

DISCUSSION HELD AT THE INSTITUTE OF ACTUARIES

The Vice-President (Mr S. Creedon, F.I.A.): This evening we have an unusual, but very welcome, and excellent, paper from Mrs Joanne Buckle, who is going to introduce the key concepts for the paper to us.

Mrs J. L. Buckle, F.I.A.: This topic is close to my heart and I am not going to spend a lot of time talking about the paper *per se*. What I want to do is spend some time talking about some of the key concepts in the paper, and also to try to steer the discussion in a way that will reflect the differences between the approaches that health economists take to these kinds of questions and the approach that actuaries take, and how those two approaches can be reconciled.

I should explain a little bit about my background and about the background to this paper. I originally wrote this paper as part of my health economics postgraduate dissertation, so it was very health-economics focused. I was marked down for introducing too many actuarial concepts. The academic health economists were not very happy with my focus on return on investment and lack of focus on quality adjusted life years. And that was part of an eye-opening experience of doing my health economics postgraduate course.

The paper then went through various iterations and I tweaked it to make it even more actuarial before it was published in the format that you see today. One of the things that I really wanted to do as part of this paper was to introduce some of the concepts that health economists use every day, and to help actuaries and health economists work more closely together. I think it is a great shame that they have not worked together enough to date as they are not poles apart. They do have lots in common and it is a shame that they do not work together more collaboratively.

The reason that I did my health economics postgraduate course was because I was becoming very frustrated with not understanding the language that health economists were speaking. Having spent some time in the US, where actuaries looked at return on investment for disease management programmes, and health economists had very little input into the process, I then came back to the UK to find that health economists were king and were having all of the input into the policy-making process around such management programmes, and actuaries were nowhere. This was brought home to me very clearly when I went for my interview at York University for my health economics postgraduate course. They basically said, "You are an actuary: who are you and why are you here, and why are you not calculating pensions contributions somewhere? What do actuaries do in health care? We have never come across one before." So, that told me quite a lot about our failure, as a profession, to communicate what we do.

On my course, it became clear that health economists are completely unaware of our existence in this arena. It is up to us, as actuaries, to communicate what we can do, to communicate our unique skills and to communicate how we can add to the debate.

I also learned that actuaries, generally, are streets ahead of health economists when it comes to modelling skills. It was a bit of a shock to me, in the second part of my course, to find that I was presented with a very simple Markov Model. It was presented to me as the best thing since sliced bread. It had been invented by health economists in the last 20 years and they were doing lots of work in this area. And it was an example of what great modellers they were. I pointed out that actuaries had been using such models for many, many decades and were very sophisticated in this kind of modelling.

Health economists, however, are a lot more clued up when it comes to developing a policy message to talk to the policymakers. They are much better at that than we are. We really need to learn from them in that arena.

Both sets of professionals could do a lot worse than spending time talking to their clinical colleagues. Both sets of professionals have a tendency to develop their models in isolation, without talking to the clinicians and understanding the underlying clinical processes. In my paper

I spent quite a lot of time reading the clinical literature and trying to understand the epidemiology of depression and how that affected my modelling approach.

There is a tendency in both sets of professionals to take a modelling approach and then replicate that across a number of diseases. That just does not work. You have to spend a lot of time understanding and talking to your clinical colleagues before you set about doing this kind of model.

The last thing that I learned was that we are pretty much the same. We just need to amend our language slightly so that we understand each other.

I have spent some time, in the paper, talking about the differing approaches of health economists and actuaries. Health economists use something called a cost effectiveness analysis or a cost utility analysis. Actuaries tend to talk about return on investment.

They are two ways of looking at the same problem. Often the question that you get asked, as a consultant, or as an academic, is, "Is this programme cost effective?" It is not really the right question because there are one million answers to that question. The question that they are really asking is, "Does this programme save us money?, which leads you towards an ROI-type approach. "Over what time period will it save us money, for which section of the population and does it reduce health inequalities? Will it create better health outcomes? For whom will it create better health outcomes and at what cost? And whose viewpoint are we talking about here? Are we talking about a society's viewpoint? Are we talking about a Primary Care Trust's viewpoint? Are we talking about a particular payer? Are we talking about the patients? And whom, exactly, do we want to consider here?"

You have to go back to those questions and break them down into lots of constituent parts because they do not make sense. What my paper tries to do is to look at a number of ways of answering those questions. I think you need to use the actuarial and health economics approaches side by side to answer the questions. I am going to consider the pros and cons of the differing approaches.

Cost per quality adjusted life year is a concept that is introduced very briefly in the actuarial exams for healthcare. It is dealt with as "This is something that health economists do but you do not really need to worry about it as an actuary". That is a shame, because without understanding it, we will not understand what the health economists are talking about.

However, there are some controversial issues with quality adjusted life years. It is the best measure which the health economists have devised, and it does allow you to equate costs with a health benefit outcome measure, but it is non-financial. So, it is somewhat alien to actuaries because you are trying to calculate a cost per unit health benefit. But it is important. What tends to happen within the actuarial literature is that we look at cost and benefits in a financial sense, and then we might tag on some health outcomes. But those health outcomes are not comparable across different kinds of health interventions. So, such an approach is not that useful, since the core of it tends to be around financial costs and benefits.

What the health economists do, by contrast, is to say, "Let us not worry about that. Let us look at health outcomes as a standardised measure." So we use a quality adjusted life year and we can compare a cost for quality adjusted life year across lots of different types of health interventions.

However, there are a few issues with quality adjusted life years, and lots of the models that you build, including the model I built for depression, around quality adjusted life years, are based on clinical literature. They are based on randomised control trials, which tend to be very expensive and therefore very small. They are difficult to generalise.

There are also issues about how you assess quality adjusted life years, and whose measure of utility is a "quality adjusted life year". Is my perception of my utility in a depressed state the same as Mr Creedon's perception of his utility in a depressed state, and how do we compare those two? Are they the same depending on your age and sex? The obvious answer to that is "No". So, they are very subjective.

There is also a lot to debate on whether or not the models are inherently ageist: that they discriminate against interventions that are of more benefit to older people than to younger

people. So, they are not the most uncontroversial measure, but they are the best measure that the health economists have come up with so far.

My big question on this is: do they really help with budget setting in an era where financial control will become more important for the NHS and other payers? I would argue that they are very useful at the margins. If you are trying to compare, as a PCT, whether you spend your extra money on investing in disease management programmes for depression or whether you spend your extra money investing in some other intervention that helps depression. But the question that most PCTs then come back with is, "What do we decommission to pay for that? How can we stack that up against all the other things that we might spend our money on?" They are not that helpful in answering that kind of macro question.

However, if we then move on to an actuarial ROI, this says nothing at all about health outcomes, so actuaries have been very constrained in the amount of analysis that they have been able to do in this area. The kind of analysis that you see in the US around disease management and return on investment says nothing about health outcomes. All budgets and all contracts are drawn up with, "Here are the cost savings. Here is the financial aspect. Oh, by the way, here are some quality measures that we are going to hold you to." They do not link those quality outcome measures to the investment.

You can understand why that is the case because, if I am a commercial health insurer, then I want to know the impact on my budgetary constraints. I want to know what my costs are going to look like over the next five years for this programme versus my savings.

So the question I have in my mind is, "How can I construct a contract that will allow me to split those savings between, say, the disease management provider and the commercial insurance company?" The question that I am not asking, because that is not necessarily relevant to my decision, rightly or wrongly, is what health outcome am I getting from my population in return for this investment? It is very financially focused.

I would argue that that is inadequate, although that is a useful skill to have. We need to have more financial control, in particular in PCT decision-making in the UK, and there needs to be a lot of emphasis on financial sustainability. If we, as actuaries, go in and say we are only going to look at money in versus money out in our models, then that is not a useful position to present to the NHS or to a PCT. All of them have government-imposed targets that are around things like health outcomes, around health inequalities, and not around saving money just for the sake of saving money.

