because younger and as yet unborn generations would not have to finance the higher nursing requirement. However, the relatives of these persons no longer qualifying for nursing benefits would face greater burdens. The incentive for younger people to make self-provision would be higher, as they would not want to forego nursing benefits when they grow old. What remains open is the issue of what happens with those who, in the event of more stringent criteria, have to do without professional nursing. Since in such a scenario their relatives

⁶ For outpatient care, which we have excluded here, about 400 000 persons in need of nursing would receive no care in 2020.

Figure 27

First assessment of the policy measures

	Generational justice	Prices of nursing homes	Rating of nursing homes	Demand for nursing	Labor market	Public expenditures	Self-provision
<div style="border: 1px solid black; padding: 2px; display: inline-block;">+</div> improvement <div style="border: 1px solid black; padding: 2px; display: inline-block;">-</div> deterioration							
Introducing more stringent criteria for claiming SNI benefits	+	(-)	(-)	-			+
Raising contributions to the SNI	-				-		
Reducing nursing rates → raising co-payments	+	-	-	-		-	+
Greater competition between nursing homes		-	-			+	
Switching the SNI to a funded scheme	+				+		+

Analysis by ADMED, HPS Research, and RWI Essen.

would not receive any nursing allowance either, many would not be able to provide nursing because they would have to earn their own living.

Introducing more stringent criteria for Nursing Levels I to III would mean that nursing homes would have to provide care for more severe cases involving higher personnel expenditure than in the past. Their costs would probably rise as a result while revenues would remain constant. To illustrate this we assume that the costs of the nursing homes rise gradually by 1% from 2009 onwards, with the rate reaching 5% by 2020. Figure 28 shows the change in the traffic light under this assumption.

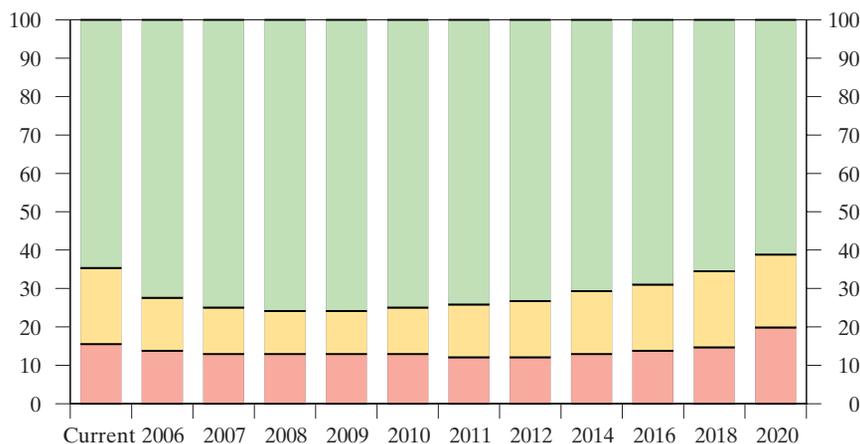
5.2 Raising contributions to the SNI

To close the financing gap of the SNI, contributions would have to be raised gradually, from 1.7% today for insured with children and from 1.95% for those without children, by roughly 0.70 percentage points to 2.40% and 2.65%, re-

Figure 28

Distribution of nursing homes by the traffic light classification when more stringent criteria are introduced (measure 1)

2005 to 2020; share in %



Analysis by ADMED, HPS Research, and RWI Essen.

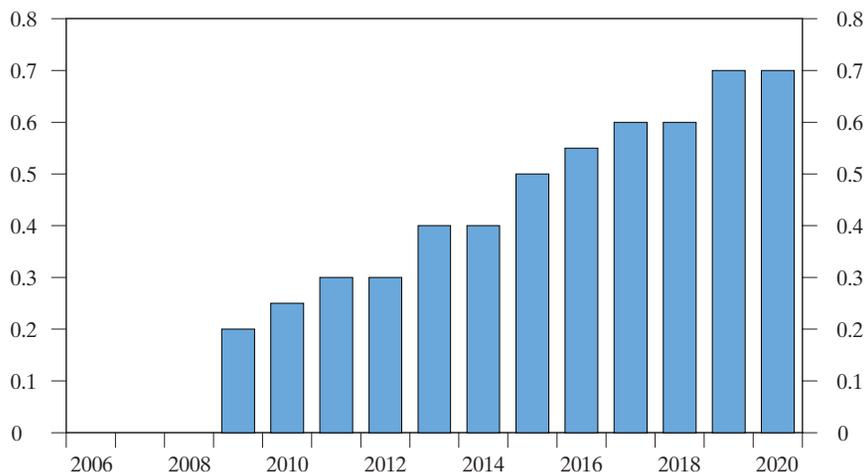
spectively, by 2020 (Figure 29). This would result in expenditures roughly being covered by revenues of the SNI by 2009. A similarly strong rise by 2020 is expected by Häcker/Raffelhüschen (2004: Figure 3) in their median scenario without cost pressure. Without corrective measures they even expect contributions to reach over 6.0% by 2050.

From the standpoint of intergenerational justice, this measure scores rather poorly since only the younger and later generations have to carry heavy burdens but without being able to expect proportionately higher benefits when their own nursing needs will have to be met. Moreover, rising social insurance contributions or the higher cost of labour is expected to have a negative impact on the labour market. Just as the first measure, this one should not be implemented – especially considering that for SHI and particularly for statutory pension insurance the rates are more likely to go up than down. An impact on the rating of the nursing homes is not likely since demand for the provision of nursing services under this scenario is not likely to differ from that of the base case scenario.

Figure 29

Raising contributions to the SNI (measure 2)

2006 to 2020; comparison to current level in %-points



Analysis by ADMED, HPS Research, and RWI Essen. – ¹Necessary raising of contributions to close the financial gap of the SNI.

5.3 Reducing nursing rates, raising co-payments

If nursing rates were lowered to the point where expenditure by the SNI would exactly match revenues, all nursing recipients would be affected more or less equally, whereas the introduction of more stringent criteria would affect only some. Declining nursing rates result in higher co-payments. We therefore assume that nursing demand will probably fall because this care will be increasingly provided by relatives. To illustrate this effect we assume that demand as a percentage will fall by half as much as co-payments rise.⁷ This decline in demand will further relieve the expenditure side of the SNI.

