



Use of age & disability as rating factors in insurance

Why are they used and what would be the implications of restricting their use?

Section 1 – Executive Summary

Insurance serves an important social need. Insurance can be provided through public social security systems or through private insurance markets. It is in the interests of consumers that insurance markets provide affordable and accessible insurance.

Where private insurance operates on a voluntary basis - meaning that consumers can choose whether to purchase insurance cover and/or choose the level of cover - differentiation between different groups of risks is necessary in order for the insurance market to function effectively. Insurers differentiate between different groups of risks using ‘risk factors’ such as gender, age or *disability*¹. However, following a European Court of Justice ruling (ECJ) on 1 March 2011, insurers will no longer be allowed to use gender as a risk factor in insurance pricing from 21 December 2012.

Some risk factors are more important than others. Age in particular is a key risk factor that cannot be readily substituted by alternative risk factors for many types of insurance in achieving the goal of providing affordable and accessible insurance. *Disability* is also an important risk factor for some types of insurance.

If insurers were not allowed to use age or *disability* as risk factors, there would be profound consequences for the availability of some types of insurance on a private voluntary basis. For example, if insurers were not allowed to offer different annuity rates for different ages then the cost of annuities in a private voluntary market would increase enormously and conceivably private insurers would withdraw entirely from providing annuities. In this case, national Governments might need to fill the gap left by the closure of private voluntary insurance markets. Similar outcomes would arise for some other types of insurance.

In this paper, we outline the reasons why we believe these outcomes are a real possibility if age and *disability* were not allowed as rating factors in insurance. Below is a summary of the remainder of the paper.

Section 2 provides background to the ECJ ruling on use of gender in insurance and discussions at European level on age and *disability*.

Section 3 considers the purpose of insurance and how insurance markets function, exploring different market models - compulsory versus voluntary insurance, risk rating versus community rating.

Section 4 considers the role of risk management in practice and expands further on risk rating and community rating.

Section 5 focuses further on community rating and the role of Risk Equalisation in community rated markets.

¹ We have italicised use of the term ‘disability’ throughout this paper for the reasons outlined in section 2.

1.1 Section 2 – Background

From 21 December 2012, it will no longer be permissible to treat men and women differently in calculating premiums and benefits for new insurance contracts in Europe following a landmark ruling by the European Court of Justice (ECJ) on 1 March this year.

This represents a restriction on the ability of insurers to manage risk. If it were not possible to differentiate premiums and benefits based on age and *disability*, this would have profound consequences for the affordability and accessibility of insurance.

1.2 Section 3 – What is insurance?

Insurance aims to provide an affordable means of protecting against potentially large financial loss to the insured, their family (e.g. life insurance), another party (e.g. third party motor insurance) or society as a whole (e.g. medical expenses, reducing the burden on the state). Insurance is therefore generally socially desirable. In this regard, an insurance market will best serve the needs of consumers if it provides affordable and accessible products.

‘Adverse selection’ (also referred to as ‘anti-selection’) can arise where there is information asymmetry between two parties to a transaction that allows one of the parties to exploit the transaction to his/her advantage. In an insurance context, adverse selection can occur if the insured life has more information about the risk he/she represents than the insurer has which results in the insured life paying less for insurance than the real expected cost of the underlying risk. For insurance to be affordable and accessible, there needs to be a ‘counterforce’ to protect against significant adverse selection.

Where insurance is compulsory for everyone and there is no choice of cover level for individuals, this counterforce automatically arises as a consequence of the relevant legislative measures that created the compulsory features of the market. In this case, insurance can be provided on a community rated basis and remain affordable and accessible without the need for risk segmentation based on age and *disability*.

Where insurance is available on a voluntary basis, the potential for adverse selection will depend on the type of insurance and market segment and the ‘counterforce’ measures in place to protect against adverse selection. For example, for individual life insurance or say motor insurance there would be considerable scope for adverse selection if individual risk rating did not apply (similar comments apply for other types of insurance). In addition, insurers may be motivated to spend considerable effort and resource on selectively marketing to the more profitable risks, which will increase the costs of insurance for consumers overall.

1.3 Section 4 – Risk management in private voluntary markets

Effective risk management in designing and pricing insurance is essential in a private voluntary insurance market in order to ensure that insurance remains affordable and accessible. Risk management can mean risk rating in some markets or market segments. In other cases, it can mean the application of various measures designed to control the level of risk such as limits on cover levels, deductibles/excesses on claim amounts, waiting periods, exclusions etc. Or it may be a combination of approaches.

For voluntary insurance, the ability to segment using risk factors is very important in ensuring affordable and accessible insurance. Age, and *disability* in the case of life insurance, represent key risk factors in pursuit of this goal taking account of the opposing aims of:

- (i) pooling of risks to the benefit of consumers
- (ii) minimising adverse selection to maintain affordability and accessibility of insurance
- (iii) avoiding excessive administrative costs in order to provide more affordable insurance

On the other hand, forms of community rating - where the same premium is charged to everyone for the same insurance coverage regardless of risk profile - can operate successfully for certain segments of private voluntary insurance markets, such as for group life insurance. This can be possible where the insurance market segment:

- (i) exhibits quasi-compulsory features and
- (i) there are explicit or implicit controls on the level of cover that an individual insured life can choose.

Where conditions do not exist to support the sustainability of a community rated approach, risk segmentation becomes very important in order to ensure the viability of the insurance market or insurance market segment and hence the affordability and accessibility of that insurance.

1.4 Section 5 – Community Rating & Risk Equalisation

Where sufficient counterforce to adverse selection exists in order for a community rated market to operate in theory, there may be a need to introduce a Risk Equalisation scheme in order to protect against the social policy goal of community rating from being undermined. There are various examples internationally of health insurance markets that operate on a community rated basis with Risk Equalisation.

However, Risk Equalisation can be complex to design and operate successfully and the challenge in developing a Risk Equalisation scheme covering multiple lines of insurance business would be very substantial.

In any event, Risk Equalisation only becomes a consideration where a community rated market is viable in the first place. As we have outlined in this paper, community rating is feasible when certain conditions exist, which provide sufficient counterforce against significant adverse selection. However, community rating is not feasible for all insurance types or insurance market segments.

In these cases, risk rating is necessary in order to provide the required counterforce to significant adverse selection and to support the affordability and accessibility of insurance cover. In this regard, age and *disability* are very significant risk factors for certain types of insurance cover and a blanket prohibition on the use of age and *disability* as risk factors would not be in the overall interests of consumers from the perspective of affordability and accessibility of insurance.

2. Background

From 21 December 2012, it will no longer be permissible to treat men and women differently in calculating premiums and benefits for new insurance contracts in Europe following a landmark ruling by the European Court of Justice (ECJ) on 1 March this year. This represents a restriction on the ability of insurers to manage risk. In brief, the ECJ ruled that article 5(2) of Council Directive 2004/113/EC (the so called “Gender Directive”) is invalid with effect from 21 December 2012. This article provides a derogation² which allows insurers to apply different premiums or benefits to men and women for the same insurance cover.