So although it is useful to save money because you can invest in other areas, you need to link the money that is spent to the health outcomes, otherwise it is meaningless for a PCT. Without understanding that, actuaries are not going to get very far.

The question that I get asked a lot by PCTs is the same question that they ask health economists, "How can I spend my budget? How can I get maximum health outcome for my budget?" That is a very big question to answer. Actuaries and health economists need to work together to answer that question.

Exhibit 1 shows a few questions which I hope will prompt some debate. Some of the questions were prompted by the questions that we, as a profession, are asked. The Department of Health sends out a lot of information to PCTs, and there are a lot of messages there about PCTs needing to understand actuarial techniques and actuarial forecasting. They ring the Actuarial Profession asking: "How can actuaries help us?" We do not have a good answer at the moment.

I spent a lot of time on the phone a couple of weeks ago to a PCT that rang me up and said, "How do we hire an actuary?" I had to explain to them that I did not think they should be hiring an actuary but they did need to understand what actuaries did, and that if they put an advert in the paper for an actuary, they were unlikely to get much response. They wanted to know how the actuarial profession will help them solve some of their problems.

The question is, "Do they understand the actuary's skillset?" The answer to that is, at the moment, "No". They do not understand what we might bring to the debate. They do not understand why we are different from health economists. They do not understand how we are going to work with the health economists. So, we need to start resolving some of those questions.

How can actuaries and health economists work together to solve health issues?

- PCTs being asked to consider “actuarial techniques” and asking how The Actuarial Profession can help?
- Do they understand the actuary’s skill set?
- How can we communicate our USPs better?
- What do actuaries need to teach ourselves to add value to the debate?
- How can we engage with health economists and work together?



Exhibit 1. Actuarial input

We need to think, as a profession, about how we communicate our unique skills and our unique selling points to those potential customers. I think we have a lot to add in the NHS. I am talking about the NHS very specifically here, but we also have a lot to add in the area of disease management in the private insurance industry, and actuaries do not tend to be used in those areas either.

There are lots of actuaries in the private health insurance industry in the UK but they do tend to be marginalised. They are in charge of the premium setting or the reserving. They are not necessarily asked to opine on, or evaluate, different health interventions.

The last question is how can we engage with health economists to work better, and to understand each other’s language?

I am happy to discuss specific aspects of the paper, but these were some of the areas that I wanted to focus on in the debate rather than necessarily the very technical details of the paper. But if anybody has any questions on that, then I am happy to answer them.

The Vice-President: Thank you, Mrs Buckle. You have certainly posed a challenge to everyone here, to health economists and to actuaries. The discussion is now open to the floor to respond to the challenge which Mrs Buckle has put to us.

Mr D. Glynn (guest, Europe Economics): I am very pleased to have been invited to this discussion. I run an economics consultancy that has done a good deal of work in the area of healthcare, and in fact in one recent project we had the pleasure of collaborating with Mrs Buckle, who was a valued member of the team. Our client was the Department of Health, and although I cannot be too precise, because the results have not yet been fully published, I can say that the study was about decision taking in a challenging area of policy. The economics was quite difficult but also rooted in common sense. The Department was very keen to have an actuarial input. It worked very well.

Thinking about it afterwards, how did the roles of the economists and the actuary compare? Could we each have done each other's work? Possibly. That is interesting because as actuaries you have economics in you as well. Mrs Buckle knew exactly what we were talking about on the economics side, and both economists and actuaries had statistics and modelling skills. We could have allocated tasks between us differently. This is not to say that we did anything that was inefficient; just that the overlap of skills meant that there was flexibility for the project management.

In view of Mrs Buckle's theme of collaborations between economists and actuaries, I wanted to say straight away that there is a very recent — and not unimportant — example of a very successful collaboration between economists and actuaries.

Ms H. Chung (a visitor): I am absolutely delighted that someone has proposed the discussion of more links between health economists and actuaries. I should say, at the outset, that I work for NICE, which is an organisation that is very much out there in the public domain. I am happy to clarify any points of fact about the organisation, but any opinions I express today are my own.

If I may start with a general comment about the remarks which have been made about health economists not understanding what actuaries are about, what they are capable of and what they can add. I work in the world of health technology assessment every day. I attend national decision-making committees as an adviser, watching these decisions being made and watching people try to grapple with the absolute edge of evidence before they have to start making a value judgment that is going to affect the health of many people throughout the country.

It is an environment where the people who make these decisions do not take lightly the responsibility that they bear, and if there is any professional group that can add to better evidence that would be welcome.

As the author said, the key challenge will be communication. Having suffered the pain of the odd actuarial exam here and there, I can remember having to memorise principles of good modelling. One of those principles — the one most fundamental to this debate — is that a good model should be able to be understood by the user.

Some of the models that NICE looks at are built by economists; some are built by operational researchers; some are built by medical statisticians. They are all very different.

The thing that makes a model most useful to a national decision is whether the people around the table can understand it; whether it is consistent with the national methodology; and whether it can be made transparent to the public about why the decision has been made.

Where health economics might have had the edge so far in decision making for health policy is that it is more tangible to the end user to be able to say, "What is this assumption I am making? What is the face validity of it? How does it relate? Can a doctor and a patient around the table say, 'This rings true to what I believe in practice?'"

Other types of models, arguably, might be more valid, more sophisticated and make better use of data. Unfortunately, they also tend to be a bit more difficult to understand. That is the big challenge.

One other point at this stage that I would be interested in, and something which I have been wondering about for some time because I do not work in the actuarial world any more, is the fact that, in the National Health sector, using cost effectiveness modelling is starting to enable the tail to wag the dog, in a way.

So we are not looking at something we have to evaluate based on a price — it is leaning in slightly another direction where, increasingly, manufacturers of technologies are willing to offer the nation a form of rebate or discount scheme in order to make a proposal cost-effective.

I was wondering, maybe not specifically related to this paper, whether insurers might use this information to initiate negotiations with manufacturers of very expensive interventions.

Mrs Buckle: This really is a question back to Ms Chung, in that my understanding of the purpose of NICE, in the way it was set up, was to start the "wagging the dog" process, in that it would enable those manufacturers of new drugs or new technologies to think about what would

be the outcome of that process rather than develop something very expensive, then NICE get hold of it and say, "That is not cost effective."

From that point of view it seems to be a very positive development. From an insurance point of view it is difficult because medical insurers still fall into two camps. There are those which believe that cost effectiveness should not have any part of their determination, because they are there to pay for the things that the NHS will not pay for. And there are those which are very quality focused which say, "If NICE does not think that this is particularly cost effective, then should we be paying for it? Is it a good quality intervention?" I know that there is a distinction between quality and cost effectiveness and once you reach the point where medicine is very efficient, you start having to make a decision between whether this is good quality or is this cost effective? At the moment they are fairly synonymous. If it is good quality, then it is probably cost effective.

There are still those insurers who believe that they should pay for anything because that is what they are there for. It is increasingly apparent to me, also working in the private insurance industry, that a lot of insurers will be going down the route in the next few years of saying, "Is this a good quality intervention? Is this cost effective? Can we justify spending our premium income on this? Is it the right way to spend those resources?" In the same way that a PCT has to determine, "Is it the right way to spend our resources?" I think that will happen, but it is not being done with any great rigour at the moment.

Again, as in PCTs, it is done around the margins. As a new thing appears, then companies will say, "Should we pay for this or not?" Nobody ever says, "What are we doing at the moment that is not effective that we should stop paying for and pay for this instead?", which is a shame.

