Dependency Insurance (I)
Fundamentals and Technical Aspects

This work on dependency insurance is divided into two separate articles which will appear in successive editions of TRÉBOL.

This first article covers the motivation and need for dependency insurance as well as the defining characteristics of this type of insurance and the technical questions which have to be resolved in order to price the risk adequately. The second article analyses the state of the dependency insurance market in countries in which this product is more developed, and the role played by reinsurance.

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Dependency Insurance is a method of insurance that covers a medically proven physical or mental limitation which prevents the insured from carrying out the basic activities of day to day life and requires the assistance of a third party in order to be able to do so. The benefits likely to be required by the insured are public health services, a refund of the costs incurred by becoming dependent and the provision of financial aid or income.

1. Factors contributing to the need for dependency insurance

Situations of personal dependency in society are not something new. Dependency and ageing are highly related concepts. However, if dependency is closely linked to life itself, why is the need to insure against it such a recent development if we compare it to other types of insurance?.

The answer to this question is not to be found in a single cause and there are several reasons for taking out this type of insurance:

1.1. Demographic factors

This is undoubtedly the most important factor with regard to the need for dependency insurance cover. The ageing of the population constitutes a fundamental element in the potential demand for this insurance product. Ageing has two separate causes:

- On the one hand, increased life expectancy, this is due to a very significant improvement in the health and hygiene of the population. This increase in life expectancy is a general occurrence in all developed countries, as can be seen from the following table:

Life expectancy at birth

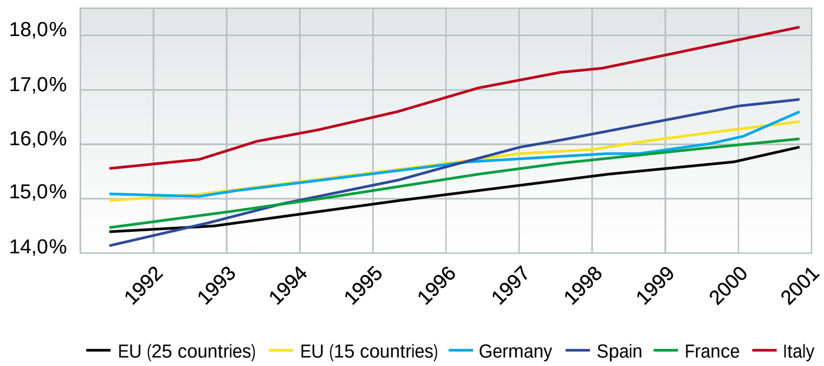
MEN	1991	1994	1997	2000
EU (25 countries)	71,8	72,6	73,5	74,4
EU (15 countries)	72,9	73,8	74,6	75,5
JAPAN	76,1	76,6	76,8	77,5
USA	72,0	72,4	72,8	74,2
WOMEN	**1991**	**1994**	**1997**	**2000**
EU (25 countries)	78,9	79,5	80,2	80,8
EU (15 countries)	79,6	80,3	80,9	81,4
JAPAN	82,1	83,0	83,2	84,0
USA	78,9	79,0	79,5	79,9

Source: Eurostat

- On the other hand, there is a reduction in the birth rate due to the use of contraceptives and other questions of a social nature, such as the massive increase in women as part of the labour market.

A combination of the above two factors brings with it an increase in the proportion of elderly people. The world population is ageing and the ratio of young people to elderly people has been moving towards the latter. The graph 1 clearly shows this continuing trend over time in our neighbouring countries.

Graph 1:
Proportion of population over 64 in Europe



Source: Prepared by us from Eurostat statistics.

1.2. Socio-cultural factors

Traditionally, dependency assistance has been to a large extent provided by informal care within the family. The increase in working women together with the fall in the birth rate and the increase in geographic mobility have brought about a substantial change in the family structure. We have gone from the extended, hierarchical family, consisting of different generations, where the elderly constitute the central core, to another family model consisting of significantly fewer people in which the elderly play a secondary role. This social change has triggered the need to replace informal care with more institutionalised care.