Gender status is currently used as a risk factor by insurers in many insurance markets across Europe for many types of insurance and so insurers will need to change their risk management approach in this regard. There are likely to be some negative consequences for consumers as a whole arising from the prohibition on gender as a risk factor, most notably the likelihood of insurance premiums rising to reflect greater uncertainty in pricing insurance risks.

Directive 2004/113/EC concerns equal access to goods and services on gender grounds. Separately, but in line with a growing trend in Europe of prohibiting discrimination on various grounds, the European institutions have developed a proposal for a Directive regarding equal treatment irrespective of religion or belief, *disability*, age or sexual orientation and this process has been underway for a number of years.

It was envisaged that this proposal for a Directive would be structured similarly to the “Gender Directive”, with a derogation clause for financial services in respect of age and *disability* where differentiation on grounds of age or *disability* could be justified on actuarial, statistical and medical grounds. Were this to be the case, it is possible that such a derogation would be ruled against by the Courts which could mean that insurers would no longer be able to use age and *disability* as rating factors.

In this context, the term ‘disability’ is not clearly defined at a European level. Furthermore we note that at an international level the *UN convention on the right of persons with disabilities*³ states that “*disability is an evolving concept*” but targets persons with disabilities including “*those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others*”⁴.

For the purposes of this paper therefore, we consider the implications for insurance if *disability* were to have a very broad meaning encompassing a wide range of disabling health conditions in addition to physical or mental impairments. In this scenario, prohibiting the use of *disability* as a rating factor in insurance would have far reaching consequences for the affordability and accessibility of many types of insurance. On the other hand, if *disability* were to have a much narrower definition (e.g. limited to physical impairments), the implications for affordability and accessibility would not be so severe. Throughout this paper we have italicised the term ‘*disability*’ to denote that we are using the term in a very broad sense.

² The derogation only applies where member states choose to apply it, in which case it is subject to requirements justifying the decision.

³ See point e. of the Preamble at <http://www.un.org/disabilities/convention/conventionfull.shtml>

⁴ See Article 1 (“Purpose”) at <http://www.un.org/disabilities/convention/conventionfull.shtml>

In effect, a blanket prohibition on the use of age and *disability* as rating factors would move the provision of insurance cover towards a 'community rated' basis for all types of insurance across Europe - where the same premium would be charged to everyone for the same insurance coverage regardless of risk profile. This would be in sharp contrast to the current situation where many types of insurance are provided on a 'risk rated' basis at present - where different premiums are charged to different people for the same insurance cover depending on risk profile.

While the ruling on the Gender Directive has introduced some restriction on the ability of insurers to risk rate, a prohibition on the use of age and *disability* as rating factors in insurance would have much more profound consequences with implications for the affordability and accessibility of insurance.

Age and *disability* are significant factors used by insurers in Europe for the purposes of assessing risk⁵ (although this is not universally the case for all types of insurance or for all market segments). The Groupe Consultatif Actuariel European has prepared this paper in order to contribute to the debate at European level on the use of age and *disability* as risk factors in insurance.

In this paper, we revisit the basic risk management principles that are necessary for an insurance market to function and provide affordable and accessible insurance to consumers. We explore the different insurance market models that exist, drawing out the distinctions between compulsory insurance and private insurance and between a risk rated market and a community rated market. We consider the conditions that are required for a community rated market to function successfully.

⁵ See [http://www.civic-consulting.de/reports/practices_of_financial_service_providers - main report_en.pdf](http://www.civic-consulting.de/reports/practices_of_financial_service_providers_-_main_report_en.pdf)

3. What is insurance?

Insurance aims to provide an affordable means of protecting against potentially large financial loss to the insured, their family (e.g. life insurance), another party (e.g. third party motor insurance) or society as a whole (e.g. medical expenses, reducing the burden on the state). Insurance is therefore generally socially desirable. In this regard, an insurance market will best serve the needs of consumers if it provides affordable and accessible products.

There are different types of insurance including, for example, life insurance, motor insurance, health insurance, *disability* income insurance etc. For some types of insurance, such as motor liability or health insurance, cover is provided on an indemnity basis. This means that the benefit paid on a claim will depend on the costs arising on the occurrence of the insured event. For other types of insurance, such as life insurance, the policyholder chooses the amount of cover (sum assured) they would like to have which is paid on the occurrence of the insured event (e.g. on death).

In all cases, insurance operates through pooling of risks across insured persons. Some insured lives may never claim on their insurance cover but they are still prepared to buy insurance because it protects them against the possibility of a large financial loss even though the risk of this happening may be very small. Through risk pooling, the cost of claims can be spread across the population of insured lives which aims to result in affordable premiums, provided that the insurance market is not exposed to significant 'adverse selection'.

'Adverse selection' (also referred to as 'anti-selection') can arise where there is information asymmetry between two parties to a transaction that allows one of the parties to exploit the transaction to his/her advantage. In an insurance context, adverse selection can occur if the insured life has more information about the risk he/she represents than the insurer has which results in the insured life paying less for insurance than the real expected cost of the underlying risk. On the face of it, this should not be a particular concern for insured persons but rather an issue for the insurer to worry about. Indeed, this should be the case to the extent that cases of adverse selection are isolated incidents or have limited impact in terms of quantum (although these cases would adversely impact the premiums charged to other insured persons). However, if adverse selection were to become widespread it could ultimately undermine the sustainability of an insurance market leading to either unaffordable insurance or no availability of insurance at all.

Taking an example, let's say that an insurer provides life cover but is not allowed to ask customers any information about themselves other than how much life cover they would like. The insurer might initially calculate premiums based on average life expectancies for the population as a whole. If everyone in the population is obliged to purchase life cover for the same amount of cover from the insurer, then the premium charged would be expected to be sufficient to cover claims costs. On the other hand, if individuals have a choice of whether to purchase life cover and, where they do, how much life cover to purchase then we would expect adverse selection to lead to an upward spiral in insurance costs:

- higher risk individuals would purchase more insurance cover at the same premium rate as others, thus benefiting from their above average risk
- this would increase the cost of insurance without increasing premium income leading to a loss

- lower risk individuals could leave the insurance pool if they think they could purchase the same cover for lower premiums elsewhere or think that they just do not want the cover at all
- with lower risk individuals leaving and higher risk individuals choosing higher cover levels on average will lead to an increase in average premium rates
- this would further increase the cost leading to other low risk individuals leaving the pool and so on

Therefore, in order to make insurance accessible and affordable there needs to be some ‘counterforce’ to protect against significant adverse selection arising. Where insurance is compulsory and there is no choice of cover level for individuals, this counterforce automatically arises as a consequence of the relevant legislative measures that created the compulsory features of the market. Where insurance is voluntary, there are a variety of mechanisms which can be used to protect the accessibility and affordability of insurance. These include:

- risk segmentation through underwriting
- limits on cover levels
- deductibles or excess on claim amounts⁶
- waiting periods⁷
- exclusions
- participation in insurance pools
- imposing special requirement on insured lives in order to provide the cover

These mechanisms are explored further in section 3.