Dr M. Soljak (visitor): Thank you for asking for comments. I work primarily at Imperial College, London. I want to echo the plea about actuaries and, in this case, epidemiologists, working together. Both groups are experts in dicing with death so we have a lot in common.

As a matter of fact, we have just finished doing some modelling work for a number of PCTs which are implementing a new national programme called NHS health checks. They are about reducing vascular risk. Interestingly, this policy illustrates the contrast between return on investment and cost effectiveness. We based all our assumptions on the economic analysis done by the Department of Health, which showed this programme was highly cost effective, according to the *de facto* criteria that NICE use. But when you looked at the return on investment in terms of each population (using population projections up to 2017) by projecting the cost to the PCT over that time of hospital admissions that would be prevented, certainly the programme reduced costs in terms of hospital admissions, but it did not become a cost saving until after 2016 to 2017.

So that is a good illustration of the difference between the two concepts. Here was something highly cost effective that was not necessarily cost saving, which, of course, is probably true of most NHS interventions.

That also reminds me that the Institute itself, and some of you may know more about this topic, commissioned some work on reducing vascular risk. I heard, at the Department of Health a couple of years ago, a presentation from Heriot-Watt University. I believe that the actuaries involved decided that it was not worth worrying about on that basis.

Also, at the Department, we had a presentation from the Government Actuary. It was a bit worrying to realise that all the projections for life expectancy were based on very elaborate manipulation of historic trends rather than looking at what the impact was of various interventions.

That is a shared challenge: we have to try to look at what the impacts of NHS interventions and other interventions might be on life expectancy, and have a much better understanding of what those impacts are going to be instead of just looking at historical trends. I am sure many pension fund managers would agree.

My question is how can health economists, epidemiologists and actuaries all engage in this task?

Dr D. J. Hughes, F.I.A.: I should like to congratulate the author on this paper. I realise the hard work involved in putting together the different approaches of economists and actuaries. I say this because in a previous incarnation I worked as an operational researcher and statistician in areas of health and care. I am fascinated to hear of your more recent experience on this boundary between professions. It was also very interesting to hear comments on the differences between the UK and the US, and it is interesting to reflect on the way in which the health actuarial professions have developed in the two countries, and whether it is related in some way to the financing of health services, which is obviously completely different.

One of the keys to progress is in the last section of the paper, where the author speaks about multidisciplinary teams. It is no good, in my view, actuaries thinking that they can just walk into a PCT and speak a lot of actuarial wisdom. It is necessary to roll up your sleeves and work with economists, operational researchers and statisticians in this area. You have to do your homework and engage with the subject, so you can see the issues from the side of the other professionals as well as your own.

There is good news here. My impression is that the area of health quantitative analysis is enormously open. It is a very broad church. You can rub shoulders with people from many different disciplines. Nobody minds. There are great opportunities.

Another piece of good news is the much greater availability of data. When I was doing this sort of work many years ago, it was extremely difficult to extract data. Of course, the data that is available is never quite the data you want. But there is much more data available now about outcomes and measurements than there was before, however glum we may sometimes feel about this.

I also advise, in a small way, a medical insurer, and my insurer is equally interested in the effectiveness of some of the expensive procedures which are being claimed by some policyholders, simply because the insurer wants to deliver best value in the same way as the NHS.

I have been listening during the discussion so far for one word. A previous speaker mentioned it, it was "evidence". We have all heard about evidence-based medicine. It is now a fairly definite criterion that interventions in many areas should be evidence-based. Maybe that is something that links all quantitative analysis and all quantitative analysts.

Mrs Buckle: I think you are right that data availability is much greater. I am a big believer in doing what you can with the data you have and then telling people where it is inadequate and hoping they will be able to gather more data.

The NHS has a wealth of data. It has great data in some ways and appalling data in other ways. And you often find that PCTs have a lot of data that they have never looked at. That is because they do not have anybody on the staff who knows how to extract the data. I have been in a situation where I have been in a PCT and they have said to me, "We think we have outpatient data but it is on a server and we do not know how to query it — we do not know how to look at it!"

There is still the issue of a lack of analytical skills in the NHS. We can help, in that the basics of looking at, for example, trends over time are not done, at the moment, in a rigorous way.

There remain lots of issues around obtaining primary care data. It is very difficult for a PCT to build up a complete episode of patient care. They will have the secondary data, and they will have some of the community data at a block level. They will not have any of the primary data unless they are employing salaried GPs. The only way to obtain that data is to go round to individual GP practices and extract it. Of course, all the GPs are on different systems.

I still have problems convincing PCTs that they need that data, in order to figure out what is happening, on what they are spending money, and on what they will be spending money in the future. They need a complete picture of where the money is going. Most of them do not have that, at the moment.

I still think that you can do an awful lot with what you have. The depression one was a slightly strange example because I was looking at clinical studies and extracting data from clinical

trials, whereas, as an actuary, most of what you do is large-scale database analysis, so you would want a very big database.

You can do a similar model around things that impact secondary care a lot, but you would not be able to find the data to do the same kind of thing around depression, for example, because it is mainly in primary care. So there are some things that you can do fairly easily, as an actuary, at the moment with the data you have. There are other things where you would have to book quite a lot of filling-in assumptions.

I agree with you: it is improving.

Dr T. Crilly (guest, Crystal Blue Consulting): Thank you for this quite provocative theme. As a health economist I have to say that I am not here to defend the line that health economists will take in terms of “QALYs”. They are controversial. I can give you three examples.

- (1) The twitter, the Internet: a degree of ridicule at the notion of giving people aged 90 and over a hip replacement, say, because the quality of adjusted life years there would be rather poor; even though that person might live until 105 ... and ballroom dancing is not unknown to older people.
- (2) Likewise, I am visiting somebody at the moment who has cerebral palsy, is aged 70-plus and is in a hospital bed and getting very good care. But from an economic point of view, expensive intervention would not comply with a QALY policy. They are doctors’ decisions rather than health economics decisions.
- (3) At a health economics level, the cost of an epidemic, where it is older people who die, is actually very cheap because death is not costed and the productive value of people over 65 or 70-plus is low.

So, socially, some of results that come out are counter-intuitive.

I was struck by the vocabulary and the fact that Foundation Trusts are coming in. By 2010 all trusts are supposed to be Foundation Trusts. The vocabulary will change because, essentially, the amount of money that is in the system, as we know because of public finance, is going to be squeezed. I think people will be rather turned on by the phrase “return on investment”, something which allows people to separate themselves from those controversial policy questions which are very loaded in terms of value judgments, and define something fairly narrowly on a financial basis. I think the next five to ten years will be quite a fertile ground for you.

Mr A. C. Edwards (student): I wanted to ask whether, in your opinion, the American system had a better affinity with the ROI idea because their health system is more commercial-based than our NHS. Also, regarding a comment from Ms Chung, when you say that the models which have decisions made on their basis more often are those where they can be more easily understood and interpreted, do you think there is an issue? Quite often people that sit at meetings to make the decisions are dealing with a lot of overviews and averages, and so on, and not enough time is spent on the “devil in the detail”, not understanding a model properly as opposed to almost taking the manager’s point of view of “Our workers have given me this best indicator so I am going to go with that”. That could be why those types of models, the simpler ones, are the ones where the decisions are made because not enough time is spent understanding the more difficult or actuarial models.

Mrs Buckle: I will respond first to the American system comment because this also ties in with what has been said about the historical basis and the fact that actuaries have been quite prevalent in the US in this area.

It is obviously a big impact that the US is 40%-50% funded by private insurers. There is this great misnomer that the American system is a private system, whereas half the spending in the system comes from the government. A lot of that spending is channelled through private insurers so it is the private insurers who perform a lot of the decision-making. A lot of the way that disease management programmes have been looked at has come from a push from the commercial disease-management company vendors because they are the ones who originally

stood up and said, “The way we are going to sell this product to the insurers is because we are going to promise cost savings.” All their contracts were written around cost savings with a few quality measures added.

