Adverse Selection, Genetic Testing and Life Insurance — Lessons from Health Insurance in Australia

James Butler

The use of predictive genetic tests in setting premiums for life insurance is a controversial issue. Critics argue inter alia that this is ‘discriminatory’, that it will lead to the creation of a ‘genetic underclass’, and that it can lead to individuals being coerced to obtain information that they might not otherwise wish to have. Advocates argue that it is necessary in order to avoid creating serious asymmetric information in the insurance industry with consequent adverse selection.

This paper is concerned with the adverse selection argument. Is there any empirical support for the concern that prohibiting the use of genetic test results in life insurance will lead to an adverse selection problem? The main argument of this paper is that there is indeed empirical support for that concern. The empirical support comes from a consideration of Australia’s experience with private health insurance, an insurance market where community rating regulations precluded the use of any information on health risk in setting premiums for many years. It is argued that these arrangements have given rise to a serious problem of regulation-induced adverse selection in private health insurance, resulting in a long-term downward spiral in the proportion of the population covered by private health insurance. It is concluded that prohibiting the use of genetic test results in life insurance will expose the industry to the same problem that has characterised private health insurance in Australia.

Given the theme of the paper, a good portion of it (the next three sections) is devoted to substantiating the proposition that adverse selection has been, and continues to be, a serious problem in private health insurance in Australia. The next section provides some background information on the private health insurance industry, the regulations under which it operates, and the proportion of the population covered over the last 25 years. The following section summarises the important policy changes that have taken place with respect to private health insurance over the last five years and their effect on coverage. The fourth section considers community rating and consequent adverse selection in private health insurance, arguing that this has been the fundamental cause of the long-term decline in coverage. Further, it is argued that the recent policy initiatives have failed to address this cause, and that recent evidence points to a continuing problem of declining coverage associated with adverse selection. The fifth section...

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then draws out the implications of this analysis for the role (or lack thereof) of genetic testing in health insurance and life insurance. The paper closes with a summary of the main conclusions.

**Private Health Insurance**

Private health insurance has been an important feature of health care financing arrangements in Australia for many years, albeit of lesser importance since the introduction of the compulsory, tax-financed, publicly provided national health insurance scheme (Medicare) in 1984. In 2000-01, expenditures on health services by private health insurers accounted for 7.2 per cent of total health expenditure (Australian Institute of Health and Welfare, 2002:Tables 12 and 19).

Policies are of two broad types — hospital and ancillary. Hospital policies provide cover against the cost of hospital services and a portion of the costs of medical services associated with an inpatient admission as a private patient in a public or private hospital. Ancillary policies cover a range of other health care items such as services provided by allied health professionals, dental services and optical items. Of the total benefits paid by private health insurers, around 70 per cent are hospital benefits and the remainder are ancillary benefits. Within ancillary benefits, dental services and optical items (spectacles) together account for nearly 70 per cent of total benefits paid (Private Health Insurance Administration Council, 2002).

The private health insurance industry in Australia is heavily regulated. A detailed discussion of the regulatory environment has been provided by the Industry Commission as part of its review of private health insurance in 1997 (Industry Commission, 1997:Ch.3). Of most importance to the present paper are the community rating regulations and associated reinsurance arrangements, and the ‘common carrier’ obligation imposed on private health insurers. The key features of these regulations as they pertained until recently were summarised by the Industry Commission (1997:33) as follows:

- Under the National Health Act, funds must accept all applicants, within certain membership categories. In setting premiums, or paying benefits, funds cannot discriminate (in relation to a contributor or his/her dependants) on the basis of health status, age, race, sex, sexuality, use of hospital or medical services, or general claiming history.

- The community rating requirement applies at the level of the State, so interstate variation in premiums is possible. For many years, the requirement was also interpreted to mean that a uniform family premium should be charged regardless of the numbers of persons in the family unit. The practical implementation of this interpretation resulted in premiums for family policies being double those for single policies.

The interpretation of the community rating requirement was changed with effect from 1 October 1996. The two membership categories (single, married)
were replaced by four categories (single, couple, single parent family, and family). The requirement that the family premium be twice the single premium was removed, and no relativities between premiums for the four categories of membership are now specified. The requirement that all tables be offered to all categories of membership has been abolished.

The introduction of lifetime community rating in 2000 also resulted in a partial relaxation of the community rating requirements, allowing private health insurers to introduce some degree of risk discrimination in setting premiums according to the age at entry into the fund and the number of years of continuous membership of any fund. This policy change will be discussed further below.