As outlined below, different European insurance markets operate in different ways and the extent to which the mechanisms above apply will depend on national legislation, which in turn will depend on social policy, as well as market forces. In defining social policy, it is important to bear in mind that some form of counterforce must exist for insurance to remain affordable and accessible.

3.1 Insurance market models

There are different models for providing insurance which can vary between countries, by type of insurance and within market segments for a particular type of insurance in a given country. First of all, an insurance market can be either compulsory or voluntary; public insurance systems are normally compulsory while private insurance systems are typically voluntary but not exclusively. Secondly, an insurance market can operate on either a ‘risk rated’ basis or a ‘community rated’ basis. These two points are inter-linked as we outline below.

3.1.1 Compulsory versus voluntary insurance

There are three distinct models under this heading – public compulsory, private compulsory and private voluntary:

- Most developed countries provide some forms of insurance through their social security systems with the state playing the role of the insurer e.g. public health

⁶ where the insurer deducts a pre-defined amount from the claim which is borne by the insured person

⁷ where insurance cover does not apply for an initial period following commencement of this insurance policy

- systems, state pensions systems etc. These are compulsory systems whereby all eligible insured lives are obliged to participate in the pooling mechanism.
- Compulsory private insurance markets also exist where private operators play the role of insurer. An example of this is the Dutch health insurance system. In the Netherlands, it is compulsory to take out private health insurance covering a standard level of benefits. Individuals can purchase supplementary cover on a voluntary basis if they so wish, but the standard level of cover is compulsory. Consumers can choose between a range of insurance companies for their cover.
 - Other insurance markets operate on a voluntary private basis. For example, this is typically the case for life insurance where an individual can choose to take out life cover or not and where life cover is purchased, there is a choice of cover available from different private insurers in the market.

There does not appear to exist a 'one size fits all' approach for particular types of insurance and different models exist in different countries and, within countries, different models can exist for different segments within the market.

For example, health insurance operates on compulsory private basis for standard cover in the Netherlands but on a voluntary private basis in some other countries such as Ireland and the UK (and indeed for supplementary cover in the Netherlands). Life insurance markets are typically voluntary private but compulsory private segments may exist as is often the case for mortgage related life insurance. In this case, all mortgage holders must effect life cover equal to the value of the mortgage. A quasi form of compulsory private cover can be observed in employer sponsored death in service benefits where an employer pays for group life cover for all eligible employees. In this case, insurance is compulsory for all eligible employees but the decision to provide the death in service benefit is a voluntary decision for the employer.

3.1.2 Risk Rating versus Community Rating

In addition to the insurance models outlined above, there are two distinct ways that insurance may be funded:

- On a 'risk rated' basis, where different insured lives are charged different premiums or receive different benefits depending on their risk profile, as assessed by the insurer.
- On a 'community rated' basis, where all insured lives are charged the same premiums and received the same benefits regardless of risk profile.

Hybrid models may also exist where some aspects of risk profile could be risk rated but other aspects must be community rated, as will be the case in future with regard to gender in Europe. Before going on to explore risk rating and community rating further, it is useful to consider how insurance premiums are calculated.

To recap, insurance entails the pooling of individual risks to achieve an average cost for the insured life (the premium) where the insured life does not want to be exposed to the risk of bearing a large financial loss individually, notwithstanding that the risk of loss might be low and the individual might not bear any loss at all if he/she did not purchase insurance. Insurers provide a conduit for individuals to pool their risks together. Insurers bear the risk of claims arising and aim to charge premiums commensurate with the risk they bear. The premium charged comprises:

- A Risk Premium (the estimated cost of paying claims)

- Expenses
- Cost of Capital⁸
- Profit

In a community rated market, the risk premium is the same for all lives effecting the same insurance plan and is calculated by the insurer by assessing the total expected risk for the group in aggregate and spreading the associated cost equally among the participants.

In a risk rated market, the risk premium varies by individual depending on their risk profile, as assessed by the insurer. Insured lives with the same risk profile are charged the same premium.

3.1.2.1 Community Rating

In a community rated market, all insured lives pay the same premiums (or are subject to the same basis for calculating premiums⁹) and receive the same benefits (or are subject to the same basis for calculating benefits) regardless of risk profile. In other words, an insurer must offer the same insurance cover to everyone for the same premium regardless of age, gender, *disability*, smoking status etc. Community rating may be at an overall market level or at an insurance plan level. Compulsory public insurance delivered through social security systems is provided on a community rated basis.

Under current legislation, some types of private insurance must be provided on a community rated basis, primarily health insurance in certain countries e.g. Australia, Ireland, the Netherlands, South Africa. Some are voluntary health insurance markets while others have compulsory features.

In these countries, insurers are allowed to apply certain risk mitigation measures in order to protect against adverse selection. Measures include the ability to apply waiting periods¹⁰, exclusions for pre-existing conditions, ability to apply deductibles or co-insurance payments and the ability to apply loadings for late entrants to the insurance market. These measures are aimed at ensuring the sustainability of the market and supporting the key policy objective of inter-generational solidarity. In addition, some form of 'risk equalisation scheme' is typically in place which aims to eliminate competition between insurers on risk grounds and promote competition in terms of service, efficiency and innovation.

The former measures are aimed at ensuring that the overall market is not exposed to an unsustainable level of adverse selection while the latter measure (risk equalisation) is aimed at supporting the policy of inter-generational solidarity within the market. This is an important point that we return to in section 4.

⁸ Capital is required by insurers to support the writing of insurance business. The cost of capital represents the additional investment return required by the providers of this capital over the return that they could achieve by investing in risk free investments.

⁹ For example, premiums could be charged as a % of income as is often the case on social security systems

¹⁰ A waiting period is a pre-defined duration of time starting from the commencement of the insurance policy during which no benefit is paid if the insured event takes place.

Forms of community rating also exist in some private voluntary markets or market segments where certain conditions support the sustainability of a community rated approach; common features being

- (i) that these markets exhibit quasi-compulsory features and
- (ii) there are explicit or implicit controls on the level of cover that an individual insured life can choose.

These aspects serve to limit the extent of adverse selection for the market as a whole.

For example, life cover related to personal loans is often provided at the same premium rate to all lives insured regardless of age or gender. In this case, choosing to take out a loan is voluntary but where a loan is sought the individual is required to put matching life cover in place. Thus there is less scope for adverse selection as:

- (i) life insurance is compulsory across the population of individuals who take out loans and so insurers collectively are not exposed to the risk of, for example, only older lives taking out life cover and
- (ii) the credit control process undertaken by lending institutions serves to check that the level of life cover applied for matches a genuine need and is not excessive from an adverse selection perspective.

3.1.2.2 Risk Rating

As noted above, insurers will charge different premiums to individuals with different risk profiles in a risk rated market. Insured lives with a similar risk profile will be charged the same premium. In a risk rated market, an insurer will segment its portfolio into different risk groups and will calculate different risk premiums¹¹ for each group. The pooling aspect of insurance takes place within a risk group but also typically across risk groups as there will inevitably be some cross subsidies between different risk groups.