Actuaries became involved because they realised that the way those contracts were written gave rise to some statistical oddities, if you like, which meant that you could create cost savings out of nothing. So you would end up in a situation where a disease-management vendor could claim a cost saving on the basis of the way the contract was written, but that cost saving was nothing to do with what the vendor had done. It was simply an artefact of the way that regression to the mean works, and the way that they had selected that population to be involved in the disease management programme.

So, actuaries became very involved in that stage and health economists, in the US, tended to be relegated to academic viewpoints. They have not been involved in those debates because they were basically commercial debates between the health insurer and the disease management vendor. There is a historical bias towards using actuaries in those areas. It is a bit of a shame because the whole debate in the US is, therefore, centred around those regression to the mean issues; how those contracts have actually been written; and whether those cost savings are real or imaginary, rather than focus the debate around whether this disease management programme is actually impacting the health of this population and what real impact is it having, both in health outcome terms and in financial terms?

Yes, it has come about because of the way the US system is funded. However, over the past two or three years, in the US, there has been a recognition that the way that these things were being calculated was really not the way that they should be looked at. The government body, Medicare, set up a proper set of randomised control trials to look at some of these issues and ask: “Are we saving money on these disease-management programmes or not?”

A lot of the disease-management vendors who took part in those trials fell by the wayside because they were half way through their demonstration project and then realised that there was no way they were going to demonstrate that they were saving money. Instead of spending their time saying, “How can we demonstrate how else we are adding value? Are we adding health outcomes or are we adding life years?” they said, “No one is going to want us if we are not saving money, so let us stop this trial now”, which was a real shame.

I am very pleased that we do not have that kind of focus in the UK; that we actually are prepared to look at things on a cost per “QALY” basis, and are prepared to look at allocating resources on what gives you the most healthy outcome for your money. However, we go too much towards the other direction in that we spend a lot of time talking about that and very little time focusing on the more commercial aspects. I think PCTs are going to have to be more commercial in the future and they are going to have a focus on financial sustainability, otherwise they are going to be in real trouble, in a couple of years’ time, when their budgets are much lower than they are now.

Some sort of hybrid approach where the health economists and the actuaries understand each other and work together to create a model that looks at both health outcomes and the impact on budgets is the way forward.

Ms Chung: I do not think there is any shortage of willingness to understand models completely, nor of human resource effort. In fact, having worked in the private sector before going to NICE, I often question whether a consultancy would strike a different balance between the fees of qualified human resource inputs informing a decision and the need to press on and decide what advice to give the client. Decisions which I see made at NICE, if made in the private sector, would probably sooner have somebody say, “I have just used my entire three actuaries and a business manager for a whole week and, perhaps, it is time to make a judgment”, whereas in the public sector, working in a fish bowl, where transparency and accountability to the public are key, you aim to justify every single part of every single decision, and as a result even more resource is put into fully understanding models.

Your point brings up something else which I am really burning to say, if I may continue. It is

that I think the question might not be so much ‘how do we engage with health economists?’ but ‘how do we engage with decision makers?’

I would suggest going straight to source. If the profession has a set of skills (finance, economics, statistics, commercial awareness), then you could look at it that there are several interest groups wanting to provide this expertise. I am totally in favour of closer work between epidemiologists and all the different special skillsets. But, ultimately, the end-user, if we are talking about this in a social policy context, is the decision-maker.

On that note, I have brought along today, just in case someone is interested, the guide that NICE uses containing our methods of technology appraisal. That sets out what the NICE institute sees as a good, standard-practice way of doing evidence synthesis, and of building an economic model.

That set of decisions makes us travel down a pathway which has been substantially led by health economists. Because that institute is duty-bound to make consistent decisions, to an extent it cannot deviate too much on any individual decision in the methodology it uses. So if the profession wants to engage, it should engage the next time the decision makers are updating the way that they make decisions; so, “here is a different way of doing this.” I think, arguably, in many cases, there is.

Mrs Buckle: I was just going to make a quick comment because I presented health economists as knowing how to talk to policymakers. The experience I have had is that they are much better at it than actuaries, but they still face an uphill battle. Both health economists and actuaries work from the fairly common sense rationale that if you build a model and it shows that the benefits are greater than the cost, no matter how you measure those benefits, and you build lots of sensitivity analysis around that, and you understand all the assumptions, then the decision makers will make the right decision.

My experience has been that that is not necessarily the case. If you are an actuary used to working in a reasonably rational commercial world, then it comes as a bit of a shock when you start engaging with the NHS and the Department of Health and you realise that that is not how decisions are made. NICE is a very good exception to the rule, but, generally speaking, decisions are not based on models.

It was a shock that you had to spend a lot of time, either as an actuary or as a health economist, educating the people who are making the decisions. The education covered models and assumptions. You also have to explain that you are not giving them the answer, rather explaining to them the range of possible answers and the key assumptions that underpin those answers, and therefore the key sensitivities around your model.

It is not simply a question that all ministerial government people actually want to know, “What is the answer? What is the cost-effectiveness of this programme? Am I going to save £1 million? Am I going to have to spend £1 million?” We have to tell them that there is no answer. They might, under certain assumptions, and these are the key things that are going to affect that answer. But we cannot give them the definitive answer.

I think there is a lot of education that needs to go on, both by actuaries and health economists, around that point because it is not as widely understood as actuaries or health economists would like.

May I also respond to the point about evidence: that we have not talked a lot about evidence-based medicine? That is true. I mentioned it in the paper as an essential component of disease management programmes. It is an essential component but it is a bit like the term “case management”, it is banded around in a lot of different ways. Everybody has a very different understanding of what “evidence based” medicine means.

In its pure form, we all understand what it should mean. However, the way that it is interpreted in practice is widely varying, and how you use evidence-based medicine, and evidence-based guidelines, as part of the disease-management programme is a very difficult question. I glibly put in the paper “evidence-based guidelines should be an essential part of disease-management programmes”. Actually getting doctors to use evidence-based guidelines is a whole field of expertise and experience in itself.

There is a lot of work to be done around how you persuade doctors practising in the field to adopt evidence-based medicine. Most doctors, as we know, practise the way that most actuaries practise, which is the way that they were taught. You do CPD and update your skillset, but it is very hard to get away from the fact that the things that you learned as a student are the things that are in the back of your mind for a long time. It is very difficult to change that practice as you get older.

One of the things I spelt out quite clearly in the paper is that those interventions which only look at GP education, such as sending out lots of educational material, or running some workshops for GPs, (and some PCTs will tell you that this is sufficient), are not going to be successful because they do not change people's practice patterns. They do not help GPs engage with patients, and they do not help patients, in particular, to change their behaviour.

So, there is a lot of work to be done around how to persuade GPs to adopt evidence based medicine and how to persuade patients to change their behaviour.

Depression is, perhaps, not the best example. When you start looking at cardiovascular disease, and whether or not you have financial or other incentives for patients to take up a more healthy lifestyle, or to reduce their weight, or to do more exercise, then that is another area of behavioural economics that is very interesting to me, but makes the disease management programme quite difficult.

Those disease-management programmes that just send a load of material out to a patient saying, "You are diabetic. Please watch your weight" are not going to be effective.

There is a lot of talk about disease-management programmes in the UK which is around coaching and sending out educational material and identifying those people who are at risk of certain diseases and then sending them a load of leaflets. Those are not going to work.

The ones that are going to work are ones that involve interventionist strategies. So the disease-management programme that I laid out around depression requires graduate mental health workers to ring those patients every week and check that they are taking their drugs, and talk about the side-effects of those drugs, and try to get to the bottom of issues that affect compliance with drug taking or other types of medication.

