

TUESDAY 14 FEBRUARY 2006

Present

Macdonald of Tradeston, L
Roper, L
Sheldon, L
Sheppard of Didgemere, L
Skidelsky, L
Vallance of Tummel, L
Wakeham, L (Chairman)

Memorandum submitted by Professor Andrew Evans

Examination of Witness

Witness: **Professor Andrew Evans**, Imperial College London, examined.

Q357 Chairman: Professor Evans, we are delighted to see you and we are most grateful to you for coming to give us some help with our inquiry. I know you want to get away, so if it comes to the point where you have really got to go, just give us a signal and we will completely understand. We are going to try and ask our questions in as short and succinct manner as we can, and I have no doubt you will give us clear and short answers if that is possible.

Professor Evans: I will do my best, My Lord Chairman.

Q358 Chairman: Thank you very much. I am told to say to all our witnesses, speak up and speak slowly, if that is not a contradiction of what I said earlier, in order that we can hear what you are going to tell us. If I may start, willingness-to-pay values of safety have been used for some time now in both road and rail safety project appraisal, and I gather they are recommended by the Treasury. What we would really like to know is whether you think in principle this method is appropriate, and if this method is used should then the same values be

applied to all transport modes, or are there good reasons for using different values in different contexts?

Professor Evans: I think that willingness-to-pay is an appropriate method for valuing the prevention of casualties, and the main reason for that is that it is consistent with the principles under which other attributes are valued in economic appraisal, so I am quite content with that. The only qualification I would make is that I am not personally a direct researcher into establishing these values; I rely on other people's results and I rely on assessments by colleagues who I, as it were, respect as to the reliability of the conclusions. In a sense, therefore, it is slightly second-hand for me, but subject to what my colleagues say I think it is an appropriate principle.

Q359 Chairman: Then the question about using different values in different contexts.

Professor Evans: One general point is that I am reluctant to give different values in different contexts, because I am very conscious that, if you do adopt different values, whatever safety resources you deploy you will not minimise the number of deaths by having different values, and if you are not going to minimise the number of deaths you need quite strong reasons not to do so. My view is that I cannot see any general reasons for valuing casualties differently on the different modes. There might be some specific reasons, but generally I do not think there is any reason for saying rail and road should have different values. That is for casualties; there might be some differences in the valuation of preventing accidents which involve other losses beside casualties like disruption and damage et cetera; you may have a different average package for the different modes, but I think the casualties themselves would be the same. However, the one qualification I would also make to that is that you might have different values in different contexts, and the one that is most persuasive to me, which has been effectively put on the table lately by the Rail Safety and Standards Board, is the valuation of trespasser casualties. It seems quite reasonable to argue that they should not be

valued at zero, but there should be a lower valuation for preventing them than, as it were, law-abiding citizens.

Chairman: That is very helpful and very clear. Lord Macdonald.

Q360 Lord Macdonald of Tradeston: Professor Evans, if you have an evidence-based framework for the amount of money spent on safety in transport and that can be offered to politicians and officials in the public sector, to what extent do you think those politicians should allow pressures, either from the public, from the media or from other politicians to influence investment patterns? Do you think they should stand by the evidence-based framework, backed by experts perhaps like yourself?

Professor Evans: In short, yes, they should. We should remember that willingness-to-pay is public preferences, they are elicited in a fairly controlled manner rather than in the somewhat chaotic manner they might be elicited in the newspapers after an accident, but essentially willingness-to-pay means that you are trying to base your valuations on the preferences of the public, so in that sense the public preferences are counted and they are indeed the basis on which we are doing it. As far as the media are concerned, in my view measuring column inches is not a very good basis for making policies, though it may be difficult to avoid that, because the media, particularly newspapers, it seems to me, publish what is newsworthy and, in particular, newsworthy events are events that happen quite rarely and therefore get undue attention. I say undue – from the newspapers' point of view it is perfectly sensible attention, but from the point of view of policy-making you have to take the rarity of the events into account.

Q361 Lord Macdonald of Tradeston: But you will understand the pressure that elected politicians are under when they are accused of not listening to what the public wants and its preference in terms of investment in the area of safety. Can you think, therefore, of a better

mechanism that would help them defend their evidence-based framework? Should they be more prominent, more familiar, more accessible before the accident happens so that people can rely on it more?

Professor Evans: I cannot think of any other way of doing it. In some ways the trouble is that people are not interested in this sort of material until an accident happens, but the more the bodies involved can be explicit about what their criteria are, the more defensible the position is after an event.

Q362 Lord Skidelsky: Could I ask a supplementary? Your written evidence suggests that the subjective value people attach rises with real income. Why should that be? I could think of a lot of general reasons, but I wonder what you think?