In determining its risk groups, an insurer will make an assessment of risk factors likely to affect the probability of a claim arising and the size of the claim where insurance is provided on an indemnity basis. The insurer will then establish risk groups based on chosen risk factors or proxies for risk factors. It will consider the significance of different risk factors in this process and, in setting the risk factors or proxies to use it will consider issues such as measurability, verifiability, cost efficiency and level of intrusion of the chosen risk factors or proxies. We comment on this point further in section 3. Examples of risk factors currently used are as follows:

- For risk rated individual life insurance, risk groups are currently segmented by some or all of the following:
 - Age
 - Gender
 - *Disability*
 - Occupation
 - Leisure pursuits
 - Amount and duration of cover
 - Education, income, dwelling location
 - Behavioral habits (like smoking, drinking, drugs)

¹¹ The risk premium will reflect a best estimate of the risk for the group but in practice there will inevitably be some variability around this best estimate.

- For motor insurance, risk groups are currently segmented by some or all of the following:
 - Age
 - Gender
 - Driving/claims history
 - Vehicle characteristics
 - Location
 - Occupation
 - Choice of excess
 - Type of cover (comprehensive or third party)
 - Geographical location of likely usage
 - Type of usage (personal/business)

As noted above, gender will no longer be permitted as a rating factor from 21 December 2012.

The process of segmenting into different risk groups is commonly referred to as the 'underwriting process' and we comment on this further in section 4.

Section 4 – Risk management in private voluntary markets

Effective risk management in designing and pricing insurance is essential in a private voluntary insurance market in order to ensure that insurance remains affordable and accessible. Risk management can mean risk rating in some markets or market segments. In other cases, it can mean the application of various measures designed to control the level of risk such as limits on cover levels, deductibles/excesses on claim amounts, waiting periods, exclusions etc. Or it may be a combination of approaches.

The key objective of risk management, whatever approaches are taken, is to minimise the scope for significant adverse selection which would otherwise have negative repercussions for consumers by adversely impacting the affordability and accessibility of insurance.

Where risk rating is applied (typically for individual insurance cover in most private voluntary markets), an insurer will segment risks into different risk groups based on chosen risk factors and calculate different premiums or benefits for each segment. In choosing risk factors and determining the level of segmentation, insurers aim to strike a balance between:

- (i) pooling of risks to the benefit of consumers
- (ii) minimising adverse selection to maintain affordability and accessibility of insurance
- (iii) avoiding excessive administrative costs in order to provide more affordable insurance

Examples of risk factors used for life insurance and motor insurance are provided in section 2. For life assurance, age and *disability* are typically significant risk factors for individual insurance cover. On the other hand, age and *disability* are not typically used in the risk management of group life insurance cover.

Why is this the case?

4.1 The importance of age & *disability* for some types of insurance

In a private voluntary market where an individual can choose (a) whether to purchase life insurance or not and (b) the level of insurance cover, there would be enormous adverse selection if no risk segmentation existed at all, unless other control mechanisms are in place. This would lead to an unsustainable level of risk for insurance markets as a whole and ultimately unaffordable or unavailable insurance cover. We explore this point further in section 5. Considering age and *disability* as risk factors in segmenting risk for individual life insurance cover:

- There is clear evidence to show that life expectancy reduces as age increases. Consequently, age is commonly used as a risk factor for life insurance and annuities. The use of age as a risk factor ultimately benefits consumers as (i) it is a significant factor in minimising adverse selection and (ii) it is objectively measurable, is easy and cheap to collect and an intrusive level of information is not required in order to verify age.

Age as a risk factor is therefore strongly supportive of the objective of ensuring affordable and accessible insurance. Furthermore, age is the most significant risk factor of the different risk factors currently used for rating life insurance and

annuities. For example, studies show that the predictive power of age is more than 20 times that of gender for both life insurance and annuities¹².

- In the case of annuities, it is instructive to compare the unisex¹³ life expectancy¹⁴ of a 65 year old compared with the life expectancy of a 75 year old for a number of European Countries:

Country	Life expectancy at age 65 (A)	Life expectancy at age 75 (B)	Ratio of A/B
Germany	19.2	11.8	163%
UK	19.3	12.0	161%
France	20.9	13.3	157%
Simple average	19.8	12.4	160%

Not surprisingly, this shows higher life expectancy for 65 year olds compared with 75 year olds. The ratio is very consistent also across the 3 countries with the number of years life expectancy for 65 year olds being of the order of 60% higher than the life expectancy for 75 year olds.

If an insurer were required to offer the same annuity rate to 65 and 75 year olds, it would be exposed to significant adverse selection unless it priced its annuity rates very conservatively. For example, if it priced its annuities assuming an average life expectancy of say 16.1¹⁵ years then the cost of annuities would be expensive for 75 year olds who would end up paying for an expected 16.1 years worth of annuity payments but whose life expectancy is only 12.4 years. Conversely, annuities would be very attractive at this price to 65 year olds who would only pay for 16.1 years of expected payments but who would expect to benefit from 19.8 years worth of payments. In a private voluntary market, rational behaviour would lead to 65 year olds buying annuities and 75 year olds choosing not to buy annuities, particularly where alternative more economic alternatives exist such as retirement fund drawdown options that exist in some markets.

This dynamic would force insurers to increase the prices to annuity rates that reflect the life expectancy of a 65 year old, leading to annuities becoming unattractive in terms of cost for ages above 65.

- The flip side of life expectancy is the probability of death, referred to as the expected mortality rate, which is the key driver of the expected cost of claims for life insurance. The following chart shows population mortality rates by age and gender for the England & Wales¹⁶. A similar picture applies for all countries across Europe.

