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# Closing remarks

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## 1. INTRODUCTION

I am very pleased to be involved in the closing of this meeting which brings to fruition a process of discussion between the actuarial profession and the Royal Society. This began when I was President of the Institute and led a little while ago to Sir Michael Atiyah coming to address our biennial dinner and to the formation of a group to try to set up this seminar.

As our current President, Duncan Ferguson, mentioned in his opening remarks, there are long connections between the actuarial profession and the Royal Society. He referred to the connections in the 17th century. The first life insurance company in the United Kingdom, and we believe in the world, to operate on a scientific basis which we would now describe as actuarial, was the Equitable Life, and that was established in the middle of the 18th century on the basis of premium calculations carried out by a Fellow of the Royal Society, James Dodson.

The first person who was actuary to that company (in the sense originally used by the company), as secretary to their board and also the person to do the mathematics, was another Fellow of the Royal Society, William Morgan, in 1775. So there is this very long-term connection between our two organizations, and I am very pleased that we are working together to try to find some solutions to these very important problems.

The discussions of the last couple of days have brought to mind the very old actuarial joke, which probably many of you know; that an actuary can tell you how many people are going to die, but only a Sicilian actuary can tell you who and when! I started off thinking that we might find that an actuary armed with genetic information might be able to rival the Sicilian actuary with the Mafia, but I discover that that is very unlikely in the foreseeable future, and Professor Anderson has emphasized that point in his summary of the scientific and medical issues.

I am not going to be able to summarize in any comprehensive way at all the vast number of issues which have come up in relation to the social, legal and ethical issues, let alone the actuarial ones. So, I am going to try to spell out in fairly brief terms some of the major issues which seem to me to have come out of the very excellent presentations which we have had from specialists in their fields, and from the quite lively discussion which I have enjoyed and which has gone to make this a very successful meeting.

## 2. SOCIAL ISSUES

There are some social issues which relate to the insurance industry, and I shall come back to those a bit later. Initially, of course, one could say that the

insurance industry provides a social function. That has been mentioned by one or two speakers. It achieves the important social and ethical purposes through the spreading of risk. But it raises other social and ethical issues of discrimination, and these are particularly associated with the process of risk classification and selection.

So far as the whole question of genetics is concerned, Professor Sally McIntyre brought to us the paradigm of the Discourse of Great Promise and the Discourse of Concern, balancing on the one hand the potential major social and economic benefits arising from genetic developments, and on the other hand the possibility that there could be a down-grading of the dignity of the human condition, the creation in the image of God, to a summation of a series of gene characteristics. That could have serious implications for both the way in which we see ourselves and the way we deal with each other in society.

We have seen, as part of the presentations that have been made, important likely social benefits to be gained from genetic testing in terms of an improvement in life expectancy through greater knowledge of genetic characteristics, better diagnosis, better treatment, and early identification of susceptibilities, which could empower people to take better care of their lives, in handling them, and in dealing with the potential problems.

There is a possibility of earlier treatment and a better response by people to the particular things that they may have inherently wrong with them. There are also reproductive issues. Those are not really central to the discussion that we have had over the last couple of days, but they are worrying ones in terms of the ability of people to control future generations and the way in which, as one of the speakers said, babies could become to be seen as a commodity.

There are also significant downsides from the point of view of individuals because sometimes it is better not to know these things. Maybe families would prefer not to know; maybe individuals would prefer not to know; and we might create this whole new class of people who are neither well nor ill. There are also possibilities that the knowledge of people's condition through genetic testing could create psychological and social problems for the people concerned.

There is also a very strong underlying concern which I do not have a separate bullet point for, but it comes within this downside, and that is the fear of discrimination. It is a fear of discrimination against those who have been tested for certain things, against those who may be carrying particular conditions, and they are fears of discrimination not only in relation to society as a whole but very particularly in relation to

the role of insurance companies. That is one of the areas which has been much aired in the last two days.