1.3. Politico-economic factors

The elderly currently enjoy higher levels of income and education. This is reflected in their lifestyle and spending, triggering greater demand in the care that they are given and greater concern for maintaining their standard of living.

In addition, a welfare state has been established in most Western countries, which provides cover for the provision of a wide range of social services on the part of the public authorities. Dependency is one of the services that the state covers, if only partially. Nevertheless policies for containing public spending as well as cover for other types of social services and the future development of spending on dependency makes it essential to find a mixed protection system where private cover secured by means of dependency insurance acquires its full meaning.

2. Definition of dependency

The concept of dependency has been coined in various forums. Its definition changes according to the organisation and the attitude to the expression. Nevertheless, all definitions have a common denominator of relating dependency to the loss of independence in carrying out the activities of day to day life. The widely used definition given by the Council of Europe (1998) holds that a dependent person is one who, for reasons related to the lack or loss of physical, mental or intellectual ability, needs substantial assistance and/or help in carrying out the activities of day to day life.

From a strictly insurance related point of view, it is very important that the definition is objective and specific so that there is no room for different interpretations. A common definition of dependency, from the insurance point of view, is determined as the state in which the insured finds himself as a result of a process of ageing, illness or accident which physically or mentally renders him incapable of carrying out the activities of day to day life without the help of third parties.

The definition of incapacity used in dependency insurance must in turn answer two questions regarding the conditions covered by the insurance:

- On the one hand, what degree of dependency is covered by the policy. The policy conditions have to stipulate the degree of incapacity which is covered. This also brings with it the level of benefits to which one is entitled.

- The criteria used to recognise a state of dependency must also be set out in the policy.

3. Criteria for the geriatric assessment of dependency

A key aspect in insuring dependency is setting objective and standardised criteria which determine the state and degree of dependency. These criteria, geriatric in nature, are based on the insured's ability to carry out two different types of tasks:

- Basic activities of daily life (BADL). BADLs are activities that a person needs to carry out on a daily basis such as:

  - Eating.
  - Washing.
  - Dressing.
  - Walking.
  - Getting up and going to bed.
  - Going upstairs.
  - Being alone at night.

- Instrumental activities of daily life (IADL). These activities are more closely related to the ability to carry out domestic tasks independently and manage one's own life such as:

  - Cooking.
  - Housework.
  - Using the telephone.
  - Using public transport.
  - Going on holiday or travelling.
  - Carrying out administrative tasks.
  - Handle personal finances.

The most common method of measuring BADL is the Barthel Index (BI). The BI is a generic measurement which assesses the level of independence of the patient with regard to carrying out a few BADLs, by which different scores and weightings are given according to the insured's ability to carry out those activities. The scores given to each activity depend on the time taken to carry it out and the need for assistance in carrying it out. This index runs from zero to one hundred, zero being the figure representing the highest level of dependency.

The most widely used method for measuring AIDLs is the Lawton test. This measures the ability to carry out tasks which involve the handling of common utensils, day to day activities and basic social skills via eight everyday jobs: looking after the home, washing clothes, preparing a meal, going shopping, using the telephone, using transport, handling money and being responsible for medication. A point is given if the individual carries out the task, not if he states that he can do it, from maximum dependency, zero points, to total independence, eight points. Dependency is deemed to be moderate if the score is between four and seven and severe if the score falls below four.

4. Types of assistance services

The new social framework confronting modern society entails a reduction in informal care, provided by family or friends, and an increase in social health services provided by professionals in geriatric care.

The range of formal care and cover that can be offered by dependency insurance is:

- Home Help. Home help consists of a programme with a preventive and rehabilitating nature in which personal assistance, domestic, psychological, social and family support services are provided in the dependent's own home.