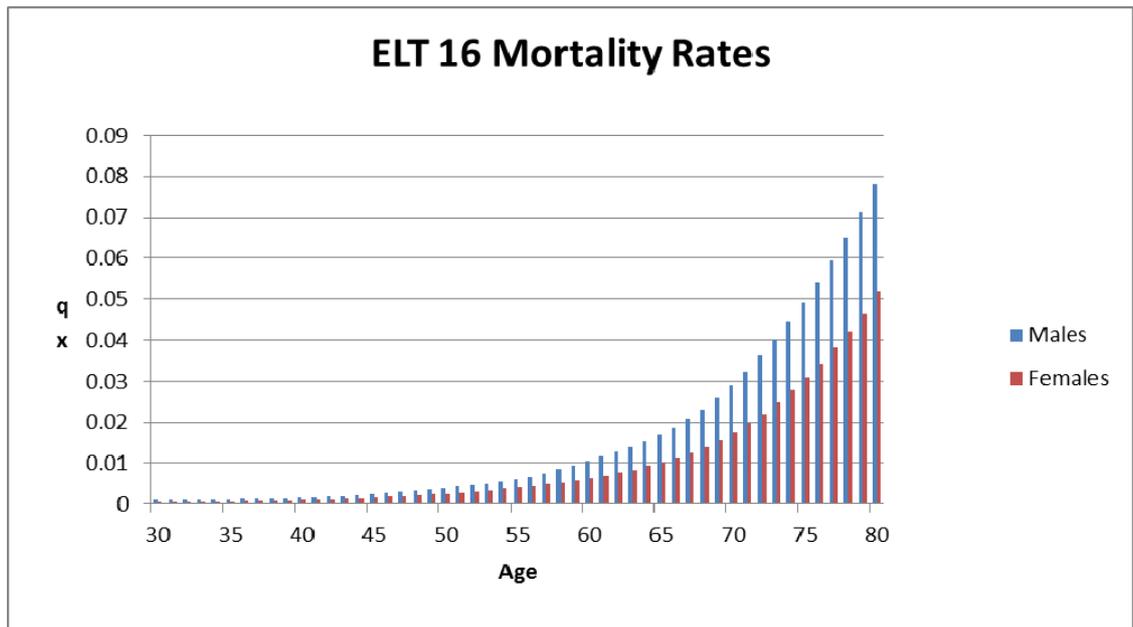
¹² Source: Richard and Jones (2004) for annuities, internal RGA Re analysis for term assurance

¹³ i.e. the combined life expectancy for men and women

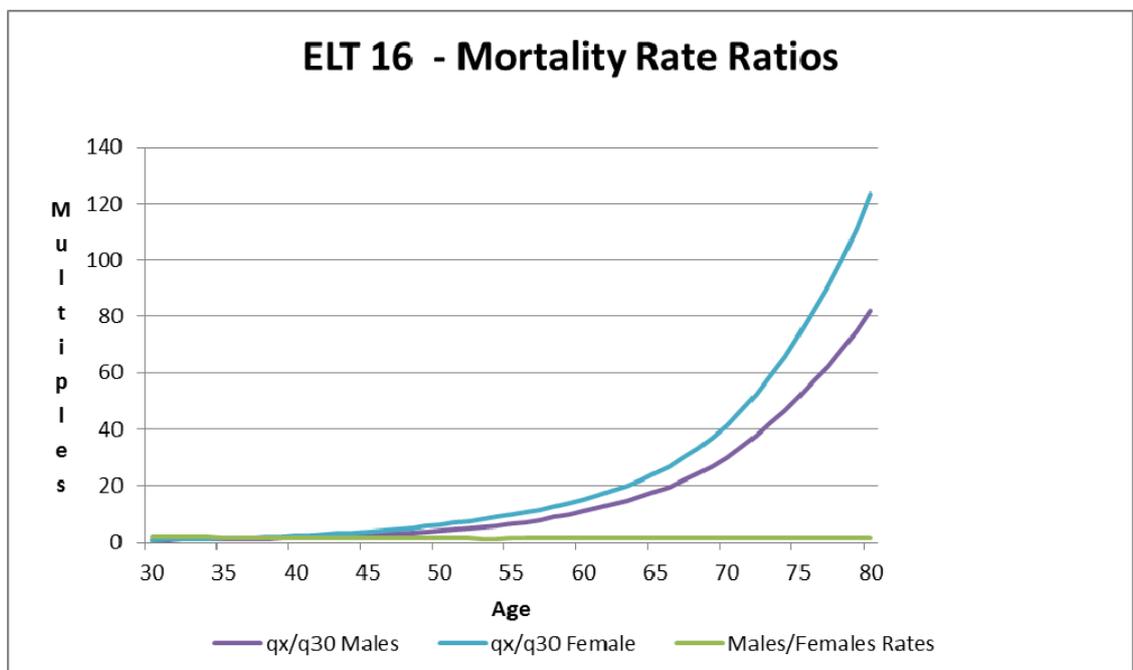
¹⁴ Source: World Health Organisation statistics 2009

¹⁵ being the midpoint of the life expectancy for the three countries on average (the simple average in the table above)

¹⁶ Source: English Life Tables No 16 2000-02



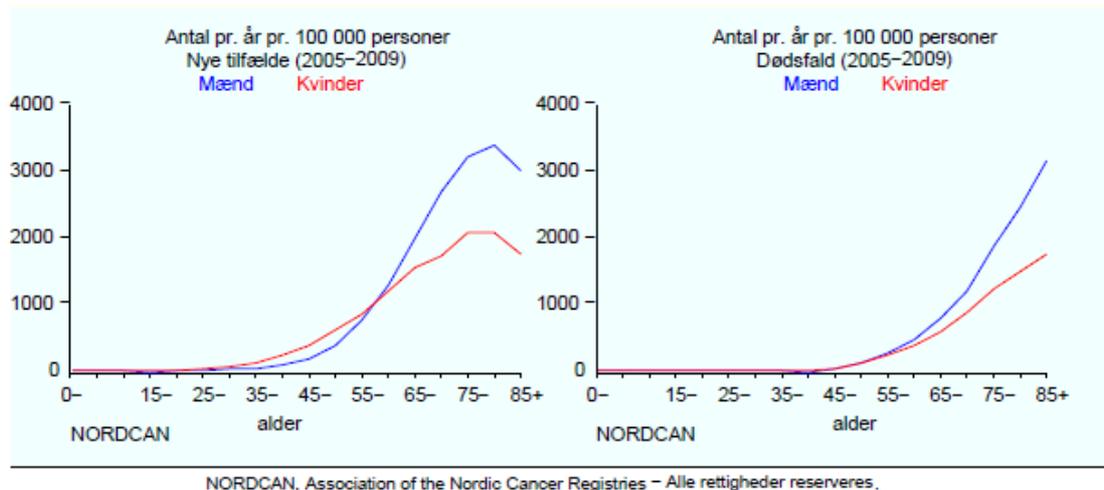
This chart highlights the significance of age in assessing mortality rates. While there is a clear pattern of higher mortality rates for males than females, the differential by age is much more significant. This is demonstrated by the following chart, which shows the ratio of mortality rates for each age compared with the mortality rate at age 30 and also the ratio of male mortality to female mortality for comparison.



The ratio of male to female mortality rates typically falls within a range of 1.5x to

2x across all ages while the ratio of mortality rates for each age compared with the mortality rate for a 30 year old increases exponentially by age up to a multiple of 80x at age 80 for males and over 120x for females.

- The following graph similarly shows the importance of age as a risk factor for critical illness and *disability* types of insurance. This shows the population incidence rates and death rates of cancer excluding skin cancer by age and gender¹⁷ in Denmark over the period 2005 to 2009. A similar picture would emerge if we considered incidence rates for other major conditions (e.g. coronary heart disease) and other countries.



- Like age, there is a correlation / causative link between *disability* and life expectancy. In the absence of other risk management measures, this introduces a high risk for adverse selection for say life insurance which threatens the sustainability of this market segment.