Professor Evans: I would expect that, simply because the valuation of many things goes up with real income, people can afford to spend more on safety.

Q363 Lord Skidelsky: They can afford to spend more on safety, but this is the value they attach to a life going up. Why should the willingness-to-pay go up with real income? I can see why the figure would go up with nominal income, but I wonder why with real income?

Professor Evans: I am not clear what you are getting at, I am afraid.

Q364 Lord Skidelsky: Why do richer people value their lives more than poorer people?

Professor Evans: Because they can afford to spend more.

Q365 Lord Skidelsky: Proportionately more.

Professor Evans: Yes, I would say proportionately more. We are not talking about lives now, we are talking about spending on reducing risk by small amounts, and I would say if you have got more to spend you can reduce your risk pretty effectively if you can afford it.

Q366 Lord Sheppard of Didgemere: Can we stay on the subject of costs and what some of the costs mean? Your written evidence implies that the Department for Transport values the prevention of a statistical road fatality at some £1.4 million. What actually does that mean? Does it mean that all road safety improvements that involve a cost per fatality prevented of less than £1.4 million are actually undertaken, and if not why not et cetera et cetera?

Professor Evans: We do not have comprehensive, systematic information about the costs of adopted road safety measures. We have quite a lot of rather piecemeal kind of evidence, of which I quoted a little bit in my evidence, so we cannot say definitely the answer to that question, but there seems pretty conclusive evidence that there are many safety measures which could be implemented at a cost of less than £1.4 million which are not undertaken, so that is the short answer. Why are things not undertaken? I would say, in the short run, budget constraints with the safety authorities, particularly local authorities; secondly, also in the short run, staffing constraints, because a lot of road safety measures are quite staff-intensive and even if you had a lot more money you could not use that in the short run because the staffing levels are determined by the sorts of monies that have been available at present. With some road safety measures you run into public acceptability issues. For example, the evidence seems to be that by having more enforcement cameras we could reduce road risks at a cost of less than £1.4 million per prevented fatality. But there is a lot of discussion about whether the public will accept more safety cameras. Those three, therefore, are the general reasons. The last question, should not something be done, I think there is a good case on those grounds to allocate more resources to road safety, and that has been the case and continues to be the case for some time. This is an interesting question, whether it should be up to the point where the costs of preventing fatalities equal the value of preventing fatalities because of public sector budget constraints. In general, we do not spend up to the level where costs equal benefits

because we have budget constraints and also because there is opportunity cost to public funds. It costs more than a pound to raise a pound of public money.

Q367 Lord Sheldon: Surely, if you were to spend the £1.4 million for the 3,000 people who die every year, how much would you reduce the number of accidents by? The trouble is, you do not know just where to spend this money. It is a bit difficult to see how these figures are worked out.

Professor Evans: I do not know the answer, but I think we would reduce it pretty substantially but not to zero – obviously not to zero. I cannot give you a figure off the top of my head but one could reduce it over time by a substantial proportion.

Q368 Lord Sheldon: Of course, the more money you spend, the more likely you are to reduce accidents.

Professor Evans: Indeed.

Q369 Lord Sheldon: But knowing in advance where that money should be spent is to know in advance where those accidents are going to occur, which is much more difficult. It is very much a theoretical exercise, is it not?

Professor Evans: One is reliant essentially on past experience as to where accidents happen and what the effects are. I am thinking in particular, when I say the costs are below the value, of local road safety engineering measures, and there is quite a lot of experience of them. It is that experience of the past that gives us an estimate of what the benefits will be. Safety enforcement cameras would be another example; we have got quite a bit of experience and they are pretty good value for money.

Q370 Lord Skidelsky: Professor Evans, your written evidence says that the cost of adopted road safety measures is less than the VPF, whereas the cost of rail safety measures is greater.

Does that suggest an inconsistency in applying the principles of risk assessment across different transport sectors and, to go on from that, does it suggest that too much is being spent on rail safety?

Professor Evans: I think it certainly implies an inconsistency, although I could qualify that by saying the inconsistency is less than it was because it is only in the last decade or so – a bit more than a decade – that the railways have appealed to a value of preventing fatalities at all, so they are at least anchored together now in a way that they were not. We are in a position where on the whole in road safety the value of preventing fatalities is treated as a maximum, we would not do any safety measures that cost more than that, whereas on the rail it tends to be regarded as a minimum – if we can save a life by that we must do it and we might do a bit more than that. There is an inconsistency, therefore, in general attitude there. As I have said, we could usefully spend more resources on road safety, but it is another question whether it should come from rail safety measures, which I am less sure about.

Q371 Lord Skidelsky: Do you think the inconsistency is a cultural one, the attitude to the motor car as opposed to the railway service?

