



Health and Ageing Newsletter

No. 26

April 2012

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Guest Editorial

Screening for Dementia and the Impact on Mortality and Morbidity in Long-Term Care Insurance

by Marc A. Cohen⁺, Jessica Miller⁺⁺ and Xiaomei Shi⁺⁺⁺

Introduction

Carriers providing long-term care (LTC) insurance have historically invested significant resources in risk management activities designed to ensure that policies are properly priced and that premiums can remain relatively stable for consumers. An important focus of such risk management activities has been the medical underwriting process and more specifically dementia screening. Dementia-related claims continue to present the single largest claim liability to LTC carriers. Moreover, left unmanaged, this potential liability can threaten the long-term stability of premium rates, something that is of particular importance to carriers, policyholders and insurance regulators. Dementia is also related to mortality, which means that as the average age of life insurance applicants increases, the ability to accurately screen for dementia becomes increasingly important.

Over the past decade, there have been significant improvements made in the ability of cognitive screens to identify individuals at the earliest stages of cognitive decline—a state known as “Mild Cognitive Impairment (MCI)”. MCI is a subtle but measurable memory disorder and a person with MCI experiences memory problems greater than normally expected with ageing, but does not show other symptoms of dementia such as impaired judgment or reasoning. Nearly eight years ago, a new cognitive screen was introduced to the market and is now extensively used by LTC carriers. The test called Enhanced Mental Skills Test (EMST) is designed to detect applicants at the very earliest stages of cognitive decline (Shankle *et al.*, 2005). This test generally replaces an earlier cognitive screen called the Delayed Word Recall (DWR) (Knopman and Ryberg, 1989), which was seen as somewhat less effective in capturing people during the MCI stage of decline.

Purpose

The purpose of this article is to report on research that examined the relationship between the very earliest stages of cognitive decline (i.e. MCI) and subsequent mortality as well as evaluate the efficacy of screening on early morbidity experience as measured by the incidence of dementia-related LTC claims. We focus on the screening experience of each of these cognitive screens: (1) the DWR, and (2) the EMST.

Data and Method

For the mortality study we relied on telephonic and in-person underwriting assessment data—including cognitive classification—which was collected between 1 January 1996 and 31 December 2008. All data was linked to the Security Administration’s Death Master File, which enabled us to determine who died during this roughly 14-year time period and also record their date of death.

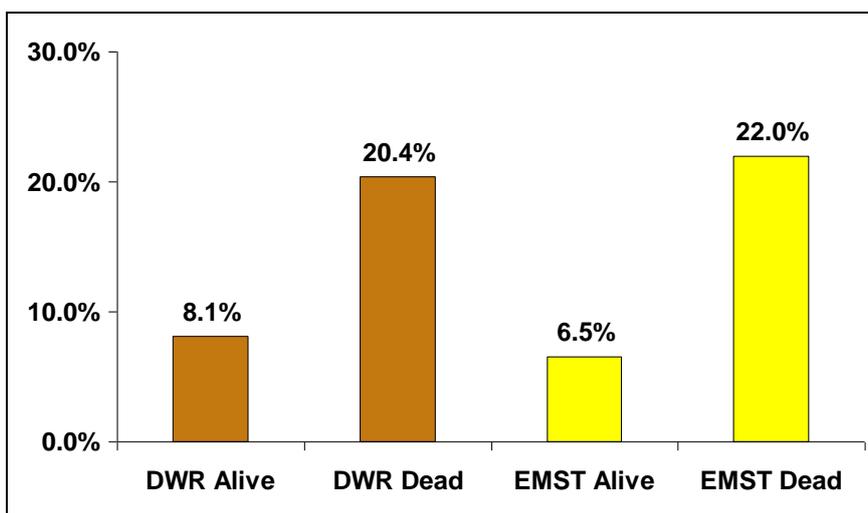
The DWR data comprised 764,037 lives and 160,255 deaths. The EMST data had 132,719 lives and 2,263 deaths. The data set had over 5.8 million exposure years of experience for the DWR sample and roughly 376,000 exposure years of experience for the EMST sample. We employed a number of analytic techniques including descriptive statistics and Survival Analysis based on the Cox Proportional Hazards Model, which is broadly applicable and the most widely used method of survival analysis.¹

For the morbidity study we compared the early claims experience of 54,836 individuals screened with the EMST and 39,735 individuals screened with the DWR. For the most part, we focused on claims experience within the three or first five years of policy issue.

A. Mortality Results

Figure 1 shows that the individuals who were classified as cognitively impaired by either the DWR or the EMST have higher relative mortality compared to those who are classified as cognitively intact.

Figure 1. Mortality status among those classified as cognitively impaired by test type



This analysis does not, however, control for differences that may be attributable to the age and gender distribution among the two samples, or it might be related to whether or not someone has limitations in activities of daily living (ADLs). We use the Cox Proportional Hazards Model to uncover the independent impact of cognitive classification controlling for other variables. What Table 1 shows is that when age, gender and ADL status are held constant, someone who “passes” the DWR has only 0.59 times the death hazard of someone who fails the test. In other words, an applicant classified as cognitively impaired has a death hazard that is 1.69 times greater than someone who is cognitively intact if we hold age and gender constant. Similarly, someone who “passes” the EMST has only 0.66 times the death hazard of someone who fails the test. Each additional year of age increases the death hazard by 11 per cent.

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¹ For a more complete description of the study see *The Relationship Between Cognitive Impairment and Mortality Rates Among Long-Term Care Insurance Applicants*, presented at the Living to 100 Symposium Orlando, FL 5–7 January 2011, Society of Actuaries.

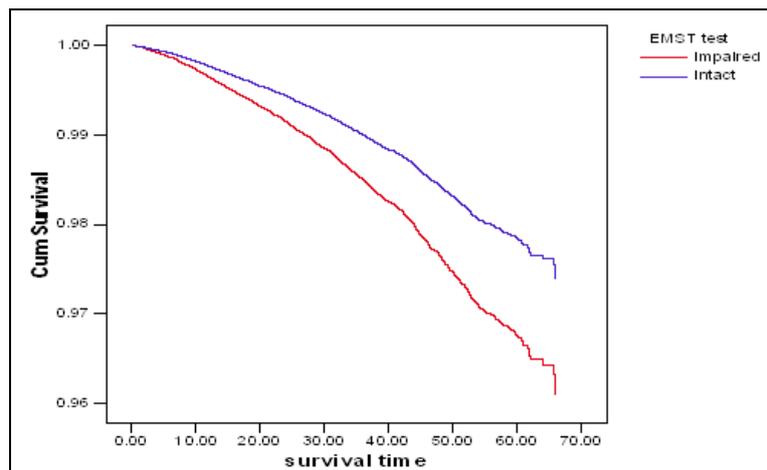
Table 1. Cox proportional hazard results

Characteristics	EMST Results		DWR Results	
	B	Exp(B)	B	Exp(B)
Cognitively Intact	-.411***	.663	-.534***	.586
Age	.102***	1.108	.109***	1.115
Female	-.447***	.64-	-.385***	0.68
Having 1 ADL Limitation	N.A	N.A	.518***	1.679

Figure 2 shows the survival function pattern for those who passed and those who failed the EMST. A similar pattern exists for the DWR test.

What this analysis shows is the very clear relationship between individuals classified as cognitively impaired and subsequent mortality experience. This relationship holds even when controlling for age, gender and in some cases, ADL status. Few of these individuals expressed outward signs of dementia at the time of application. Experience in the LTC insurance industry suggests that screening for cognitive impairment can be administered successfully as part of the underwriting process and has implications for older age life insurance underwriting.

Figure 2. Survival function for pattern for EMST



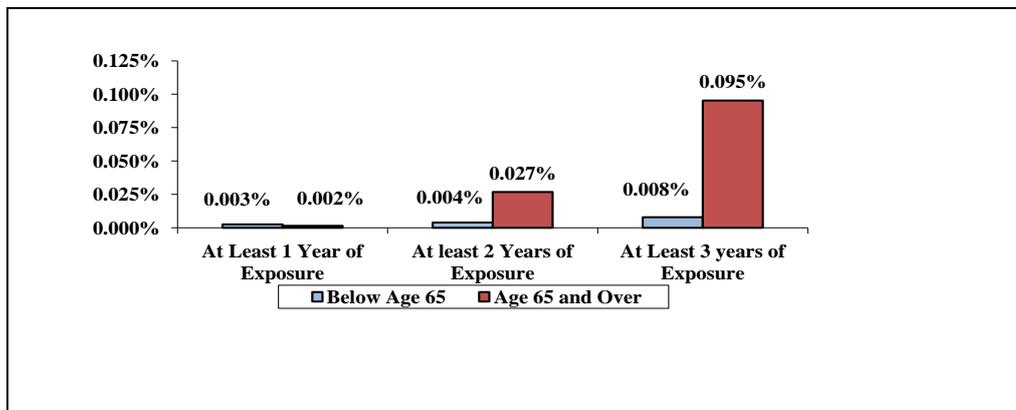
B. Efficacy of Cognitive Screening on Morbidity Experience

As mentioned, cognitive claims are among the most costly, even though they are not the most prevalent claim cause facing LTC insurers. For example, within two years of policy issue cognitive claims comprise 16 per cent of the total claim count whereas by year six, such claims grow to 30 per cent. However, in terms of liabilities, by year six the percentage of claim costs attributable to dementia is 52 per cent. We completed two analyses in order to determine the efficacy of cognitive screening on early claims experience. First, we analysed the claims experience from 209,000 LTC applicants who had held their policies for up to three years. Then we compared this to general population data related to the incidence rate for MCI for the over- and under-65 age groups. Secondly, we compared the effectiveness of the EMST and DWR on a group of applicants by analysing their claims experience over the first five years after policy issue.

