

## **“Private Compulsory Long-Term Care Insurance in Germany”**

**Helga Riedel**

Germany

Summary

In Germany the compulsory long-term care insurance was established in 1995. The private health insurer undertook to implement compulsory long-term care insurance for that part of the population which had a private substitutive health insurance. The paper deals with the history of the private compulsory long-term care insurance, its calculation – i.e. principle of equivalence with the same premiums lifelong provided that there is no inflation in benefits and with ageing provision. Furthermore the implemented transfer-elements and the financial equalisation are explained, which are necessary to compensate both the insurance of very old people and such needing long-term care as well as the legal restrictions on premium.

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Zusammenfassung

In Deutschland wurde 1995 die Pflegepflichtversicherung eingeführt. Die privaten Krankenversicherer haben es übernommen, für den Teil der Bevölkerung auch diese Pflegepflichtversicherung durchzuführen, welche eine private substitutive Krankenversicherung innehat. Das Papier handelt von der historischen Entwicklung, der Kalkulation der privaten Pflegepflichtversicherung nach dem Äquivalenzprinzip mit lebenslang gleichen Beiträgen bei gleichen Leistungen und mit Alterungsrückstellung. Darüber hinaus werden die implementierten Umlageelemente und Ausgleichsmechanismen erläutert, welche durch die Versicherung von bereits Pflegebedürftigen und sehr alten Personen und durch gesetzliche Beitragsbeschränkungen erforderlich sind.

# “Private Compulsory Long-Term Care Insurance in Germany”

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## **1. Introduction**

In the beginning of 1995 the compulsory long-term care insurance was established in Germany. The law which was published in 1994 states, that every inhabitant of Germany has to be insured against the risk of long-term care and that the insurance is to be provided by the same institution that also provides the health insurance. That means that all those people who were not members of the statutory health insurance system but had instead a private health insurance had to be insured in the private compulsory long-term care insurance — whether they were young or old, healthy or ill or even needing long-term care. Moreover the law limits the premiums in the private compulsory long-term care insurance to the maximum premium in the social one and gives some more restrictions. So the calculation of the private compulsory long term care insurance which has to observe the principle of equivalence, has to include considerable transfer-elements. That means above all, that part of the premium is calculated as usual in private health insurance and another part is a contribution to finance the premiums of those who would otherwise have to pay too much.

This paper gives a brief outline of the history of compulsory long-term care insurance in Germany and the special legal features. Then the calculation is explained, both for new business and with regard to adjusting the premiums for business in force. The third part is devoted to the pooling system in the private compulsory long-term care insurance which is necessary with regard to the transfer-system.

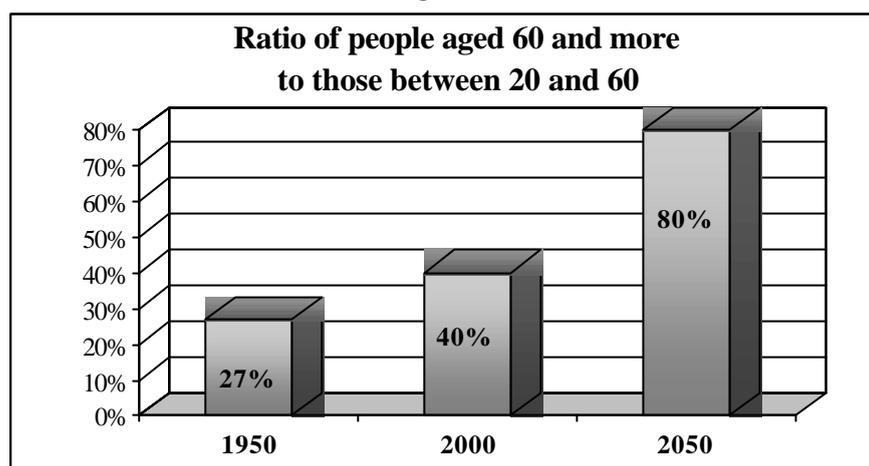
## **2. History**

The need for insurance to cover long-term care has been discussed in Germany since the 1980s. The number of senior citizens is growing in relation to the rest of the population in Germany, as in all industrialised nations (diagram 1). Moreover, the costs of such long-term care are very high and frequently exceed the financial means of the people concerned. This burden consequently had to be borne by the general public, more accurately by the system of public assistance which is financed from tax revenues. The idea was to find an insurance system to cover such long-term care, firstly to relieve the public sector and secondly to save people the humiliation of having to contact the social welfare office with its test, whether they are in need or not, and the possibility of relatives having to bear the costs.

A voluntary model was preferred at first. Both private health insurers and life insurers developed tariffs providing for daily allowances in accordance with the level of long-term care required on the one hand, as well as reimbursement of a certain share of the costs on the other. However, the political system failed to make good on its promise of creating tax benefits for this form of provision and thus providing an incentive for its widespread application.

The debate then turned towards compulsory solutions, including fully funded models on a purely private basis. On the other hand, a method also had to be found to relieve the public sector of the "old burden", i. e. those already receiving long-term care and those who could soon be in need of such care on account of their age. At the same time, however, the premium for such an insurance had to remain affordable. For this reason, attention gradually focused on a system of social insurance embracing the entire population on a cost-sharing basis.

Diagram 1



The private health insurance industry played a part in the debate from beginning to end. Calculations were set up for all the various models and methods developed for implementing them. This naturally applied above all in the case of models based on private long-term care insurance. When the political debate began to tend towards general compulsory insurance in the social insurance system, it became the industry's goal to provide those who already had comprehensive health insurance, with long-term care insurance.

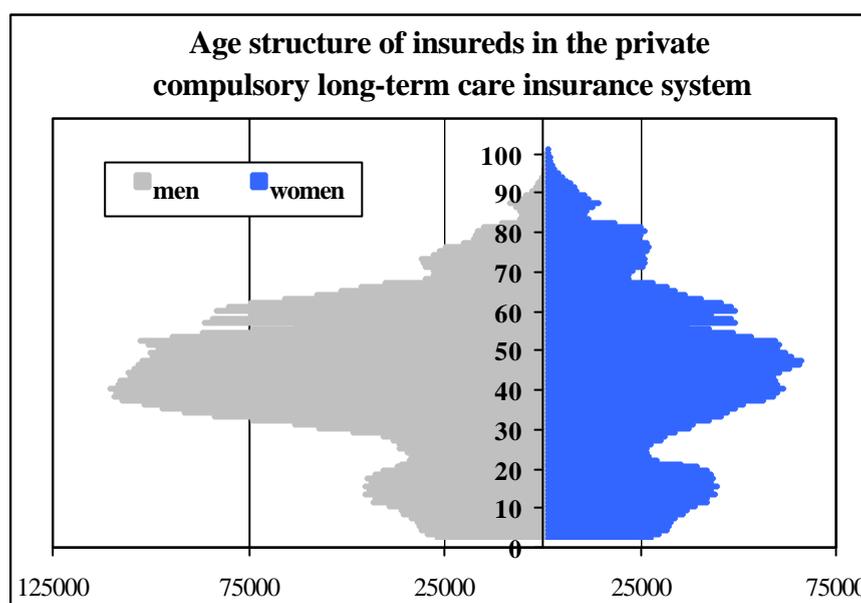
The key word here was: "care follows sickness" and meant that long-term care insurance was to be provided by the same institution that also provided the health insurance. This will prevent disputes between health insurance and long-term care insurance institutions over who is to bear the costs of long-term care in the event of a claim.