The suggestion of NICE for depression was that you might ring the patient up every two months, or invite them in every two months. Every two months is not going to hack it. It has to be a very interventionist strategy. It is very important to realise that all the different elements of a disease-management programme have to be in place for it to work. You cannot take just one part in isolation because that happens to be the cheapest and easiest part and then expect everything else to fall into place. It just does not work like that.

Mr J. Instance, F.I.A.: Just taking up the latter point and a point made earlier, we are moving into a regime where there is not any more money, so there are not going to be any more interventionist strategies because they cost a lot of money.

The point about how the decision-makers work: I am fairly naive about it, but I guess politicians are going to look for the easy answers. They are going to do those nice little superficial things, like sending a leaflet, because it is cheap and it shows that I am taking action and that gets me the vote.

I suppose the question I am putting is, "Yes, this is great. But what can we do?" We can discuss all of this but actually nothing is going to happen in reality because there is no money. It is all being spent. It is being spent on whatever it is. It is keeping hospitals clean, because that is what voters vote for. That is probably a good health economic outcome because people will survive, but it is £105 billion and it is going to stay £105 billion and we are not going to be able to spend any more money because there is no more money.

"Become more efficient" — okay, I am sure everybody can become a little bit more efficient. But "more efficient" actually means cutting jobs. That is going to mean fewer hospital cleaners, fewer nurses, fewer doctors. That is what efficiency means because there is not really much else. The NHS spends most of its money on people, I think.

So how do I become more efficient? I can put the squeeze on drug companies. I can raise the NICE criterion so they can make less profit perhaps, and so give the NHS drugs more cheaply, or

whatever it is. Nonetheless, it has to be people. Again, in today's environment unemployment is rising at something like 100,000 a month. If you start sacking nurses can you imagine how many politicians are going to accept that?

Dr Crilly: That is not a very actuarial response, is it? It is highly political. Essentially, there is over £100 billion in there. 70%-odd of costs are to do with staffing, but staffing has gone up by 28% over the last ten years. These are all moveable feasts.

But the purpose of the health service is not simply to be a job creation scheme. It is reasonable to compare and contrast different options. Presumably a strategy would be that, as actuaries, you would be comparing different things: different means of achieving certain outcomes.

On that basis, I would challenge the shrugging shoulders, saying that it is all too difficult and there is no point. It is such a big industry. It is huge. Sure enough, the private sector, in percentage terms, has been reducing because the amount of cash in the system has tripled and so it is less than 10% in this country and I think it is over 50% in the US.

So, essentially, countries tend to spend roughly comparable amounts (as a percentage of GDP) from their public purse and it is the private bit that varies. That has been reducing in this country because waiting times have reduced. As people find that access is difficult, that may increase in the future.

Apparently one of the reasons why General Motors is going down the tubes is that its healthcare costs are too great. Essentially, everyone wants to know how to contain costs. The easiest way to contain them is simply not to spend and to say, "We just will not do that." With mental health, it is relatively easy to turn off the tap. But the fact is that public policy comes into play: there is public risk, and there are all sorts of checks and balances that will constrain. So my basic response is to say "try to find the cracks in the system where it is possible to ask interesting questions and make the comparisons". People do not stay in the service forever.

Dr Soljak: Just to continue the debate a little more, I think that there is certainly plenty of evidence that a lot of very cheap and simple interventions are not currently being delivered. A good example is statins which are part of the NHS health checks programme. They have been costed in at £60 a year per person, which is probably an overestimate: they are extremely cheap. In fact, there is evidence in the US — I do not think it has been done here — which is starting to show what an impact that is having on population life expectancy. It has probably been one of the biggest recent influences on population life expectancy. So there are a lot of very cheap interventions that should be implemented.

Also, there are probably a lot of very low value interventions going on at the moment as well. I do not want to choose particular groups, but certainly a lot of specialties are still not operating in terms of evidence-based care. There is a huge debate to be had. For example, surgeons would like to operate on a patient's cataract as soon as vision starts to deteriorate, but in terms of cost effectiveness the benefits are very low. That debate about where that threshold is drawn has not been had, as yet. So there is huge potential to apply the current resourcing of the NHS a lot better.

Mr T. J. Llanwarne, F.I.A.: I am the new Government Actuary. I looked at the list of questions. I was in the private sector before I took on my present role. I think 'how would the private sector look at that?' They would say, "'Come up with a solution' is the answer to the rhetorical question at the top of the slide".

But, actually, I have had a number of people say to me over many years, "If you have an issue, can you do the same for lower cost or can you do more for the same cost?"

I am starting to ask myself that sort of traditional question. If, therefore, we have epidemiologists and health economists saying, "Look, there is a bit of conflict between what we are coming up with 'QALYs' and what you, the actuaries, are coming up with", then I think I am saying to myself, "I wonder if we can ask a different type of question, which is: 'can we get the same "QALYs" at lower cost so it comes in before 2016-17' in accordance with Dr Soljak?"

We are the ones, as actuaries, who can start addressing those types of questions when people give us alternative scenarios, and we can do that mathematical modelling which I do not then see as being in conflict with the health economists, if I have understood it correctly.

So I am looking at something which says, "Surely, as actuaries, there must be something at which we can start to look. If we pose the challenge back to the health economists to give us two or three different ways of getting the same 'QALYs', and then we can evaluate over the long-term to ascertain which is the cheapest way."

We are starting to come up with solutions and answers which are simple responses to ministers, which I would think will go down well and put the actuarial profession in a better position in this area than, perhaps, it is.

Mr Glynn: Just to follow up a couple of the recent remarks, there is, it seems to me, a current issue which might lend itself very well to a big study, somehow, between the Government, NICE and actuaries. This is the question of risk bearing on new medicines. A new kind of pricing is being put forward. The companies are getting interested in it. There is some practical experience.

It involves a great many complex economic issues, and obviously actuarial issues, and health policy issues. I would have thought that would be a jolly good candidate for an expanded chapter in the next methodology book published by NICE; and I am sure Europe Economics and the actuaries could help a great deal in working the issues through.

Ms Chung: I have a related point. One of my questions to the author was going to be: what specific techniques do you think actuaries would bring to the table? I think it is precisely the area, to which a previous speaker referred, of long-term modelling under conditions of uncertainty. This is the case with evaluating health technologies such as pharmaceuticals.

This, to me, is a key area where actuaries have expertise, perhaps more so than some of the other players in the field. I think that there are countless decisions revolving around regression modelling; extrapolation from short-term clinical trial data to a lifetime horizon in chronic illnesses; what evidence should be used for an input; how we bring it all together; and how we mesh clinical trial evidence with clinical opinion.

There is a lot going on in national decision-making with regard to Bayesian evidence. Every time I see it I think, "My, god! I wish there were some more actuaries around doing this" because it feels as if there is a certain amount of reinventing the wheel going on at the moment.

Mrs Buckle: I would just respond quickly to the long-term point. I think that is a core skill of actuaries. I should like to tie it up with Dr Soljak's point saying that actuaries, unfortunately, have, particularly in the life arena, spent a lot of time looking at historical evidence, projecting it out into the future and tweaking trends.

What we need to be doing alongside that is understanding the medical changes that are going to impact those trends. What we have not been good at, and why working in multidisciplinary teams is so important, is to understand that you cannot just take historical trends and project them out into the future with a few tweaks. You also need to understand what is going on in the real world.

I had a good example of that recently where some of my life colleagues were saying to me, "What are the new things that are coming on the scene from a medical point of view that are going to make a huge step change in life expectancy? What are those things that we need to build into our model?"