Community rating is underpinned by reinsurance arrangements that apply to the hospital claims of people aged 65 years and over, and those with more than 35 days of hospitalisation in any one year. These arrangements redistribute funds between insurers in favour of those with above average claims for people in the specified categories. As will be argued more fully later in this paper, community rating has resulted in private health funds being left with an increasingly adverse selection of risks. The argument is that younger, healthier people have been dropping their cover relative to older persons, so that older persons are accounting for an increasing proportion of those insured. In a bizarre twist, the reinsurance arrangements in place since 1989 effectively over-compensated insurers with above average claims from the elderly and chronically ill, thus providing a financial incentive for funds to recruit from these groups even though, from an industry perspective, this exacerbated the adverse selection problem. This perverse incentive was removed on 1 January 1995 (Industry Commission 1997:Appendix D).

The percentage of the Australian population covered by private health insurance has been characterised by a declining trend over the last 25 years (see Figure 1). This trend was evident even prior to the introduction of the national health insurance scheme Medicare in 1984. Over the four year period from December 1976 to December 1980, coverage dropped from 66.0 to 55.8 per cent, a drop of 10 percentage points or an average of 2.5 percentage points per year. The trend was interrupted by the introduction of tax subsidies for private health insurance in 1981, but resumed again in 1983. Not surprisingly, the introduction of Medicare in 1984 caused an acceleration in the decline in coverage in that year but after this effect had passed through, the long-term decline resumed. A series of policy initiatives commencing in 1997 and culminating with the introduction of lifetime community rating in 2000 caused a major increase in coverage in 2000 but a declining trend has again emerged since then.

**Recent Policy Changes**

Commencing in 1997, a number of policy changes were introduced in an attempt to counter the long-term decline in private health insurance coverage. The Private Health Insurance Incentives Scheme (PHIIS) came into effect on 1 July 1997 and provided subsidies for low-income individuals and families who purchased private
health insurance. At the same time, a financial penalty in the form of a Medicare levy surcharge of one per cent of taxable income was introduced for high-income individuals and families who did not purchase private health insurance.

Figure 1: Proportion of the Population Covered by a Hospital Insurance Table with a Private Health Fund, Australia, December 1976 to June 2002

As is evident from Figure 1, the PHIIS had little effect in terms of arresting the long-term decline in the proportion of the Australian population covered by private health insurance. This led to an enhancement of the subsidy component of the scheme with effect from 1 January 1999. The original subsidies, which were available only to low income individuals and families, were replaced by a rebate equal to 30 per cent of the premium for any eligible policy available to all who purchased private health insurance. This policy does appear to have arrested the decline, with an increase in coverage occurring through 1999.

On 29 September 1999, a third policy initiative — lifetime community rating — was announced with effect from 1 July 2000. Following implementation, this policy resulted in an increase in the base premium of two per cent for each year
that the age at first entry into private health insurance exceeded 30 years, that is, an age penalty was applied to the premium for those aged over 30 years and joining a private health fund for the first time. The age penalty was capped at 70 per cent which is the penalty applying to a person who first joins a fund at age 65 years. A more detailed discussion of the lifetime community rating policy and the other policy initiatives introduced since 1997 can be found in Butler (2002).

The prospect of paying premium increases of up to 70 per cent if not privately insured by 1 July 2000 clearly had a major effect on private health insurance coverage which grew rapidly over the first half of 2000 and subsequently peaked in the September quarter 2000 (see Figure 1). The continued growth in membership into the September quarter reflects an extension of the effect date of lifetime community rating from 1 July 2000 to 15 July 2000 consequent to the large increase in demand for coverage. As membership statistics are published quarterly, the full impact of the policy must be observed from the September quarter 2000 statistics.