Professor Evans: I think I probably would, yes. If you raise the question later I shall come back to it, but there is a long tradition on the railways, particularly in certain sorts of accidents, of taking the view that if you can do something you should do something.

Q372 Lord Vallance of Tummel: Looking again at your written evidence, Figure 1, we can see over a 30 year period there is a steep decline in accidental fatalities and then, perhaps rather perversely, over the last ten years, when there has been an unprecedented interest in health and safety, the trend has flattened out. What do you think of the public policy implications of this and has the law of diminishing returns set in, or should we be looking at

more radical options, even though they might impinge on individual freedoms – such as banning motorcycles or whatever?

Professor Evans: I do not think there are any obvious policy implications of that drop. I do not think you can say that because we have not had a reduction in the last decade that somehow we have fallen behind and therefore we should do more than we otherwise would. On your last point, as I have tried to indicate before, I do not think we are at the stage of diminishing returns with regard to safety measures, certainly on the roads and possibly on the railways as well. What is efficient is always changing with technology as well – things that are now thinkable were not thinkable 20 years ago. I would not favour the sorts of draconian bans that have been mentioned, largely because for road safety it is necessary to get the public on side because, in the end, we do not wish to criminalise many otherwise law-abiding citizens, and therefore what the public will accept is quite a limitation in road safety. Banning using the car to drive to work, for example, if the public transport was a good alternative, is not a way forward. If you want to reduce road use – and there may sometimes be a case for that and safety may be part of that case, but only part of it – then pricing seems to be the obvious mechanism, which is very much on the agenda. One of the reasons why cost-benefit appraisal is used a lot in transport is that you do rely on valuations of the users to quite a high degree – in other words, you do not try and second-guess the users, but to get the users to act efficiently you need the right price.

Q373 Lord Vallance of Tummel: How would that impact on motorcycles, which are perhaps the highest risk form of transport? They are at the moment exempt from such pricing.

Professor Evans: From the safety point of view that was a questionable decision and it is certainly true that motorcycles have risks per kilometre that are far higher than any other

mode of transport. If we had not invented them it is questionable whether we would, but we have and they are very useful for some people, so again I do not think I would ban them.

Q374 Lord Roper: As far as diminishing returns on rail are concerned, your written evidence suggests that the cost for each prevented fatality associated with the introduction of the Train Protection and Warning System (TPWS) is significantly higher than the value placed on a prevented fatality in normal safety investment assessments. Does this imply that the decision to introduce TPWS is inconsistent with the normal rail safety assessment guidelines, or could you say something about the other benefits of introducing TPWS and reducing accidents which presumably justify it?

Professor Evans: One needs to distinguish between TPWS as implemented and TPWS as originally proposed. I drew attention to that distinction by quoting the House of Commons evidence that they had received from Mr Armit, the Chief Executive of Network Rail, where the original proposal for the Train Protection and Warning System had a cost of preventing fatalities that was almost certainly less than £3 million, when you take the other benefits of preventing train collisions into account. At the time also, I should say, the railways valuation of a prevented fatality was higher than the £1.4 million it now is, so at the time with the lower initial cost the Train Protection and Warning System was within shouting distance, shall we say, of the official valuation; in that sense it was not wildly out of line. I would also say that TPWS is a very clear case. Its characteristics are – again as I have tried to indicate in my written evidence – that there was a known and persistent risk. The data on the kind of accidents that would be prevented by TPWS are remarkably clear – they were risks that went on and on, not very frequent but very persistent. Until Automatic Train Protection came along there was no technical solution to it, but then suddenly we had a technical solution and in the case of TPWS quite a cost-effective one as well, and there was also a clear railway responsibility there, because if ever there was a class of accident that was not the victim's

fault, it was that one. The situation is you have a known risk, you can do something about it, it is the railways' responsibility. Back to your question about accountability, there is a very strong tradition in that situation of saying you should do it and that was a very strong argument. In that situation, therefore, given the original costs, it seems a good buy and so that would be a case where I think I would have exercised political judgment – if it had been my responsibility – in favour of it. That is an example of a situation where, as it were, you should have discretion, you should not regard the values as gospel. The further expenditure for the last five fatalities which I mentioned, I do not know how that happened and obviously the case for that is a lot weaker.

Q375 Lord Sheldon: The rail industry was opposed to Automatic Train Protection but it welcomed the Train Protection and Warning System. Was it because it was cheaper?