Some parts of the industry were sceptical whether it could be right to take on the risk of private compulsory long-term care insurance for the complete business in force. The risk lay particularly in the lack of data on the need for long-term care in the population, above all as defined by the new law. Even the voluntary long-term care insurance which was already established was unable to supply any data, as new insureds were accepted with normal assessment of the medical risk and the portfolio consequently did not include any elderly people who were about to require long-term care, nor any significant number of cases receiving such care.

After numerous discussions, both the Ministry and the other politicians accepted that such a two-tier system would be appropriate. The result was that the law on compulsory long-term care insurance now stipulates, that all insureds with private health insurance must also conclude

private compulsory long-term care insurance (diagram 2). In doing so it was treated as a single entity so that no-one is obliged to obtain compulsory long-term care insurance and health insurance from the same insurance company. Insureds in statutory health insurance funds automatically receive compulsory long-term care insurance from their health insurer. The only exceptions to this rule concern those who are voluntarily insured with the social health insurers: they can request exemption from the social branch and obtain such insurance from a private insurance company. Very few actually do so, however. On the other hand, those insureds who cancel their health insurance with a social health insurer and obtain private medical insurance, must also take out private compulsory long-term care insurance.

Diagram 2



### 3. Conditions of private compulsory long-term care insurance

In order to obtain the compulsory long-term care insurance, a considerable number of insureds had to be included in the private compulsory long-term care insurance, although they had neither purely statutory nor purely private health insurance: their health insurance is instead provided by separate insurance funds for the Post Office and Federal Railways. However, only civil servants with the former rights prevailing prior to privatisation are insured here, with the result that these are increasingly aged, dwindling groups without growth in the form of new members. Due to the other basic conditions prevailing, this portfolio had to be subsidised from the outset. This was the political price to be paid for ensuring that the private health insurance companies did not lose their own insureds to the social insurance sector where compulsory long-term care insurance was concerned.

The private health insurance companies had to meet a whole series of further conditions, such as that all insureds with private health insurance had to be covered as a whole, i. e. including those already receiving long-term care and those of an age where they may soon require such care, without any extra premium or exclusion of past illnesses. In other words, burning houses had to be insured. That portfolio is called the "old burden".

Where premiums are concerned, it was stipulated that

- children must be included in the insurance without an additional premium,

- premiums must be the same for men and women, i. e. without discrimination on account of a person's sex,
- no-one may be required to pay more than the highest contribution for social compulsory long-term care insurance (this applies after a period of five years in the case of new business) and
- married couples must not pay more than 1½ times the maximum premium for social compulsory long-term care insurance if one of the partners has no income or only a very small one (this does not apply in the case of new business).

Since the premiums were brought very closely into line with the social insurance system as a result of these conditions, the benefits were also established within the same framework as regards both the limits and the prices. The schedule of benefits provides for both cash and non-cash benefits under the social long-term care insurance scheme on the one hand and reimbursement of costs under the private branch on the other. The amount of benefits paid is limited so that increasing prices do not play a part even for reimbursement of costs, unless the maximum benefits are increased by law. The classification criteria as regards the levels of care are also the same in private and social long-term care insurance. All this consequently makes it certain that if the entire private system proves feasible and calculable from the outset, then it will also remain so in future.

However, such basic conditions can only be met if the entire insurance system is calculated on a uniform basis, i. e. with uniform premiums on a net basis excluding costs. Transfer-contributions must be included in these premiums due to the assumption of the "old burden" and the restrictions on premiums. Comprehensive financial equalisation must therefore be ensured both in respect of premiums (through transfer-contributions) and as regards the benefits (when the actual benefits exceed those actuarially assumed). This was something which had to be anchored in the law in order to ensure that all insurance companies actually participate in this system.

If this were not prescribed by law, it is conceivable that those companies which have only recently appeared on the market and therefore only include young insureds, could refuse to share in the financing of the "old burden" and could then offer their insureds compulsory long-term care insurance at a very much lower price than that, offered by companies with old portfolios. To avoid this competitive pressure, the old companies would be forced to set up their own new companies with which to attract young insureds. The entire old burden, i. e. all elderly insureds and all people already receiving long-term care, would be left out in the cold and their premiums would become unaffordable.

Once these conditions were laid down in the law, the industry as a whole basically agreed to accept the risk of compulsory long-term care insurance.

#### **4. Calculation**

This chapter sets out to explain how the premiums for private compulsory long-term care insurance are calculated. These basic principles apply equally

- to the starting phase when this new insurance was introduced,
- to the new insureds who are constantly joining this insurance and

- to the development of the portfolio, taking into account the fact, that the old burden will be reduced in the long term and the basis for calculation will change.

A straightforward cost-sharing system could not be established, since insureds are not allocated automatically. On the other hand the private compulsory long-term care insurance has to be a guaranteed life-long insurance at affordable prices. As a result the calculation must be the same as in the German system of private health insurance, i. e. with the principle of equivalence and the formation of an ageing reserve in order to safeguard future claims. This is far more important than in health insurance, due to the steep profiles in long-term care.