The conclusion I would wish to draw is that this area of discrimination is not really a big issue or a serious problem for life insurance companies because life insurance is not seriously a necessity of life. It is an important add-on in our economic systems but it is not essential for people to have it. You can get loans without life insurance. Most people have group life insurance or pension benefits associated with their employment, and therefore it is not a great problem if people are not able to get life insurance; and we will see as we go on that actually there are not many people who cannot get it anyway. It would be a very much more serious issue in relation to private health insurance, and I think a continuing theme throughout the meeting has been that there are areas of insurance other than life insurance where this is a very important issue which needs to be taken into consideration in our thinking about how to move forward.

### 3. LEGAL ISSUES

The legal issues are those on which I am least qualified to comment. Our Chairman is the person who should be commenting or summarizing these particular aspects. Many of the legal issues which have been discussed, particularly in this morning's sessions, were concerns over property rights relating to human material (who owns the genetic material?), and that was a little peripheral to the discussion which we have been having about the interaction with insurance. Nevertheless, there have been legal developments in this area. We heard about the European attempts, through the European Patent Convention, to try to restrict the use of patents for things which are contrary to public order or the public interest. Who decides that? Is it our learned judges? We heard about the proposal of the European Commission for a directive to clarify patenting and the issues surrounding it in the area of biotechnology, and the fact that the European Parliament actually rejected this, and it is still pursuing its course through the European organizations.

We heard also about the Convention of Human Rights from the Council of Europe, which was something that was causing some concern to the insurance industry in Europe in its earlier drafts. I believe—and this seems to have been confirmed from things that have been said during this seminar—that the offending article has actually disappeared in the final draft which was produced a couple of months ago.

Apart from these issues of patenting, which I do not want to go into any further, there are obviously insurance issues on the legal side. Some countries have produced legislation to try to restrict the possibilities of insurance companies making use of genetic information and there is obviously the possibility that that could happen here. A number of people raised the threat that if the insurance industry did not get its act together and respond in a positive way, through a voluntary code of conduct, then there would be a threat of legislation in the UK to ensure that genetic information was not, as some people would see, misused in this field.

### 4. EMPLOYMENT ISSUES

The employment issues, which were primarily dealt with in Tom Ross's session, appear not to be of tremendous difficulty. At the moment most employers are not taking much medical information into account in deciding who they should employ. The level of medical evidence required and medical examination is not great, and it is very unlikely that employers will want to use genetic information for this purpose for the foreseeable future. There could be an indication that for certain key positions, where particular aspects of health are very important, there could be a change from the existing position. But I would say that the most significant impact of all of this on employers will be the increasing costs of pensions as a result of the improvements in longevity which we expect to see arising from the genetic developments.

### 5. ACTUARIAL ISSUES

Our continuing theme has been the debate on mutuality against solidarity, which was kicked off by Professor David Wilkie at the beginning of our discussions yesterday—the question of how much risk sharing there should be. After all, insurance is all about the sharing of risk, but at what level? Is the level of discrimination inherent within the insurance system a level which is acceptable to society? That is probably something that changes over time. David Wilkie explained to us how the smoking debate had gone on for years and it was only after a very long process that it became acceptable—indeed, virtually a requirement of society—that insurance companies should differentiate in their rates between smokers and non-smokers.

Dr O'Neill talked about actuarial fairness. I am not sure that I have seen her definition before. The definition which she gave implied to me a much more individualized approach to risk rating than most actuaries would adopt. Essentially, actuarial fairness is capable of definition in a number of ways, but it is more to do with the value of costs equalling the value of the benefits for a prescribed group. The group can be prescribed in any way you like. The actuarial profession has developed techniques for defining it in different ways. Different countries use different systems. The general insurance industry uses very fine levels of detail in terms of defining the groups, using postcodes, and all sorts of other characteristics. But the life insurance industry has not done that. As we have heard there are quite broad bands which are adopted and therefore there is not this sense of the individual getting value for money in quite the same way that might be implied by Dr O'Neill's definition, but more of participating in a group where there is mutuality and sharing and the risk borne across the group. So this particular idea of actuarial fairness does not preclude risk classification, nor does it prejudice the way in which that classification should be carried out. One has to recognize that the risk subdivision which we use within the insurance industry and within society has to be determined by society rather than by actuaries. It is

something which is a reflection of fairness as seen within society, and it may be that there are aspects of what we have been discussing in relation to genetic testing where science and society may demand an approach to risk sharing which differs from that which we have had up to now. But that is something which is perhaps still to emerge.