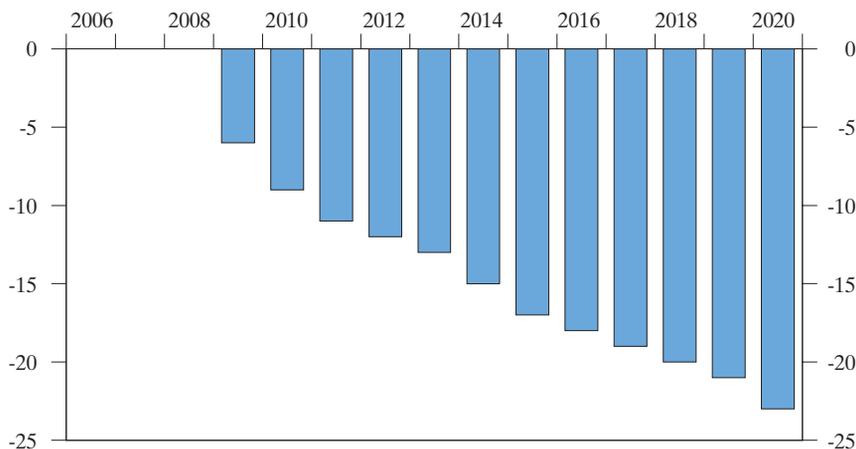
Despite the assumed decline in demand, the nursing rates for SNI would have to be lowered drastically – by more than 20% by 2020 (Figure 30). Co-payments would rise by the same magnitude. The prices of nursing homes stay constant. Figure 31 shows the reduced demand for nursing benefits. As a result, the occupancy rate of the nursing homes is reduced temporarily, but in the long term this is outweighed by growth in demand so that the situation from 2009 to 2011 would turn out only slightly worse than in the base case scenario (Figure 26). Already from 2012 there would no longer be any noticeable dif-

⁷ This number is a pure assumption for illustration. It is not based on empirical evidence. Further research should provide this.

Figure 30

Reduction of nursing rates (measure 3)¹

2006 to 2020; %

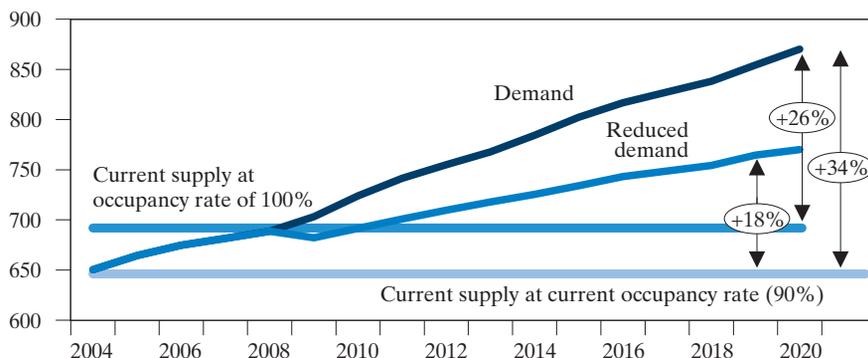


Analysis by ADMED, HPS Research, and RWI Essen. – ¹Necessary reduction to close the financial gap of the SNI.

Figure 31

Potential reduction of demand for nursing home places by reduced nursing rates¹

1000



Analysis by ADMED, HPS Research, and RWI Essen. – Source: German Federal Statistical Office 2005a. – ¹Assumption: Relative reduction of demand half as large as relative reduction of nursing rates.

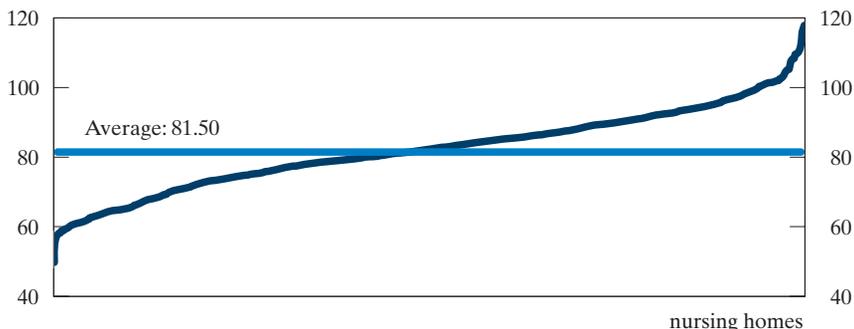
ference compared with the base case scenario.⁸ For this reason we have refrained from presenting the effects on the rating.

⁸ We assume that the construction of new nursing homes will adjust to changes in demand, with consequently no overcapacities resulting and the occupancy rate rising to 95% in the long term.

Figure 32

Current average price level of nursing homes

€



Analysis by ADMED, HPS Research, and RWI Essen. – Source BKK 2005. – Average price for nursing service is a weighted average of the price of each nursing level. The national demand for nursing levels are the weights. In addition, prices for accommodation and meals as well as the investment component are added.

5.4 Introducing greater competition between nursing homes

Prices currently vary widely between nursing homes. Prices range between € 60 and about € 120 per day, with the average being € 81.50 (Figure 32). This includes the prices for the nursing services themselves, the costs of accommodation and meals as well as the investment cost component. At the same time, clusters of high-priced and low-priced regions are clearly discernible (Figure 21).

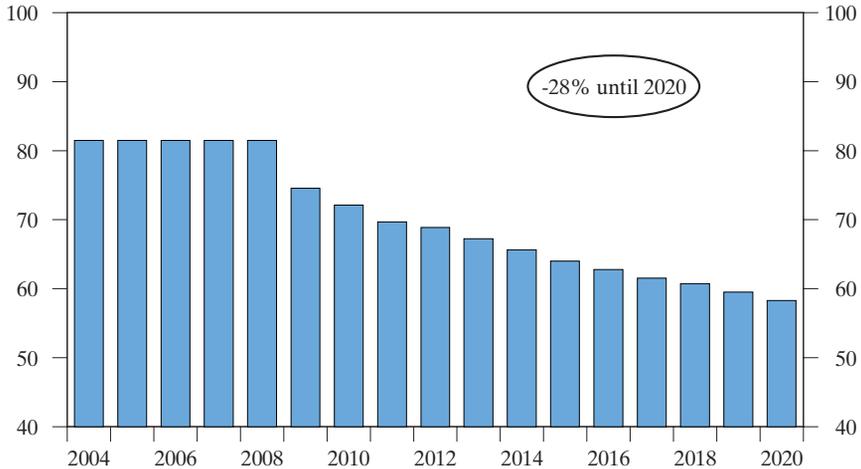
In Section 3.3 differences in personnel intensity and in disposable income were mentioned as possible reasons for price differences. However, these alone do not suffice to explain all the price differences. Further causes might lie in distortions in or a lack of competition. The fourth measure looks at how far prices would have to fall so as to close the financing gap of the SNI. Here we assume that the entire price reduction can be applied to a reduction in nursing rates and that co-payments remain unchanged in absolute terms. In this case, the price level would have to fall by 28% by 2020 (Figure 33) and thus to the current level of the country's lowest-priced nursing homes.