- Home tele-assistance. Home tele-assistance consists of a fast process of location and aid for possible mishaps that the insured may suffer at home. The tele-assistance service is provided by means of a terminal in the insured's home which is connected to a central monitoring station. The insured wears a device which, when pressed, emits a signal which is received by an operator who contacts the insured by telephone to ascertain the reason for the alarm and find the most appropriate solution. If the circumstances require, the operator can send urgent assistance.

- Day Centres. This is a social health and family support service which provides, during the day, care for the basic personal, therapeutic and socio-cultural needs of elderly people with various levels of dependency, assisting them with independence and remaining in their normal environment.

- Adapting the Home. This cover provides the elderly person with appropriate living and accessibility conditions. It can take the form of a refund of the cost of adaptation, or the provision of the service or even the provision of a lump sum.

- Residential Services. Residential services consist basically of homes where people with varying types of dependency can live. In Spain, this is the most developed resource in the system of care for the elderly.

5. Types of dependency insurance

Since it was first marketed, Dependency Insurance has taken different forms. The various products in the insurance markets where this type of product is sold can be grouped under different criteria. These are, according to the various classifications:

5.1. Depending on the health of the insured when the policy is taken out

- Products designed to be taken out by healthy policyholders. This is the most common insurance option. In this case, when the insured takes out the insurance, he is not dependent and it is taken out to insure against the risk of becoming dependent.

- Products designed for policyholders who are already dependent. In this type of insurance, marketed in the United Kingdom, *("Point of Need Plans")*, the policyholder is already dependent when he takes out the insurance. In this case, the risk assumed by the insurance company stems from quantifying the duration of the dependency. This product, which is marketed on a single premium basis and in the form of an annuity, has the disadvantage of high premium costs as the benefits of the insurance are received immediately. Its advantage over other annuity products is that it is cheaper than traditional insurance of this type due to the use of the survival probability of dependents which is substantially lower than that of healthy policyholders.

5.2. Depending on the frequency of receipt of benefits

- Single Benefit. Under this option, a refund or a lump sum, is received at the time of becoming dependent. This cover is usually in addition to another main dependency policy which provides regular benefits. The reason for including this supplementary insurance is usually related to the cost of the necessary adaptation of the insured's home due to the fact that they have become dependent.

- Regular Benefits. The receipt of regular benefits, whether by way of refund or fixed payment, is the most common insurance option. The inclusion of conditions for indexing the benefits is particularly important for this type of cover. A policyholder who does not include these clauses, even though it makes the premiums substantially cheaper, may be under-insured with regard to the cost of his assistance requirements when he becomes dependent. In the North American market most insurance companies require applicants who do not want the inflation protection option ("inflation riders" or "inflation protection"), to sign a declaration confirming their refusal of inflation protection.

5.3. Depending on the frequency of payment of premiums

- Single premium. This insurance option is usually related to the receipt of a single lump sum and not a periodic refund or an annuity due to the fact that the capital sums comprising the latter options are higher and this substantially raises the amount of the single premium.

- Regular Premiums. This is the most common form in the market. The possibility that the premiums are not guaranteed for the whole term of the insurance is common with some products, especially in the European market, and review clauses are inserted in those policies after a certain period of time. However, these clauses usually limit the possible increases, both in terms of amount and period of application. When a person becomes dependent, there is usually a provision for him to be exempted from future premiums.

5.4. Depending on the length of cover of the risk

- Temporary Cover. This product, although sold in a few markets, is not adequate as it does not protect the insured sufficiently. The reason for taking out temporary cover is purely to reduce the premium.

- Cover for Life. Covering the risk of dependency for life is the most common type of cover available internationally. The insurer has to be especially careful in drafting the technical bases of the insurance due to the fact that when the policy is taken out there is a very substantial capital sum at risk which must be matched by adequate premiums which include safety margins on the calculation hypotheses of incidence and mortality of active people and dependants over a period of time.