The literature on the prevalence of MCI suggests that roughly 7 per cent of individuals age 65 and over and between 0.7 per cent to 1.5 per cent of individuals under age 65 have MCI; the incidence rate is between 0.08 per cent and 5.8 per cent (Margolis, 2007). Figure 3 below shows that the incidence rates of cognitive claims by years of exposure is very small. In fact, out of 209,000 applicants screened with the EMST, only 19 individuals went into claim during the first three years after policy issue. This is an aggregate claims rate of 0.0091 per cent or 1 out of 11,000 individuals. The expected claims rate is closer to 0.39 per cent, which is a conservative estimate of prevalence since we account for the fact that the LTC applicant population is expected to be healthier than individuals in the general population.

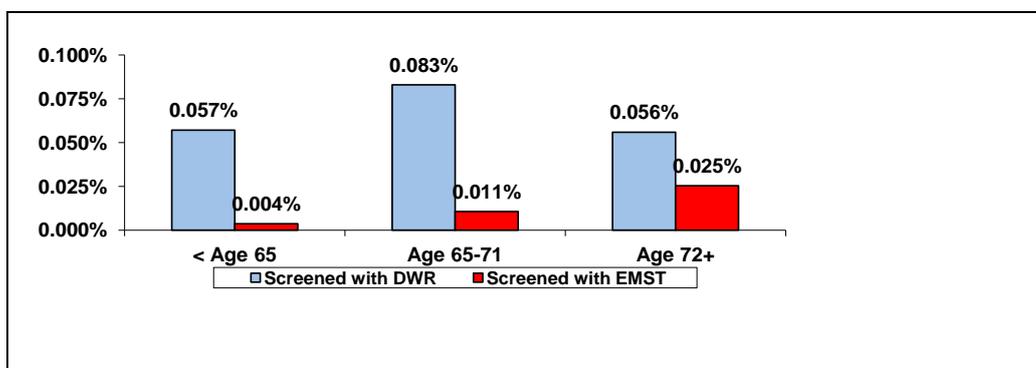
In essence, the EMST screen has successfully eliminated upwards of 90 per cent of the expected claim prevalence over the period.

Figure 3. Cognitive claim results by year of exposure and age



To compare the relative efficacy of the two tests for the first five years following policy issue, we analysed claim results for 54,836 individuals screened by the EMST and 39,735 individuals screened with the DWR. We controlled for age and exposure years and compared claim rates. Figure 4 shows the difference between the age- and exposure-adjusted claim rates for each of the two tests. On average, claims rates among the population screened with the DWR are five times greater than for the EMST over the study period. Depending on age, the claims rates for the DWR are between 2 and 16 times greater than for the EMST, based on this sample. Thus, the move toward the EMST and away from the DWR has been justified as evidenced by the improved claims experience of the former.

Figure 4. Adjusted claims rates by age and cognitive screen



Summary

These analyses demonstrate that being able to identify whether or not someone is at the earliest stages of cognitive decline can have a significant impact on underlying mortality and morbidity experience. Regarding mortality, not only dementia which is effectively screened for by both the EMST and the DWR, but also earlier forms of cognitive decline like MCI are related to excess mortality. Moreover, effective identification of MCI leads to improved early claims experience, especially when compared with screens that focus more on mild to moderate dementia. Finally, the successful use of these screens in the LTC insurance context suggests that they could be applied to other market segments that are focused on selling to older individuals.

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Invited Article I

Private Versus Public Age-Related Utilisation of Public Hospital Services in Ireland*

by Brian Turner⁺ and Edward Shinnick⁺⁺

Ireland's health system is characterised by a complex interaction between public and private financing and delivery. Private health insurance is available on the basis of community rating, whereby insurers are not permitted to vary premiums by age, gender, current prospective state of health or any other factor that might affect the risk that an insured person represents to an insurer. This makes private health insurance more affordable for older (higher-risk) consumers than risk rating would, which means that more of these consumers are treated privately, taking pressure off the government-funded public healthcare system. However, this effect is mitigated by state subsidisation of the privately insured. This research examines differences in the utilisation of public hospitals by public and private patients and goes some way towards quantifying the benefits to the state of having so many older patients treated privately rather than publicly.

The Irish Health System and the Role of Private Health Insurance

Despite universal access entitlements to the tax-financed public hospital system, around half of the population is covered by voluntary private health insurance. In Ireland, this serves a primarily supplementary role, although in recent years more plans have begun to provide partial reimbursement for primary care, and thus private health insurance is now playing a complementary role (for a discussion of this categorisation, see Mossialos and Thomson, 2009).

The privately insured may be treated in private hospitals, the cost of which would be beyond the reach of most people on an out-of-pocket basis, or in public hospitals. Private health insurance entitles the holders to accommodation in a semi-private or private room, depending on the level of cover and the availability of such accommodation.

Public hospitals may—and in most cases do—designate a proportion of their beds as private beds for use by private patients (although in some cases these beds are used for public patients, such as in cases of isolation for infection control). The maximum permitted proportion of beds that can be designated private is 20 per cent, although it appears that this ratio is breached in some cases (see, for example, O'Reilly and Wiley, 2010). These private beds in public hospitals make up approximately half of the private bed stock in the country.

Furthermore, insurers are not charged the full economic cost for use of these private beds in public hospitals, although in recent years successive governments have been moving towards full economic costing. More recently, the Minister for Health announced his intention to charge insurers for the use of public beds by private patients—currently they are not charged for these beds, which represents a lost revenue stream to public hospitals, as highlighted by the Comptroller and Auditor General (2009). The state further subsidises privately insured patients through tax relief granted on private health insurance premiums (currently 20 per cent for all subscribers) and through the subsidisation of training for medical professionals, some of whom operate in the private sector.

In terms of the operation of the Irish private health insurance market, it is based on the principles of community rating, open enrolment and lifetime cover. A set of prescribed minimum benefits, which must be covered by any eligible plan, is also set out in regulations. Risk equalisation has been on the statute

* The authors wish to thank the HIPE/NPRS Unit of the Economic and Social Research Institute for providing data on which this study draws, and various members of the Department of Economics at University College Cork and participants at the Health Economists' Study Group Summer 2010 meeting for helpful comments on earlier versions of this work.

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books from 1996-1999 and again from 2003-2008, but no payments were ever made under either scheme. A new risk equalisation scheme is expected in 2013.

It should be noted that the new government (elected in 2011) has proposed a radical shift from the current structure of the health system which will include a shortening of waiting lists, the introduction of free at-the-point-of-use GP care for all, and universal health insurance to ensure a single-tier health system. There is some debate regarding the feasibility of these proposals however, and the current private health insurance market will continue to operate as a voluntary market until at least 2016, which is when universal health insurance is due to come into effect.

Community Rating Versus Risk Rating

Community rating makes health insurance more affordable for older consumers (who would be viewed as high-risk consumers) than risk rating. In a risk-rated market, those for whom private health insurance is relatively affordable are low-risk, younger, healthier consumers, while premiums are less affordable or unaffordable for those who need it most, i.e. high-risk, older, sicker consumers. Therefore, it is possible that those who can afford it do not purchase it because they do not need it—or at least do not perceive a need for it—while those who need it cannot afford to purchase it.

Table 1 shows take-up rates of private health insurance by age in Ireland. It can be seen from these figures that take-up rates peak in middle age groups but remain reasonably high for those aged 65 and over.

Table 1. Take-up rates of private health insurance by age: Ireland, 2007

Age Band	18-24	25-34	35-44	45-54	55-64	65+	Total
% with PHI	39	45	57	57	50	42	49

Source: HIA (2008).

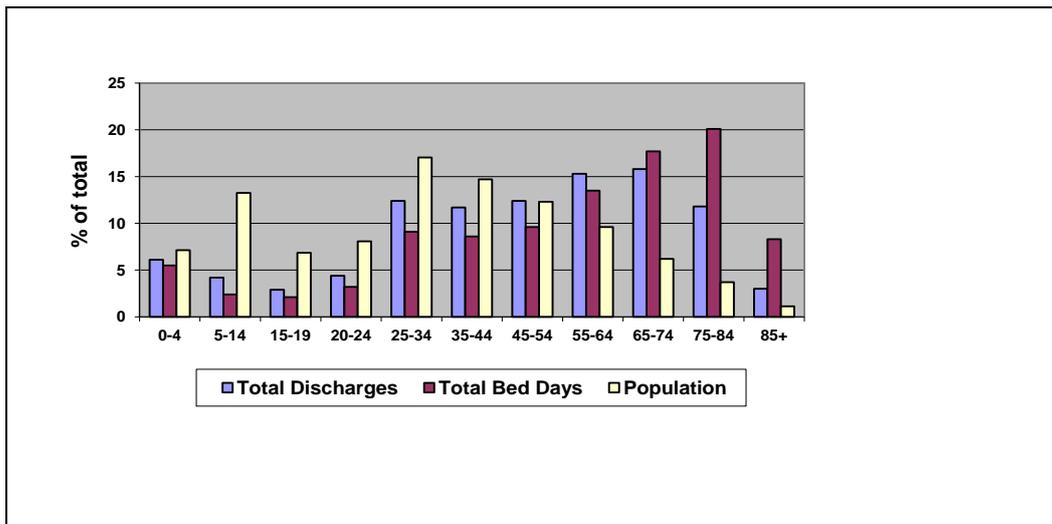
The fact that community rating makes health insurance more affordable for high-risk consumers (who would generally be older and sicker consumers) clearly attracts a higher take-up rate among older age groups than a risk-rated market in which health insurance could be very expensive for such consumers. Turner and Shinnick (2011) compare the Irish and Australian voluntary private health insurance markets, both of which are community rated, with the U.K. market, which operates on the basis of risk rating, and find significant differences in overall take-up rates and relative take-up rates among older consumers.