The 30 per cent rebate for private health insurance premiums coupled with lifetime community rating resulted in an increase in private health insurance coverage from 30.1 per cent in the December quarter 1998 to 45.8 per cent in the September quarter 2000 — an increase of 15.7 percentage points or a 52 per cent increase in coverage. Several estimates of the quantitative impact of the 30 per cent rebate component of these two policies on coverage have appeared. Butler (2002) argues that most of the increase in coverage from the December quarter 1998 to the March 2000 quarter (1.2 percentage points, or a 7 per cent increase in coverage) — and also, perhaps, some of the increase which occurred even after March 2000 — can be attributed to the 30 per cent rebate. While lifetime community rating was announced in September 1999, the main promotional activities concerning the policy were concentrated in the March and June quarters 2000. Frech, Hopkins and MacDonald (2002) argue that the effect of the policy should be confined to 1999 but that the increase in coverage on account of the 30 per cent rebate should be calculated with respect to what coverage would have been at the end of 1999 in the absence of the policy (as opposed to what coverage actually was at the end of 1998). On this basis, they estimate that the 30 per cent rebate gave rise to an 11 per cent increase in coverage. Finally, in response to a question in Parliament regarding the estimated effect of the rebate, the Prime Minister indicated that coverage was expected to increase to 33 per cent (Commonwealth of Australia, 1998:624). This suggests a 2.9 percentage point increase, or a 9.6 per cent increase, in coverage.

Taken together, these estimates suggest that the 30 per cent rebate gave rise to an increase in coverage of between 7 per cent and 11 per cent. Given the overall increase in coverage of 52 per cent, this implies that lifetime community rating was responsible for at least a 40 per cent increase in coverage and hence accounted for the bulk of the increase in coverage between December 1998 and September 2000.

These estimates of the relative quantitative effects of the two policies are all based on the assumption that such effects are independent and additive, that is,
that there is no interaction effect between the policies. It is possible that such an interaction exists, in which case the effect of lifetime community rating may also depend upon the level of the rebate (subsidy) available. However, it is not possible to produce empirical evidence of this based upon observed buying behaviour, as a state of the world in which lifetime community rating exists in the absence of a subsidy has not been observed.

Community Rating and Adverse Selection

In the context of the present paper, the importance of the long-term decline in private health insurance coverage, and the policies introduced since 1997 to ameliorate that decline, lies in the extent to which adverse selection has been a cause of the decline and the extent to which subsequent policies have addressed the causes of that adverse selection. Community rating can lead to regulation-induced adverse selection because it precludes health insurers from discriminating on the basis of health risk. A uniform premium for any given policy will make that policy more attractive to high-risk individuals and less attractive to low-risk individuals. Low risk individuals therefore have an incentive not to purchase the policy (or to stop purchasing the policy if they are presently purchasing it). The converse applies to high-risk individuals. The resulting increase in the average level of risk in the insured pool leads to an increase in the community-rated premium, making the policy even more unattractive to low risk individuals. In this way, an adverse selection spiral can develop characterised by rising premiums and declining coverage.

Using age as a proxy for health risk, there is no doubt that the risk composition of the privately insured hospital pool shifted towards higher risk persons during the 1990s. In the September quarter 1989, 9.9 per cent of those covered by a hospital table were aged 65 years or over. This proportion increased steadily during the 1990s, reaching 14.9 per cent in the December quarter 1998 (PHIAC A Reports, various years). There is also no doubt that this shift in the age composition reflects more than just ‘pure ageing’ of the insured pool. Using population estimates from the Australian Bureau of Statistics (ABS), at June 1989 the proportion of the total population aged 65+ was 11.0 per cent. By June 1998 this had increased to only 12.2 per cent, indicating that the shift in the age composition of the insured pool towards persons aged 65+ years was much greater than the corresponding shift in the age distribution of the underlying population.

The argument that community rating provided strong economic incentives for this shift in risk distribution is supported by the age distribution of hospital benefits paid under private health insurance. Figure 2 shows the per capita hospital benefits paid in 2001 by five-year age group and sex, illustrating clearly the positive gradient with age for both sexes. For persons under age 50, the per capita benefits are for the most part well under $500 per year. For persons aged 70 and over, the benefits are well over $1,500 per year. Community rating, at least prior to the introduction of lifetime community rating in 2000, resulted in premiums that were uniform with respect to age. Such a premium structure
provides a powerful economic incentive for older persons to purchase private health insurance while at the same time providing an equally powerful economic disincentive for younger persons to purchase cover.

Lifetime community rating introduced an age gradient into private health insurance premiums for those first joining a fund after the implementation date in July 2000. The importance of this policy is that, to the extent that age is a proxy for health risk, it introduced a degree of risk discrimination into premiums for private health insurance. The success of this policy in stimulating uptake of private health insurance was noted above. This early success suggested that the policy may have addressed the problem of a complete absence of risk rating in premium setting and the attendant problem of adverse selection. Many of those who purchased private health insurance in the run-up to the implementation of lifetime community rating were in younger age groups, providing a much needed influx of lower risk individuals into the insured pool. Between December 1999 and September 2000, the average age of those covered by a hospital table dropped from 39.4 years to 37.2 years (PHIAC, 2002).