The pressure on the homes concerned to adjust would be enormous. Without corrective measures, about 60% of these would slide into the red zone by 2020 (Figure 34). This would sound the knell of countless nursing homes. It would wipe out nursing capacities on a large scale and it would no longer be possible for aggregate demand to be met. In an alternative calculation we have assumed that the prices of outpatient services also fall. If they fall by half as much as those of nursing homes, the price level of the homes would only have

Figure 33

Necessary price reduction to close the financial gap of the SNI (measure 4)

2004 to 2020; average price level of nursing homes in €

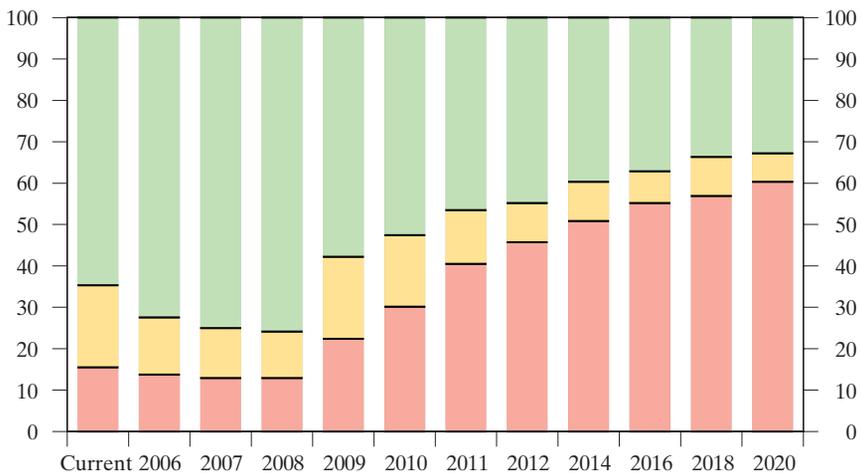


Analysis by ADMED, HPS Research, and RWI Essen. – Assumption: prices for outpatient care do not change. For calculation of prices see Figure 32.

Figure 34

Distribution of nursing homes by the traffic light classification when the price level falls (measure 4)

2005 to 2020; share in %

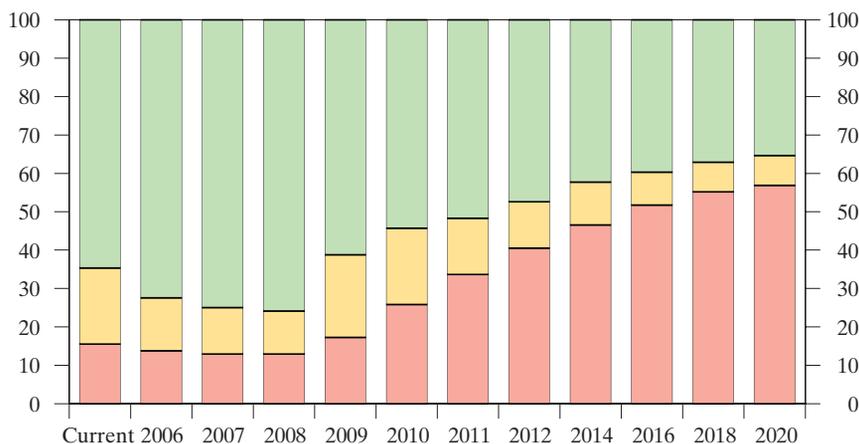


Analysis by ADMED, HPS Research, and RWI Essen. – Assumption: prices for outpatient care do not change. For calculation of prices see Figure 32.

Figure 35

Distribution of nursing homes by the traffic light classification when the price level falls partly (measure 4)

2005 to 2020; share in %



Analysis by ADMED, HPS Research, and RWI Essen. – Assumption: prices for outpatient care fall by half as much as those for nursing homes. For calculation of prices see Figure 32.

to be reduced by 20%. The worsening in the rating would not be quite as pronounced (Figure 35).

5.5 Changeover to a funded system

Although the demographic problems of a pay-as-you-go nursing insurance system were already known in 1995, policymakers nevertheless chose to introduce the SNI system. Häcker/Raffelhüschen (2004) put the sustainability gap of the SNI (scenario without cost pressure) at 50% of GDP. In this amount provisions would have to be formed in order to service the liabilities of the SNI for future benefit recipients. With the introduction of the SNI, future generations were saddled with a liability, and the older generation handed a gift, in the same amount.

To close the sustainability gap, Häcker/Raffelhüschen (2004) propose gradually phasing out SNI parallel to the introduction of a mandatory private nursing insurance. To cover liabilities still outstanding, the younger generation is required to pay an income-based solidarity amount averaging 1.2% of income which is reduced to nil by about 2046. The older generation has to pay an additional lump-sum amount. By then a sufficiently high capital reserve will have been built up through the private nursing insurance scheme to finance the

nursing requirement. The authors show that in the scenario without cost pressure the sustainability gap would thus be removed. In our view this proposal does represent a sensible solution, but we fear that it would be very difficult to implement politically given that the notions of “funded schemes” and “individual responsibility” in the political debate are often equated to being “contrary to the principle of solidarity”.

We do not expect an impact on the rating of the nursing homes since this change would be financed by the total expected demand. Possibly, nursing homes would become more differentiated in their offering if a private nursing insurance gave nursing recipients more freedom to choose from the range of benefits available.

5.6 Mix of measures

It has been shown that – apart from the last one – no measure on its own is capable of fixing the financing problem of SNI without entailing drastic effects. We therefore recommend a mix of the measures described. On the one hand we propose a slight increase in contributions while simultaneously reducing in the benefits of SNI (by introducing more stringent criteria, trimming the range of benefits and lowering nursing rates) coupled with the establishment of an additional private insurance scheme along the lines of the fifth measure.

At the same time the nursing market has to be deregulated and greater competition between providers of nursing services allowed. For example, it does not make economic sense to limit the size of nursing homes as is the case in some federal states. Book XI of the German Social Insurance Code (SGB XI) should be reviewed for outdated provisions. Agreements on service volumes and quality as well as federal state regulations on staffing structures should be scrutinised. A greater degree of flexibility in these areas would have a positive impact on efficiency and thus the quality of the homes.