Impact of Community Rating on the Irish Health System

Thus, one significant impact of community rating in the private health insurance market in Ireland is to increase the relative take-up rate among older consumers significantly above that of a risk-rated market. As medical expenses for older consumers tend, on average, to be higher than those for younger consumers, this means that community rating, by attracting a relatively higher proportion of older consumers, increases the average risk in the insured pool, with a consequent reduction in the average risk in the uninsured community. Evidence for the higher medical expenses for older people can be seen in empirical studies, such as Berk and Monheit (2001).

In Ireland, figures from the Central Statistics Office (CSO) and the Economic and Social Research Institute (ESRI) show that the proportions of total (inpatient and day case) hospital discharges and total bed-days accounted for by those aged 55 and over are significantly higher than the proportion of the population in that age group, as can be seen in Figure 1. This is consistent with the findings of Layte *et al.* (2009), who note that just 10 per cent of patients accounted for almost half of inpatient bed days in 2006, and that these patients were older, poorer, sicker and more likely to be medical card holders than other users.

Figure 1. Hospital utilisation and population by age, 2006



Source: CSO (2007); ESRI (2008) Table 3.3.

Data on activity in public hospitals in Ireland are collected and published using the Hospital In-Patient Enquiry Scheme (HIPE), which is managed by the ESRI in association with the Department of Health and Children and the Health Service Executive. Since 1999, discharges have been classified by patient status (public or private). However, this does not distinguish how private discharges paid for their consultant care, i.e. whether this was through private health insurance or out-of-pocket payments. Nevertheless, it is likely that a significant majority of private discharges would have been paid through private health insurance.

The ESRI data show that private inpatients consistently have shorter average lengths of stay than public inpatients. From 1999 to 2009, the average inpatient stay in a public hospital by a private patient has been between 0.47 and 0.93 days shorter than that of a public patient.

When analysed by age, the average length of inpatient stay for private patients is lower than for public patients in all categories except for the 15-44 age group. The higher average length of stay in this age group is likely related to maternity stays. Evidence for this can be found by examining figures by age and gender. The age/gender categories of patient for which private patients consistently (i.e. each year between 1999 and 2007 inclusive) have a longer average length of stay than public patients are females aged 15-34.

However, this does not take into account the complexity of treatment received. The shorter average length of stay for private patients compared with public patients begs the question whether private patients receive the same mix of treatment as public patients or whether they receive less complex care.

The HIPE & NPRS Unit of the ESRI also produces a Casemix index (CMI) in conjunction with the Department of Health and Children and the Health Service Executive. Casemix is a system that measures hospitals' activity in terms of the complexity of treatment undertaken (HSE, 2008), with the overall figure for all treatment in all hospitals in the Casemix scheme being 1. A CMI value above 1 indicates a more complex mix of treatment, while a CMI below 1 indicates a less complex mix of treatment than the average.

Figures for the Casemix index by age for inpatient and day-patient discharges for 2005, 2006 and 2007 were provided by the ESRI pursuant to a data request by the authors. These figures show that the CMI for private patients in most age bands tends to be higher than for public patients in the same age bands. This applies to both day-patient and inpatient treatments. For the total of all age bands, the CMI was 0.999 for private inpatient discharges compared with 0.954 for public inpatient discharges, while for day-patients the figures were 1.177 and 0.947 for private and public discharges, respectively.

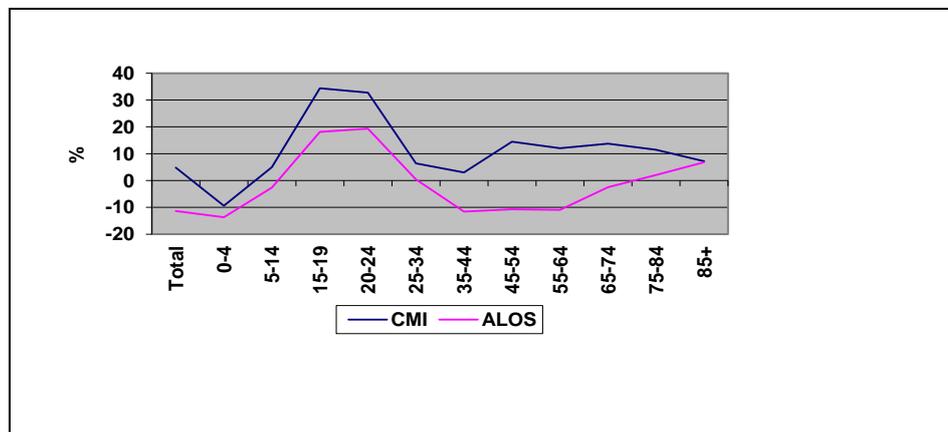
There is a clear link between age and average complexity of treatment. For inpatient treatment, all age groups under 45 have below-average intensity, while all age groups from 45 upwards have above-average intensity, relative to the inpatient total. This applies to both public and private discharges. The

patterns for day-patient treatment are almost the opposite, with all age groups under 55 having above-average intensity, while all age groups from 55 upwards have below-average intensity, relative to the total of day-patient activity. Again this applies across both public and private discharges.

It would appear therefore that private patients in most age groups have shorter average lengths of stay than their public counterparts, despite receiving a more complex mix of treatments in most cases. This can be seen in Figure 2 which shows the percentage difference in CMI and average length of stay for private versus public inpatients by age. A positive difference indicates a more complex mix of treatment or a longer average length of stay for private patients.

As can be seen from this figure, private patients had a more complex mix of treatments in 2007 across all age groups except 0-4 years. The difference peaked in the 15-19 age group, with private patients in this age group having a CMI that was 34.4 per cent higher than their public counterparts. Meanwhile, private patients aged under 14 and 35-74 had shorter average lengths of stay in 2007 than their public counterparts. Even in the age groups where private patients had a longer average length of stay than public patients, the percentage difference in treatment complexity was greater than the percentage difference in average length of stay. The figures for 2005 and 2006 show similar patterns, with the relative average length of stay (ALOS) being lower than the relative CMI in all age groups.

Figure 2. Relative treatment complexity and average length of stay of private versus public inpatients by age, 2007



Source: Authors own calculations from data supplied by HIPE & NPRS Unit, ESRI.

Although the reason for the more favourable ALOS relative to complexity for private patients is unclear, it is obvious that if significant numbers of older private patients were to discontinue private health insurance coverage and rely on being treated as public patients, then this would add to the burden of treatment on the public system.

An examination of ALOS figures by age and patient status, provided by the ESRI, reveals that private patients aged 55 and over consistently have longer inpatient average length of stay than the overall average of public inpatients.

Furthermore, analysis of the CMI figures shows that private inpatients in all age categories from 45 upwards have a more complex mix of treatment than the average of all public inpatients, while private day-patients in all age bands have a more complex mix of treatment than the average of public day-patients.

Conclusions

The widespread availability of private health insurance clearly provides substantial savings to the public healthcare system, particularly as the operation of community rating encourages higher numbers of older consumers to take out insurance than would be the case in a risk-rated market. The savings to the public system are, however, mitigated by the state subsidisation of private health insurance as mentioned above. Nevertheless, in its absence, such patients would be forced to rely on the public system, which would increase the overall average length of inpatient stay and complexity of treatment among public patients, thereby increasing the utilisation of public inpatient beds. If these patients were to rely on the public healthcare system then either the public system would require additional resources or waiting lists for public treatment would be lengthened further.

This effect is likely to become even more important in the future, due to the ageing of the Irish population. According to the Central Statistics Office (CSO, 2008), those aged 65 and over are projected to account for 20-25 per cent of the Irish population in 2041, compared with 11 per cent in 2006. Meanwhile, those aged 55-64 are projected to account for 14-15 per cent of the population in 2041, compared with less than 10 per cent in 2006. This suggests that encouraging take-up of private health insurance among older people in Ireland will become increasingly important in the context of the public health system budget.