Professor Evans: The tone of the description of resolute resistance is slightly in error. It is not true to say that the British Railways Board, which was the key body at the time, was resolutely resistant. In fact, the history is that the British Railways Board committed itself to installing Automatic Train Protection - it did not resist it - in November 1988, really as soon as it became a practicable possibility, and essentially for the same grounds as later TPWS was approved. It was a known risk, you had a technical solution, we are a responsible operator, therefore we should install the safety measure. That was essentially the line of argument, but there is no reference to costs in that argument as I have just said it. It was in those circumstances that the British Railways Board ordered equipment for the Chiltern and Great Western lines in order to develop it to a working level for the whole network. So in the late Eighties and earlier Nineties they were very keen on it. What made them change their minds, as they did in the end, was that (a) they got more reliable estimates of cost than they previously had, and it turned out to be pretty high, and (b) they had more reliable estimates than they previously had of how many lives it could be expected to save, and when they

divided the latter into the former they got a very high figure which they felt they could not justify. They felt you could spend better safety resources, even within the railways, and save more lives in other ways. One of the British Railways Board's last acts before it handed over to Railtrack in March 1994 was to advise the Secretary of State against network-wide installation of ATP. They were convinced by the argument, but it was still against their nature in a way as a responsible railway operator. Just to complete the story, when the Secretary of State received that recommendation he referred it to the Health and Safety Executive who were the safety regulators, and they in turn said that they considered it to be not reasonably practicable by their normal criteria. I have forgotten the exact wording, but it was something like that. The Secretary of State concurred with that decision, so it was in the end a collective decision not to do it, essentially on the grounds of cost and with TPWS being developed as a cheaper alternative. They did decide against it, therefore, but in a sense reluctantly. Part of the reason for that is that the train drivers were driving very safely. It is because they were so good at obeying red signals that you got so little return on devices to help them. On the question of the change of heart about TPWS, I said there is a much stronger case because the cost is lower – or at least in the original form it was – but I think once it is mandated it is not in the interest of anybody in the railway community to say we do not want it, because it does save them from accidents that they really do not want. Likewise, the public will also welcome it provided that the taxpayer is paying for it and it does not affect the fares.

Q376 Chairman: The last question we have got is, in your view, how should the safety levels on different transport modes be compared: risk per passenger-mile, risk per passenger-hour or risk per journey, the three options we have got down here? How would you do the comparison?

Professor Evans: The answer to that is it depends on the purpose for which you are doing the comparison, and I will try and give some illustrations. I have used all three of those measures for different purposes and I might try and use some illustrations. I gave an example of the access risk in my written evidence of rail journeys and I tried to show that in fact the access risk of rail journeys is bigger than the risk on the train journey itself, and for that purpose I was using per journey as the divisor and I think it is appropriate because there are two accesses, one at each end, and that is independent of the length of the rail journey. Within that calculation I used walking kilometres and driving kilometres as measuring the risk in the access process, so I combined journeys and kilometres or miles covered in I hope a sensible way. For some other purposes I think risks per hour are very interesting, and one of the purposes for which they are very interesting is that you can calculate passenger risk per hour as the Department for Transport does and as I have done. One of the uses of that measure is that you can compare travelling per hour with doing other things per hour, which you cannot on any other measure, but I did not produce any results of doing that in my written evidence because I have not got anything that I regard as sufficiently up-to-date. When I last did it, one of the interesting findings was that, for most people who do not do exotic things like risky sports, travel is the most risky thing you do, especially travel as a pedestrian. We all do it, and there are very few activities that have a higher risk per hour. That seems interesting to me and it is another reason for devoting resources to road safety.

Chairman: Thank you very much. Lord Skidelsky.

Q377 Lord Skidelsky: Two quick ones, if we have got time, My Lord Chairman. I just want to go back to the willingness-to-pay methodology. Would you say that the value attached to preventing fatal accidents as measured by willingness-to-pay is less for road transport than for rail transport?

Professor Evans: The only piece of evidence that I am aware of, and it is very specific evidence, has actually been prepared by your Specialist Adviser, who did a study – he can correct me if I am wrong after I have left the room – for the Health and Safety Executive and, essentially, in a more careful way than I can describe tried to ask people that very question: “are you willing to pay more to prevent an accident as a railway passenger than you are as a road user?” And the answer to that was “no, we are not”. They got the same value. They even repeated it, very interestingly. The first study was done in 1998, which was about halfway between the Southall and the Ladbroke Grove railway accidents, and they repeated the study after Ladbroke Grove. They found that people were willing to pay slightly more when Ladbroke Grove was in people’s minds, but negligibly more, not much more. The answer was the same even then.

Q378 Lord Skidelsky: So the culture should not be constrained on safety measures?

Professor Evans: If you rely on willingness-to-pay I agree with you.