6. Conclusion

The capital reserve of the SNI has been diminishing since 1999 revenues fell short of expenditures. In 2005 there was still about €3bn left, which will likely be used up by 2008. Unless drastic countermeasures are taken, the SNI in a few years' time will no longer be able to cover its financing gap by drawing on a capital reserve. The gap is even set to widen further as the population greys – by 2020 we expect, assuming an unchanged need for nursing, an additional 600 000 outpatient and inpatient nursing cases compared with 2005 and as a result an investment requirement of about €15bn to €17bn. Policymakers must therefore act now if they are to stabilise the financial situation of the SNI. The following five measures have been discussed in the present Study:

- Introducing more stringent criteria for claiming SNI benefits and/or reducing the range of benefits.
- Raising contributions to the SNI.
- Reducing the nursing rates of the SNI and/or raising co-payments.
- Bringing about lower prices at nursing homes through greater competition.
- Gradually switching the SNI from a pay-as-you-go to a funded scheme along the lines of the Häcker/Raffelhüschen model (2004).

None of the first four measures can be implemented in isolation without entailing drastic consequences in terms of either intergenerational justice, the job market, nursing recipients, their relatives, the state, the quality of nursing or nursing homes. The fifth measure is generally to be welcomed, as it would produce intergenerational justice. However, its implementation could founder on a lack of political will and resistance from various lobby groups. We therefore recommend a mix of measures to ensure that the additional burdens are shared equally by the older and younger generations coupled with a private provision scheme, as well as by the nursing home facilities, and that the burden for unborn generations is significantly reduced:

- introducing slightly more stringent criteria for claiming SNI benefits and a moderate reduction in the range of benefits,
- slightly raising contributions to the SNI,
- slightly reducing the nursing rates of the SNI and/or raising co-payments,
- deregulating the nursing home market and strengthening competition between providers with a view to bringing down the price level,
- establishing an additional private insurance scheme.

To assess the impact on nursing homes, we prepared balance sheet ratings on the basis of 116 annual financial statements encompassing over 500 nursing homes. About 16% of the nursing homes from this data set have a very high probability of default, which puts them in the red zone of homes that are especially at risk over the next few years. 20% have a slightly elevated risk of insolvency (yellow zone). If the entire financing burden of the SNI up to 2020 were passed on to the nursing homes alone, the red zone would rise to 60%. Given the growing need for nursing, the question that this raises is one that touches society itself: How can sufficient capacities be ensured in future in a situation where many nursing homes cannot be run efficiently and without efficiency the required capacities cannot be built?

This Study shows that the rising need for nursing can be covered neither on the basis of the SNI in its current form nor on the basis of the current structure of nursing homes. Many nursing homes are inefficient and have little prospects of

surviving very long into the future. A deregulation of nursing home planning will drive the consolidation of the nursing home sector led by large groups and chains of homes having the wherewithal to invest in large, modern and efficient facilities.

The question of “when and where” new capacities are to be built will depend not only on the regional requirement for nursing but also the extent to which the regional environment will allow for an efficient nursing offering. Not only income but also regulatory restrictions, for example on the number of qualified staff or maximum home size, come into play here. While policymakers have to deliver the framework conditions so as to enable nursing homes to operate efficiently, the nursing home will also have to re-invent itself. It should strive to become part of an intersectoral system of integrated healthcare spanning hospitals, rehabilitation facilities, community-based doctors and the real estate industry. It should (be able to) segment its services according to the needs of nursing patients and to form groups or chains to improve efficiency through economies of scale. Particularly small homes in our survey appear to have a disproportionately high probability of default of around 4.6%. Although it is not possible to derive the “ideal” nursing home from the sampling available on account of its small size, the Box 2 nevertheless attempts to portray the nursing home of the future on the basis of case studies.

Box 2

Characteristics of the “future nursing home”

1. *Co-operation:* The modern nursing home, either on a stand-alone basis or in co-operation with other healthcare providers, hospitals, rehab facilities, community-based physicians or medical care centres (MVZs), offers a wide range of healthcare services. It might be based within a large health centre, or might co-operate on an affiliated basis with other local healthcare providers. The traditional lines of division between acute and non-acute medicine, inpatient and outpatient treatments as well as medical disciplines have given way to a flow structure in which the patient is the focus of interest and uses healthcare services based on a treatment path spanning all health sectors. This confers both medical and economic advantages. Duplication of examinations and communication problems at the points of interface between sectors are avoided, treatment paths can be standardised, making them more transparent for providers and patients alike. The nursing home comes in at the interface of acute medicine with pre- and post-inpatient care. Lastly, the difference between senior citizens' homes with additional services for assisted living and short-term nursing on the one hand and nursing homes on the other is fast fading.

2. *Segmentation:* The service package offered by the nursing home is focussed on certain groups of patients, thus enabling it to look to the individual needs of its occupants. Standard and premium packages are conceivable, special additional services including ethnic concerns can be taken into account. Solutions in urban areas differ from those in rural areas, those in high-income areas from those in structurally weak regions. By such differentiation, the nursing home acquires competitive advantages over other homes. If its size allows, either on a stand-alone or affiliated basis, it offers the entire range of nursing services and benefits.