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Invited Article II

Health Status and Portfolio Choice: Does Feeling Better Affect your Attitude Towards Risk?*

by Silvia Bressan⁺, Noemi Pace⁺⁺ and Loriana Pelizzon⁺⁺

1. Introduction

Modern Portfolio Theory (MPT) postulates risk averse investors who choose their investment portfolios in order to maximise their expected return for a predetermined level of risk. Which optimal portfolio the investors will choose depends on the shape of their utility function. In recent years the basic assumptions of MPT have been widely challenged by the behavioural finance approach which has thrown new interesting insights on investment decision theory. Behavioural finance evaluates risk by relying mostly on laboratory experiments and survey or questionnaire instruments, and concentrates on beliefs, attitudes and risk perception in particular circumstances. Among other factors, individual health status has recently gained attention as a potential determinant of risk perception and, as a consequence, of stockholding. Recent literature has developed a portfolio choice theory that includes the presence of "background" risk. It constitutes an uninsurable component of individuals' income risk that decreases additional financial risks (Guiso and Paiella, 2001).

Whether bad health status can be regarded as a form of background risk is still an open issue, and there is no consensus on the fact that health can have an impact on financial risk taking. With this work

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we attempt to contribute to the debate by studying the relationship between health status and portfolio choice.

The literature has surveyed different ways for health to exercise an effect on portfolio choice, though the general statement is that a negative health shock tends to shift resources to safer types of financial investment. Some authors (e.g. Heaton and Lucas, 2009; Berkowitz and Qiu, 2006; Atella, Brunetti and Maestas, 2011) maintain that because of precautionary saving purposes the threat of future medical expenditures shifts resources from financial investments. In some other works (e.g. Edwards, 2008; Love and Smith, 2010) health is regarded as a direct argument of the investor utility function and a health shock is found to raise the marginal utility of consumption. Finally, the interrelation of health with some other features that affect the life span horizon, such as ageing (Coile and Milligan, 2009) or bequest motives (Feinstein and Li, 2006), can impact household portfolio choice.

In this study, we use data contained in the first wave of SHARE, the Survey of Health, Ageing and Retirement in Europe. Its main focus is to paint a picture of the lives of Europeans aged 50 and over, collecting data in 11 countries from Scandinavia to the Mediterranean. The survey covers 19,548 households and 28,517 individuals on a wide range of topics, encompassing health, socioeconomic status, financial transfers and intensity of social interaction. For our research, particular attention goes to variables expressive of wealth and health conditions. From these, we manage to construct indicators for portfolio choice and to relate them to different health proxies. A peculiar feature of our work is that we always look at health in its different dimensions (objective, subjective and mental), so that we can identify which particular profile of health is in fact capable of having an impact on portfolio composition. Moreover, once we have surveyed the decision of holding some stocks in the investment portfolio, we also look at the weight associated with such securities with respect to other safer assets. Finally, our analysis attempts to explore different channels of health risk transmission to understand the driving forces of the relationship between health status and portfolio choice.

2. Measuring Health Status

SHARE devotes a section of the questionnaire on measuring health status. Empirically, health status is an intrinsically unobservable variable. A formal definition of health status involves unavoidably a number of facets. It would be hard to provide an explanation of “health conditions” that would point in a single direction. This suggests that we must explore different variables available in SHARE to take into account these multiple dimensions. At first approximation, we can divide the information of health status into “objective” and “subjective”. Regarding the first category, SHARE provides the number of limitations in activities of daily living (ADL) and the number of chronic diseases. The former includes difficulty in dressing, walking, bathing, eating, getting in or out of bed, and using the toilet. The latter includes heart attack, high blood pressure, high blood cholesterol, diabetes, asthma, arthritis, osteoporosis, Parkinson’s and cancer (chronic). Regarding the second category, SHARE provides information on self-perceived health status (SPHEU), reported on a 5-point scale (1 = Excellent, 2 = Very Good, 3 = Good, 4 = Fair, 5 = Poor). The last significant health variable included in SHARE is mental health. This is measured by a depression scale variable (EUROD), which runs from 0 to 12, depending on whether or not the individual reported having problems during the previous month with one or more negative feelings among a list that includes depression, pessimism, guilt, irritability and tearfulness.

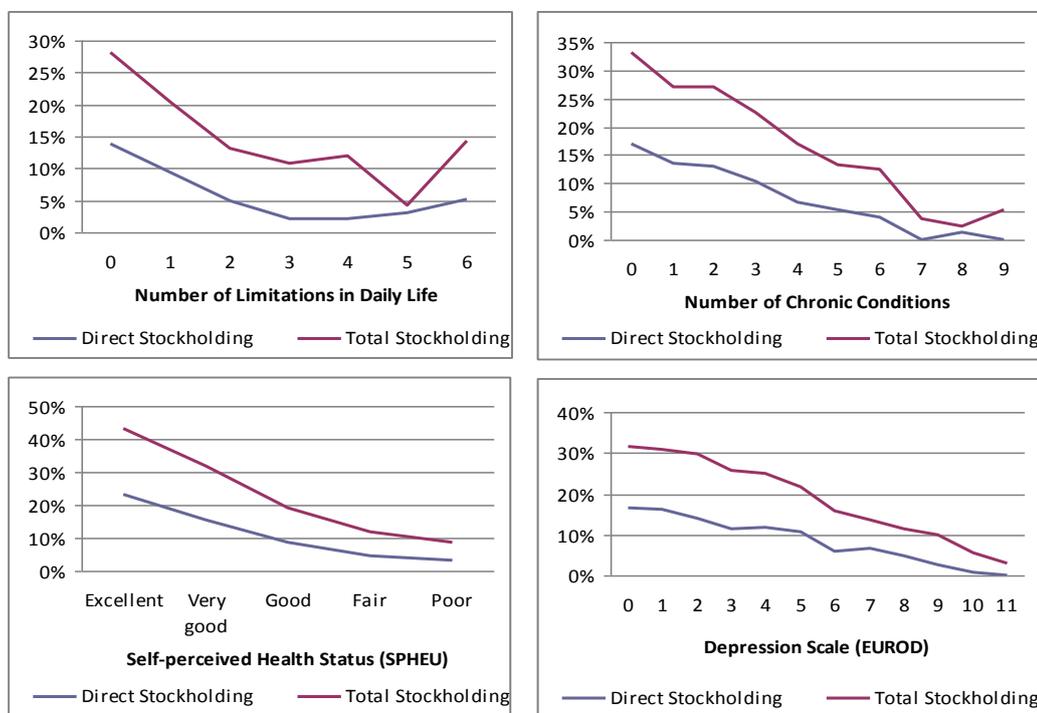
3. Stockownership and Risky Investment

SHARE respondents are asked about the amount of money they have invested in the following financial products: bank accounts, bonds, stocks, individual retirement accounts, contractual savings for housing, whole and term life insurance. As in Christelis, Jappelli and Padula (2010), we distinguish between direct stockownership and total stockownership, which includes stocks held directly plus stocks held through mutual funds and investment accounts (assuming that whoever holds mutual funds and retirement accounts has some stocks in them). In addition, we are also interested in providing some statements on the fraction of the portfolio attributed to such securities. In particular, we define the “risky” fraction of the investment portfolio as the sum of stocks, mutual funds and individual retirement accounts over the total gross financial wealth. Thirteen per cent of our sample invests directly in stocks, while more than the double (26.7 per cent) holds stocks either directly or through mutual funds and individual retirement accounts.

4. Unconditional Relationship Between Stock Market Participation and Health Status

Our purpose is to investigate the relationship between the investment variables we have just described (namely stockholding and risky investment) with health conditions identified by four variables (disabilities in ADL, chronic conditions, SPHEU and mental health). To get a first glance on the type of connection, in Figures 1 and 2 we plot stockholding and risky investment (respectively) as functions of the four proxies of health conditions. In general, the objective health seems to affect negatively both stockholding and the relative amount of risky investments, though the path is not continuous and some jumps are observable for a large number of limitations or chronic diseases (see Figures 1a and 1b). The effect of SPHEU, the self-reported health condition, is easier to see. The dependent variables in Figure 1c decrease in a monotonic way, suggesting that as soon as the individual reports a worse view of himself, he tends to leave the equity market and places resources in other different and “safer” forms of investments. While people reporting excellent health conditions hold 20 per cent of their resources in risky assets, individuals in poor health reduce this proportion to below 5 per cent. The effect is the same when we consider the mental health indicator EUROD. Figure 1d shows that the stronger the depression symptoms, the more investment participation drops.