Q379 Lord Skidelsky: Just one last question, to go back to the assumption that as societies become wealthier they become more risk averse, which seems to be the common view. If you believe, as the Prime Minister seems to, that we are in danger of becoming excessively risk averse – that would be the tenor of his big speech last year – how does the Government act to counter this natural tendency towards increasing risk aversion, if it believes that that is not a healthy development? By reducing the volume of safety regulation as the natural risk aversion increases? I know it is not a question one can answer quickly, but do you think there is a danger that we are becoming too risk averse?

Professor Evans: I think there is a possible danger that we are putting too much weight in some areas and not enough in other areas. One thing that I had not thought about that struck me as I prepared the graph in Figure 1, which is the graph of trends in accidental death, I

suspect that most of the deaths in that graph are actually in private arenas rather than public arenas – the two big groups are roads, which is a mixture of public and private, and at home which is almost entirely private. I suspect that a lot of the large “Other” group is also largely private, sporting accidents and that kind of thing. Therefore, in a way, a lot of what this risk regulation is about is attacking a rather narrow field of total deaths.

Q380 Lord Sheldon: I am just looking at table 4 in your report and I am looking at the access modes. It seems that walking is the most dangerous of all the access modes.

Professor Evans: Absolutely, apart from motorcycling, which is not in that table. Motorcycling is even worse, but I have omitted it from the table because it is not much used in access to rail journeys. One of the surprising things about this piece of work we did is the amount of walking that is associated with rail journeys, something I had not guessed. My estimate is that five per cent of all walking is to and from mainline railway stations, and probably another five per cent is to and from underground stations, because they are about the same number of journeys. So that accounts for a lot of walking, and that is why it is important in that table, it is about a kilometre for every rail journey. Motorcycling has got higher risks, but there is a great deal less of it associated with rail journeys.

Chairman: Thank you very much indeed. You have answered a lot of questions in jolly quick time. We are most grateful to you for that and we are grateful to you for coming. You have been very helpful to us and you have been spot-on some of these areas we are most concerned about. Thank you very much indeed.

Witness: **Professor Sir Richard Peto**, University of Oxford, examined.

Chairman: Thank you very much for coming. You know the routine pretty well, I guess, and your expertise is going to be, I am sure, very helpful to us in our study of these questions of risk. I am told to remind everybody who comes to be a witness to speak up and to speak slowly and clearly so that we get an accurate report of what you have to say. You know something of the questions, but if I may I will ask Lord Macdonald if he would like to start.

Q381 Lord Macdonald of Tradeston: Sir Richard, I wanted to start by asking if you could give us your assessment of the health risks associated with passive smoking in the home or at work and in other public places. It would be helpful if you could give us an indication of both absolute and relative magnitudes of the health risks and also the degree of uncertainty attached to the available statistical evidence.

Professor Sir Richard Peto: I am sorry, I know that is what you would like to be given, but the point is that these risks are small and difficult to measure directly. What is clear is that cigarette smoke itself is far and away the most important cause of human cancer in the world – that is, cigarette smoke taken in by the smoker – and passive smoking, exposure to other people’s smoke, must cause some risk of death from the same diseases. Measuring that risk reliably and directly is difficult. You can do it indirectly by suggesting approximate proportionality of hazard to exposure, but the assumptions become almost untestable. The arguments that have been forward for the various thresholds, that there is some dose below which there is absolutely no risk, have no scientific plausibility. They have come up a lot of times because, as you know, when there is the statement “there is some risk” then there is political pressure to get rid of that risk, so it would be very convenient if one could be told that there was no risk, and so various implausible models involving thresholds got proposed. There is going to be some risk and there is always going to be quite a lot of uncertainty about

the magnitude of that risk, I am sorry. What is definite is that cigarette smoke is causing about 100,000 deaths a year in this country, and a few million deaths a year worldwide, that this number of deaths is still increasing in some other countries, although not in this country, and that passive exposure to cigarette smoke in various circumstances must be producing some risk. That is definite, and the threshold arguments are often politically motivated inventions which do not have much scientific plausibility. I am sorry not to be more helpful; you want numbers and I could give you numbers by direct extrapolation, but what does one make of them? These hazards cannot be directly measured.

Q382 Lord Macdonald of Tradeston: If you have such a large sample of people dying of lung cancer, would it be possible to interview them about their personal circumstances in a way that would allow you to deduce whether they had frequented bars or had a smoky home or whatever?

Professor Sir Richard Peto: This has been done. People who persistently smoke cigarettes have about 20 times the lung cancer risk of those who never smoke; that is a 2000 per cent excess. The exposure that one would get when breathing other people's smoke obviously depends on the circumstances, but even heavy exposure would be something like one per cent of what a smoker gets, maybe in other circumstances 0.1 per cent, so you would expect if there was proportionality to get something up to about a 20 per cent excess. That is what you see in the average of all the studies, and people have pointed to the uncertainties in this evidence – it could under-estimate the real hazards, or it could over-estimate the real hazards. It is however, roughly what you would expect from simple proportionality.