**Figure 2: Hospital Benefits per Person covered by Private Health Insurance, by Age and Sex, Australia 2001**

Source: PHIAC (2002)
However, while lifetime community rating did introduce some degree of risk discrimination into premiums for private health insurance, the degree of risk discrimination so introduced was much less than complete. The highest premium for any given policy under lifetime community rating is 1.7 times the lowest premium, given the two per cent per year age penalty applying between ages 30 and 65. Using benefits data for 2001 as shown in Figure 2, the per capita benefits for persons aged 65+ years in that year were $460 compared with $36 for persons up to age 30 years, that is, the average per capita benefits for those aged 65+ years were 12.8 times greater than for those aged 0-29 years. Hence, despite the introduction of lifetime community rating, there remains considerable cross-subsidisation between younger and older individuals in the privately insured pool.

Given this continued cross-subsidisation, it would not be surprising to find that adverse selection again becomes a problem for the industry in the future. Indeed, in the December quarter 2000, the first full quarter following the implementation of lifetime community rating, the total number of persons covered by private health insurance began to decline again. The decline in numbers was concentrated in persons aged less than 65 years, while the number of persons aged 65 years and over actually grew.

Table 1: Percentage Changes in Numbers Covered by a Hospital Insurance table with a Private Health Fund, by Age, Australia, December 2000 to June 2002

<table>
<thead>
<tr>
<th></th>
<th>&lt;65</th>
<th>65+</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage change over preceding quarter</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>December quarter 2000</td>
<td>-0.71</td>
<td>1.04</td>
<td>-0.53</td>
</tr>
<tr>
<td>March quarter 2001</td>
<td>-0.41</td>
<td>1.00</td>
<td>-0.26</td>
</tr>
<tr>
<td>June quarter 2001</td>
<td>-0.18</td>
<td>0.67</td>
<td>-0.09</td>
</tr>
<tr>
<td>September quarter 2001</td>
<td>0.13</td>
<td>1.14</td>
<td>0.24</td>
</tr>
<tr>
<td>December quarter 2001</td>
<td>0.16</td>
<td>1.39</td>
<td>0.30</td>
</tr>
<tr>
<td>March quarter 2002</td>
<td>-0.29</td>
<td>0.84</td>
<td>-0.16</td>
</tr>
<tr>
<td>June quarter 2002</td>
<td>-0.57</td>
<td>0.41</td>
<td>-0.46</td>
</tr>
<tr>
<td>Percentage change — June quarter 2002 over December quarter 2000</td>
<td>-1.86</td>
<td>6.68</td>
<td>-0.96</td>
</tr>
</tbody>
</table>

Source: PHIAC, PHIAC Reports, September quarter 2000 to June Quarter 2002

While it was possible that at least some of this change might have been attributable to new members not making the first payments on their policies when they fell due (Butler, 2002), the overall decline in membership and the change in the age mix of the insured pool have now continued well beyond the point where new members who failed to make their first payment would account for the
observed changes. Table 1 shows the percentage changes in numbers covered by a hospital table over the period December 2000 to June 2002. The trend is clear — over this 18-month period the number of persons aged less than 65 years covered by a hospital table fell by 1.9 per cent while the number aged 65+ years grew by 6.7 per cent. An adverse selection spiral appears to be re-emerging.

The arguments developed here regarding community rating and adverse selection in private health insurance have been based on the use of age as a proxy for health status. It is certainly the case that average per capita health benefits increase with age, as shown in Figure 2 above. However, reliance on a comparison of mean per capita benefits between age groups may well be masking considerable variation in benefits per person within age groups. For example, Van de Ven and Ellis (2000:759) point out that ‘risk-adjusted premiums can easily differ by a factor of ten or more for demographic factors such as age, and factors of 100 or more once health status is also taken into account’. As such, reliance on a comparison of mean benefits per capita between age groups may well lead to an underestimate of the effects of adverse selection in private health insurance, particularly with respect to its effect on premium increases. This is because, within older age groups, it is likely that those with private health insurance are in the upper end of the distribution of health expenditures within that age group, while in younger age groups it is likely that those dropping private health cover are at the lower end of the distribution of health expenditures within that age group. If this is the case (data are not publicly available to ascertain this empirically) then the differences in benefits per capita between those who retain private health insurance and those who do not is likely to be much larger than the comparison of means suggests, and the consequent impact of the change in the composition of the insured group on insurance premiums much larger also.