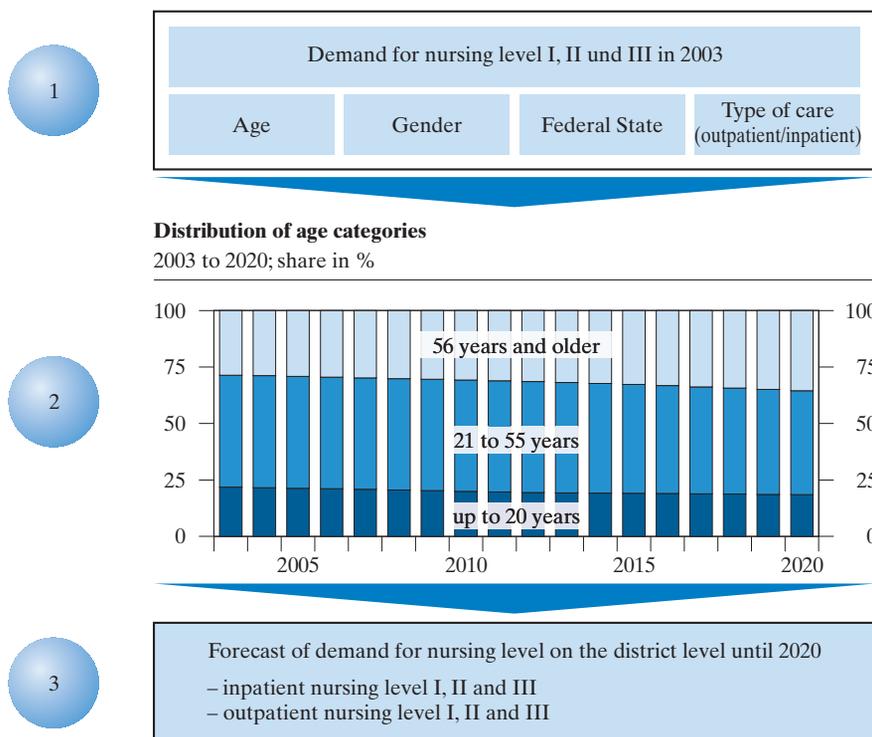
3. *Size:* The nursing home attains a size at which it can provide its service offering efficiently. The number of places well exceeds the current average of 72. The construction of small nursing homes and those without any affiliation to other healthcare providers, as is still being observed in some cases, is viewed critically; their prospects of survival are rather slim. Driven by a strong market consolidation, there are mergers and further ties are forged between operators at the regional and national level. Eventually the market is dominated by big nursing home chains exploiting economies of scale. A central management organisation develops a uniform corporate strategy, which is then broken down to the individual company divisions. A central performance and quality management organisation and the flexible use of personnel throughout the group structure as a whole allows for the realisation of cost advantages. Know-how in planning, investment and in the operation of nursing homes is also put to work in secondary areas such as catering, laundry, cleaning, logistics and additional services. Already today a large nursing home has advantages in recruiting and professional training of qualified staff. Furthermore, many nursing homes report problems in finding qualified personnel and management capacities.

7. Appendix

7.1 Forecast of nursing demand

Demand for nursing services is based on demand in 2003 (Federal Statistical Office 2005a) and the expected demographic trend until 2020 (BBR 2004; Figure 36). For nursing demand in 2003 we differentiate between outpatient and inpatient nursing as well as by Nursing Levels I to III. The incidence of nursing P of a given nursing level S varies depending on age A , gender G and federal state L (Figure 37). We link the calculated nursing incidence of a nursing level $P(S|A,G,L)$ by age, gender and federal state to the demographic trend at the district level, making the assumption that the nursing incidences at the district level and at the level of the respective federal state are the same. We then obtain a forecast of nursing demand at the district level for each nursing level in the outpatient and inpatient area.

Figure 36

Basis for forecast of the demand for nursing care

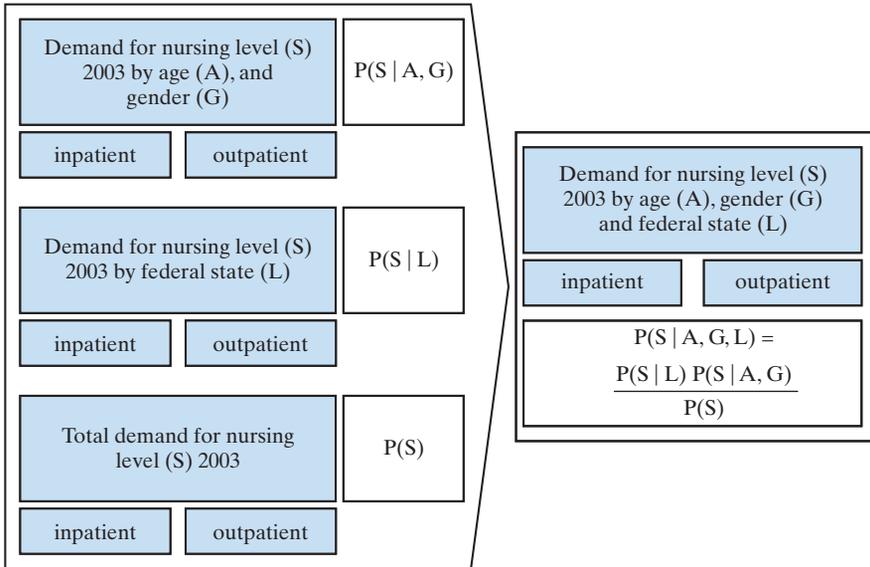
Analysis by ADMED, HPS Research, and RWI Essen. – Source: BBR 2004.

For lack of more detailed information we assume a constant nursing incidence up to 2020. For the population projection at the district level it has to be noted that it also can depend on the birth and mortality rates of a district, but especially on interregional migrations. These migration movements can be influenced heavily by economic factors which over the forecast period may lead to a demographic structure at the district level other than the one forecast.

7.2 Forecast of financing situation of the SNI

The forecast for the financial situation of the SNI is an extrapolation of the current situation. As in the scenario without cost pressure of Häcker/Raffelhüschchen (2004), we assume that prices for nursing services will rise by at least to the same extent as the wages of all other employee categories (as also

Figure 37

Deviation of the demand for nursing care¹ by age, gender, and federal state

Analysis by ADMED, HPS Research, and RWI Essen. – Source: German Federal Statistical Office 2005a. – ¹P: Incidence of nursing care.

held by Rothgang 1997; Schmähl 1999; Breyer 1999)⁹. As a result, revenues will rise to the same extent due to wage increases as expenditures will rise due to the increase in prices for nursing services. For the sake of simplification, we therefore assume in the forecast constant price and wage levels.

Under this model, expenditures of the SNI only follow demand for nursing and revenues follow the total employment. Employment will probably decline as a result of the demographic trend. We expect the number of contribution payers to decline by 0.4% p.a. Not taken into account is the fact that the employment rate for women could rise or the unemployment rate could fall. Against this background, we may be underestimating growth in revenues. However, the error is likely to be minor by 2020. Overall, the model was calibrated in such a way that it largely corresponds to the Häcker/Raffelhüschchen (2004) scenario without cost pressure.

⁹ With the measure “greater competition and falling prices” we do however assume a potential price downside for nursing services.

7.3 Basel II and ratings

Banks have to make reasonable provision for the risk of credit default in order to limit their own risk of insolvency. This provision is made in the form of equity coverage for loans extended. On account of the increasingly complex finance system and in response to some spectacular bank failures, special supervisory rules have been put in place for credit institutions. The Basel Committee on Banking Supervision works to promote the convergence of these rules. This international Committee brings together risk management experts from the fields of science, economics and politics. It is based with the Bank for International Settlements in Basel and sets out the rules on the equity coverage of credit institutions.