Figure 1. Direct and total stock market participation by health conditions

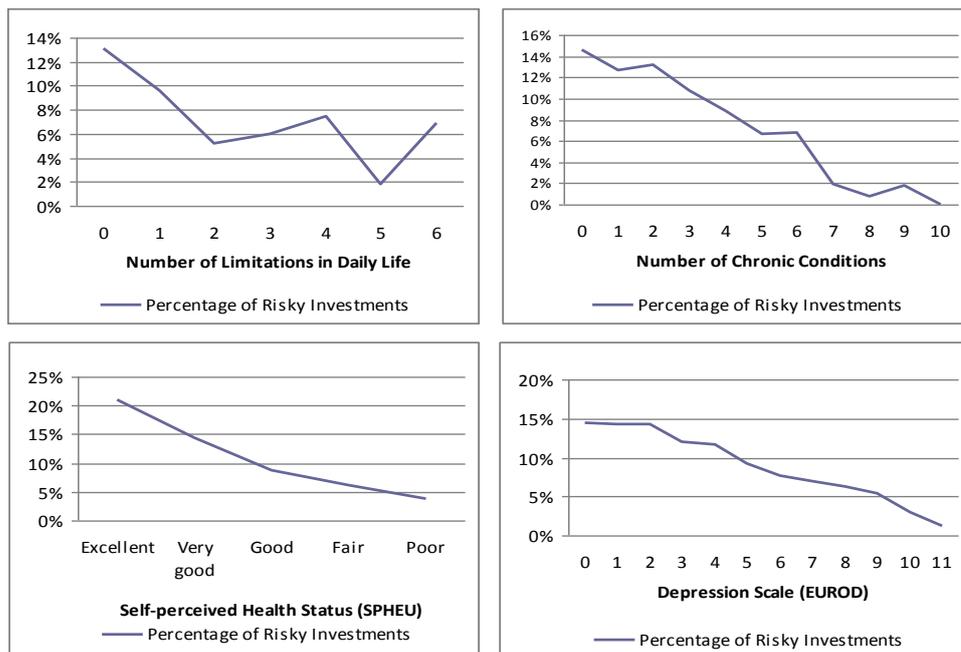


Note: 1a) number of limitation in ADL, 1b) number of chronic conditions, 1c) SPHEU, 1d) depression scale (EUROD).

5. Conditional Relationship between Stock Market Participation and Health Status

An unconditional analysis may hide the role of other explanatory variables affecting stockholding. For this reason, we estimate a regression model for each of our three dependent variables (direct stockholding, total stockholding, share of risky investment)² in which we consider stockholding on the left-hand side and health status plus a set of control variables on the right-hand side. In particular, we include the following control variables: age and its square, education level, number of household components, employment characteristics, indicators of household resources (gross financial income, real assets and household disposable income), a variable for social activities, a set of indicators for cognitive abilities, the expectations of leaving an inheritance and country dummies. The four proxies of health status (number of limitations in ADL, number of chronic conditions, SPHEU and mental health) are considered separately.

² We estimate a probit regression model when we consider direct or total stock holding as dependent variable, and a tobit model when we consider the percentage of risky investment.

Figure 2. Share of risky investment by health conditions

Note: 2a) number of limitation in ADL, 2b) number of chronic conditions, 2c) SPHEU, 2d) depression scale (EUROD).

That is, for each dependent variable, the health proxy is changed and the regression is run over again, according to which health explanatory variable is considered. Moreover, we consider the four health proxies simultaneously and, to overcome possible multicollinearity issues among health variables, we replace the original variables with the corresponding set of orthogonal variables, using a modified Gram-Schmidt procedure (Golub and Van Loan, 1996). This allows us to filter in part the effect of each proxy over the other.

Before presenting the results, we would like to mention some of the other variables included as control:

- Household gross income, gross financial wealth and real assets: in our framework, these key indicators of well-being and quality of life are particularly relevant, as wealth is a buffer against the financial risk of investment portfolios, as well as against the health risk that elderly increasingly face.³
- Education: we used a scale variable that denotes the highest level of education reported (levels 0-2 pre-primary, primary and lower secondary education, 3 upper secondary education and 4-6 post-secondary education of the international standard classification of education—ISCED).
- Cognitive abilities: these are defined in the neuro-psychological literature as an individual's capacity to use brain networks more efficiently. We included areas that seemed more relevant to financial planning: the ability to perform numerical operations, planning and executive functions, and memory.⁴
- Investor's horizon and bequest motives: our empirical analysis focuses on a sample of aged people for whom the shortening time horizon plays a key role in driving many of their choices and behaviours. For this reason we always check for age and squared age, in order to consider possible non linearities in the relationship between time horizon and the dependent variable. Moreover, since expectations of future events also matter in portfolio allocation, we included a variable that proxies the expectation of leaving a bequest.
- Social interactions: previous studies have noted that many individuals make economic decisions based on information received via social interaction. Therefore we included an indicator for social activities (sport, social club, participation in a political or community-related organisation).

³ The variables are adjusted for the purchasing power parity, using Germany in 2004 as basis.

⁴ The numeracy score is constructed basing on four questions requiring some mental calculations; the indicator fluency, corresponds to the number of animals that the respondent can list in exactly one minute of time; for the evaluation of memory has been asked to listen to a list of ten items and then to report after a while the recalled ones.

The whole set of health variables has negative effect both on stock market participation decision as well as on the percentage of risk carried by the portfolio. Between the two proxies of objective health status (ADL and chronic), statistically significant effects are found only for the indicator of chronic diseases with respect to direct stockholding. The results become highly significant when the health indicator is allowed to coincide with self-reported health conditions. Results show that SPHEU has a significantly negative coefficient for all the dependent variables, so that a negative view of personal health status pushes downwards equity investment and risk taking.

6. Disentangling Health Risk Transmission

In this section we try to disentangle the different channels through which health risk may explicate an effect on investment decision that consists of a disaffection from the equity market and a decrease in the level of assumed financial risk. As mentioned in Section 1, previous contributions identify three main channels: precautionary saving motive, pure risk aversion and shortening of the life span. Let us start with the latter. Bad health is perceived as a factor that shortens the individual time horizon, with the immediate consequence of setting up safer portfolio choices. In our specifications, we always control for age and age squared, and the results show that these variables are almost never significant, suggesting that age *per se* has no explanatory power on portfolio choice. To support this statement, we also split the sample into people aged less than 65 and people aged 65+. The negative relationship between health conditions and stockholding and between health conditions and the fraction of risky investment still holds. Again, the proxy of subjective health status is always statistically significant at 1 per cent, and the marginal effect for stock market participation is even slightly lower in absolute value for people aged 65+, evidence that reinforces our idea that the results are not driven by the older fraction of the population. Moreover, as already noticed, the expectation to leave a bequest can have effects on the perception of lifespan. For this reason, we also check in our specifications for the bequest motive, and the negative relation between stockholding and the proxies of health status still holds. Overall, the results seem to suggest that the shortening of the lifespan is not a channel of health risk transmission.

There are two other potential channels that need to be explored: the precautionary saving motive and pure risk aversion. In general, we observe that it is quite difficult to disentangle these two effects. Nevertheless, in order to test for precautionary saving motive, we have also performed the analysis on a sub-sample of financial respondents who own private health insurance (under the hypothesis that people would buy health insurance as a buffer against future expenditures due to health shocks) and check whether health status still affects investments.⁵ Preliminary results (obtained without taking into account potential endogeneity problems related to the choice of acquiring private health insurance) show that the negative relationship between health conditions and portfolio choice is confirmed. Even if individuals insure themselves against health shocks, it seems that this protection is not sufficient to overcome the suffering of health risk. In the same spirit, we then consider the payment at the household level of out-of-pocket (OOP) medical expenditures.⁶ We concentrate on households that have not faced any OOP in the previous year, in order to verify whether health risk still weakens financial market participation, even when there is no need for health care utilisation which can attack household savings. The results show that (see footnote 5) for the sub-sample of people who do not face any OOP medical payment the effect of health is still negative and significant for the subjective health indicator.

Summing up, on the basis of this analysis, we can state that precautionary saving and especially the shortening of the life span are not channels of health risk transmission in our sample. First, we find evidence that the negative relationship between health status and stockholding holds even controlling for proxies of the individual time horizon. Secondly, we do not find evidence that buying health insurance is sufficient for health risk coverage. The interpretation that we favour lies instead in the direct effect that health shocks have on individual risk aversion. Negative health shocks impact directly individual attitudes and, in particular, financial risk aversion is altered, namely augmented. Unavoidably, this leads to a revision of the investment portfolio composition with a larger amount of resources devoted to lower risk products.

⁵ These results are not reported but are available under request.

⁶ OOP includes non-refunded expenses for inpatient care, outpatient care, prescribed drugs and nursing homes sustained in the previous 12 months, with monetary values expressed in euro and adjusted by the purchasing power parity.

7. Conclusions

Using data from the Survey of Health, Aging and Retirement in Europe, we studied the relationship between health conditions and portfolio choice. We find that stockownership and the share of risky assets in the portfolio react always correlate negatively with deteriorating health conditions, even after controlling for a large set of individual characteristics. One of the major results is that the health variable that we find to be significantly and consistently negative across specifications is the self-perceived health status. While the literature has proposed different channels of health risk transmission, a further econometric investigation suggests that the negative relationship between health conditions and portfolio choice is mainly due to an increase in individual risk aversion, rather than a precautionary saving intent or the shortening of the lifespan. While our analysis suggests that we can be pretty confident in rejecting this latest channel, more work needs to be done to explore the precautionary saving motive. This will be the objective of our future research.

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Invited Article III

Public–Private Partnership Scenario in the Health Care System of Pakistan*

by F. Ahmed[†] and N. Nisar^{††}

Background

The concept of co-operation between public and private provision of health care was instituted in Pakistan in the national health policy in 1960 and started as a model of corporate social responsibility to serve the nation's health needs. Public–private partnerships (PPP), as they are now called, are a health sector reform to create long-term, task-oriented and formal relationships among the public and private sectors in sharing their core competency and resources. This includes some degree of joint decision-making and innovative interaction to provide sustainable improvements in the provision and enhanced utilisation of health care services and also to address emerging health challenges for the benefit of society. A core set of objectives of PPP in basic health services delivery relate to improving service provision such as coverage, quality and infrastructure, as well as raising the demand for health by the

* This article was initially published in *The Eastern Mediterranean Health Journal*, Vol. 16 No. 8, 2010.