There was a lot of debate. We involved lots of medical people and we sat around and had a long discussion about it. With my health economist's hat on, I then said, "We are talking about all these new cancer drugs and how they are going to cause a great step change in life expectancy, but who is going to pay for them?" Nobody had taken that aspect into account. There is a case for saying you need to consider the medical viewpoint. But considering the fact that there is going to be some great new drug that is going to stop people dying from breast cancer in five years' time, and cause some step change, is irrelevant unless you take

into account the health economics viewpoint that says somebody is going to have to pay for that, and ask 'is it going to be a good use of resources?' If it is not, then it is not going to make much difference to life expectancy.

Mr M. A. Pomery, F.I.A.: I came along here tonight thinking we were going to have a discussion about depression and disease-management programmes and I thought I might say a few words near the end about the role of actuaries in this field. However, the author, in addition to writing an excellent paper, has sent us down this route in her introductory remarks.

I have long thought the health area was one in which UK actuaries could become actively employed, using our actuarial skills. The Institute and the Faculty have given a lot of consideration in the past into trying to get actuaries into new areas. It is very difficult to achieve this from the top down.

The Institute of Actuaries does not employ any actuaries. It is not in a position to instruct actuaries as to what work they are going to do. We do not have a "command economy", where somebody in charge can instruct people into what areas they are going to work.

So if we are going to do it, we need individual actuaries to branch out into these new areas. It needs to come from the bottom up. On tonight's evidence, the author is a perfect example of the sort of thing I have in mind: somebody who has tried out a new area, done some postgraduate work and is now actively involved in it.

The role of the professional body, if we do have actuaries moving into a new area, is to find ways to facilitate and nurture the growth and help things along. We do have a healthcare practice executive committee. I hope they are "on the case". I am sure they are aware of the possibilities for UK actuaries in this area. The fact that it is a big area for actuarial employment in the US, and in some other countries, is obviously of some help.

That is a rather long introduction to get to the main point I want to make. I do not think, when we are trying to move into a new area like health economics, we should sell ourselves too short. As well as our actuarial modelling skills, which have been referred to tonight, I think we bring a number of other attributes to the table.

Firstly, one thing that actuaries are very good at is long-term thinking, rather than short-term thinking. That is a valuable attribute for which, sometimes, we do not give ourselves enough credit. We also have an ability to handle large quantities of data. Because we do this all the time, it comes as a surprise to us when we find other people do not have that skill to quite the same extent. We also have experience of coping with inadequacies or gaps in the data and getting round that in an effective way. Again, it is a skill that other people do not have, whereas we might take it for granted.

There are other aspects, too. I thought the sensitivity analysis in ¶6.10 was a very good example of what actuaries do, almost as second nature.

My final point is that one of the other attributes that we bring is that we are members of a profession and all that includes, in terms of setting qualification standards, insisting on CPD, having a code of conduct and a discipline scheme. We share those things with the medical profession, but maybe some of the other people involved in this area do not have them.

I should like to thank the author for an excellent paper. I have enjoyed the discussion tonight, mostly. The one bit I did not enjoy is when I realised I am rapidly approaching the age when it is not worth the National Health Service spending any money on me. I hope I can put that off a bit longer.

Dr Crilly: I am just thinking about how we might diversify, branch out. By way of introducing that, have you heard of the most expensive breakfast in history where Tony Blair sat with David Frost on the couch and said that NHS spending was going to reach the European average which at that stage was eight point something and we were spending six point something of our GDP? Then of course that resulted in a flurry through the Department of Health and the Treasury. There was no evidence base, there was no prior consultation with the Treasury, and that has stimulated this whole chapter of huge spending.

Along the same lines there was a survey which I think Alan Milburn put out which was in

Sainsbury's and other places. There were cards saying, "What do you want?" Of course inevitably people want more staff, want more doctors and more nurses. So by way of being responsive, which the Government was, having had 5000 student places, an extra 1000 capacity has been put in place. So the number of medical students has been increased from 5000 to 6000. It is a 20% increase, which is taking us towards the Eastern Europe former Soviet countries where, essentially, they over-produce doctors.

It strikes me, in terms of long-term planning, that maybe some cost implications, some co-working with the economics division in the Department of Health might actually be welcomed with specific questions. Long-term planning and modelling: it is quite true when you do something and you have been trained, you do not have a great deal of respect for it until you find other people could not get anywhere near it. I suppose the phrase is workforce planning for the medical staff, but there is a bit of a dearth of skills. It is something to consider; another currency to contemplate.

Mr S. M. McLaughlin, F.I.A.: I am president-elect of the Society of Actuaries, and I also happen to be a Fellow of the Institute.

This has been a very interesting discussion. Does your paper, do your results, give an indication of whether it is more efficient to pay for disease-management programmes through private or public funding programmes?

In the US, we have 45% or 50% that is public funded, and the rest is private. As you point out, a lot of the management is private. We are looking, probably, to increase the percentage of funding that is managed by the government. Is that a good idea? We may not have a choice. There may be policy matters or political decisions that take us in that direction. But this is a perfect example of where models that we build, and the outcomes that we find, may actually be informative to the process as to how we would fund basic care or how we would fund disease-management programmes.

I would be interested as to whether you have any opinion on that.

I do take the point that, as actuaries, we should work together with health economists. I think we should do that, not with the idea in mind of finding the one perfect model that will solve all problems, but rather to make sure that we are not overlooking something vital or that health economists are not collaborating here to build better results from imperfect data, from taking different approaches.

I do think that, as much as we work hard on our models, there will not be any ability to predict the future from the past. We can simply use different techniques to come up with different suggestions, different ranges of outcomes, and my suggestion is what we, as actuaries, focus on is using our unique actuarial perspectives to contribute to the discussion, to contribute to the debate, to acknowledge, as a previous speaker said, the fact that we are pretty good at using incomplete or inaccurate datasets. Healthcare data tends to vary significantly from one set of observations to another. Data that is six months out of synch with other data cannot be combined. So there is much that we can contribute, I would say. We should not only contribute in terms of improving models, the way actuaries look at them, but try to reflect risk uncertainty, sensitivity testing, stress testing, even perhaps stochastic models.

Also, we should not simply build better models but also make sure that they are applied correctly; the use of models is important. We have not discussed that.

To the extent that there is a shortage of funding available, disease-management programmes become more important rather than less important. It is a matter of prioritisation.

That is where I think actuaries can go even one step further, which is not just building better models but taking public policy positions. It is something which we have not done very much in the past. We thought that good work will speak for itself and the decision makers out there will use that information correctly. In many cases they do not. They do not understand it. There are other pressures.

So we as a profession should actually be prepared, not all of the time, but some of the time at least, to take a position and say here is where we think the decision makers should go, whether it is private or public.

Mrs Buckle: I did not look in the paper about whether it would be more efficient to deliver these management services via the public sector or the private sector. That was because I accepted the *status quo*. I was looking at the cost effectiveness of intervention rather than necessarily the delivery mechanism.

However, it is an interesting point. As an economist who moves much towards the free market end of the spectrum, I would tend to say using private vendors for some of these things is probably going to be relatively efficient even once you take into account the profit margin. However, what I spend quite a lot of my time doing is warning PCTs against private vendors. They have this inherent bias anyway in that they are very scared of private vendors, although they are becoming more prevalent in the NHS.

PCTs are simply not equipped with the skills to negotiate with private vendors. It is quite an interesting phenomenon. What you tend to see is, as a private vendor, even as a private vendor of consulting services, let alone as a private vendor of something as big as a disease-management programme, PCTs are quite reluctant to engage because they think, quite frankly, they are going to get taken for a ride by people who are smarter than they are. They simply do not have the skillset to be able to evaluate those programmes.

It is shown from the US experience that disease-management companies can be extremely creative in how they claim savings and how they persuade commercial insurers to take them on on the basis that they will save them a lot of money. I think, to be fair to them, they themselves did not understand the statistical issues in how those savings were calculated. I am not sure that a lot of them were knowingly being misleading in those claims.