In 1988 the Committee presented its first framework of rules on the international convergence of minimum capital requirements for securing credit risks. It came to be known by the name Basel I and as a rule required an equity coverage of 8% for loans to corporate entities. This safety net applied independent of whether the borrower represented a high or low individual risk of default. As a result this did not adequately reflect a bank's true risk profile.

To address this situation and to stabilise the international financial markets, the Basel Committee developed a new framework (Basel II) in which the equity coverage for loans is linked to the borrower's individual risk of default (BIS 2003, 2004). In the insurance industry, for example, the amount of premiums is nowadays always calculated on the basis of the insured entity's individual risk. In 2007 Basel II will replace the first framework. The move from a mean-oriented calculation towards terms reflecting the actual risk of credit is being accelerated by Basel II but did not start with it. Already in the past, efforts to adopt more effective rating and pricing models to determine individual interest margins for loans were driven by the weak earnings position of German credit institutions on an international comparison, mounting competition, advances in capital markets theory as well as the availability of modern information and communication technologies.

Depending on the degree of default risk and the collateral furnished by the borrower, the risk margin for coverage of the default risk is determined. This risk margin has two components: firstly, the bank must make provision for those credit losses it expects as the statistical mean loss when it extends the loan. Hence, it can be assumed that with a probability of default of 1% per year the default will average 1% of the loan amount per annum and will have to be covered by provisions. However, since this value is only a statistical mean, the actual losses may be higher or lower. Basel II requires banks to make adequate capital provision for unexpected high losses. It is calculated by means of a complex process which is set out in the Basel framework. The equity capital provided as coverage cannot be used in a bank's actual banking operations, re-

sulting in opportunity costs. These are included in the risk premium as the second component. For borrowers with a low risk this means that they will obtain cheaper financing in future, whereas borrowers with a high risk will have to face rising costs or even the possibility of not being extended any more loans.

Under Basel II, a bank is required from 2007 to assess the credit standing of a borrower by means of an internal rating. A rating is a means of classifying companies based on their probability of default. Each rating class represents a certain range of probabilities of default. The rating takes account of a company's material risk factors and weights these according to their explanation power for the company's aggregate risk. Statistical methods are applied to identify as well as weight the risk factors. For this purpose a data set of past annual financial statements is set up in such a way that it contains a sufficient number of insolvent and solvent borrowers. It is only in this way that the relevance of presumed risk factors or determinants for explaining the development of a credit default can be filtered out using statistical methods. Ratings that do not apply the methods described above are based on qualitative expert estimates and are generally inferior to approaches based on statistical methods. The quality of a rating model is measured by its forecasting power. The better it is at forecasting company failures, the more valid it is. This can be determined *ex post* using a validation data set.

7.4 Rating method of this Study

The development of a rating specific to nursing homes would require an extensive data set of insolvent and solvent nursing homes and a wide range of information on these homes, notably in the form of past annual financial statements. Such a data set is not available. So as to still be able to apply proven methods, this Study uses a balance sheet rating for medium-sized companies which is oriented on Engelmann et al. (2003). It was tested by GENO Consult GmbH and compared with other methods. The key financial data included in the rating, their significance and their general trend are shown in Figure 38.

To enhance the stability of the rating, RWI Essen and ADMED GmbH limited the values of each key ratio to a plausible interval. This was done in order to exclude the possibility of implausibly high or low values being overweighted and of the rating becoming far too favourable or poor. For example, the key figure "liquidity" might be assigned an extremely high value if on the balance sheet liabilities with a term of up to 1 year are not stated or are understated. The probability of default calculated in this way can easily amount to 0.0%. This is avoided by limiting this key figure to a plausible interval.

Figure 38

Figures of the rating by ADMED and RWI Essen

Figure	Definition	Relevance	Assessment
Debt ratio	Liabilities / Total assets	high	lower is better
Bank debt ratio	Bank liabilities / Total assets	low	lower is better
Liquidity	Cash and equivalents/ Liabilities up to 1 year	high	larger is better
Financial power	Cash flow / (Liabilities – Advances)	high	larger is better
Working capital	Working capital / Revenues	medium	lower is better
Short-term liabilities	Liabilities up to 1 year / Total assets	high	lower is better
Pure asset rate	Trade liabilities / (Total assets – Deficit not covered by equity)	medium	lower is better
Capital turnover	Revenues / Total assets	medium	larger is better
Value creation	(Revenues – Cost of materials) / Personnel expenses	medium	larger is better
Return on equity	Earnings from ordinary operations / Total assets	low	larger is better
Revenue growth	Revenues / Revenues of previous year	not relevant	moderate is good

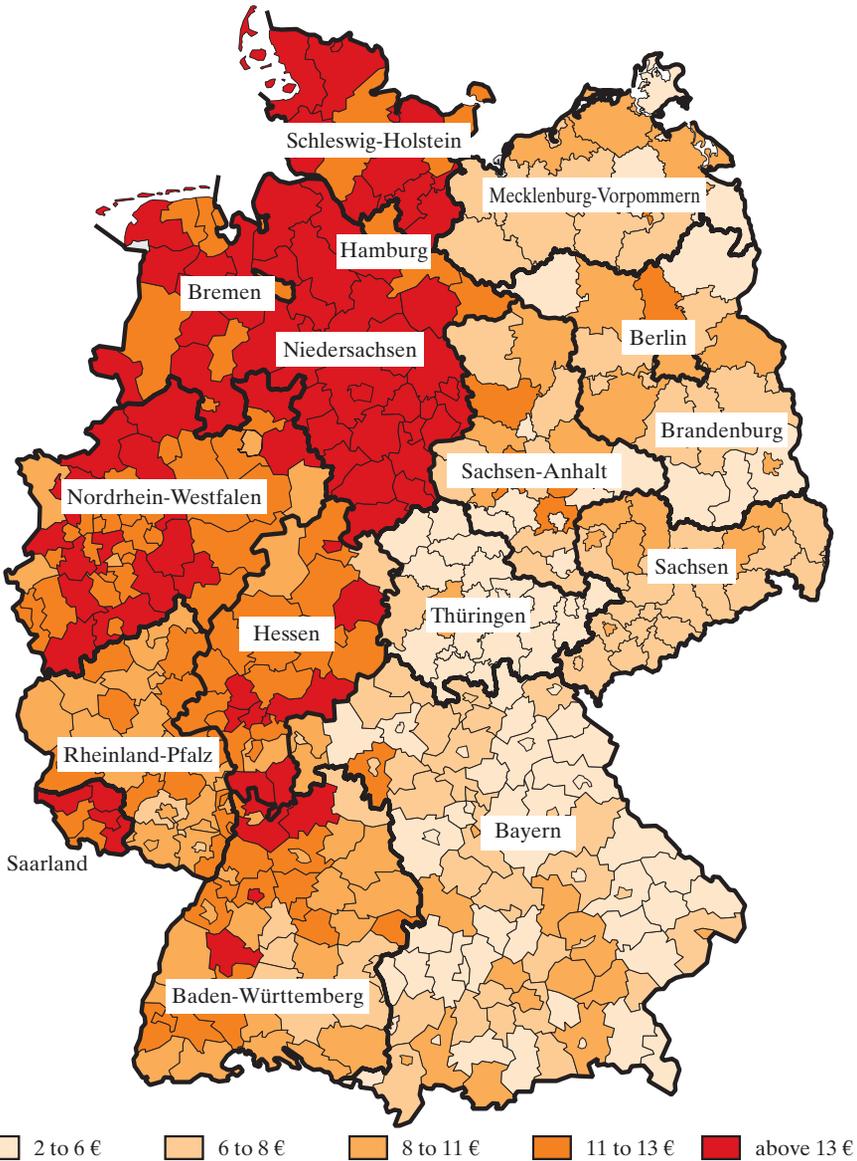
Analysis by ADMED, HPS Research, and RWI Essen. Engelmann et al. 2003. –¹Up to 25%: “larger is better”.