Q383 Lord Skidelsky: 2000 as opposed to 20.

Professor Sir Richard Peto: Yes. You would expect an excess of a few per cent, or several per cent. The one thing that is often left out of this is that these are the excesses for lifelong

non-smokers. Smokers who have stopped, who have given up smoking, have much less lung cancer risk next year than they would have had if they had not stopped, but they still have a lot more risk of lung cancer than if they had never smoked. A lot of the cells in their lungs will be altered part-way towards cancer for the rest of their life, and if they are lucky then they will live out the rest of their life and none of those cells will suffer that final step. Those people would probably be at greater risk of damage from breathing other people's smoke than lifelong non-smokers would be, because lifelong non-smokers are going to have so few cells that are at risk of that final step. But, of course, when studying people who have smoked for ten years or 20 years and then stopped, it is very difficult to work out exactly what their risk would be without passive smoking, so it is difficult to do reliable epidemiological studies of them. So, people have done epidemiological studies of lifelong non-smokers because it is a cleaner comparison. It is however the ex-smokers, those who have stopped, who are probably going to suffer the greatest absolute risk as a result of exposure to other people's smoke, at least in terms of cancer.

Q384 Lord Macdonald of Tradeston: I am just trying to see if you can break it down into categories. Presumably, non-smoking shepherds would be much healthier than non-smoking traffic wardens.

Professor Sir Richard Peto: There probably would not be a very big difference. The amount of exposure from cigarette smoke is so much greater than the amount that you would get from the ambient air outside in the city, certainly nowadays, that there is not so much difference between non-smokers in urban and rural populations. There are some differences, but they are really quite small.

Q385 Lord Macdonald of Tradeston: What I was heading towards is the suspicion that the next way this is taking us might be the banning of smoking in the home, and I wondered what evidence you would bring forward that would allow that debate to take some sensible form.

Professor Sir Richard Peto: I do not want to be cast in the role of advocating banning smoking in public places or in private places. What I am concerned with is that enormous risks should be taken seriously, like the extent to which smokers kill themselves – there is about a 50 per cent chance that a person who smokes cigarettes and continues to do so will be killed by tobacco, which is vastly greater than almost any other risks around. It is the relative importance of this that I somehow want to get across. But, we are concentrating now, because this is your task, on the effects of breathing other people's smoke, although the main way smokers kill people is by killing themselves, not by killing other people – they are a lot better at killing themselves than they are at killing other people.

Q386 Chairman: It is very difficult, but the message I am getting is that when you look at the evidence that is put forward by the tobacco companies to say there is not any serious evidence, or when you get evidence put forward by people who are totally opposed to smoking of any sort, then when you come to deal with the question of passive smoking you would be sceptical about any of the evidence that is produced on either side, further than you have indicated.

Professor Sir Richard Peto: I think there has got to be some risk. The extent to which active smoking is causing cancer, heart disease and lung cancer is enormous. There is about a 50 per cent chance that a smoker who carries on smoking will eventually be killed by this, and that is definite. When you release some mix of chemicals, more or less, in to the general air, it must cause some risks, so I think the statement that there is some risk to non-smokers is well-founded; you would have to use the most extraordinary, implausible metaphysical arguments to argue for threshold doses below which there is zero risk,, especially in a world where there

are a lot of ex-smokers whose lungs are already well off any zero on the dose response relationship. The definite statement is that some people are killed by breathing other people's smoke, and then there is reasonable uncertainty about the number killed. I am sorry – there is bound to be wide uncertainty when you are trying to measure risks like this. There is,, however, a rather odd finding, which seems to come up repeatedly, of quite a marked excess of mortality from heart disease among those exposed to other people's smoke. This is odd because the hazard is much bigger than you would expect from extrapolation from the hazards faced by smokers. It is not impossible, but it is odd, and in the case of heart disease, the apparent risks in passively exposed non-smokers are bigger than one would have expected. It is possible, however, that there are paradoxical dose response relationships, with rather substantial risks at low doses. To take an extreme example, if you plotted the probability of sneezing against the dose of smoke, smokers on the whole do not make themselves sneeze but they can quite easily make non-smokers sneeze. This example shows that there can be a medical effect with a very odd dose response relationship. It is not impossible, therefore, that passive smoking produces a substantial risk of heart disease, and if that were so then it would represent a really substantial public health hazard. There is argument as to whether such a hazard is real, and there is still reasonable disagreement about this, but I do not think there is reasonable disagreement with the statement that smokers do kill some non-smokers.