The fact was that lots of insurance companies did take these disease-management programmes at face value and then when savings did not materialise, and their health cost trends were still 10% a year, they threw their hands up and said, "Oh! What is happening here! We were promised we were going to save \$x million and that has not happened."

There is a case for looking at delivering certain parts of that disease-management programme through the private sector, and PCTs simply do not have the capacity or the skillset to implement some of those things themselves.

Also, there is a case which says bringing in external vendors into the NHS, and into PCTs, helps to do some of those things in a way that people who have been embedded in the organisation for a number of years just cannot make happen.

You see quite a lot of historical bias in the way that PCTs operate in that a lot of them are staffed by people who have been in and out of the local hospital and they still tend to have this idea that their function is to keep the local hospital afloat.

So, whereas the system is ostensibly set up whereby a PCT has the budget and they dispense those funds to the hospital, and they should dispense those funds in the most efficient way, in fact a lot of the culture is, "We are here to manage the whole health economy and part of that management is keeping the local hospital in business", which makes it very difficult to implement something like a disease-management programme which, sometimes, is going to keep people out of hospital. Sometimes outsourcing that kind of thing to a private vendor can be very helpful because, within the PCT, they do not have the culture to be able to do that.

Mr Edwards: I just want to make a general comment on how we tackle things in the UK, and it is probably common in other countries as well. The approach to mental illness is to "cure the symptom". In the UK, and probably elsewhere, the biggest point where we let the population down is in the younger age group, between 15 and 25.

The paper mentions how, later on, you can effectively teach people how to deal with their depression and identify when they are going to have a relapse. They can manage it themselves and still undertake the tasks in their life which allow them to contribute towards economic activity, so they do not just drop out of work or write themselves off for a few weeks, and so on.

I firmly believe that we need to take on a more sourced approach of making things more available to people when it is beginning to happen. Surely, we do not believe that children are depressed, already displaying signs; but somewhere in that changeover to being an adult and

being involved in the economy because you become a worker we do have people who are depressed and are developing minor depression and therefore go on, sometimes, to major depression.

If we worked closely, or were more active in saying to people, "This change you are going through while growing up is alright. Everybody has certain thoughts, or whatever" that would contribute towards stifling that depression setting in in the first place. I know you cannot measure it. It is easier to measure whether a treatment is cost-effective because you can see whether someone has improved, but you cannot really identify whether stopping people getting depression has worked.

That was a general comment that we should go to the source rather than always treating the symptom and chucking our money there.

Mrs Buckle: The whole area of preventative medicine has been a difficult one. NICE have recently taken up the gauntlet in looking at public health intervention activities.

In my experience, and I have some personal experience of this because my mother has depression, it is very difficult to access the right parts of the service at the right time, and it is very difficult to obtain help until things have gone so far down a certain path that you are in a far more serious situation than you should be. Many people end up being hospitalised simply because that is the only way that they can access the service.

Until you reach that stage of having a very serious episode, nobody will take you seriously. You can go along to your GP, and obviously it depends upon how good your GP is, and until something very serious has happened none of the other services kick into action.

The other issue about accessing NHS services is the way that they tend to be siloed in terms of age bracket. You might find a particular PCT has decided that there is an issue with depression in people in old age. So they set up a service for people with depression in old age. That is great if you happen to be 65 and you have depression. If you happen to be 64 and you do not fulfil their criteria, you cannot access that service. Therefore there is a big gap in the system.

I suspect it is very similar for young people as well. Certain parts of the country have very specific services for adolescents. Others will not see that as a priority and, therefore, have not invested any money in that area. Instead they might have an old age depression service. You can see how that comes about. It is very ad hoc and people often fall between the gaps.

I have spent a lot of time in antenatal care recently which has been another eye opener for me: I do not interact with the NHS on a personal level very often. So it has been a little bit scary.

The overwhelming message that I get back from all the people with whom I interact with is: 'it is okay because, clinically, we are very good. We might be really bad at the administration process, but clinically we are great.'

My response to that is that the administration processes are an essential part of clinical outcomes. They are not a nice-to-have or add on. You cannot have good clinical outcomes without having good administration processes. Evidence-based medicine is part of that.

An example is that I have to go every so many weeks to have my antenatal check-ups. But nobody keeps tabs on that. There is nothing in the hospital's computer system that says, "This week, you are 24 weeks and therefore we will book you in for an appointment at 28 weeks because that is your next appointment." I have to remember that. You would think that the computer system would flag that up automatically, because most people who are 24 weeks, four weeks later are going to be 28 weeks. But the computer system does not do that.

So, it is up to me to initiate that service each time and to make a fuss when I am not getting the care that I realise I am entitled to. The only reason that I know that I am entitled to that care is because I do some research and I see my schedule of visits. But nobody else has that in hand. People who are less clued up fall through those cracks all the time.

You spend a lot of time working out how to access the system. There is a lot of rhetoric at the top. If you look on the NHS choices website it will tell you that London is the only area in the country where you can access antenatal services and midwifery services directly without a

referral from your GP. It then invites you to type in your postcode to tell you where your local midwife service is. So I type in SW19, which is reasonably central in London, and it tells me that there is no such service within 30 miles of that address. That, basically, is the whole of London.

So, accessing services at a local level is very difficult, and it is the same for depression: it is very difficult to get in the system unless you have had a serious event. Even once you have had a serious event and you are in the system, if you then recover for a fairly short period of time, say six months, and you have been signed off by the psychiatrist that you have not had any more events, next time that happens, even if it happens to be in a year's time, you have to go through the whole process again: you have to start from scratch. Once you have been signed off by the consultant then you are no longer on the database, and you are no longer monitored.

It is quite frustrating as an end user trying to access some of these services.

Ms Chung: That brings to my mind a few disconnects in the system which I wonder if anyone else would like to comment on.

A little known fact about NICE is we do not make decisions about affordability. It is not within our remit. We only operate on that margin. I am delighted it has been very clearly pointed out in the paper. Of course, the Department of Health has to think about the budget impact and PCTs have to think about budget impact, but NICE has given us a very specific remit looking at the margin. I'm not suggesting the separation is inappropriate, more that I wanted to highlight it because often people are not aware of it.

Another disconnect in the health system is in perspective. We are only at the margin from the perspective of the budget. We imagine we live in this bubble of a fixed budget of the NHS and personal social services, but as is very nicely illustrated in this paper, depending on whose perspective you are looking from, whether it is worth making an intervention or not is something for which you might get a completely different answer if you look only at direct or indirect costs. NICE is countlessly asked: why can we not look at societal perspective? It is about the opportunity costs. We are only looking at opportunity costs to the NHS (and Personal Social Services). So another disconnect can be the perspective. Again, I'm not suggesting the separation is inappropriate, in fact there are good reasons for it.

The third disconnect that this paper raises is, within NICE we have clinical guidelines, and we have technology appraisal guidance. The guidelines look much more broadly at how to address the issues of joined up thinking, say, in antenatal care and the management of depression, and what makes sense of who should do what first. Cost effectiveness models are built but we cannot have that for every single part, whereas a technology appraisal is very much more specific.

Working at that margin we are very careful to think about setting up our decision. We spend a lot of time and a lot of public consultation defining exactly what is the intervention and exactly what is the comparator that might get displaced from current practice.

Looking at that paper, it is a very challenging decision to look at a whole disease-management programme.

I have two questions. How did you go about defining the comparator, costing and defining what might get displaced by the elements of the disease-management programme? Secondly, and I am aware of my ignorance of not having read the whole paper recently, did you look at separate analyses, breaking down the elements of the disease-management programme? My thinking is that some might be more cost-effective than others. From the NHS perspective sometimes it is easier to implement if you work in an incremental fashion and just pick up one or two things that you have on your wish list.