Using age as a proxy for health status, the Industry Commission estimated that adverse selection explained around 14 per cent to 19 per cent of the real increase in hospital insurance benefits per person covered over a five or six year period in the 1990s (Industry Commission, 1997: Tables 7.18, 7.19). If the above argument is correct — that differences in mean benefits between age groups underestimate the true differences between those who drop cover and those who retain cover — then the Commission’s estimates of the effect of adverse selection may be a serious underestimate of its true impact on growth in premiums.

This section has argued that the available empirical evidence on the demand for private health insurance supports the hypothesis that regulation-induced adverse selection associated with community rating explains the long-term decline in coverage that has been observed. Two counter arguments will now be considered. The first, which can be more easily dismissed, is that the long-term decline in coverage is intrinsic to a system characterised by publicly provided national health insurance. According to this argument, the mere existence of Medicare in Australia makes private health insurance a less attractive option. However, while it can certainly be expected that the introduction of Medicare would reduce private health insurance coverage, this would likely be a ‘once off’ effect as individuals dropped private cover in response to the new system. Such
an effect was apparent upon the introduction of Medicare in 1984 (see Figure 1) and is akin to the ‘once off’ effect of the introduction of the GST on the prices of good and services. It is much more difficult to sustain an argument that the introduction of Medicare has led to a continuing decline in private health insurance coverage. In any event, community rating regulations were introduced, and the long-term decline in coverage was evident, well before the introduction of Medicare, as attested to by Figure 1.

The second argument is that insurers can subvert community rating regulations by offering a variety of plans that differ according to the illnesses and/or health services covered. Plans that exclude services used predominantly by older individuals, such as hip replacements and coronary artery bypass grafts, can be offered at lower premiums. Such plans have more appeal to younger age groups at lower risk of demanding these services. In this way, insurers can induce consumers to self-select into plans that reflect their risk and effectively counter the adverse selection associated with community rating. The possibility that screening of risks through plan differentiation may lead to a separating equilibrium in insurance markets has been considered by Stiglitz (1977).

This argument has been put in the Australian context by Vaithianathan (2001). She compares the Australian and New Zealand private health insurance markets, the latter being of interest because premiums are not community rated. She finds that the largest private health fund in Australia (Medibank Private) offered 21 plans compared to 11 plans offered by the largest private health insurer in New Zealand (Southern Cross). On this basis, she concludes: ‘The diversity of plans offered by Medibank provides casual empirical evidence that screening may occur’ (Vaithianathan, 2001:11).

While this argument is clear in principle, there is a number of factors in the Australian setting that suggest risk rating through plan selection is not widespread and that it has not countered adverse selection associated with community rating to a large degree. First, the number of plans on offer by Australian private health insurers is not a reliable indicator of the extent of screening through plan selection because, under the current regulatory regime, it is very difficult for funds to close plans while those plans retain paying members. The regulations, as implemented by the Commonwealth Department of Health and Ageing and PHIAC under the National Health Act 1953, prohibit funds from coercing members out of some plans and into others. Consequently, any growth in plan diversity is, at least in part, an artifact of the regulatory regime.

A second factor relates to the regulatory regime as it applies to the approval of new plans. Funds cannot introduce new plans without the approval of the regulators, and the regulators monitor closely any proposed exclusions of benefits from a plan. In some areas, for example, psychiatric care, there is universal prohibition of plans that exclude care for particular illnesses or exclude particular services. Hence the extent to which risk rating can be achieved through a proliferation of separating plans is limited by regulation. While some liberalisation of the regulations governing plans did take place in the mid-1990s, thereby providing insurers with a (limited) increase in scope for circumventing the
community rating regulations, the regulators have maintained considerable control over the funds’ ability to create and extinguish plans.

Finally, if risk rating through plan selection has tended to curtail adverse selection, the effect appears to have been small and certainly insufficient to completely offset it. Notwithstanding the liberalisation of some regulations in 1995 and the introduction of the PHIIS in 1997, the decline in coverage continued unabated through to the end of 1998 (see Figure 1). Further, following the ‘once off’ announcement effect of the introduction of lifetime community rating, the long-term downward trend in coverage has resumed. This is consistent with the hypothesis that adverse selection is continuing to occur.