Q387 Lord Skidelsky: I just want to ask a supplementary. You would be reluctant then to commit yourself to a statement such as that in first report of the Select Committee on Health: “It is currently estimated that second-hand smoking causes at least 12,000 deaths each year in the United Kingdom...”, which was repeated by the Secretary of State on the *Today* programme this morning. The way the legislation and the case are being presented is much more definite than the statement you have just made.

Professor Sir Richard Peto: Yes. That is the approximate number that you would get if you take the excess of heart disease deaths that is observed among people exposed to other people's smoke. If you take the heart disease risk as real, then you could get estimates like the one you quoted, and there is argument as to whether the heart disease risk is real or not. I do not know, and you have a very difficult job in deciding what rules to enact. I was asked in the papers you sent me whether regulations on passive smoking or breathing other people's smoke should be promulgated because they would reduce the number of people who choose to continue smoking themselves. I do not want to argue for or against any rule, but there does seem to be a consensus that it would affect the number of people who choose to smoke. If that were not the case, then the tobacco industry would not be so concerned about it, and the strength of their concern does indicate that their reckoning is that it would decrease the number of people who continue to smoke. If that is the case then one side-effect of such regulations would be to avoid quite a number of premature deaths, but I do not want to distort the direct science of what breathing other people's smoke does for the non-smoker or, more importantly, the ex-smoker on account of that. If, however, you are making regulations, then probably you should bear in mind both the direct and the indirect effect of those regulations; it would be irresponsible not to do so.

Q388 Lord Roper: Sir Richard, you have from time to time used the word extrapolation as a way of getting to these sorts of estimates of risk. I think I follow what you mean by that, but I wonder if you could restate what you would be extrapolating from and what the process would be.

Professor Sir Richard Peto: Extrapolation is the common-sense idea that if you get about one per cent as much exposure then you might get about one per cent as much risk, or something of that order of magnitude. Obviously, the dose response relationship does not have to be a

straight line, and to the extent that it is not a straight line then those answers might be wrong, they could be too high or too low.

Q389 Lord Roper: But numbers like the 12,000 are numbers which have arisen ...

Professor Sir Richard Peto: That particular number came from another source. The trouble is that because these risks are small they are difficult to measure, for obvious reasons. In many populations the main way cigarette smoke kills smokers is by causing death from heart disease rather than causing death from lung cancer. Studies have been done, as you suggested, on lung cancer patients, asking what they smoke, how they lived – and those studies indicate in aggregate, roughly the sort of risk that you might expect from extrapolation of the risks among smokers. On heart disease, similar studies indicate risks from passive exposure that are a lot bigger than would be expected from extrapolation downwards from the effects of smoking on the smoker. Nobody has really argued the studies away, yet everybody feels uncomfortable with the conclusion, unless it could be better understood. Another problem in studying heart disease rather than lung cancer is that whereas lung cancer is quite a rare disease in non-smokers, heart disease is quite common and has many different causes. If you just try and compare people getting heart attacks with others, then you do find an excess of people exposed to other people's smoke, but it is very difficult to interpret this reliably. I do not think – and I could go into this if you want – that the suggestion by the tobacco industry that there is no risk is plausible, but there is a wide range of estimates coming from other sources.

Q390 Lord Sheppard of Didgemere: In addition to the debate that has taken place on passive smoking, there has also been a debate at various times about such things as traffic exhaust. Given that it is difficult to measure the effects of passive smoking impact on non-

smokers, it is probably equally difficult to measure the impact of exhaust systems, but do you want to comment on those two debates that have occurred at various times in the last years?

Professor Sir Richard Peto: In terms of general pollution it has been possible to demonstrate the hazards of persistent exposure to coal smoke, because there have been lots of cases where the hazard has been so extreme that it has been really clearly demonstrable; it is more difficult with traffic exhausts because whole populations in an area of a city are exposed to them and the main concern about traffic exhausts is not that they are going to cause cancer in the non-smoker, but they are going to make the risks bigger in the smoker. That is very difficult to measure because there are variations in the way people smoke and the intensity with which they smoke their cigarettes can also produce differences in risk, so the main concern about traffic exhausts is not whether they kill non-smokers but whether they increase the risk among smokers, as radon has recently been shown to do. Radon as a pollutant of the domestic environment, of houses, increases the extent to which cigarettes kill people, it multiplies up the risks of smoking, and the concern is that some of these other sources of pollution might do the same. In the case of radon, the hazard happened to be measurable because technically it was relatively easy to measure persistent differences in exposure.

Q391 Lord Sheppard of Didgemere: Going back to passive smoking as such, does it matter if one cannot measure the impact of a regulation? If, for example, the effect is that it stops parents smoking at home in front of their children, it most probably helps, does it?

Professor Sir Richard Peto: Does it matter if one cannot measure it? I am sorry, I do not quite follow the question.