As a result, insurers will typically attempt to assess the expected impact of *disability* from a risk perspective and thereby minimise the risk of adverse selection. Typically life insurers do this by focusing detailed information requests (e.g. medical test results) on cases where the risks of adverse selection are evidently higher. This could include, for example, cases where the level of sum assured chosen is high, or where answers provided by individuals to medical questionnaires indicate a potential higher level of risk.

For an individual voluntary life insurance market, it is difficult to overstate the importance of age and *disability* as risk factors. It is likely that without the ability to use these factors, the market would face huge levels of adverse selection which would have the potential to make the market unsustainable.

These comments are not specific to individual voluntary life insurance and apply to other types of insurance and market segments too. For example, for motor insurance:

¹⁷ the blue line shows the male rates; the red line shows the female rates

- Motor insurers currently using risk rating with age as a rating factor have assessed males aged 17 to be over eight times more costly than males aged 65, based on claims experience over the insured population, and adjusting for other rating factors such as type of car and location. The equivalent ratio for males and females combined is over five times.

These examples (which are not exhaustive) serve to illustrate the point that age and *disability* are key risk factors in managing adverse selection to an acceptable level for particular types of insurance or market segments. If this were not the case, the insurance in question would become unaffordable and inaccessible. In practice, this outcome is not likely to be immediate but rather would be preceded by an iterative cycle of excess adverse selection, leading to rising prices and exiting of lower risks from the market (a ‘death spiral’¹⁸) with the possibility of failure of some insurers along the way.

4.2 Why community rating can work for other types of insurance

Group life insurance on the other hand does not typically involve the same level of individual risk rating, except possibly for very small schemes. Typically, a group life insurance scheme will be put in place by an employer for all eligible employees, with the amount of cover expressed as a multiple of salary (e.g. 4 times annual salary). The insurer will calculate a single ‘group rate’ which will apply for all eligible employees. In calculating the group rate an insurer will apply some weighting to the individual characteristics of the group scheme (e.g. overall age profile, type of occupation) but will also aim to pool the features of this group scheme as much as possible with the features of other group schemes.

For group life insurance, the level of potential adverse selection is much lower than for individual life insurance cover as all eligible employees are included and individual employees cannot choose whether or not to participate. Furthermore, the level of cover is set on the same basis for all individuals and subject to overall individual limits. In essence, a form of community rating can operate successfully for group life insurance because, as noted in section 2:

- (i) this market exhibits quasi-compulsory features and
- (ii) there are implicit and explicit controls on the level of cover available to an individual insured life.

Where conditions do not exist to support the sustainability of a community rated approach, risk segmentation becomes important in order to ensure the viability of the insurance market or segment and hence the affordability and accessibility of that insurance.

¹⁸ In their 1998 paper *Adverse Selection in Health Insurance*, David M. Cutler and Richard J. Zeckhauser (Harvard University and National Bureau of Economic Research) explore the concept of a ‘death spiral’.

Section 5 – Community Rating & Risk Equalisation

5.1 Community rated insurance markets

In section 2, we highlight two very significant challenges which arise in the context of community-rated insurance markets:

- (i) The first relates to the sustainability of the market as a whole resulting from the likelihood that community rating will increase the level of risk in the market overall.
- (ii) The second relates to imbalances which can arise between the risk profiles of insurers in a community rated market which can ultimately lead to segmentation within the market, undermining the principle of community rating and disadvantaging consumers. Let's take these points in turn.

5.2 Increased risk and unsustainable markets

Moving from a risk rated market to a community rated market is a policy decision which may reflect a reasonable attempt to provide fair access to insurance products for all people. However, community rating introduces significant issues which will affect the viability of the insurance market as a whole and which must be given serious consideration. It is conceivable, possibly even likely, that for some forms of insurance, a community-rated market would be unsustainable and would lead to a situation where no consumers have access to insurance products on a private voluntary basis. In this scenario, it would be left to public systems to meet the social need for insurance.

If human beings behaved in a fully rational way then we would compare the expected cost of an insurance policy to the expected value or benefit of the policy. The greater the excess of expected cost over expected benefit, the less likely an individual would be to purchase insurance. In a community rated market, everyone pays the same premium. In this situation, people who are more likely to benefit from insurance cover (we could refer to these people as high risk) are more likely to wish to purchase insurance, as the premium will not reflect this higher expected benefit. In contrast, individuals who are less likely to benefit (i.e. low risk) will be less inclined to take out a policy.

This is a fundamental challenge for a community rated market. Community rating in itself encourages riskier lives to take out (more) insurance, and discourages less risky lives from taking out insurance – adverse selection. This can result in an increase in risk for the market as a whole. This in turn could drive up the community rated premiums, which could result in further departures of low risk consumers from the market, leading ultimately to an unsustainable market.

Given such a doomsday scenario, one could wonder how community-rated insurance markets can currently exist. In fact, community-rated insurance markets are relatively common in the world of health insurance but it is difficult to find any examples of effective community-rated markets in other areas of insurance. What is it about health insurance that lends itself to community rating, and could similar approaches apply to other forms of insurance?

Firstly, in some community rated markets, the health insurance in question is compulsory. Where individuals must take out an insurance product, then this key

difficulty of community rating is eliminated. Put simply, community rating will not lead to riskier lives joining the market and less risky lives leaving the market, if everyone is compelled to take out the insurance.

This is an important point, but is only valid where the cover that individuals can choose is in some way limited. Health insurance is a form of indemnity insurance, and whilst there can be differences in the richness of the benefits available, ultimately the individual cannot choose exorbitant benefit levels where he or she knows that they are high risk individuals, to the detriment of other individuals in the insurance pool. Compare this to a form of insurance where an individual can choose the level of insurance cover without any limitation. In this scenario, riskier lives would choose very high levels of cover, and the same issues around sustainability of the market would occur.

So community rating may work for compulsory insurance where the level of cover is in some way limited. However, there are a number of health insurance markets worldwide where the insurance is voluntary rather than compulsory and where community rating applies. In this scenario the challenge of community rating creating an unsustainably risky market once again comes into view.

In the health insurance example, someone who has just been diagnosed with a condition that will require expensive treatment could take out insurance at that point (anyone who has been diagnosed with a condition, who does not already have insurance, would be foolish not to). This will naturally increase the level of risk within the market and taken to a logical conclusion would result in only sick people taking out health insurance as the community rated premium would be too high for healthy people to bear. To counter this problem, voluntary health insurance markets will typically introduce additional measures designed to protect the stability of the market. For example, a measure that eliminates cover for pre-existing conditions could be introduced.

Even with this measure in place there would still be an incentive for riskier lives without pre-existing conditions to purchase insurance, increasing the level of risk in the market as a whole and potentially pricing less risky lives out of the market. For example, utilisation of health services, and hence health insurance claims costs, tend to increase with age. There is a natural incentive in a community rated voluntary health insurance market for older people to take out insurance. To counter this, it is common too for health insurance markets to have waiting periods before individuals can claim, and these can increase with age.