The re-emergence of an adverse selection spiral in private health insurance is particularly serious when considered alongside the sizeable direct expenditures and tax expenditures involved in subsidising private health insurance. The sequencing of policy changes with respect to private health insurance over the last five years has resulted in such expenditures now approaching $3,000 million (Butler, 2002). If an adverse selection spiral re-emerges with membership declining at the same rate as over the period 1989 to 1998 then, as several analysts have estimated, coverage will return to 1998 levels in around 10 years time (Frech, Hopkins and MacDonald, 2002; Quinn, 2002). In short, the policy changes will have failed to achieve a durable increase in private health insurance coverage. If this scenario does eventuate, as now seems increasingly likely, the cause will be the failure of those policy changes to address the underlying adverse selection dynamic associated with community rating of private health insurance premiums.

Genetic Testing and Insurance

Genetic testing is increasingly being employed in both health and non-health applications. Non-health applications include forensic genetics, paternity testing and proving family relationships between visa applicants and their sponsors for immigration purposes. Most of the public debate surrounding genetic testing, however, has revolved around health applications. These applications fall into two categories — diagnostic and predictive genetic testing. Diagnostic testing refers to the use of genetic tests to confirm or refute a diagnosis in a person who already has symptoms of disease. Predictive genetic testing, or genetic screening, involves the use of genetic tests in asymptomatic individuals to provide further information on their risk of developing genetically related disorders in the future. Predictive testing falls into four categories:

- heterozygote screening — to determine carriers of specific disorders in otherwise healthy populations (for example, Tay-Sachs disease in Ashkenazic Jews) to inform reproductive decisions (when both partners are carriers, their offspring have a higher risk of being affected);
- prenatal diagnosis — to determine the risk of a foetus or embryo developing genetically related diseases;
newborn screening — to enable therapy to be initiated early enough to
prevent severe complications of genetically related disorders; and
presymptomatic genetic screening — to determine the risk of genetically
related disease in persons with a family history of the disorder (for
example, breast cancer).

Predictive genetic testing, and in particular presymptomatic genetic
screening, has created much debate because of its potential to increase
discrimination in employment and insurance. This kind of screening has the
potential to provide more accurate information than is currently provided by
family history on an individual’s predisposition to disease. The number of
diseases known to have a genetic component is growing. Some authors now assert
that ‘most diseases probably have some genetic component, the extent of which
varies’ (Beers and Berkow, 1999:2470). As an illustration of this variation
consider two diseases — Huntington’s disease and breast cancer. Huntington’s
disease is an hereditary disease with full penetrance in those carrying the genetic
mutation (that is, the probability of developing the disease conditioned on being a
mutation carrier is 100 per cent). In simple terms, all Huntington’s disease is
attributable to a genetic mutation and all who have that genetic mutation will
develop the disease. Breast cancer has a genetic component but, on the current
state of knowledge, most cases of breast cancer are not genetic in origin —
mutations on the BRCA1 and BRCA2 genes explain about 1-2 per cent of all
breast cancer while all inherited factors might explain 5-15 per cent of all breast
cancers. However, the lifetime risk of developing breast cancer with a BRCA1 or
BRCA2 mutation is 80 per cent (National Breast Cancer Centre, 1997).

While the proportion of individuals with genetic mutations actually
developing disease varies across diseases, it is often less than 100 per cent.
Nevertheless, such individuals usually have an elevated risk of developing the
disease compared with those who do not carry the mutation. Genetic testing
therefore has the potential to allow more informed sorting of individuals into risk
classes for disease. Associated with this is the potential for insurers to sharpen the
degree of risk discrimination in setting premiums for insurance against morbidity
and mortality risks (health, life and disability insurance being the main areas
affected). ‘Insurance companies therefore have every reason to wish disclosure of
existing information on genetic tests that is accurate, clinically valid and relevant
to the cover/product applied for’ (Organisation for Economic Cooperation and

Preventing insurance companies from relying upon the results of genetic tests
in setting premiums creates an asymmetric information problem leading to adverse
selection. If individuals are allowed to conceal the results of genetic tests from
insurers, then those with genetic defects will have a strong economic incentive
both to purchase insurance if they did not previously do so, and to purchase larger
quantities of insurance, at premiums that are underpriced relative to actuarially fair
premiums. Subramanian et al (1999) have conducted simulations of the cost of
adverse selection in life insurance if the results from genetic tests for breast and
ovarian cancer could not be used in setting premiums. They found that an important determinant of the cost of adverse selection is the extent to which those who test positive for a genetic defect purchase additional cover. Their results lend support to a policy of restricting the value of cover that can be purchased without having to disclose the results of genetic tests. The authors also explore the cost of adverse selection where life insurers are prohibited from using family history information as well as genetic test information. Under these circumstances, the cost of adverse selection is considerably higher.