7.5 Maps

Figure 39

Current investment cost component for nursing homes by districts

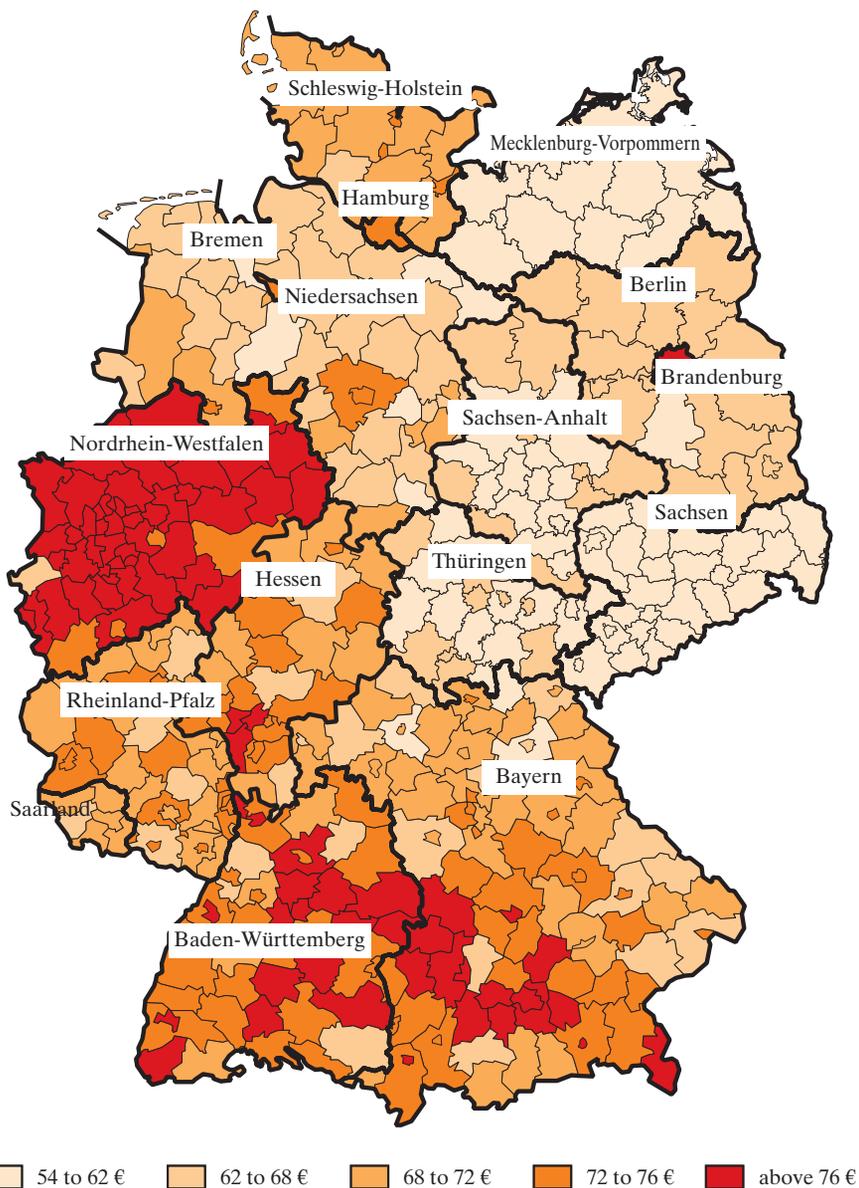
€/day



Analysis by ADMED, HPS Research, and RWI Essen. – Source: BKK 2005. For the federal states see Figure 7.