5.5. Depending on the type of benefit insured

The insured benefit is in fact the element which defines the type of insurance in relation to the company that markets the product. The various types of benefit which can be offered by this cover are:

- Provision of services. In the event of the insured becoming dependent, he is given the social support and healthcare that he needs, either in a residential home or in his own home. From the point of view of the insured's need for protection, this is the most comprehensive type of insurance. However, providing dependency cover in this form is not very widespread due to the fact that insurance companies are wary of the risk of long term inflation with regard to the cost of providing these services.
- Repayment of costs. Under this scheme, the insurance company refunds a percentage, with a set maximum limit, of the cost of the social and healthcare services that the dependent insured incurs. If he receives informal care from a family member, he is usually paid a lump sum equivalent to a percentage figure below the limit fixed for institutionalised care. In this type of product, the repayment is accompanied by a medical consultancy service which helps to select the most appropriate care for the patient.
- Fixed Sum Payment. With this type of dependency Insurance, in the event of a claim, a lump sum is paid with the frequency and duration of payment laid down in the policy. The most common method of marketing consists of actuarial dependency annuities paid while the insured is alive with automatic indexing clauses to minimise the effect of inflation. From the insurance company's point of view, this option is easy to manage because, in addition to making the payments, the company only has to check when the insured ceases to be dependent, whether due to recovery or to death. However, from the insured's point of view, it is not the best option because receiving an amount of money does not guarantee that it is used in the most efficient manner for the dependent's care. In many cases, informal care is received from members of the family and friends when professional care in a residential centre would be more appropriate.

Dependency Insurance with benefits in the form of provision of services, refunds or subsidies, is usually marketed by companies in the health branch, the most common being dependency annuity policies sold by life assurance companies.

Types of Dependency Insurance

Depending on the health of the insured when the policy is taken out	• Products designed to be taken out by healthy policyholders. • Products designed for policyholders who are already dependent.
Depending on the frequency of receipt of benefits	• Single benefit. • Regular benefits.
Depending on the frequency of payment of premiums	• Single premium. • Regular premiums.
Depending on the length of cover of the risk	• Temporary cover. • Cover for life.
Depending on the type of benefit insured	• Provision of services. • Repayment of costs. • FIxed sum payments.
Depending on the relationship between this cover and other insurance cover	• Principal cover. • Supplementary cover.

5.6. Depending on the relationship between this cover and other insurance cover

- Principal Cover. The importance of this insurance, combined with the high cost of the premium, makes it advisable for it to be marketed independently.

- Supplementary Cover. Dependency can be incorporated, in various ways, as supplementary cover in health and life insurance.

These various options are:

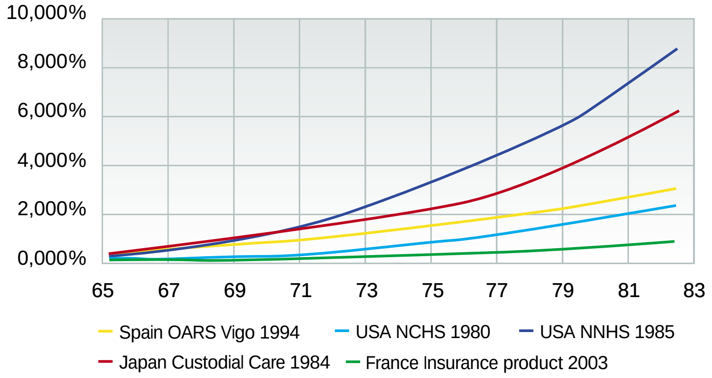
- Additional cover in health assistance or refund of medical expenses insurance.

- Dependency annuity in addition to an actuarial or fixed annuity. ("enhanced pension").

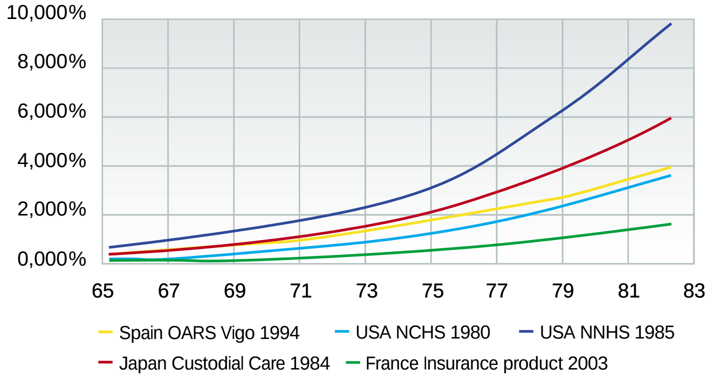
- Regular advance payment of a percentage of the principal sum insured for death, in the event of dependency, in a whole life insurance policy.