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community. The 1973 Constitution of Pakistan, Article 38(d), guarantees that the state shall provide the basic necessities of life, including the provision of health care. Yet, the apparent priority given to national security over human development means that the government seems unable to fulfil its constitutional promise to bring reforms to the health sector of Pakistan. The provision of basic health services in the country is inadequate and is a major obstacle to human development. Pakistan is facing a double burden of disease. Not only is the country failing to overcome infectious diseases such as poliomyelitis that others have tackled, but it is also facing the challenge of chronic noncommunicable diseases. As far as health indicators are concerned the infant and maternal mortality rates for Pakistan are very high compared even with other developing countries, at around 100 per 1000 live births and 340 per 100,000 live births respectively.

Barriers to Public–Private Partnership

Privatisation policies in Pakistan remain largely unexamined and insensitive to the need for basic health services that are accessible, available, affordable and of acceptable quality. This could be due mainly to the downsizing of social capital and inadequate financial resources or to disparities in power and lack of trust between the public and private sectors that inhibit collaboration at the policy and operational level in the provision of health care in Pakistan. As a result, the health sector in Pakistan is far from developing a consistent form of interaction between the public and private sectors, and suffers from a persisting political polarisation along three major intersecting faultlines—bureaucrats, technocrats and the military—that have been evident in Pakistan since the partition of the Indian subcontinent in 1947. This in turn is reflected in a high burden of disease, lack of health care staff, staff absenteeism and poor access to health facilities for patients (United Nations Children’s Fund, 2001). According to the Pakistan National Health Policy 2001, primary health care in Pakistan is currently functioning mainly in the private sector through the contracting out of health services, which implies handing over un- and under-utilised government health facilities such as basic health units, rural health centres and hospitals to the private sector. This is supposed to provide support for awareness raising and the management of clinical and non-clinical services in the community (Ministry of Health, Government of Pakistan, 2001). This was implemented through a rural support programme.

Pilot Programmes

Pilot programmes were established in eight districts of Punjab in 2005. About 104 basic health units in one district, Rahim Yar Khan, were handed over to a large non-governmental organization (NGO) on a pilot initiative to provide primary health care services to overcome the inability of the health care services delivery system to tackle diseases at basic health units.

The World Bank has been a catalyst for such contracting out in the Rahim Yar Khan district. Services include providing funds and technical support. However, the Sustainable Development Policy Institute, in cooperation with the University of Birmingham in the United Kingdom, recently conducted a study and found that the PPP results in Rahim Yar Khan district were disappointing due to lack of a preventive approach, disparities in power, and other factors.

While the overall utilisation of facilities has increased, insufficient numbers of patients were attending basic health units. In this district—where the poorest of the poor are still socially excluded, live in inaccessible areas, lack confidence and information, and are unable to pay for services—the services provided remain un-utilised (Siegmann and Shaheen, 2006). The government of Pakistan has decided to scale up the programme to the national level but the benefits of this have not yet become apparent in the general population in terms of improved public health.

Examples of Public–Private Partnership

The goals of PPP are to create a financially sustainable system and provide capacity and management reform in the public–private sector that may lead to increased health care delivery and utilisation, preventing unintended outcomes of private sector growth in health, control health care costs and create improvements in the health status of society, thus facilitating socioeconomic development. In Pakistan there are some examples of successful public-private collaborations in health care provision:

- A mobile doctors programme run by a tobacco company since 1980 in the tobacco cultivation areas and at their factories as a part of their corporate social responsibility strategy (Pakistan Tobacco Company, 2005).

- National programmes for malaria, tuberculosis and HIV/AIDS control implemented through a collaboration of government and private health care providers, including the Ministry of Health and the GreenStar Network, the Asia Foundation and HealthNet International; the World Health Organization (WHO), the United Nations Development Programme (UNDP) and World Bank support all providers in the services; the Ministry of Finance, Government of Pakistan, subsidizes the insecticide-treated bednets.
- A public sector mother and child hospital in Shikarpur district in the Sindh province whose management is handed over to a private practitioner.
- The Health and Nutrition Development Society (HANDS), an NGO and Sindh government partnership providing primary health care services at basic health units in Karachi.
- The Aga Khan University Karachi, Pakistan, a private sector partnership with the Sindh Government to provide primary health care services in rural and urban slum communities for disease surveillance, vaccines and drug trials.
- Heartfile, an NGO in partnership with the government, the International Vaccine Institute (South Korea), WHO, Save the Children and United Nations Children's Fund (UNICEF), acting as the supporting agency in a policy development initiative to control non-communicable diseases.
- A Ministry of Population Welfare and United States Agency for International Development partnership that established a social marketing programme from the GreenStar Network in Pakistan to enhance contraceptive use.
- A private company that educates young mothers about healthy baby-care practices and teaches five to nine-year-old children about basic hygiene habits, as part of the company's marketing strategy (Procter and Gamble) (Siegmann *et al.*, 2006).

PPP are considered to be successful models of health reform in the health sector of other countries (Allen, 2001; Nayani *et al.*, 2006; Nikolic and Maikisch, 2006). So the challenge ahead is for Pakistan to facilitate the implementation of various components of health sector programmes, including establishing norms, tackling morality and accountability issues, building a legislative framework, defining operational strategies, as well as safeguarding the Consumer Protection Act to protect the interest of consumers.

The issues we are facing to facilitate implementation of partnerships in providing and encouraging the utilisation of health care services include a lack of appropriate monitoring and reporting mechanisms, a lack of clarity in policies and low efficiency of the private sector in taking care of the poorest sectors of society.

The research in the field of establishing effectiveness of PPP in providing and raising demand of health care services in the community in Pakistan is limited to rare cases. Furthermore, the data to promote health sector reform in Pakistan is unavailable or unpublished. PPP is a multidisciplinary and multi-sectoral approach, which needs significant institutional development, monitoring and evaluations systems. The government of Pakistan is committed to achieving the Millennium Development Goals for eradicating poverty, providing health and education facilities, ensuring gender equality and combating HIV by 2015 in partnership with WHO and the World Bank. To meet the challenges of globalisation and achieving a prosperous Pakistan in the 21st century we need to promote and practise PPP in providing health care services to improve the health status of our society.

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Summary of the 8th Geneva Association Health and Ageing Conference—Insurance and Dementia

by *Christophe Courbage**

On 14-15 November 2011, the 8th Health and Ageing conference of The Geneva Association took place in Toronto, Canada. The conference was co-organised with Sun Life Financial and addressed the topic of “Insurance and Dementia”. More than 50 participants originating mainly from Canada and the U.S. attended the conference. Most of the attendees came from insurance companies, but some also from universities, medical centres and other private companies.

The aim of the conference was to understand better the nature of dementia, its future cost and how insurance can help cover this risk. In particular, the conference addressed the medical, social and economic aspects of dementia, the challenges of dementia for insurers, and the development of the insurance market and products to cover financial risks linked to dementia.

Session 1: Medical and Social Aspects of Dementia

The first speaker, Dr. Mulsant from the University of Toronto, addressed the epidemiology of dementia. He first stressed that there was no perfect diagnostic test but rather diagnostic criteria for dementia. In particular, biomarkers are used to detect brain disease before symptoms appear. Then, Dr. Mulsant exposed the various risk factors of dementia, among which are older age, a lower level of education, positive family history of dementia, Down’s syndrome, stroke, head injury, smoking, major depression, and mild cognitive impairments. In terms of protective factors, he listed exercise, being married, use of statins and antihypertensives, and having a diet rich in antioxidants. In addition, some people do not develop memory loss despite having Alzheimer disease pathology in their brain. This seems to be the case when more reserves delay the onset of symptoms even when pathology is present. It might come from bigger brains, free of damage or other brain disease, and functional terms (e.g. a higher level of education). Finally, if dementia is more prevalent in developed countries, it is already affecting more people in developing countries. Most of the risk factors are the same and they are increasing around the globe (e.g., longer life expectancy, urbanisation, obesity, diabetes and hypertension).

The second speaker, Dr Cohen from the Toronto Memory Program, gave a presentation on anti-dementia drugs. Anti-dementia drugs are a small but important part of the treatment approach to Alzheimer disease (AD). The current approved drugs for AD are all neurotransmitter-based drugs. Two classes are approved by regulatory authorities worldwide, the cholinesterase inhibitors and the glutamate modulator. They offer modest symptomatic benefit, good tolerability and are under-prescribed. Drugs also exist for treatment of the psychiatric symptoms of dementia such as depression, agitation, paranoia and sleep disturbance. Many choices of antidepressants, anxiolytics and neuroleptics are available on the market. However, few are tested in those with AD, and their efficacy is not known. In addition, some present significant side effects. It is worth stressing that pharmacological treatments are still under development and great hope exists for better symptomatic treatments and for drugs that will alter the progressive course of AD. With regards to disease-modifying approaches, anti-amyloid drugs are the leading class and will yield important trial read-outs in mid 2012. There is no doubt that approval of a disease-modifying drug in AD will change the landscape dramatically.