Diagram 3

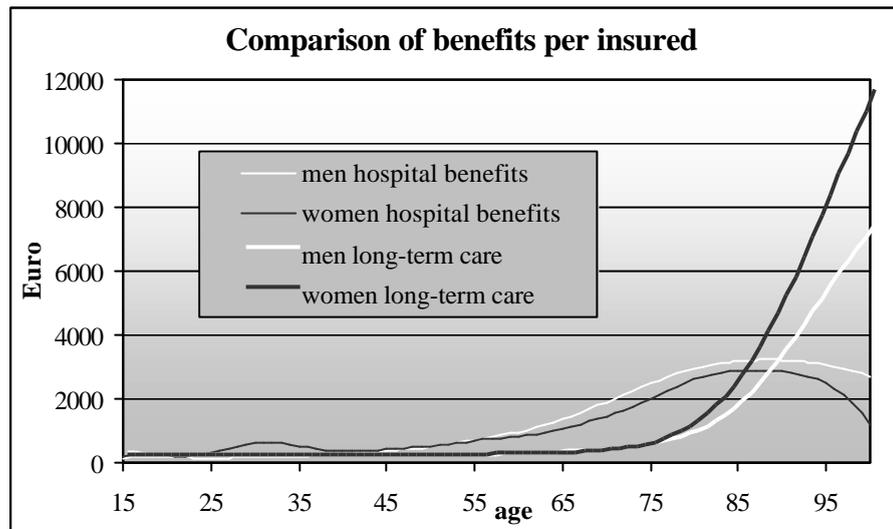
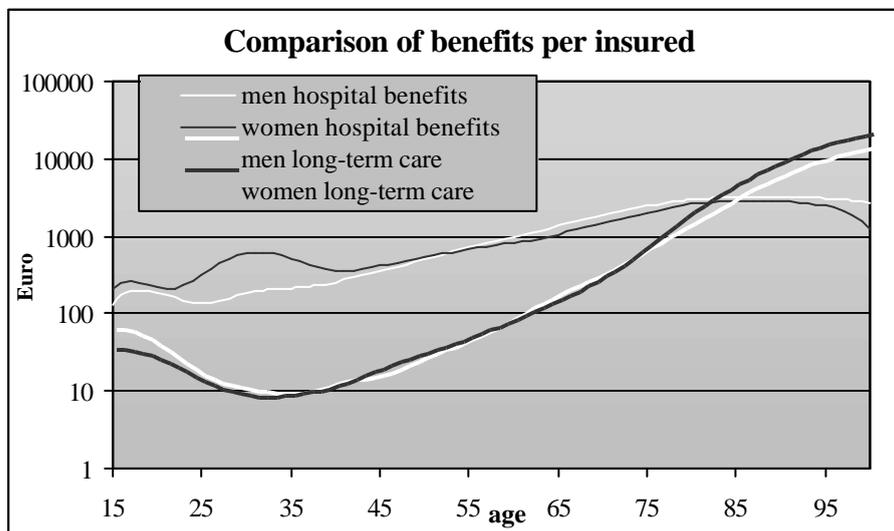


Diagram 3 shows the comparison between the per-capita benefits of long-term care (including the restrictions imposed by the law) with the average benefits per insured for hospital care. You see that young people receive virtually no benefits from long-term care insurance, while a large proportion of older insureds can be expected to receive 100% of the maximum benefit. (That is why the claims amount per risk in long-term care is always shown on a logarithmic scale - diagram 4.)

Diagram 4



#### 4.1 Calculation of the premium

In order to guarantee life-long insurance with unchanging premiums (on condition of unchanging benefits), the premiums for compulsory long-term care insurance are calculated according to the principle of equivalence, as in health insurance. This means that the sum of all future benefits must be equal to the sum of the future premiums, taking into account the income from interest. Depending on the age at entry and sex, the premiums are then calculated on the basis of

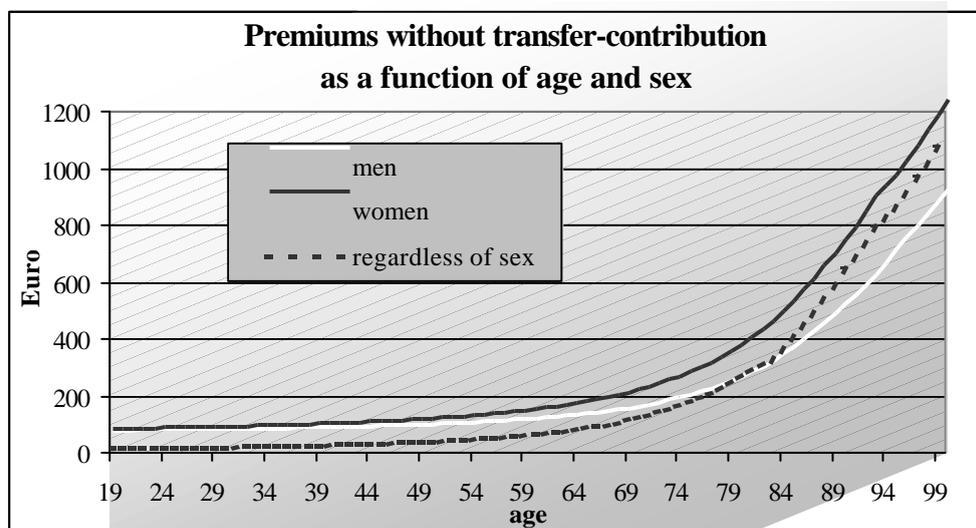
- age and sex-related claims amount per risk,
- the decrement rate based on the mortality rate and lapse rate, as well as
- the actuarial interest of 3.5% as for health insurance.

The same basis is used to calculate the ageing reserve. The calculation does not depend on inception rates for long-term care and its duration. The formula for the calculation of the net-premium at an entry-age and for the ageing reserve are laid down in the appendix.

The costs must then be added to the resultant net premiums. The costing method is not uniformly prescribed on account of antitrust provisions, but a so-called maximum cost rate must be specified for the calculation as a whole so that the required transfer-volume for the old insureds can be calculated. The individual companies can remain below this cost rate for all insureds, but can also exceed this cost rate for younger insureds who have not yet reached the maximum premium. Premiums will henceforth always be shown with the maximum cost rate permitted in the calculation. A safety loading of 5% of the gross premium is added to compensate any fluctuations, and finally the transfer-contribution, if the maximum premium is not yet reached.

In the case of children up to and including the age of 18, premiums are calculated without contribution to the ageing reserve, i. e. only containing the risk element which remains the same for the entire group. This corresponds to the procedure for health insurance, the reason being that almost all young adults withdraw from the private insurance and are subject to social insurance contributions when they start to work.

Diagram 5

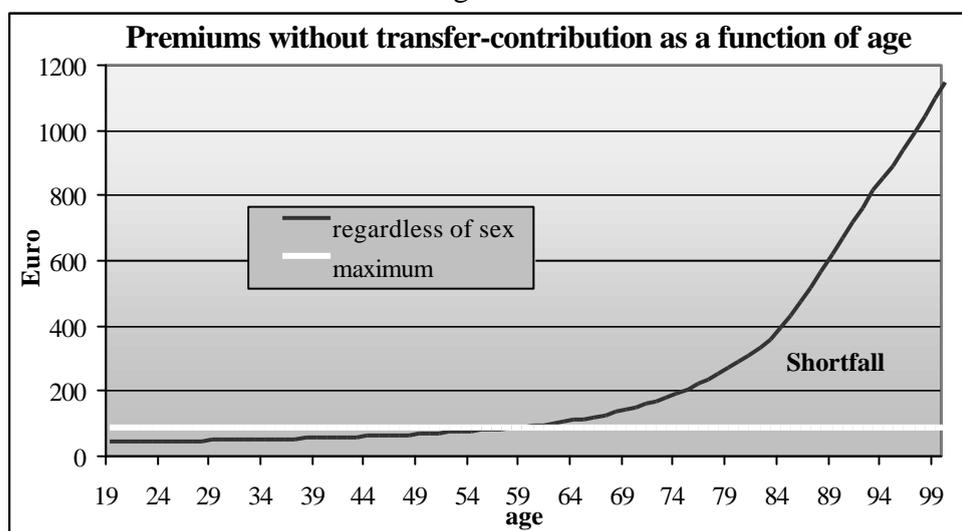


As for health insurance, compulsory long-term care insurance premiums are basically calculated according to sex. The resultant premiums based on the current calculation data for the individual age groups you see in diagram 5. However, the law stipulates that premiums must be the same for men and women. The premium regardless of sex is therefore calculated for each age group from the premiums for men and women in accordance with the equalised ratio of men to women in the portfolio. The separate premiums for men (white line) and women (black line) consequently yield a premium regardless of sex (dashed line). The premiums shown are always those for new business.