Figure 40

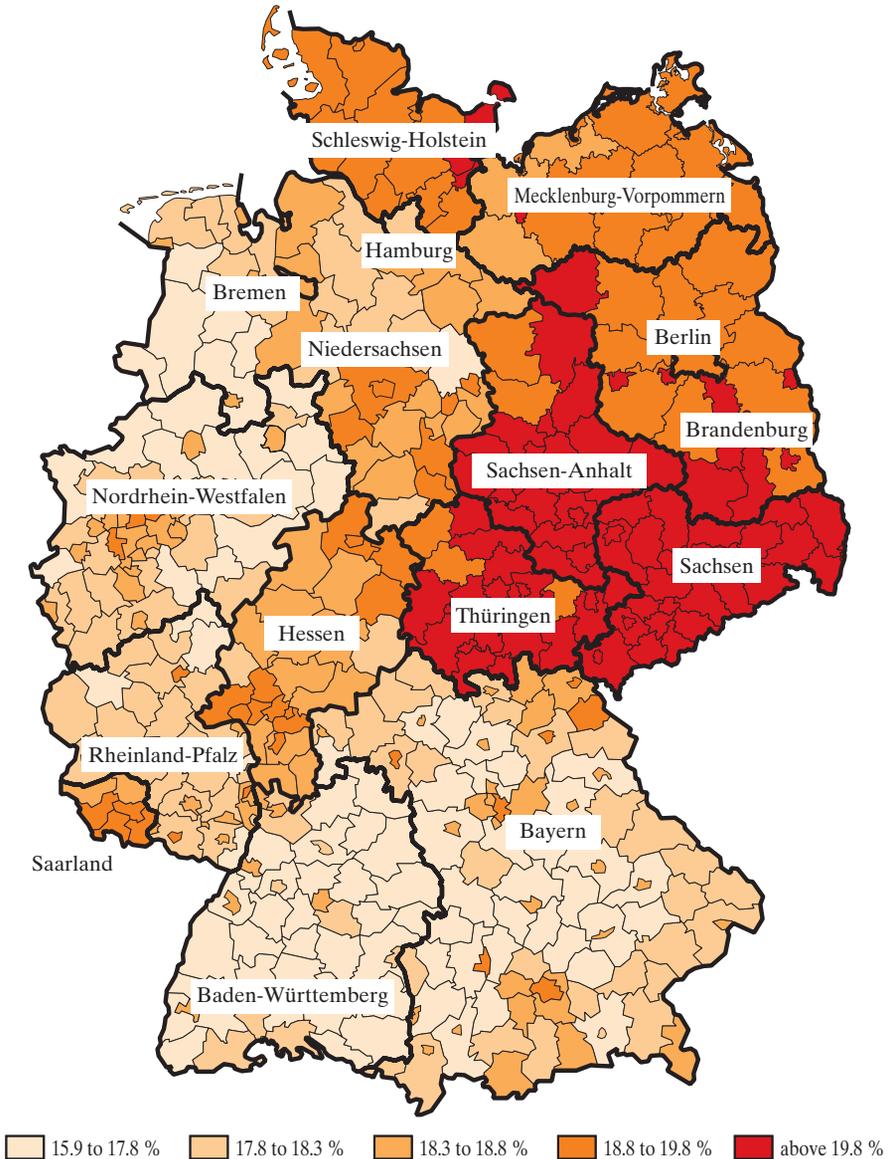
Average price level for nursing and costs of accomodation and meals by districts
€/day



Analysis by ADMED, HPS Research, and RWI Essen. – Source: BKK 2005. For the federal states see Figure 7.

Figure 41

Distribution of population at the age between 50 and 64 years by districts
share of total population in %



Analysis by ADMED, HPS Research, and RWI Essen. – Source: German Federal Statistical Office 2003. For the federal states see Figure 7.

Literature

- Arbeitskreis VGR of the Federal States – Arbeitskreis VGR der Länder (ed.) (2006), Volkswirtschaftliche Gesamtrechnungen der Länder. Ergebnisse der Revision 2005, Arbeitnehmerentgelt, Bruttolöhne und -gehälter in den Ländern und Ost-West-Großraum-Regionen Deutschlands 1991-2005. Reihe 1 Länderergebnisse Band 2 (im Excel-Format). Stuttgart.
- Augurzky, B., D. Engel, S. Krolow, Ch.M. Schmidt und St. Terkatz (2005), Krankenhaus Rating Report 2006. Wege zu einer nachhaltig finanzierbaren Patientenversorgung – Entwicklung der deutschen Krankenhäuser bis 2010. RWI : Materialien 22. RWI, Essen.
- Bähr, J. (1997), Bevölkerungsgeographie. Verteilung und Dynamik der Bevölkerung in globaler, nationaler und regionaler Hinsicht. UTB für Wissenschaft 1249. Stuttgart: Ulmer.
- Bank for International Settlements (ed.) (2003), *Third Consultative Paper*, 29. April, Pillar 1. Basel.
- Bank for International Settlements (ed.) (2004), *Modifications to the capital treatment for expected and unexpected credit losses*, 30. Januar, Basel.
- BBR – Bundesamt für Bauwesen und Raumordnung (ed.) (2004), *Indikatoren und Karten zur Raumentwicklung – Laufende Raumbbeobachtung*. Bonn.
- Bindewald, A., C. Böcker et al. (2004), *Chancen zum Aufschwung nutzen*. Mittelstandsmonitor 2004. Jährlicher Bericht zu Konjunktur- und Strukturfragen kleiner und mittlerer Unternehmen, gemeinsamer Bericht der Creditreform, KfW, IfM Bonn, RWI Essen und ZEW Mannheim. KfW, Frankfurt a.M.
- BKK – BKK Bundesverband (ed.) (2005), *Pflegedatenbank PAULA*. Essen.
- Breyer, F. (1995), Ökonomische Grundlagen der gesetzlichen Pflegeversicherung. Diskussionsbeiträge der Fakultät für Wirtschaftswissenschaften und Statistik der Universität Konstanz 277. Konstanz.
- Engelmann, B., D. Hayden and E. Tasche (2003), Testing rating accuracy, Credit Risk, RISK January 2003. Internet: www.risk.net.
- Federal Ministry of Health and Social Security – Bundesministerium für Gesundheit und Soziale Sicherung (ed.) (2005), *Statistisches Taschenbuch Gesundheit*. Bonn.
- German Federal Statistical Office – Statistisches Bundesamt (ed.) (2003), *Bevölkerung Deutschlands bis 2050*. 10. koordinierte Bevölkerungsvorausberechnung. Wiesbaden.
- German Federal Statistical Office – Statistisches Bundesamt (ed.) (2005a), *Pflegestatistik 2003 – Pflege im Rahmen der Pflegeversicherung. Deutschlandergebnisse und Ländervergleiche: ambulante Pflegedienste, Pflegeheime, Pflegebedürftige*. Wiesbaden.
- German Federal Statistical Office – Statistisches Bundesamt (ed.) (2005b), *Pflegeheime auf Kreisebene 2003*. (im Excel-Format) Wiesbaden. Häcker, J. und B. Raffelhüschen (2004), Denn sie wussten, was sie taten: Zur Reform der Sozialen Pflegeversicherung. *Vierteljahrshefte zur Wirtschaftsforschung* 73 (1): 158–174.

- Mäding, H. (2004), Demographischer Wandel und Kommunalfinanzen. Einige Trends und Erwartungen. *Deutsche Zeitschrift für Kommunalwissenschaften* 43: 84–102.
- Rothgang, H. (1997), *Ziele und Wirkungen der Pflegeversicherung*. Eine ökonomische Analyse. Frankfurt a.M.: Campus.
- Schmähl, W. (1999), Pflegeversicherung in Deutschland: Finanzbedarf und Finanzverflechtung, empirische Befunde und offene Fragen. *Allgemeines Statistisches Archiv* 83: 5–26.