The third speaker, John Evans from SCOR, addressed the modern diagnostic methods and therapeutic prospects in AD. While the major pathological findings have been known for over a century, it is surprising that there is still no cure available. One explanation is that the amount of research funding is very low. Hopefully, we seem to be witnessing the dawn of a new era and calls for actions are being launched in Europe to prioritise dementia research. There is a wish to develop a European charter to increase the participation of people with dementia in clinical trials, share best practice and examine current obstacles. Earlier diagnosis of Alzheimer’s disease may be possible using new diagnostic criteria. This could lead to better clinical results with presently available drugs. In the future, substances

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that stop or reverse the disease process will become available. For the present, global management with combinations of palliative drugs affecting neurotransmitter concentrations may stabilise some patients.

Finally, Prof. Richard Schulz from the University of Pittsburgh, closed the session by addressing the issue of caregivers of dementia patients. The number of dementia caregivers in the U.S. was estimated to be 15 million in 2011 providing 17 billion hours of unpaid care at a value of US\$202 billion. Caregivers are involved in various types of help, including assistance with activities of daily living, medication management, behaviour management problems, care coordination, paperwork, companionship and emotional support. Caregiving can entail chronic stress exposure, and generates physical and psychological strain with little opportunity for adaptation. It also generates secondary stress in multiple life domains. Looking at the future, the need and demand for care will increase. This is explained by an ageing of the population, an increased number of persons with cognitive impairment, infant and childhood survival to old age, and an increase in disabling health conditions such as obesity. At the same time, the availability of informal and formal support will decline due to fewer children of baby-boomers, higher labour force participation of women, fragmented and geographically dispersed families, costs of formal care being too high and unsustainable, and a shortfall of health care professionals with geriatric expertise.

Session 2: Economic Aspects of Dementia

The first speaker, Anders Gustavson from Quantify Research, a consultancy company specialising in health economics and outcome research, spoke about the global economic burden of dementia. The economic burden of dementia is composed of direct medical costs (care and pharmaceuticals), direct non-medical costs (transportation and home-delivered meals), indirect costs (sick leave, early retirement, decreased productivity) and intangible costs (reductions in quality of life and premature death). The cost of dementia worldwide is estimated at US\$604 billion in 2010, where 70 per cent occurs in Western Europe and North America and 42 per cent represents informal care costs. Yet, there is still uncertainty about how to value informal care since various methods exist. The human capital approach values informal care in terms of foregone production. The replacement cost approach values informal care in terms of a professional carer's cost. Finally, the stated preference approach values informal care in terms of a caregiver's own perceptions of the value of their time.

The second speaker of this session was Johan Hjertqvist who made a presentation on the project of the Dementia Alzheimer Index. In the field of dementia/Alzheimer there is poor documentation and implementation of best practice from the medical point of view. Further, little is known about the societal conditions: who is engaged in caring for demented people, what is the situation of family carers, are there reimbursement and housing facilities? Are there insurance, pensions, etc., to support people with dementia illness? The Dementia Alzheimer Index would therefore not only form indicators expressing key qualities around these diseases, but would also provide a comprehensive, easily understandable benchmark of the situation in each country included in the index.

Session 3: Challenges of Dementia for Insurers

The first speaker of the session was Michaela Grimm from Allianz, who gave a presentation on the challenges of dementia for an ageing society. She first reminded the assembly of the various trends of ageing and the risk factors of dementia (head injury, stroke, high blood pressure, heart disease, diabetes, family history and age). The majority of people with dementia live at home. The informal caregivers are mainly the children or children-in-law, and spouses. They live mainly in the same household and are women. The average age of caring family members is 55 years. There will be fewer informal care givers available. Due to the ageing of the workforce, the number of employees with an older family member in need of care will rise. All these trends create a growing demand for private health and long-term care (LTC) insurance and assistance.

The second speaker, Marc Cohen from LifePlans, gave a presentation on screening for dementia and the impact on mortality and morbidity in LTC insurance. He first reminded the audience that there is a need for cognitive screening to fight against the growing risk of anti-selection, but also because dementia is one of the leading and most costly claim causes. About 25 per cent of all claims occurring within the first five years of issue refer to dementia. Marc recalled the history of cognitive screening. Prior to 1990, there was little to no cognitive screening occurring. In the early 1990s, two methods were

used by the LTC insurance industry. The first was the Short Portable Mental Status Questionnaire (SPMSQ) which was designed to identify current dementia status. The second, the Delayed Word Recall (DWR) was designed to be predictive of future (1-2 years) dementia status. In the late 1990s, a variant of the DWR, the Minnesota Cognitive Acuity Screen, was introduced to identify the presence of dementia and its early symptoms. Finally, in 2004, the Enhanced Mental Skills Test was introduced to identify Mild Cognitive Impairment and used exclusively as an underwriting screen. Each generation in cognitive testing leads to improved identification of earlier stages of cognitive loss. Experience in the LTC insurance industry suggests that screens for cognitive impairment can be administered successfully as part of the underwriting process. Widespread market acceptance suggests that such screens could be applied in other markets such as older age life insurance and disability insurance.

Session 4: Insurability of Dementia and Insurance Market

The first speaker was Chris Ball, a consultant medical officer from Gen Re LifeHealth, who gave a presentation on the potential for creating a market for dementia insurance. A multifaceted approach to solving the long-term problem is required so that appropriate financial products and advice can take root and support those needing care. Changing the funding model must be considered as part of a wider agenda to raise awareness and engage consumers about LTC. Consumer awareness about LTC is currently very low with few understanding how much it costs or where to go for advice. This increases the likelihood that people will not find the right funding solution to meet their expectations. A simpler funding model combined with a government-led information campaign would be an important step forward in this regard.

The second speaker, Philip Smalley from RGA International Corporation, gave a presentation on insurability and insurance products covering dementia. Dementia is commonly undiagnosed. There is lower risk in mild cases at older ages. There is definitely a need to design new products to meet the needs of the elderly and to cover dementia risk. Insurance can help to cover the risks linked to dementia and various products are already offered on the market, including life insurance, critical illness, LTC insurance, enhanced annuities and impaired annuities. In the U.S. there has been a move away from lifetime benefits, with tighter underwriting and an increased focus on cognitive functions. There is a more active claims administration. There are a series of prognosticating factors such as age, severity of dementia, rate of deterioration, co-morbidities, low weight, swallowing problems, pneumonia, falls and hip fracture.

The last speaker, Judy Beamish from Sun Life Financial, gave a presentation on the future of dementia. In that respect she tried to answer a series of questions. Will there be major changes to age-adjusted dementia incidence? In which direction? Can we prevent or delay dementia? Could current trends lead to more or earlier dementia? How will new information impact selection or anti-selection for dementia products? If environmental factors could account for up to 50 per cent of cases of AD dementia, the other risk factors are diabetes/metabolic syndrome, increased weight mid-life, vascular risk factors, elevated homocysteine, hearing loss, depression, head injury, tooth loss. There are also various factors that decrease risk such as physical activity, Mediterranean diet, moderate alcohol and coffee. The potential for age-adjusted dementia is likely to grow due to increasing obesity and diabetes at young ages and sedentary lifestyles. This increase in dementia is theoretically preventable. However, dementia prevention needs to begin in childhood not at age 65. Insurers need to monitor age-adjusted prevalence of risk factors and predict future trends in age-adjusted incidence. Indeed, potential for anti-selection is significant for dementia products, as risk is predictable based on family history and risk factors/prodromal symptoms.

All in all this conference proved to be very successful and it undeniably offered a broad view of the issues at stake. It seems clear that insurance can play an essential role in covering risks linked to dementia, and it seems fortunate that its role will grow in the future.



9th Geneva Association Health and Ageing Conference

The Geneva Association is pleased to announce the 9th Geneva Association Health & Ageing Conference on:

Genetics and Insurance

**8-9 November 2012
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co-organised with Länsförsäkringar AB

With the sequencing of the human genome, a map of all the human genes has been completed. Not only will it provide clues to the understanding of human biology, but most importantly it can revolutionise the diagnosis, treatment and even prevention of a number of diseases. In particular, gene therapy and pharmacogenetics open new and promising perspectives on curing patients. Genetic testing makes it possible to predict how likely a person is to develop a particular disease and offer access to personalised prevention.

At the same time, the availability of genetic information raises many ethical, legal and social concerns and, in particular, the issue of genetic differentiation or discrimination. This is particularly relevant for the insurance industry as genetic information can be a valuable tool in risk classification, especially for health and life insurers. Risk classification is the basis of insurance operations as it allows insurers to fight against adverse selection, and it improves their ability to predict expected loss and to set premiums accordingly. The use of genetic information by insurers generates controversy as it is widely regarded as negative for consumers on the grounds of fears of discrimination, privacy issues, loss of employment and confidentiality.

The aim of the conference is to understand better the nature of genetics and how it can influence insurance, its function and its role in covering risks. In particular, it will address, but will not be limited to, the following topics:

- Medical aspects of modern genetics (gene therapy, gene technology, pharmacogenetics, genetic testing, personalised prevention)
- Legislative aspects of using genetic information by insurers
- The role of genetics in underwriting
- Genetics and risk classification, social justice versus actuarial fairness
- Ethical issues linked to the use of genetic information
- Public perception and awareness of genetic information
- Liability risks linked to the use of genetics

Participants will come from insurance and reinsurance companies, universities and related institutions. There is no conference fee. The conference will only comprise a limited number of participants to guarantee an active exchange of opinions and animated discussions.