#### 4.2 Maximum premium and shortfall

The maximum premium stipulated by law has been plotted as a white line in diagram 6 with the required premiums regardless of sex and intersects the premium curve at age 59. This means that all insureds aged 59 or more don't pay the full premium required for their insurance.

Diagram 6



The premium shortfall can be covered in three ways:

- One possibility is to provide the complete cash value corresponding to this shortfall in the form of an ageing reserve. However, this would have cost billions which no-one could have afforded.
- Another possibility would have been to calculate only the momentary premium shortfall, albeit with inclusion of the decrement rates for the "old burden" and consequently the future reduction in this shortfall. However, this approach is impossible for reasons of caution, since the calculation as such was already uncertain due to the lack of data on the need for long-term care. Admitting an additional uncertainty factor by directly including the reduction in "old burden" appeared too risky. It must also be remembered that the "old burden" due to imposing a ceiling on the premiums for married couples could never have been grasped in this way, since the data needed to appraise the change of state "married couple in which

one partner has no more than a small income" are simply not available and cannot be estimated.

- The last remaining possibility was consequently to cover the unfinanced premiums ascertained on the basis of the current portfolio by loading the premium of young insureds who had not yet reached the maximum premium payable. Such an approach must be reviewed regularly, however, so that the transfer-contribution can be redetermined as the portfolio changes.

The last method described has been applied in practice.

The portfolio consequently serves as the basis for determining

- the premium required for premium-free children (*ch*)

$$U_{ch} = \sum_{j \in ch} P(j) ,$$

- how much is lacking for older insureds (*oi*, which don't belong to *mc*) due to the imposition of a maximum premium

$$U_{oi} = \sum_{j \in oi} \max\{P(j) - MP ; 0\} .$$

as well as

- the shortfall in premium income for married couples (*mc*)

$$U_{mc} = \sum_{j \in mc} \max\{P(j) - 0,75 \cdot MP ; 0\} .$$

with:  $P(j)$  = actual premium regardless of sex of the insured person  $j$  without limitations

$MP$  = maximum premium for social compulsory long-term care insurance

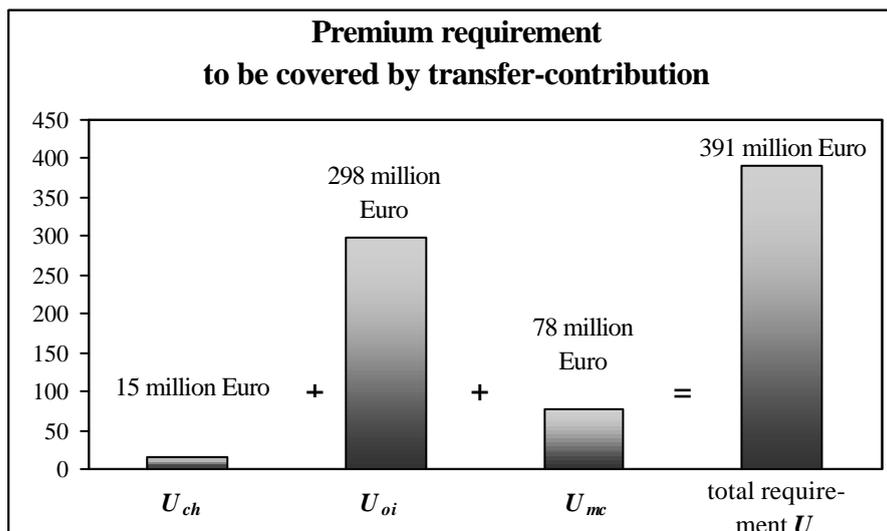


Diagram 7

### 4.3 Transfer-contribution

The sum  $U = U_{ch} + U_{oi} + U_{mc}$  must be borne by the younger insureds whose premiums have not yet reached the applicable ceilings (diagram 8). Those insureds whose premium is already relatively close to the limit can bear only a small transfer-contribution, while younger insureds can bear more. The greater the total transfer-volume required, the larger the number of insureds who do not pay the maximum transfer-contribution. The system is consequently destabilised as the required total transfer-volume increases.

The original calculation had shown that the entire system collapses if the capitalisation procedure with formation of an ageing reserve is chosen even for very old insureds. This means that all insureds would have been required to pay the maximum premium, although the required premiums for all insureds would still not have been covered as a whole. For this reason, the capitalisation scheme was not applied in the case of those insureds who were 80 or more years old when compulsory long-term care insurance was introduced (diagram 9). This risk could be accepted since this group of insureds is relatively small and, secondly, will dwindle steadily over the next 25 years as a result of deaths. Cover is guaranteed for this period of time by the existing portfolio of young insureds, even for the growing risk posed by these very old insureds.

Diagram 8

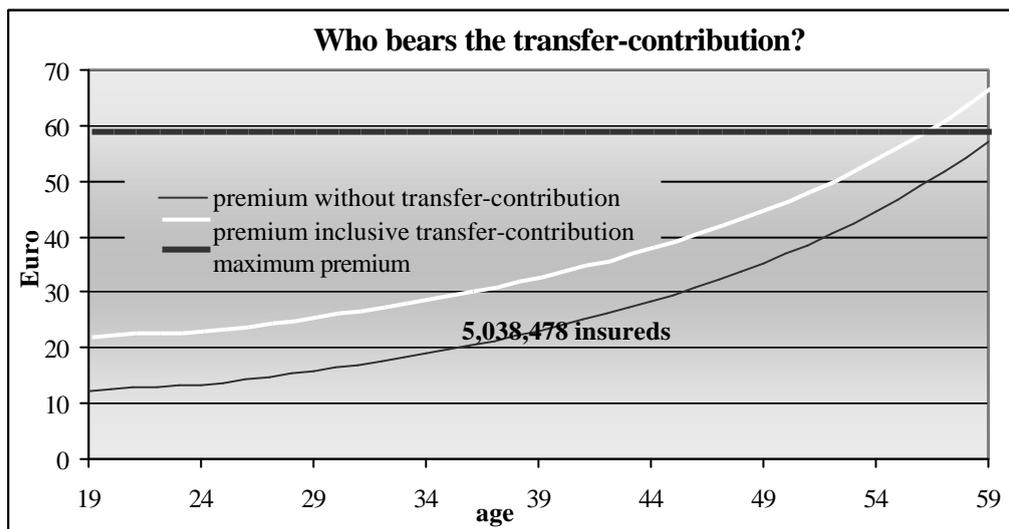
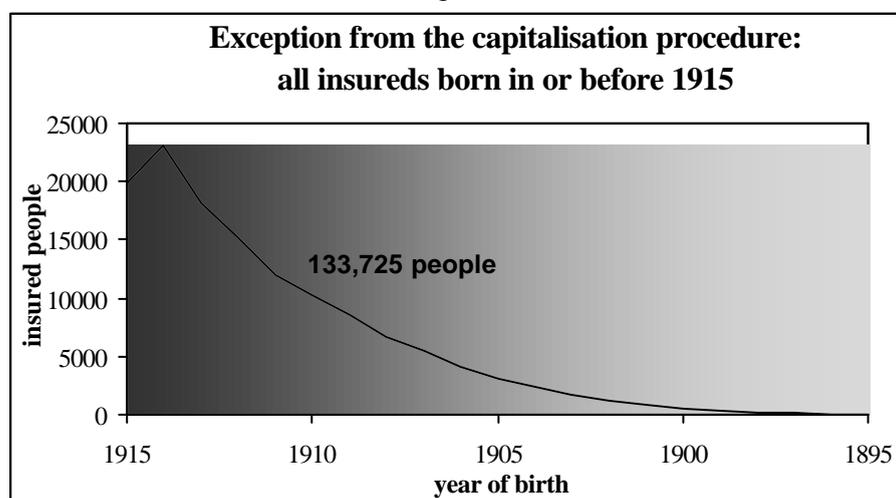