- Invalidity insurance which from the age of 65 is converted into a dependency annuity.

Graph 2:
Incidence rates in various countries Men



Graph 3:
Incidence rates in various countries Women



Source: Prepared in-house.

6. Technical aspects of pricing dependency insurance

The technical assessment of this type of insurance for premium pricing presents peculiarities which have to be taken into account. A few aspects which have to be considered are:

6.1. Statistical information on dependency

Dependency Insurance in Spain is still in its infancy. This early stage of development of this type of insurance means that at the present time it is difficult to obtain technical bases for our country.

The lack of statistical data from insurance experience in Spain forces us to examine healthcare data of a general nature. These types of studies, of national[1] and independent[2] scope, although of interest due to the representative nature of the population studied and the sample volume, do not provide information broken down by age and sex, a necessary requirement for carrying out actuarial calculations. This information is available in other local studies.

In other, more mature insurance markets, such as the United States and Germany, the available information is more reliable and comprehensive. In those countries, there are statistics for their insured population.

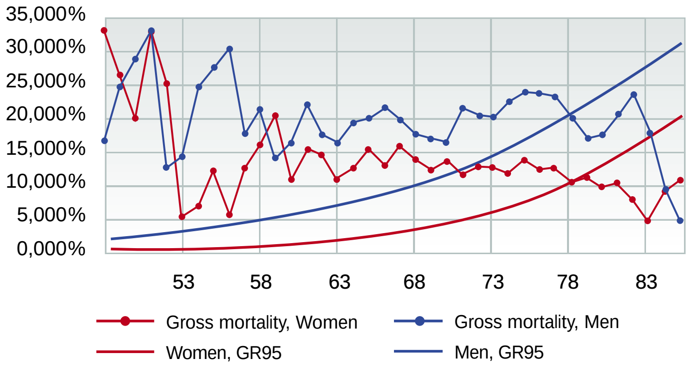
6.2. Obtaining dependency incidence rates

In some of the countries in which dependency Insurance is marketed, there are local incidence rates which are used to price the insurance. To apply these statistics directly from one country to another can be risky due to the fact that, on the one hand, the

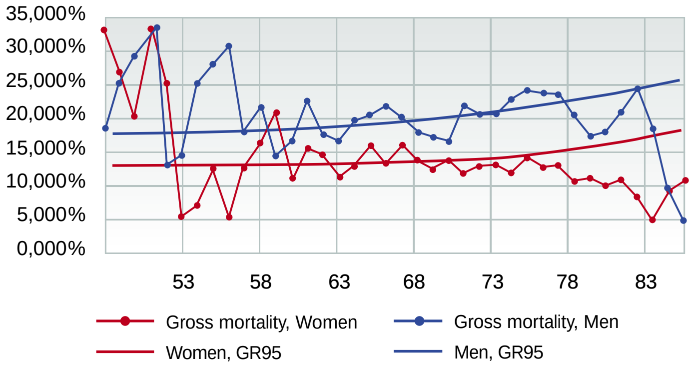
1. *Source: Survey on disabilities, deficiencies and health. INE (1999).*
Survey on health in Spain. (1979).