The question of life underwriting was addressed by Desmond Le Grys and I think we have seen over the course of this meeting that there have been some fairly major misconceptions around as to how insurance companies underwrite and what they do with the information, confidentiality, and so on. In principle, insurance companies operate on this basis of *uberrima fides*—that all information that is relevant will be disclosed by the prospective policyholder—so that the insurance company and the prospective policyholder are on the same playing field, the same level playing field, in terms of what they know about the potential situation from an underwriting point of view.

What is quite clear from Desmond's presentation is that the underwriting process that is used in life insurance is designed to be very simple. Tradition, especially in the UK and Europe, is to try to maximize the people who fall within the standard categories—albeit now subdivided into smoker, non-smoker, male and female—and we have only a very small proportion that are subject to any rating beyond that, and a very, very small proportion who are declined.

Note, however, the very high level of mortality in those classes which are not falling within the standards, so there is quite a strong potential, within the modelling which Dr Macdonald produced, to get an imbalance as a result of changes in habits and buying characteristics.

It seems at the moment that a lot of the information which is potentially available to underwriters and to insurance companies is not in fact used. Mr Le Grys pointed out that there are all sorts of things that could be deduced from simple things like blood pressure levels, and cholesterol levels, which ought to imply differential pricing but do not in the present world; and therefore it seems even less likely that insurance companies will want to use genetic information in this way.

The key issue so far as underwriters are concerned is to avoid action against the selection process—people anti-selecting against the insurance company. Therefore, there is this emphasis on financial underwriting. Should people be taking out as much insurance as this? What relevance is an insurance cover of half a million pounds to an individual like this who earns only £20000?, and that sort of thing. That is, seeing whether insurance is at a level which is relevant and helps to reduce the possibility of anti-selection.

Genetic information is not really needed for this underwriting process. People have asked: would companies use it were it to be available? Would companies use it were it to be the subject of some question, even on the proposal form, as to whether people had had a genetic test? The response tends to be: 'well, we want to know about it in case it seems relevant. We do not want to give away the right to ask the question because it may trigger other questions'. In

particular, there is concern about the precedent which it could create, and the right to continue to be able to underwrite, to select and to use risk classification.

But, as some speakers have pointed out, there is also potentially a beneficial effect for the customer in the disclosure of genetic information, because some will be able to get insurance at better terms as a result of that disclosure. It may be that we have got a trade-off here. If there is a society feeling that we should not use this genetic material in any way, then some people will gain from that and some people will lose; but it is part of the mutuality. Indeed, it is perhaps part of the solidarity which we are seeking to take out of our insurance industry.

From the actuarial point of view we have seen in particular Dr Angus Macdonald's very interesting paper, where he explored a relatively simple model which had quite a lot of power in terms of its ability to look at different aspects of this problem. Underlying all of the thinking, from an actuarial point of view, would be that the impact of genetic developments is likely to be steadily improving mortality, perhaps faster than hitherto.

Actuaries tend to be conservative about their assumption of future trends in mortality, and usually assume that they will tail off over time and not continue in the way that they have in the past. It may be that for some years to come we will see continuing improvements in mortality as a result of these developments in genetics.

The interesting anti-selection problem came back to the surface in Angus's paper—the question as to whether the super-fit, those who are perceived as a result of their genetic profile to have a very sound position and a very low probability of early death, might anti-select by not taking out insurance, and that would weaken the mutualization of risk within the insurance pool.

There is also a possibility that some may anti-select the other way because they know that they have something which is relevant to their expectation of life, it may reduce it somewhat, and they do not declare that to the insurance company. They may indeed seek to take out larger sums assured than would otherwise be the case and therefore imperil the financial position of the insurance company.

Dr Macdonald demonstrated that it had to be pretty extreme for it to imperil the financial condition of the insurance company, and the sorts of buying habits which are likely to take place quickly as a result of these things may not have very dramatic impacts. That would probably mean that the genetic information is not going to add great value from the insurance company's point of view in the short term and could possibly be managed without.

On the pensions side, of course, we continue to have this concern that longevity and the increases in longevity above what we might have otherwise have expected will aggravate the demographic imbalance in the next century, which continues to be a problem for most industrialized countries, including our own.