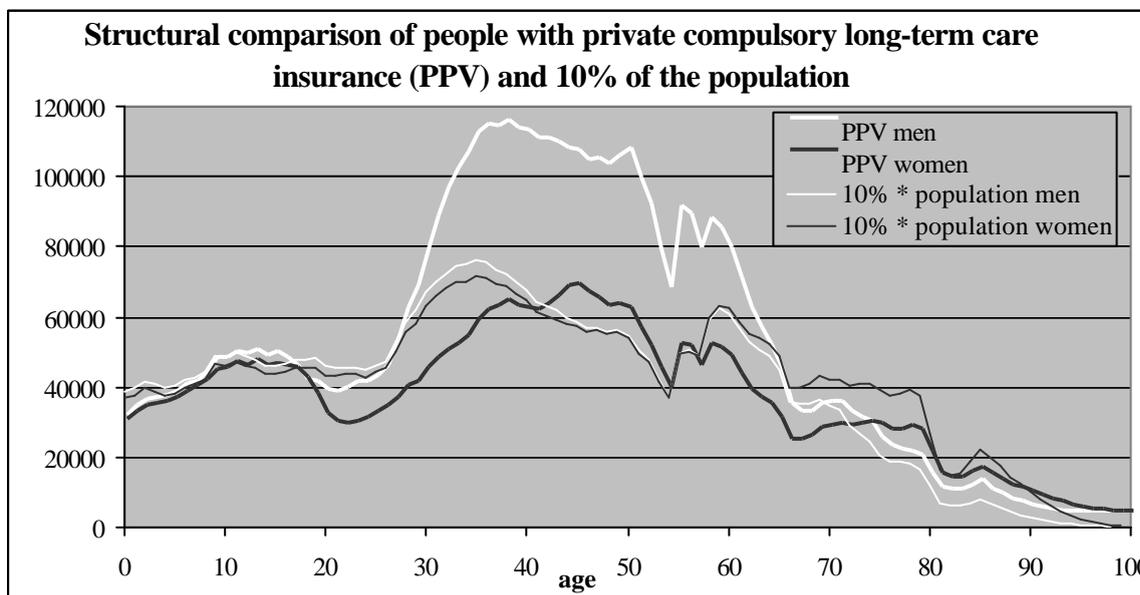
Diagram 9



The structure of insureds in the private health insurance system was an advantage for ensuring cover under the overall restrictions on premium. In terms of age and sex, this structure is currently better than in the population as a whole. The insureds in total amount to 10 % of the population. In diagram 10 you see this comparison. In other words, the ratio of women to men is more favourable among people with private health insurance than in the public at large, i. e. fewer women have private health insurance, relatively speaking. Moreover, the ratio of people aged between 20 and 60 in relation to those aged over 60 is also more favourable than in the population as a whole.

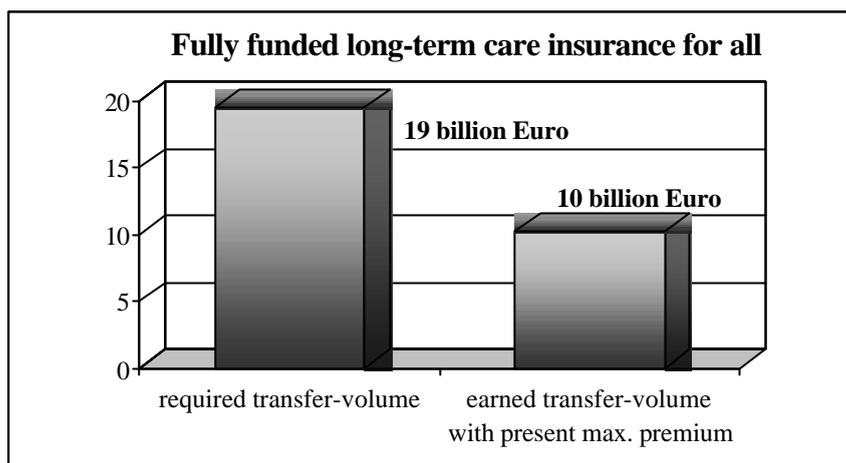
Where the advantageous proportion of women is concerned, this is due to the fact that women earn less on average and are therefore less likely to earn enough to be eligible for private health insurance. They are also less commonly self-employed, which would be another prerequisite for obtaining private health insurance. The advantageous age ratio is due to the times in which people with private health insurance were able to change back to statutory health insurance upon reaching retirement age, sometimes even without payment of statutory health insurance premiums. This is no longer possible and the ratio will gradually come into line with that of the population. In fact, it will probably even exceed it, since people with private health insurance have a longer life expectancy than the population as a whole. For the introduction of compulsory long-term care insurance, however, this structure had the advantage of making the system feasible.

Diagram 10



Model calculations encompassing the population as a whole and based on current accounting principles have shown the limits of the system (diagram 11). If the present ceiling remains unchanged and assuming that only those aged 80 or more are excluded from the funding procedure, the result is, that the exemption from premiums and the restriction on premiums will give rise to a required transfer-volume of more than 19 billion Euro although the younger insureds can only contribute little more than 10 billion Euro.

Diagram 11



This means that either the maximum premium must be raised to at least 123% of the current ceiling or the capitalisation system will also have to be abandoned for insureds aged 70 or more.

On the other hand, however, this would mean that all insureds – and particularly all pensioners – would have to pay the maximum premium. Married couples with only one income would also have to pay 150% of the maximum premium instead of paying only for one person as is the case in social compulsory long-term care insurance today. This shows that, from a social point of view, such a far-reaching funding system could not be implemented at once for the population as a whole and cover the "old burden".