The Vice-President: Before I invite Mr Sissons to close the discussion and the author, I hope, to respond to Ms Chung's question, I should like to echo everything that has been said about the quality of the discussion that we have had this evening. It is greatly to the author's credit, and the credit of the paper, that it has stimulated such an interesting discussion.

I did find myself wondering about the kind of tables, which I am sure we have all seen, that the Economist magazine regularly publishes on the proportion of GNP absorbed by healthcare in

different countries. It usually has the US in double figures and most of the European countries in high single figures. The Economist usually goes on to say that they do things much better in France and Spain than they do anywhere else.

It makes me wonder what really is the measure of the value of the healthcare system, and what role can actuaries play in contributing to that. I did a quick calculation that the 500 or so health actuaries in the US cannot account for anything like the gap in proportion of GNP accounted for, so I hope, as I think the author hinted, actuaries are part of the solution rather than part of the problem.

Dr Soljak posed a very interesting challenge to our profession which was half answered, at least in terms of how we look at future life expectancy, which is a huge issue for the life insurance industry and the pensions programmes for which we are responsible.

It is true that we do look out of the back window in assessing these issues. It is not for lack of trying to look forward, and the profession has been engaged in trying to build dialogue with people who are undertaking research into futures for mortality. Unfortunately, the view out of the front window is much less clear, it is much fuzzier than looking out the back window. I think the challenge is a justified one. The suggestion which Mr Glynn made, and Ms Chung echoed, for some future research is a good one.

I will do my best not to steal Mr Sission's thunder but I think the issues for the actuarial profession are potentially considerable. We could have gone on to talk about our educational capacity. For example, I was struck by the reference to actuarial techniques rather than actuaries in the question the author posed.

Are there things we can do, in the big tent sense, to reach out and to bring more people, at least partly, into the actuarial fold?

I think research and communications are key challenges for the profession. We know our members would like to see the profession being more active in issues which are legitimately our sphere of interest. That is another reason for taking on board the suggestions for getting involved in long-term research.

We have had an excellent discussion and Mr Sissons has the unenviable task of closing it.

Mr I. Sissons, F.I.A.: I think there are multiple beneficiaries from the discussion tonight. The author certainly gets some benefit from it. The health and care professional executive committee needs to take away some of the thoughts that have been raised tonight. The profession has some interesting things to think about. So, we all take something away from this meeting.

The paper could have led to a discussion on a wide range of different topics, from very precise technical detail of the modelling in the paper through to ways of working between different professions and ways of influencing decision makers.

In her opening remarks, the author steered us towards the question of if, and how, different professions, in particular health economists and actuaries, may work more effectively together. That shaped a lot of the discussion.

The speakers from the floor certainly rose to the challenge with some consistent threads running through the discussion which I shall try to pull together.

The author pointed out in her introductory remarks that the profession has not been very effective in communicating what the profession can do in this field. However, Mr Glynn commented that he, as a health economist, has enjoyed working with actuaries. Ms Chung recognised that actuarial modelling skills would, if communicated well, be welcome in complex health evaluations.

A number of participants picked up on the modelling point, with Mr Edwards querying whether the recipients of the modelling output really take time to understand what it is that the models are actually saying. This was backed up to some extent by the comments of the author that there can be a "give me the answer" mentality when actually trying to present these models to decision makers.

Mr Llanwarne also picked up on modelling issues and pointed out that long-term modelling does have a role to play, particularly against the very robustly put "there is no money" point validly made by Mr Instance.

However, a balance between the long and short term was struck by Dr Soljak's point that it is not all about big spending, and low-cost innovations can deliver high benefits. The author pointed out that there have been certain controversies over the use of "QALYs" in her opening remarks. Dr Crilly picked up on this point and provided a generally supportive view. It is controversial, but the general gist from a number of participants is that there are limitations but we have to live with them because it is a concept which is now clearly regarded and used as a measure.

Mr Pomery emphasised that the actuarial skillset extends beyond just modelling on precise data, but also looks at inferring results from data sets with holes and introducing sensible sensitivity analyses. Mr McLaughlin picked up on this theme and produced a supportive view. Health data is not necessarily very ideal, a point emphasised by Dr Hughes. Both Mr Pomery and Mr McLaughlin took us into the area of how the actuarial profession, both in the UK and the US, can influence decision makers.

Both put forward the view that this is something in which we should be taking the opportunity to extend our area of involvement. That is a message to the UK actuarial profession, and one which they need to consider, particularly in the health and care practice executive.

Mr Pomery also made the valid point that the impetus has to come from individuals. It needs individuals to push to make this influence felt rather than any instruction from above.

Dr Hughes made the very valid point that you cannot just walk into a PCT and expect to be heard. You do need to work with other professions and make a joint voice heard.

It was suggested that the likes of the author, who is already involved in this field, are the ones who could be providing this push.

Ms Chung and Mr Edwards both raised queries on the alternatives to disease-management programmes. Time actually ran out at this point but we could certainly see other discussions in this hall on that matter.

So who can take what away from the meeting? The author can take away from the meeting supportive comments from a wide range of contributors in response to a paper that is rather different from many of the papers that we see presented in this hall. She can be extremely pleased with the proceedings.

The PEC and the profession can take away the comments on the difficulties of expanding our activities into the broader health arena. We need to consider the messages that have been provided to us this evening.

I hope that all our guests tonight can take away some enjoyment of the discussion, and we certainly have benefited from your contributions. Thank you very much. We will all take away our own personal thoughts on tonight's proceedings. Unfortunately, I cannot get out of my head the comment of the author that individuals who work in insurance or reinsurers in health are marginalised as I am such an individual.

I thank the author for a great paper tonight and I will now give her the opportunity to respond.

Mrs Buckle: I should like to say thank you very much for coming. It has been really interesting for me to see such a wide range of viewpoints represented here and the wide range of comments that people have had. I am aware that they are coming from very different perspectives. That was really what I wanted to stimulate: a discussion that reflected a range of viewpoints. Often Institute papers are presented by an actuary to a room full of 200 actuaries. One of the criticisms which have been made of actuaries, in the past, is that, sometimes, they have slight tunnel vision. It is very important that we break out of that, and healthcare gives us a great opportunity to do so. We are forced to work with other professions in order to understand our subject area. It is simply not possible to operate in the health and care field without becoming involved with doctors, with epidemiologists and with medical statisticians. You have to understand the underlying processes. I think health actuaries, generally, have been better at that than in some of the other areas.

One particular point on which I should like to respond is what the profession can do. I agree 100% with Mr Pomery's point that the impetus has to come from the bottom. It is only people

like me going out and talking to potential new clients, getting into new subject areas and making the effort to understand what other professionals are doing, that really pushes this thing forward.

However, where I think the Institute has a role to play, which they have not necessarily fulfilled to date, is on the education of student actuaries. It is a very chicken-and-egg situation in that until there are enough actuaries working in a particular field then you question the validity of training student actuaries about that field. At the same time it grieves me a lot to see student actuaries learning about healthcare, and learning how to be a healthcare actuary in an insurance company, but very little about the wider ranging aspects of healthcare.

I am always limited in how much I can say about it because the obvious response is, "Why don't you write the material?" I am not necessarily in a position to be able to do that.

That is an area where I think the actuarial profession has to think quite seriously about how they are training actuaries, and are they training them to work with other professionals and to understand the language of other professionals?

Thank you very much for participating.

The Vice-President: I should like to thank the author for the last point, which was very well made, as indeed were all the points she has made in the discussion this evening.

It remains for me to express my thanks, and I am sure the thanks of everyone here, to the author, to the closer for an excellent closing contribution, to our guests and to our members who participated in this evening's discussion.