2. *Source: Survey on health in Cataluña. (1994 y 2002).*

Graph 4:
GR-95 mortality table figures adjusted by a multiplier



Graph 5:
GR-95 mortality table figures adjusted by linear transformation



Source: Prepared in-house from raw dependents mortality data from the LTC Intercompany Experience Study 1984-1993. SOA.

socio-demographic reality of each geographic area is different and, on the other, the definition of dependency used may also vary. In graphs 2 & 3 we can see the differences in the incidence rates of various countries, in some cases fairly significant, bearing in mind the source from which the data was taken:

6.3. Mortality figures for dependents

Another key factor in pricing this type of insurance is obtaining mortality figures for dependents. The usual practice is to use the same mortality table as is used for general mortality, although certain adjustments are made to the figures to cover the effect of excess mortality applicable to most dependents.
The question then asked is what type of modification is made to general mortality figures to obtain valid adjustments to reflect the mortality of dependents.

It is normal to opt for linear transformation or a multiplier, or a combination of the two, to be applied to the mortality figures of the general tables. Graphs 4 & 5 show the mortality adjustment to the GR-95 insured population mortality tables on the basis of a multiplier or linear transformation.

6.4. Premium calculation methods

There are various calculation procedures for pricing dependency Insurance.
The most common are:

- The multi-state model.
  In this calculation model, the possible states which can occur are initially determined as well as the transitions between states and their associated probabilities. The premium is produced from those figures.

  Although this procedure is the one which produces the most reliable premium for dependency cover, it has the disadvantage that obtaining transition probabilities is difficult and so this method is not widely used.

- The indemnity-annuity model
  The most extensively used premium calculation method is the indemnity-annuity model. In this procedure, the current actuarial value of the future cost associated with a state of dependency is multiplied by the possible dependency rates for each age. In the case of refund of costs insurance, it also includes an average adjustment factor indicative of the level of use of the insurance.

  A simplification that this model usually assumes is to consider that once a person has become dependent they do not return to a state of non-dependency. This assumption has very little impact on the elderly whose likelihood of recovery once they have become incapacitated is very small. In addition, this simplification assumes a small safety margin is built into the price.

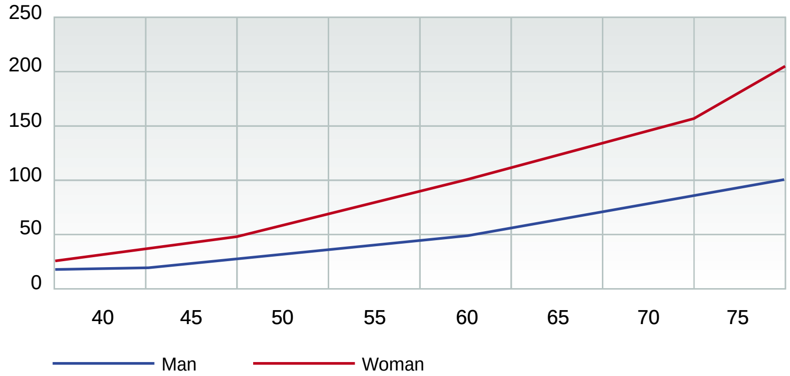
- The procedure used in German health insurance.

The method used in German health insurance[3] consists of obtaining the unit cost profile for dependency taking into account age and sex risk factors. It is obtained by dividing the total cost by the number of persons exposed to the risk. With the unit cost profile obtained by this method, premiums, natural or level, mathematical provisions and guaranteed values, if any, can be calculated.

This procedure has the disadvantage that it does not include information on the behaviour of the total loss experience in relation to the duration of the state of incapacity, incidence rates of becoming dependent or cost distribution according to the various levels of disability.

Graph 6 shows the structure of the price of dependency Insurance on a cost refund basis.

Graph 6:
Monthly premiums for Dependency Insurance
Cost refund method



Source: Prepared in-house.

From the results obtained we can see that:

- Premiums grow exponentially with age.
- The rates for women are considerably higher than those for men. Throughout the age range, men's premiums are approximately half those for women. This is due to two factors:
- Lower rates of incidence of becoming dependent in men.
- Greater probability of survival in a state of dependency for women. This raises the total amount of refunds to be received while remaining in a state of incapacity.

3. *Also known as Manchester Unity Approach/Friendly Society.*