#### 4.4 Development of premiums

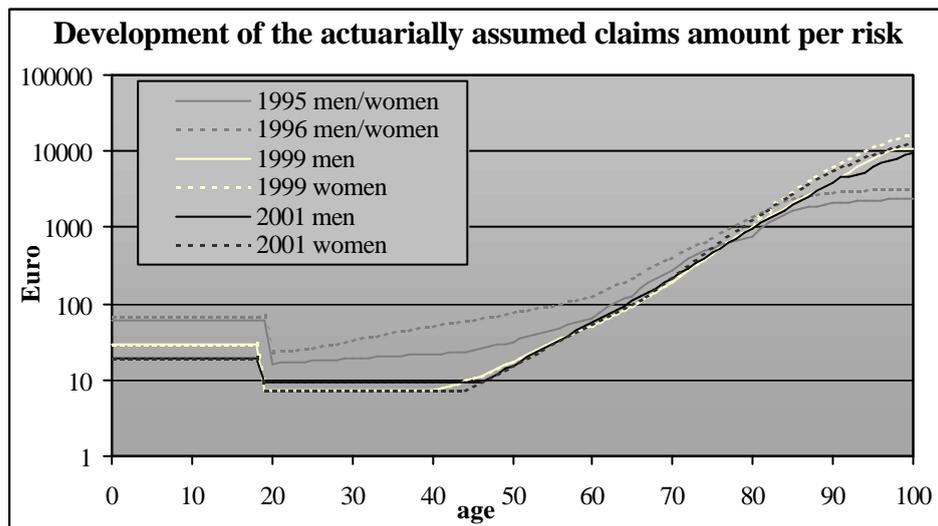
As already mentioned, the fact that the transfer-volume is reduced as a result of deaths, is disregarded when calculating it. The withdrawals due to deaths and lapses by insureds who could bear a transfer-contribution, are similarly disregarded. Another factor which is also disregarded, is that new insureds will join the system and must also pay their contribution to the transfer-volume. The ruling that premiums for new insureds must not be lower than those for the existing portfolio ensures that every new addition is immediately included in the transfer-system with adoption of the "old burden". The additional premium-free children increasing the contribution burden are roughly balanced out by the number of young insureds leaving the premium-free insurance scheme either because they have reached the age limit or because they have started work. In this way, uncertainties on one side are compensated by certainties on the other.

When compulsory long-term care insurance was introduced, it only covered the benefits for outpatient care. The cover for long-term inpatient care was added 18 months later. Premiums had to be adjusted as a result of this increase in benefits. The maximum premium was also increased to ensure guaranteed cover. The first calculation based on empirical data was undertaken in 1998, i. e. after the first full year in which benefits were paid for both outpatient and inpatient care. As diagram 12 shows, this led to a major change in the claims amount per risk. The dashed grey line which is the same for men and women, represents the claims amount per risk for both outpatient and inpatient care as originally calculated on the basis of the inadequate data. (The solid grey line shows them for only outpatient care.) The white lines represent the actuarial claims amount per risk based on the first observations. Subsequent

observation data have been compiled in the meantime, yielding the actuarial rate represented by the black lines.

The premium adjustment clause applies to both private compulsory long-term care insurance and private health insurance. This means that the actuarial claims amount per risk must be compared with the actual claims per risk every single year and that the premiums must be reviewed if the difference exceeds a certain margin in either direction – in this case 5%. Premiums have been adjusted in accordance with the premium adjustment clause on two occasions, namely on 1 January 1999 and on 1 January 2001, in addition to the changes necessitated by inclusion of long-term inpatient care as from 1 July 1996. In both cases, the claims amount per risk was redefined on the basis of the empirical data. The decrement rate was also changed with effect from 1 January 2001, since the mortality rate has continued to decline among people with private insurance. Diagram 12 illustrates the premiums regardless of sex without restrictions and without transfer-contribution, but with the calculated maximum costs as per 1 January 1995, 1 July 1996, 1 January 1999 and 1 January 2001.

Diagram 12



As you can see in diagram 13, the premium required in the higher age groups has risen strongly over that originally calculated in the second and third lines. This is due to the considerably higher claims amount per risk in the higher age groups, resulting in a very much higher required transfer-volume. However, the premium for the middle age groups declined so strongly as a result of the first recalculation, that the transfer-contribution is lower for each individual insured. Certain surpluses were also available and used to reduce the transfer-volume. Such surpluses were employed again when adjusting the premium with effect from 1 January 2001. Observations up to this date had also shown that the previously assumed claims amount per risk was in some cases too cautious and could therefore be reduced, thus compensating the longer life expectancy. The first reduction in premium on 1 January 1999 was followed by a further reduction on 1 January 2001, but it only affects the younger insureds who do not yet pay the maximum premium.

Diagram 13

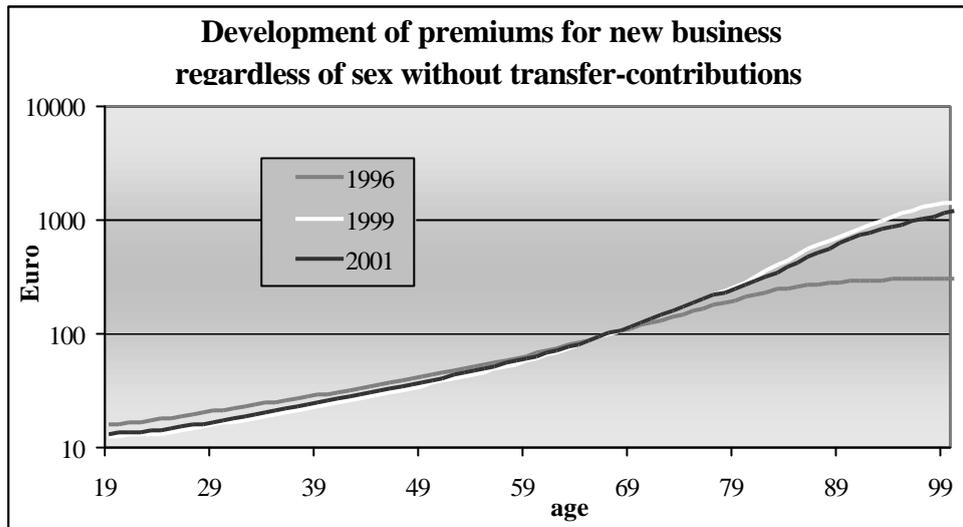
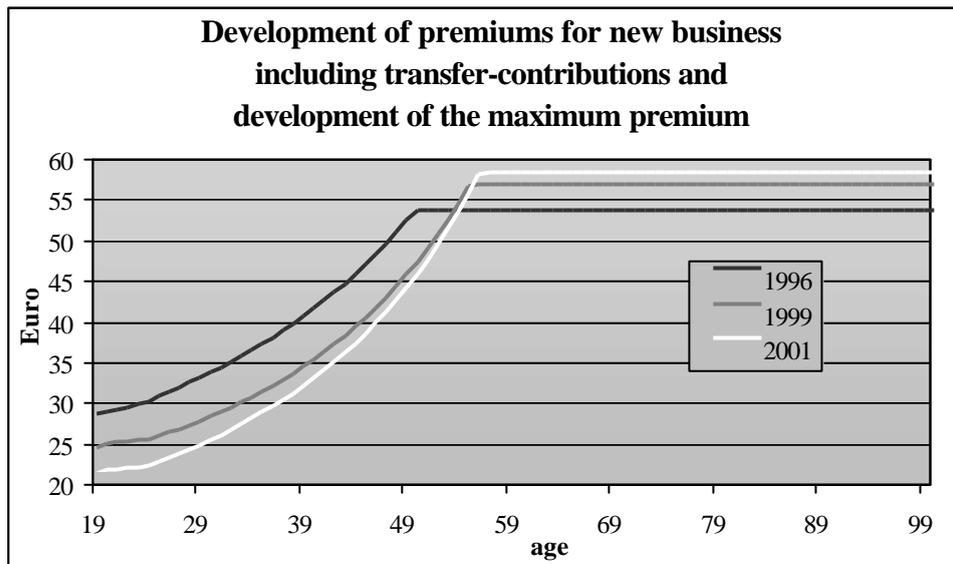