Some health insurance regulators have taken additional steps to prevent the community rated market from becoming excessively risky. In Australia, for example, 'Lifetime Funding' applies, a concept whereby individuals pay a higher premium the later in life that they join the market. For example a 50 year old who has had a health insurance policy for many years pays the same community rated premium as a 30 year old in contrast to a 50 year old who has just entered the market who pays a higher premium. This approach provides an incentive for people to join the market when they are younger and helps provide for a more sustainable market.

We can see, therefore, that in a market like health insurance, community rating is possible, but requires significant supports if the sustainability of the market is to be maintained. Applying the same considerations to other types of insurance creates significant challenges.

Let us consider a community rated life insurance market as an example. For the most part, life insurance is a voluntary market. A simple life insurance contract would operate as follows. In exchange for paying a premium (typically a monthly premium for a fixed term), an individual receives a promise that the insurer will pay a lump sum benefit to the individual's estate, if they die within the term of the contract. The insured life normally chooses the appropriate benefit level and the premium is calculated accordingly. Premiums are generally risk rated, typically increasing with age, and taking account of other factors like smoker-status and gender (although the recent gender directive ruling will change this). Given the voluntary nature of the market, considerable levels of underwriting apply, with exclusions on benefit payments for pre-existing conditions, or additional premium loadings applying to unhealthy lives.

The key challenge in a community rated market relates to the treatment of risk. If an insurer is forced to charge the same premium for two individuals with very different ages and health conditions, then what is likely to happen. Certainly an 80 year old who has just been diagnosed with cancer might reasonably decide that it is in his family's interest to take out a life cover policy with as high a sum assured as he possibly can. By contrast a healthy 20 year old may feel less inclined to take out a policy, particularly if his or her premium will reflect a market average risk, and will wait until he or she perceives they are higher risk. In this situation, it is easy to see that a rational market would gravitate toward older unhealthy lives with large sums assured, and younger healthy lives would leave the market. We would quickly arrive at a marketplace with unsustainable levels of risk.

For a health insurance market where the benefit levels are in some way limited, it is possible to manage this level of risk through other means – whether through exclusions, waiting periods or other methods like the Australian Lifetime Funding, but in a life insurance market where benefit levels are chosen by policyholders, this is more challenging. Any market which does survive would be likely to have considerably lower levels of available benefits, and the needs of insurance consumers would not be met.

In the case of motor insurance, unintended social consequences could arise if it were not possible to risk rate by age. In this scenario, motor insurance could become more accessible for young men¹⁹, which could lead to more young men buying motor insurance. As young men tend to be involved in proportionately more road accidents of significant impact than other age groups in relative terms (based on claims costs), this could lead to more road deaths. This potential outcome would be exacerbated by the fact the younger men could afford to insure higher powered vehicles on introduction of community rating compared with the cost of insurance on a risk rated basis.

¹⁹ A study undertaken in 2007/2008 by a working party of the Institute & Faculty of Actuaries in the UK estimated that the cost of motor insurance for young drivers (under age 25) would fall by 17% if age were removed as rating factor:
Free Market Pricing GIRO Working Party Paper 2007/08
(<https://web.actuaries.ie/sites/default/files/event/2009/01/090323%20Free%20Market%20Pricing%20paper.pdf>)

5.3 Imbalances in insurer risk profiles

In this section, we consider the second key challenge for community rated insurance markets – the impact of imbalances in risk profile between different insurers in the market place. For the purposes of this section we assume that the issues relating to a marketplace with sustainable overall levels of risk have been addressed.

One could be forgiven for thinking that the balance of risk between insurers is perhaps a commercial consideration which will affect the profitability of one insurer relative to another, and should best be left to market forces to address. However, this issue can have profound consequences for consumers in a community rated insurance market, and can ultimately lead to the policy objective underlying community rating being significantly undermined.

Consider an insurer operating in a community rated market. Given the community-rated nature of the premiums, there is an immediate incentive for the insurer to target lower risk lives. This could be done through product design, benefit packages, marketing campaigns or other methods. If an insurer is successful in attracting lower risk lives, then the insurer can make a healthy profit relative to its peers. Two insurers with different risk profiles would experience very different claims profiles, and typically very different levels of profitability. This creates a number of challenges:

- Firstly, if insurers are competing for lower risk customers, then there is a clear danger that higher risk customers will be disadvantaged. This may be at odds with the policy objectives of introducing community rating in the first place. For example, products may be designed to meet the needs of lower risk consumers, with higher risk consumers missing out. In the case of community rated voluntary health insurance markets, insurers may typically seek to target younger and healthier lives. Health insurance products may be designed with enhanced benefits that would appeal to this demographic (e.g. benefits like teeth whitening, maternity benefits, free membership of sports clubs) whilst reducing benefits that might appeal to older consumers (e.g. orthopaedic benefits).
- Secondly, insurers who are successful in attracting lower risk consumers can expect to make considerable profits based on the risk profile of their customers. Lower claims experience in a community rated market will have a considerable positive impact on the bottom line. The difficulty here is that community rating encourages competition on risk grounds, but the benefits of a good risk profile can be so high that competition in other areas is reduced. There is very little point in putting a lot of effort into developing more efficient claims handling practices if the improvements you can make to your bottom line are dwarfed by the benefits of having a lower risk profile. The experience of community rated markets is that competition tends therefore to be focused around risk profile. In a normal market, competition is good for consumers as it can drive down prices. For example, if insurers are competing to be more efficient, then this can result in savings for consumers overall. This is not the case with competition based on risk. Whilst this form of competition may be of some benefit to lower risk consumers, at an overall level, competition of this nature does not benefit consumers.

- Thirdly, community rated insurance markets can become segmented, and ultimately community rating can be undermined. For example, it is common in community rated health insurance markets for insurers who have been established for longer to have an older (and typically riskier) portfolio of insured lives. By contrast newer insurers will typically develop a portfolio of younger lives. This allows newer insurers to charge lower premiums and still make higher profits. In turn this will encourage customers to switch to the newer insurer, but there is considerable evidence that lower risk individuals (e.g. younger and healthier individuals) are more inclined to switch²⁰, even where pre-existing exclusions only apply when an insured life first effects insurance and not on subsequent switches of cover between insurers. This can exacerbate the problem. The main challenge in this scenario is that the customers remaining with the established insurer are typically older and less healthy and they will end up paying higher premiums than the younger healthier customers who switch to the new insurer.

This point can be further exacerbated where insurers deliberately target younger lives through product design. The combination of segmentation occurring due to the inertia of older lives and the deliberate targeting of younger lives through product design and marketing campaigns can have a significant impact on higher risk consumers. Taken to an extreme, it is possible for insurers to design products with specific appeal for particular groups of individuals, and then to community rate each product. Products with benefits which appeal to high risk individuals could be available at a high premium – community rated for anyone wishing to take out the product. Similarly products with benefits which appeal to lower risk individuals could be available at a low premium – again community rated for anyone wishing to take out the product. In effect the result would be higher risk individuals paying higher premiums, in other words risk rating.