In the Australian context, it might be argued that the issue of genetic testing will not be important for private health insurance as the industry is already subject to mandatory community rating. This is not so. Genetic testing can be expected to exacerbate the regulation-induced adverse selection that already characterises the industry by improving the ability of consumers to discern the risk classification to which they belong and make their health insurance purchase decision accordingly. This has been borne out in some recent simulations of the effect of genetic testing on private health insurance in Australia by Manners (2002).

With regard to life insurance, the experience of private health insurance in Australia indicates that adverse selection can have serious long-term implications for the viability of insurers. Community rating regulations, which precluded risk discrimination in private health insurance premiums for many years, provide a natural experiment on the effect of adverse selection on the insurance industry. Against this, it might be argued that the regulations governing private health insurance have given rise to a particularly severe form of adverse selection that would not characterise the life insurance industry if it were prohibited from using the results of genetic tests in setting life insurance premiums. There is some merit in this argument. At present, the proportion of disease that is attributable to identified genetic defects is relatively small so that adverse selection would be confined to a small subset of the population with life insurance.

Countering this is the capacity of individuals to purchase large amounts of life insurance consequent to an adverse genetic test result. In contrast to health insurance where health care costs impose a ‘natural limit’ on the value of claims that can be lodged, there is no such limit on the value of life insurance that can be purchased by an individual. Further, again in contrast to health insurance, individuals can increase the quantity of life insurance purchased by buying multiple life insurance policies thus precluding the use of price-quantity contracts (or non-linear pricing) to counter adverse selection (Hoy and Polborn, 2000). Thus even though the subset of the insured population giving rise to adverse selection in life insurance may be relatively small, if they have a propensity to purchase large quantities of life insurance then the impact of adverse selection may be considerable. This was shown in the simulations by Subramanian et al (1999) mentioned above. Recognition of this problem has led some countries to place caps on the amount of insurance that can be purchased before triggering a requirement on the part of those insured to disclose the results of genetic tests. For example, in the UK an agreement between the government and the
Association of British Insurers (ABI) has resulted in a five-year moratorium on the use of genetic test results for life insurance up to £500,000 and for critical illness, income protection and long-term care insurance up to £300,000 (information obtained from the ABI website: http://www.abi.org.uk). Even for cover in excess of these amounts, only the results of relevant genetic tests already undertaken will need to be disclosed, that is, the industry will not ask for tests to be undertaken before writing cover for these amounts. ‘Relevant’ genetic tests have been determined by the Genetics and Insurance Committee.

Another difficulty with the argument that adverse selection in life insurance is confined to a relatively small subset of the insured population is that this subset may well not continue to be small in the future. It is anticipated that the proportion of disease attributable to genetic defects will grow in the future following the complete mapping of the human genome. The burden of genetically related disease depends upon the establishment of a relationship between a genetic defect and a disease, the frequency of that genetic defect in the population, the penetrance of the defect (the probability of developing the disease given the presence of the defect) and the course of the disease itself (Macdonald, 2003). As genetic epidemiology develops and further research on each of these factors is undertaken, the proportion of the disease burden attributable to genetic defects can be expected to increase. The severity of the adverse selection problem can be expected to grow accordingly.

If life insurers were prohibited from using genetic test results in premium setting, could they not separate risks by offering different life insurance policies with different exclusions, thereby encouraging self-selection of low risks into restricted plans? For example, a life insurance policy which excludes death from a range of genetically related causes might be offered at a lower premium. This argument was considered earlier in this paper with respect to private health insurance in Australia. In the absence of regulations precluding such behaviour, life insurers could attempt to circumvent the prohibition on the use of genetic test information through plan selection. However, drawing on the lessons from private health insurance, it seems likely that the regulators would move to limit the ability of life insurers to engage in plan selection. If the regulators allowed insurers to circumvent the prohibition by plan selection thereby resulting in higher risks paying higher premiums anyway, what is the rationale for prohibition in the first place?