Diagram 14



The insurance premium for all older insureds paying the maximum premium increases with the annual rise in maximum premium payable in social compulsory long-term care insurance. At the same time, however, this increase on the one hand and the lower premiums on the other have also increased the age limit above which the maximum premium becomes due from 50 to 56 years. Meanwhile the age limit of those, who have been in the insurance since 1995, has increased to 62 because of the principle of equivalence with constant premiums and ageing reserve.

## 5. Financial equalisation

As already mentioned, financial equalisation between the insurance companies is necessary to compensate the old burden. The law requires that this financial equalisation be negotiated between the private health insurance companies and the supervisory authority. It is set out in a pool agreement which contains not only general provisions and requirements with regard to the necessary statistical surveys, but also three parts concerning equalisation as such:

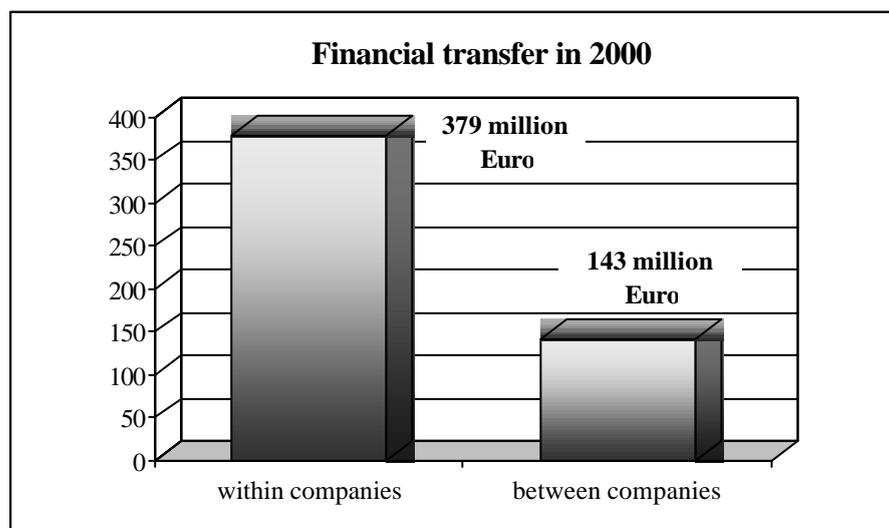
- Premium equalisation
- Equalisation of benefits
- Appropriation of the surplus

### 5.1 Premium equalisation

Where premium equalisation is concerned, the transfer-contributions applied to young insureds are assigned to those insureds with premium-free insurance or who do not pay the full premium required for them. The calculated transfer-volume totalled 522 million Euro as per 1 January 1999 and 391 million Euro in 2001. The required volume is consequently declining.

The transfer is predominantly effected within the companies concerned, while the remainder takes the form of a financial transfer between companies (diagram 15). For this purpose, all companies establish the total sum which would have been required as premium for the individual insureds according to their actually required sex-based premiums. This is offset against the total revenues actually received from insureds by the respective companies. Those companies whose premium income does not suffice to cover the total required receive the difference from those whose revenues exceed the requirements. This equalisation between the companies has been calculated to a total of 143 million Euro in the year 2000.

Diagram 15



The arithmetic is naturally not quite right. The probability that the requirement over all companies is greater than the total revenues is very small on account of the calculation and the inclusion of safe assumptions in the transfer-contribution. The risk here was naturally far greater in the beginning, as reliable data were not yet available. Under the terms of the agreement, however, the deficit would be evenly spread over all the companies in accordance with their portfolios in such a case. As a rule, the premiums earned are higher than the total required. Those companies which have earned more than they need themselves, must only surrender the amount required by the others to cover their needs. This financial transfer between companies consequently leaves the net contributors with a surplus, while the net recipients remain without a surplus.

## **5.2 Equalisation of benefits**

Equalisation of benefits is another established area. The insurance benefits actually paid are compared with those actuarially assumed. The actuarial benefits are covered by premiums, at least following equalisation of the premiums. If the actual benefits which also include the cost of new business (defined as two premiums per month of the newcomer), exceed a company's actuarial benefits, this difference must firstly be covered by the safety loading received and by the excess interest on capital investments. Any remaining difference is then covered by all those companies whose actual benefits are lower than those actuarially assumed.

The safe assumptions contained in the actuarial rates, their constant review and the possibility of adjusting premiums if necessary make it virtually impossible for the actual benefits paid by all companies to exceed the actuarial benefits by more than the safety loading. In the beginning, however, there was always the risk of benefits having been calculated inadequately. Although this did indeed happen for certain age groups – as can be seen from the development of the actuarial claims amount per risk in diagram 12 – this risk did not affect the entire portfolio. For these reasons, the equalisation of benefits between companies only amounts to roughly 25,500 Euro per year at present.

## **5.3 Appropriation of the surplus**

The third part of the pool agreement concerns the appropriation of profits. The transfer-contribution and the general calculation – with safety loading, the cautious assumption of actuarial benefits and the cautious assumption of mortality rates – give rise to surpluses which have neither been earned by the company concerned, nor are they attributable to particularly economic management by the company. They must consequently be considered as belonging to all. The pool agreement therefore includes a ruling by which these surpluses are used to reduce the required transfer-volume.

Since this should be done without necessitating any further transfer of monies between the companies, the agreement specifies a schematic statement of account in the form of an abridged income statement for each financial year. Certain items at the discretion of the company need only be reported at a flat rate.