These are significant practical challenges faced by community rated health insurance markets (both voluntary and compulsory markets). For such markets to function effectively it is necessary to introduce some form of loss compensation or risk equalisation scheme, but this is not without its own challenges. For the purposes of simplicity I refer to risk equalisation (RE) in the remainder of this section, but other forms of loss compensation scheme can apply, and the terminology can vary from country to country.

In principle, an RE scheme aims to equitably neutralise differences in insurer claims costs which arise from differences in the risk profiles of their insured lives, in a community rated market. The principle is straightforward – where differences in claims costs are driven by differences in risk profile, then these should be neutralised. This eliminates the incentive for insurers to compete on grounds of risk and makes for a more sustainable community rated market which meets the needs of all consumers within the market.

²⁰ For example, van de Ven WPMM. et al. observed that younger people age between 19 and 39 switched their health insurance three times more often than people aged over 65 in Switzerland over a 10 year period to 2006 and that the health care expenditure for switchers was half of that for non-switchers (*Risk adjustment and risk selection in Europe: 6 years later. Health Policy (2007), doi:10.1016/j.healthpol.2006.12.004*)

Moving from the principle of RE to the practical implementation of an effective RE system is more challenging. The key challenge relates to identifying the extent to which differences in claims costs are caused by differences in risk profile. Two insurers selling community rated health insurance products in the same market could experience very different claims costs. This may be driven by a number of factors including differences in product design or benefit levels, difference in insurer policy in relation to claims payment, differences in efficiency, differences in risk profile, economies of scale or other competitive advantage or disadvantage and random variation (good luck or bad luck).

To be effective an RE scheme would need to isolate the differences relating to risk profile from the other factors. Needless to say, this is not necessarily a straightforward matter. Typically the approach taken will be to identify factors which can influence risk profile and attempt to equalise claims costs based on those factors. For health insurance factors might include age, gender, some measure of *disability* (perhaps diagnosis with particular conditions or extent of prescription drug use) as well as other factors like geographic location, income level and so on. In effect, the risk equalisation process will aim to calculate the risk rate that would have applied if the market were risk rated and to recognise the difference between what individual insurers actually charged compared with what they might have charged in a risk rated market. The more factors that are taken into account, the higher the potential for a sophisticated and effective scheme, but with a corresponding increase in complexity.

Most international community rated health insurance markets have introduced some form of RE scheme (or plan to), and a wide variety of approaches has been taken. One particular choice that needs to be considered is whether the scheme should operate on a prospective or retrospective basis. Retrospective schemes typically attempt to equalise claim payments based on actual amounts paid. Prospective schemes on the other hand involve equalisation payments based on expected levels of claims payments (determined by a measure of risk profile). Retrospective schemes can be more accurate, but have the disadvantage that payments can be less predictable than prospective schemes. Some schemes combine retrospective and prospective features. For example, the Dutch RE scheme involves primarily prospective payments with a retrospective adjustment payment.

In terms of the practical challenges that can arise in relation to RE schemes, the health insurance experience can be instructive:

- The variety of approaches taken in designing RE schemes for community rated health insurance markets highlights the practical challenges of developing a scheme that is practical and effective²¹.
- Typically RE schemes will involve payments to some insurers and not to others. In some cases, depending on scheme design, some insurers will pay into the scheme while others will benefit. Where there are significant differences in risk

²¹ The real challenges associated with developing an effective risk equalisation scheme are well chronicled in two studies by van de Ven WPM. et al. of risk equalisation systems in 5 countries which were carried out 6 years apart:
Risk adjustment and risk selection on the sickness fund insurance market in five European countries 2002
Risk adjustment and risk selection in Europe: 6 years later. Health Policy (2007),
doi:10.1016/j.healthpol.2006.12.004

- profile, the amounts involved can be large, and there have been instances of insurers taking legal challenges against RE schemes.
- Where health insurance markets have a range of benefit levels, it can be difficult to design an RE scheme which neutralises differences in risk and which does not also neutralise differences in benefit levels.
 - For retrospective schemes (or schemes with retrospective elements) it can take some time for the data to become available for calculating the relevant payments. In the Dutch system for example, it can take 3 years before RE payments can be finalised, causing significant delays in the production of finalised financial statements.

The difficulties outlined above of developing an effective RE scheme for health insurance are likely to be magnified if community rating is extended to other types of insurance. Whilst it is beyond the scope of this paper to address the design of a RE scheme in any detail, it is worth considering at a high level some of the additional issues that arise.

Insurers can typically write a range of different types of insurance covering a variety of risks. Designing an appropriate system, and gathering sufficient data, to effectively equalise differences in risk profile across a wide variety of insurance types will be a key challenge. In particular, it is likely that schemes would need to take account of a wide range of factors in respect of a variety of life and non-life insurance products including:

- Annuities
- Lump sum death cover
- Critical illness cover
- Disability income protection cover
- Motor insurance

Some risks will be short term in nature, with other risks continuing for a period of many years. To accurately address imbalances in risk profiles between insurers, it will be important to develop high level rating factors for each type of risk and to gather accurate and verifiable data for each type.

Considering the interactions of very different types of insurance risk will be a challenge – for example where insurers write both annuity and life assurance business. In addition it will be important to correctly allow for other factors (such as surrenders, maturities or other forms of policy terminations) which might affect an insurer's risk profile, or interpretation of its risk equalisation data.

There are additional practical challenges relating to RE schemes. Typically a central agency or authority will be required to administer the scheme and to calculate the payments involved. Apart from the costs of running such an authority, and the legislative requirements for empowering such an authority, consideration would need to be given to the cross-border nature of the European insurance market if European legislation were to prohibit use of age or *disability* as pricing factors in the same way that gender can no longer be used as a rating factor.

Should a RE scheme operate on a pan-European basis, operated by a single European central authority, or should it operate separately in each territory, and possibly with a

separate scheme for each line of business in each territory? Should country-specific risk equalisation schemes operate on a host country or home country basis?

In summary, the experience of health insurance markets where RE schemes have been introduced suggests that there are significant challenges which arise in trying to introduce such a scheme, even where the scheme is limited to a very specific class of insurance, and applies only to insurance policies sold in a single territory. It is likely that extending the scope of such a scheme in terms of the types of insurance covered or the geographical range of consumers covered is likely to significantly increase the complexity of the scheme and as a result the challenges of introducing the scheme.

5.4 Risk Equalisation may not be the answer

Notwithstanding the significant complexities and practical difficulties of designing and implementing a Risk Equalisation scheme, Risk Equalisation only becomes a consideration where a community rated market is viable in the first place. As we have outlined in this paper, community rating is feasible when certain conditions exist that provide sufficient counterforce against significant adverse selection. However, community rating is not feasible for all insurance types or insurance market segments.

In these cases, risk rating is necessary in order to provide the required counterforce to significant adverse selection and to support the affordability and accessibility of insurance cover. In this regard, age and *disability* are very significant risk factors for certain types of insurance cover and a blanket prohibition on the use of age and *disability* as risk factors would not be in the overall interests of consumers from the perspective of affordability and accessibility of insurance.