Allowing life insurers to use genetic test results in premium setting raises the possibility that another insurance market will develop to provide cover against the results of genetic tests, that is, one might be able to purchase insurance against the financial consequences of having a genetic mutation. There are two difficulties with the development of such insurance, however. First, the insurer would need to be certain that the individual has not already been tested and informed of the result. In practice, this could be difficult to enforce. Second, even if this were enforceable, there is a positive correlation between having a family history of disease and being a mutation carrier. Depending upon the strength of this correlation, insurers would then be charging higher premiums to those at higher
risk of being a mutation carrier. Prohibiting insurers from risk discriminating in this way would create an adverse selection problem in the market for genetic test result insurance.

In Australia at present, life insurers are not prohibited from using genetic test information in underwriting decisions. However, the Investment and Financial Services Association (IFSA) has adopted a Standard on genetic testing that specifies, *inter alia*, the following: insurers will not initiate any genetic tests on applicants for insurance (clause 10.1); insurers may request that all existing genetic test results be made available to the insurer for the purposes of classifying the risk (clause 10.2); and insurers will not use genetic tests as the basis of ‘preferred risk underwriting’ (that is, offering individuals insurance at a lower than standard premium rate) (clause 10.3) (IFSA, 2002). This Standard avoids any coercion of individuals to have genetic tests but also protects the industry from asymmetric information problems by requiring individuals who have been tested to provide the results of those tests to the insurer.

The Commonwealth government also has the right to use genetic tests to avoid adverse selection problems in immigration decisions, as the *Migration Act 1958* and processes under that Act are specifically exempt under the *Disability Discrimination Act 1992*. The health status of visa applicants is commonly assessed as part of the immigration decision. Applicants with potentially high health care costs can be rejected on these grounds.

In February 2001, the Commonwealth government requested the Australian Law Reform Commission (ALRC) and the Australian Health Ethics Committee (AHEC) to conduct a joint inquiry into genetic testing and information. The ALRC and AHEC have been asked to consider what sort of regulation may be needed, in relation to human genetic samples and information, to protect privacy, provide protection from unfair discrimination, and ensure high ethical standards of conduct. The report of this inquiry will be provided to the government in March 2003. In its submission to the inquiry, the New South Wales (NSW) Anti-Discrimination Board has not recommended prohibition of the use of genetic test information in either insurance or migration decisions. It does recommend that an independent body be established to evaluate the ‘scientific reliability and actuarial relevance’ of both genetic and non-genetic information for underwriting purposes, and also that consideration be given to whether existing review and appeal mechanisms in the *Migration Act 1958* are adequate (NSW Anti-Discrimination Board, 2002).

**Conclusion**

This paper has argued that the long-term decline in the proportion of the Australian population covered by private health insurance is due primarily to a dynamic problem of adverse selection attributable to the community rating regulations governing the industry. For many years these regulations precluded any risk discrimination in the determination of premiums for any given policy. Even the introduction of lifetime community rating in 2000, which allowed for an
age penalty to be applied to those over age 30 years taking out cover for the first time, has resulted in only a modest amount of risk discrimination with substantial cross-subsidisation continuing to occur within the insured pool.

The main lesson from this experience for genetic testing and life insurance can be stated as follows: a prohibition on the use of genetic test results in determining life insurance premiums runs the risk of setting the life insurance industry up for a similar adverse selection spiral. This is not to deny that there are important social and ethical issues associated with the use of genetic testing in life insurance (see, for example, Lowden, 1999). However, these issues are better addressed through social policies specifically designed to address those issues rather than regulating the life insurance industry by prohibiting the use of genetic test information. For example, a program of explicit government subsidies to those individuals who face dramatic increases in life insurance premiums as a result of a genetic mutation would provide targeted assistance to those affected. At the same time, this would avoid the adverse selection side-effects of regulations that attempt to avoid such premium increases by prohibiting the use of the information on which they are based. As the OECD (2001:52) has indicated in this context, ‘the issue of adverse or anti-selection is a serious one’. The Australian experience with private health insurance bears this out.

References


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*This article was stimulated by a recent conference on Genetics and Financial Services organised by the Centre for Actuarial Research at the ANU’s School of Finance and Applied Statistics, the Institute of Actuaries and the Securities Institute. The author would like to extend his thanks to the reviewers for their helpful comments.*