<b>Statement of account for the pool</b>	
	Premium earned
±	Premium equalisation
+	Interest earned (interest rate max. 6%)
-	Insurance benefits
±	Equalisation of benefits
-	Allocation to ageing reserve
±	Change in other provisions
-	Actuarial cost of new business
-	Actuarial administrative costs
=	Surplus
If surplus > 0	
	surplus * 2/3 = Allocation to pool reserve for premium refunds

These include the actuarial interest rate for which no more than 6% are reported in the statement of account, but not more than the net interest earned in the company. If a company can earn higher interest on the market, this income is not included in the statement of account for the pool. Costs, on the other hand, must be reported at exactly the actuarial value. Profits and losses are similarly omitted from the statement of account for the pool.

The statement of account yields a surplus, two-thirds of which (before taxes) accrue to the pool-provision for premium refunds. When adjusting premiums, funds are withdrawn from this provision for premium refunds in order to reduce the transfer-volume.

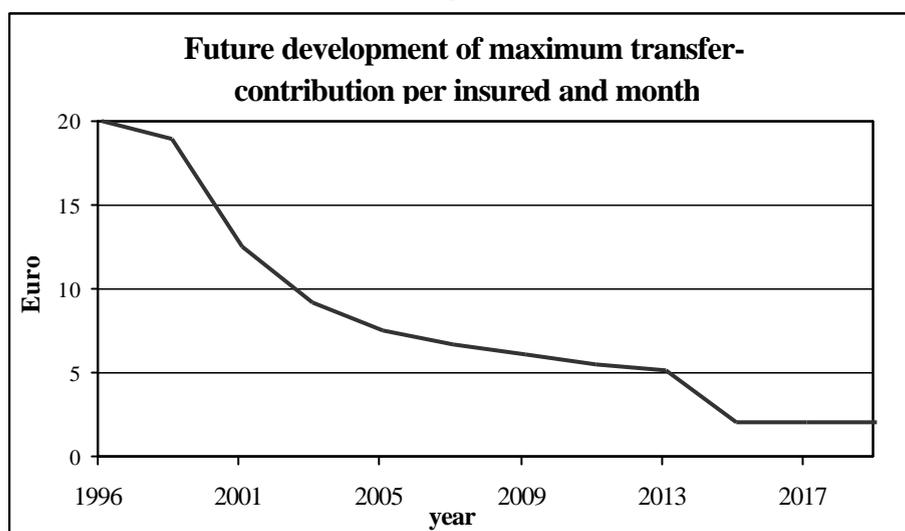
The procedure is as follows:

In the case of the old insureds who cannot pay their required premium themselves, the sum needed to reduce it permanently to the maximum premium is transferred to the ageing reserve, starting with the oldest insureds. This procedure is followed by each company until the sum available has been exhausted. The required transfer-volume as a whole is reduced in consequence. By adjusting premiums in this way, the transfer-contribution for all young insureds can be reduced through the use of limitation funds. The old insureds continue to pay the maximum premium. The transfer-contribution is gradually reduced in this way by financing the old burden. Companies with few or no older insureds must finance the premium-free children and help to reduce the transfer-volume in that way. (Any funds which then remain, can be used to grant the company's younger insureds an entitlement to lower premiums when they become older.)

Diagram 16 shows how the transfer-contribution can be reduced in the coming years without changing the benefits and without changes in mortality. It does not take into account the continuing increase in maximum premiums in line with average wage and salary developments, nor does it include any growth in the portfolio due to insureds transferring from the social insurance system. The lower transfer-contribution is due firstly to the fact that the old burden is

dying out and secondly to the use of surplus funds. This reduces the premiums and increases the age limit above which the maximum premium is due.

Diagram 16



Surpluses accruing outside the schematic statement of account, such as those due to higher interest earned on provisions, can be used by the companies as desired to reduce their insureds' premiums or to give it for example to those without benefit claims. According to the law, at least 80% of any such surplus remaining after taxes must be used for this purpose.

All in all, it should be said that this equalisation procedure does not ensure justice down to the very last detail. Nevertheless, this is the system on which all companies – old and young and with very different structures – were able to agree. Young companies can offer their insureds the advantage of using surplus funds almost entirely to reduce the premiums of their own insureds from a very early date. Through their long-term investment policy, older companies can offer advantages in the form of interest earned, as well as in the form of profits based on the cost rate resulting from large portfolios, at least as regards those costs, such as certain data processing costs, which are not related to the size of the portfolio.

## 6. Outlook

The system as a whole has proved its value to date, as indicated by the now stable calculation and declining premiums. Although it has not yet proved necessary to compensate any major rise in benefits, the mortality has already been reduced – with similar effect. Model calculations have shown that increases in benefits can be mastered, particularly in view of the fact that they are introduced concomitantly in both private and social compulsory long-term care insurance and the maximum premium is also the same in both systems.

The long-term advantages of the capitalisation-system are evident from the declining premiums for private compulsory long-term care insurance as compared with the situation in the social branch, which is already reporting a deficit despite the surpluses earned in the beginning. These

advantages will become even more pronounced in the future, as older people account for an ever greater proportion of the population.

## Appendix

Formula for premium and ageing reserve

$$P_x = \text{net premium at an entry age } x \text{ for each sex}$$

$$= \frac{A_x}{a_x}$$

with

$$a_x = \text{present value of an annuity}$$

$$= \frac{N_x}{D_x}$$

$$N_x = \sum_{t=x}^{100} D_t$$

$$D_x = l_x \cdot n^x$$

$$n = \frac{1}{1+i}$$

$$i = \text{interest rate}$$

$$l_0 = 1,000,000$$

$$l_{x+1} = l_x \cdot (1 - q_x - w_x)$$

$$q_x = \text{mortality rate at an age } x$$

$$w_x = \text{lapse rate at an age } x$$

$$A_x = \text{present value of the benefits}$$

$$= \frac{\sum_{t=x}^{100} K_t \cdot D_t}{D_x}$$

$$K_x = \text{actuarial per capita benefits at an age } x$$

$$b_x = \text{gross premium}$$

$$= \frac{P_x + \Gamma}{1 - s}$$

with

$$s = \text{safety loading}$$

$$\Gamma = \text{cost loading per capita}$$

$$\begin{aligned}
 V_{x+m} &= \text{ageing reserve (= reserve for increasing age) for a person } j \text{ with entry age } x \\
 &\quad \text{after } m \text{ years} \\
 &= a_{x+m} \cdot (P_{x+m} - P(j))
 \end{aligned}$$

with

$$P(j) = \text{actual sex-related premium of the insured person } j \text{ without limitations}$$

$$P_{x+m}^{new}(j) = \text{Premium of a person } j \text{ with entry age } x \text{ after } m \text{ years and a premium adjustment}$$

$$= P_{x+m}^{new} - \frac{a_{x+m}^{old}}{a_{x+m}^{new}} \cdot P_{x+m}^{old} - P^{old}(j)$$

with

$$new = \text{after premium adjustment}$$

$$old = \text{before premium adjustment}$$