Should you be interested in contributing to or participating in this conference, please contact christophe_courbage@genevaassociation.org.

Recent Geneva Association Publications

Financing Long-Term Care in Europe— Institutions, Markets and Models

Edited by Joan Costa-Font and Christophe Courbage

Published by Palgrave Macmillan

2012

The ageing of the European population brings new financial risks that call for state, market and societal responses. In 2011, the first baby-boom generation is turning 65, and forecasts predict that the size of the old-age population in need of long-term care will double in the next 50 years in Europe. However, how different countries are responding to the challenge of financing long-term care is still a question open to further examination, including the role of market development, changing intergenerational contracts and especially the constraints of state intervention.

Growing long-term care needs in several European countries as well as the reshaping of traditional modes of caregiving further increase the pressure for sustainable funding of more comprehensive long-term care systems. This book examines different forms of partnership and the potential cooperation of state, market and societal stakeholders. It not only offers a full understanding of the institutional responses and mechanisms in place for financing old age but also provides a deep analysis of both the demand and supply factors underpinning the development of financial instruments to cover long-term care needs in Europe.

Composed of 16 in-depth pieces from the main experts in the field (including leading academics, the OECD, Swiss Re and civil servants), this book draws on past meetings and research The Geneva Association has organised on the topic of LTC insurance. It addresses the different forms of LTC financing, whether this is public coverage, insurance markets, family and housing as self-insurance for LTC, and is illustrated in light of the main European countries.

Further information at <http://www.palgrave.com/products/title.aspx?PID=406106>

The Geneva Association is pleased to announce The Geneva Report °5

Extreme events and insurance: 2011 annus horribilis

Edited by Christophe Courbage and Walter Stahel

March 2012

This report comprises nine essays by leading insurance academics, economists and insurers that underline the significant importance of risk adaptation and management measures in developing physical and economic resilience to natural catastrophes, including the important role of insurance in such mechanisms. It also provides the implicit “lessons learned” from the catastrophes that will enable better risk assessment and adaptation to similar risks in future.

2011 was an unusual year with regards to the regional distribution of events and the proportion of geological activity in the total number of events but one consistent theme is the global need for adaptation and risk reduction measures. *Extreme events and insurance: 2011 annus horribilis* highlights how a clear and transparent allocation of risks and responsibilities among public authorities, private firms, including insurers, and individuals is a key component of any comprehensive disaster risk management strategy.

A full copy of the report is available on The Geneva Association website:

[http://www.genevaassociation.org/PDF/Geneva_Reports/GA-2012-Geneva_report\[5\].pdf](http://www.genevaassociation.org/PDF/Geneva_Reports/GA-2012-Geneva_report[5].pdf)

Insurance and Resolution in light of the Systemic Risk Debate

A contribution to the financial stability discussion on Insurance

Edited by Daniel Haefeli and Patrick M. Liedtke

February 2012

Company failures are at the heart of the systemic risk discussions and are occupying the minds of many regulators, supervisors and policymakers the world over. Much of the discussion is centred around banking and the most recent experience during the financial crisis. Experts realise how much damage failures in banking often create and how quickly they can generate a systemic threat and consequently an immediate need for substantial and very expensive government interventions. The picture in insurance is much less clear to many of those experts. And while historically no insurance demands special attention and careful analysis: How do these processes work specifically in insurance and how do they relate to the systemic risk discussions and possible new financial services regulation?

Building on the first three reports of The Geneva Association on financial stability, this report examines the existing features of recovery and resolution mechanisms in insurance and their relation to ongoing international supervisory and regulatory discussions on systemic risks. It also proposes recommendations for possible measures to increase the existing resilience of financial systems.

The report is available at http://www.genevaassociation.org/PDF/BookandMonographs/GA2012-Insurance_and_Resolution_in_Light_of_the_Systemic_Risk_Debate.pdf

The Geneva Association is pleased to announce the forthcoming issue of

The Geneva Papers on Risk and Insurance—Issues and Practice

Special Issue on Climate Risk and Insurance

Guest Editor: Reimund Schwarze

April 2012

- Editorial—Insurance Law and Economics Research for Natural Hazard Management in a Changing Climate, *by Reimund Schwarze*
- Explaining the Failure to Insure Catastrophic Risks, *by Carolyn Kousky and Roger Cooke*
- Disasters and Decentralisation, *by Jason Scott Johnston*
- A Comparative Study of Public—Private Catastrophe Insurance Systems: Lessons from Current Practices, *by Youbaraj Paudel*
- Climate Change, Weather Insurance Design and Hedging Effectiveness, *by Ines Kapphan, Pierluigi Calanca and Annelie Holzkaemper*
- What Role for “Long-term Insurance” in Adaptation? An Analysis of the Prospects for and Pricing of Multi-year Insurance Contracts, *by Trevor Maynard and Nicola Ranger*
- Risk and Insurability of Storm Damages to Residential Buildings in Austria, *by Franz Prettenthaler, Hansjörg Albrecher, Judith Köberl and Dominik Kortschak*
- The Impact of Climate Change on Precipitation-related Insurance Risk: A Study of the Effect of Future Scenarios on Residential Buildings in Norway, *by Ida Scheel and Mikkel Hinnerichsen*
- Proposal for a National Earthquake Insurance Programme for Greece, *by Aglaia Petseti and Milton Nektarios*

The Research Programme on Health and Ageing

The Health and Ageing research programme of The Geneva Association seeks to bring together analyses, studies, facts and figures linked to issues in health provision and the role of insurance, with an emphasis on the changing demographic structure whereby the population over 60 years old largely exceeds that of other groups. The key is to test new and promising ideas, linking them to related works and initiatives in the health sector and to try to find solutions for the future financing of healthcare.

We are particularly interested in the impact of an ageing population in health insurance systems; the development of insurance for long-term care risk; the effect of technology on health insurance; development of health care systems and the capitalisation issue; the interaction of public and private systems in health provision; performance of health systems; health issues for an ageing population in the workplace.

The Geneva Association

The Geneva Association is the leading international insurance think tank for strategically important insurance and risk management issues.

The Geneva Association identifies fundamental trends and strategic issues where insurance plays a substantial role or which influence the insurance sector. Through the development of research programmes, regular publications and the organisation of international meetings, The Geneva Association serves as a catalyst for progress in the understanding of risk and insurance matters and acts as an information creator and disseminator. It is the leading voice of the largest insurance groups worldwide in the dialogue with international institutions. In parallel, it advances—in economic and cultural terms—the development and application of risk management and the understanding of uncertainty in the modern economy.

The Geneva Association membership comprises a statutory maximum of 90 Chief Executive Officers (CEOs) from the world's top insurance and reinsurance companies. It organises international expert networks and manages discussion platforms for senior insurance executives and specialists as well as policy-makers, regulators and multilateral organisations. The Geneva Association's annual General Assembly is the most prestigious gathering of leading insurance CEOs worldwide.

Established in 1973, The Geneva Association, officially the "International Association for the Study of Insurance Economics", is based in Geneva, Switzerland and is a non-profit organisation funded by its members.

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The Geneva Association Newsletter—Health and Ageing, N° 26, April 2012

This Newsletter for Health and Ageing is linked to the Research Programme on Health and Ageing and is published biannually in April and October. For information and suggestions, please write to the Editor at the Geneva office. To subscribe to the Newsletter (hard copy of electronic version) please go to:

http://www.genevaassociation.org/Home/Publications_Request.aspx.

Printed copies: 1,100 copies. Unrestricted circulation. Free of charge.

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Download the electronic version from: www.genevaassociation.org

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ISSN: 1605-8283

Forthcoming Conferences Organised and/or Sponsored by The Geneva Association

2012

April

12-13	The Hague	10th ART of CROs, hosted by Aegon (<i>CROs of member companies only</i>)
19	Washington D.C.	12th Geneva Association Associates Meeting , hosted by Prudential Financial (<i>Associates only</i>)

May

29	London	M.O.R.E. 26 on Mapping and Modelling Risks and Opportunities (MMR+O 3) , hosted by Risk Management Services
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June

6-9	Washington D.C.	39th General Assembly of The Geneva Association (<i>members only</i>)
17-20	Rio de Janeiro	The Geneva Association/IIS Research Award Partnership

September

17-19	Palma de Mallorca	39th Seminar of the European Group of Risk and Insurance Economists (EGRIE)
<i>tba</i>	Manila	4th CR+I Seminar of The Geneva Association

November

5-6	Paris	9th Annual Liability Regimes Conference on “Evolving Litigation Tactics and Procedures Affecting Liability for Insurers” , hosted by SCOR
8-9	Stockholm	9th Health & Ageing Conference of The Geneva Association on Genetics and Insurance , co-organised by Länsförsäkringar AB
28-29	Munich	8th CRO Assembly , jointly organised with Munich Re

December

10-11	London	9th International Insurance and Finance Seminar of The Geneva Association , hosted by Lloyd's
<i>tba</i>	Geneva	The Four Pillars: The Next 25 Years