Professor Wilkie talked a little about the history of the mortality investigations within the actuarial pro-

fession, the way in which the studies have been carried out over the years in order to look at mortality in the insurance industry, and how long it took for us to produce something which was viable in order to base smoker/non-smoker rates that were different from the aggregate. It can only work at such a point where the risk factors which are under consideration are acceptable to society and therefore used by insurance companies; that the information is being collected by the insurance companies according to those risk characteristics; and then you have a period over which you measure and carry out studies and then you publish. So the whole process is extremely lengthy and the results at the end of the day may show differences in mortality but they do not necessarily prove causality in relation to the particular risk characteristic. This is well-known in relation to smoking, where the differential between smoker and non-smoker in terms of mortality is pretty likely not to be entirely attributed to smoking but to all sorts of other characteristics of the individuals in question.

It suggests (does it not?) that there is no imminent likelihood of any serious rating being carried out by the insurance industry in relation to genetic characteristics because the information will simply not be available in a sufficiently reliable form for them to use.

## 6. FURTHER WORK

It was not clear when we set out on this seminar that we would actually come out with a conclusion or that we would necessarily see very clearly what the way forward might be. What I have put on the screen as a suggestion for a way forward is not in any way a consensus of opinion so much as my own flyer. It is based on some of the discussions which are taking place and our discussions yesterday evening and the thinking which seems to be emerging from our seminar.

A possible way forward might be, in relation to life insurance only, for the insurance industry (led by the ABI) to develop a code of practice of potentially a voluntary nature; or perhaps it might be to encourage that everybody should participate, which would give a temporary moratorium on *asking* for genetic tests—effectively, this is already taking place. But it might also give a temporary moratorium on the *use* of genetic information by not requiring it to be disclosed; albeit that contradicts the principle of *uberrima fides* at low levels of insurance. It is for discussion as to what that level might be. It might be £100 000 sum assured, or less for term assurance, which would cover the normal insurance needs of the majority of people, and would enable insurance companies to adopt full underwriting process and ask for genetic information for people who were seeking to insure themselves for very large sums, where the potential for anti-selection is much greater.

We should perhaps also pursue the idea of whether

in the longer term it might be more practicable to establish some form of pooling for the excess mortality risks arising from the genetic testing process, and whether that could be a better solution in the long term than simply turning a blind eye to the genetic information which, as I have said earlier, could in some cases improve people's possibility of being insured rather than the reverse.

The actuarial profession, as has been said several times during this meeting, is not the insurance industry. We have a good many members in the insurance industry, but many outside it also. We are in any case a professional body and we exist for public interest reasons and not to serve the commercial interests of the insurance industry. Nevertheless, the profession with its influence such as it has with the insurance industry would seek to do what it could to hasten the development of such a code of conduct and perhaps to assist in the development of a longer term scheme of pooling.

I would exclude from this the particular categories of insurance (i.e. critical illness, accelerated benefits, PHI, and health insurance), where it is quite clear that there are much more difficult problems.

So the agenda for the future, and maybe the subject of a subsequent meeting either of this type or of a more intimate discussion type, could be to look at the issues of long-term care, permanent health insurance, critical illness and accelerated benefits, medical expenses insurance, and the wider issues of health care cost financing within the National Health Service and the associated private industry. To explore how one might approach the problem in relation to these much more intractable areas, and whether there are strong messages which we as actuaries, on the one hand, scientists and medics on the other, might wish to put forward to government regarding the mutualization of risk in this area and the solidarity that is currently inherent in the national systems which we have (which may be undermined if we move too fast in the direction of privatization). This is a whole area for further work, for further dialogue, and further thought about practical solutions in these areas.

## 7. CONCLUDING POINTS

I should like to thank you all very much for participating in this meeting, and I hope that you found it valuable and as stimulating as I have. It is important that we will be able to carry on this type of dialogue in a manner which will be constructive in terms of the way in which genetics develops and the way in which our insurance and financial industries develop within the United Kingdom. Both are very important parts of our national structure and economy. We, as professionals in these areas, can have a big part to play in ensuring that some of these apparently difficult issues are brought to a sensible conclusion.