Q392 Lord Sheppard of Didgemere: The policy can still be right even if, when you got down to it, one might even be accused of exaggerating the impact of it?

Professor Sir Richard Peto: The main thing that parents smoking definitely does is that it encourages the kids to smoke. Kids who live with parents who smoke are more likely to smoke themselves and, therefore, are more likely to get killed by smoking; there is an association of the smoking habits of the parents with the smoking habits of the children when the children reach adult life. When considering the hazards for smokers, we now know that cigarette smoke is an extraordinary mix of toxic chemicals and what is really surprising when you look at the pharmacology of cigarette smoke is that half of all smokers do not get killed by it. That is really the surprising thing: there are thousands of chemicals that have been identified in cigarette smoke, you breathe them in and you get an increased risk of cancer of the mouth, throat, oesophagus and lungs; they go to the edge of the lungs and cause emphysema and then they go around the body and you finish up with mutagens damaging all the cells of the body that are exposed to these chemicals. Eventually they get concentrated in the urine, in the bladder, causing a risk of cancer of the bladder, and even after the smoker passes urine the urine is mutagenic to cultured cells in the laboratory. It is really surprising that more than half of all smokers are killed by their habit. I notice that in their evidence to this committee the tobacco manufacturers described the cellular repair systems trying to repair the damage done by chemicals; it is remarkable how well they work, given this permanently mutagenic fluid in which the smokers' cells live all the time, yet you finish up with only half of the smokers getting killed by it.

Q393 Lord Macdonald of Tradeston: A quick follow-up on exhaust fumes. About 30 years ago there was public concern about lead in exhaust fumes and action was taken.

Professor Sir Richard Peto: Yes.

Q394 Lord Macdonald of Tradeston: Has there subsequently been evidence of reductions in the related illnesses that were causing the concern?

Professor Sir Richard Peto: I am sorry, I have just got no useful information to answer that. I have read popular articles suggesting that, yes, exposure was reduced – the trouble with current levels of exposure to lead is that we are a lot too close to the levels of lead in the blood that do have effects on human intelligence. We are within a factor or two of levels that would actually have measurable effects. But, although the effects on intelligence of current exposure levels might not be measurable, this is one of the exposures where we do not have any kind of comfortable safety margin. Nobody, if one had a choice based purely on toxicology, would want to be as near as we are to a level of blood exposure that has measurable effects on intelligence.

Q395 Lord Skidelsky: This is really the follow-up to Lord Sheppard's question: recent research, based on evidence from America, appears to suggest that a ban on smoking in public places might actually increase smoking in the home, which is much the most important source of the danger of passive smoking. Does one then, by passing legislation, run the risk of simply transferring the habit and its effects from a less dangerous place to a more dangerous one?

Professor Sir Richard Peto: I am sorry, I am much more of a student of the consequences of smoking than of the causes of smoking, and I do not know whether that statement is true or not. This is not an area that I have studied, I am sorry, as to how regulations on smoking in public places would affect the extent to which people smoke at home.

Q396 Lord Skidelsky: It is a question about consequences rather than causes because legislation may have these unintended consequences.

Professor Sir Richard Peto: I stand informed. If you say it does then ...

Q397 Lord Skidelsky: I am quoting a study. I have a supplementary to that – or would you like to say any more about that?

Professor Sir Richard Peto: No, not really. The key thing about smoking in the home is (a) the parents, or whoever it is in the home, have a fair chance of killing themselves and (b) they have a fair chance of making it more likely that the kids start to smoke.

Q398 Lord Skidelsky: The argument is that the effect of passive smoking is much greater in the home than in a more public place because of the proximity of contact between the smoker and the non-smoker, and it is the continuity of contact as well as the proximity.

Professor Sir Richard Peto: I do not know what effect such legislation would have on where people smoke. One thing is that people addicted to nicotine seem to need is to get their blood levels up to a certain level, and I am not sure that what they have been doing during the day would have very much carry-over effect as to what they were doing in the evening, but I do not know.

Q399 Lord Skidelsky: Thank you. If I could ask a supplementary, it is really more of a technical one. In the evidence we received from the Imperial Tobacco Company ---

Professor Sir Richard Peto: I was sent a copy of it last week.

Q400 Lord Skidelsky: It is paragraph 9, page 2. You have the sentence: “For example, if investigators were unable to achieve statistical significance at the standard 95 per cent confidence level to confirm their *a priori* hypotheses, they merely lowered the confidence level to 90 per cent.” Is it the case that by lowering the confidence level you increase the probability of accepting the wrong hypothesis as correct? If that is so, then one may be sceptical about the science.

Professor Sir Richard Peto: I think this is a caricature of what has actually gone on. Yes, certainly, as you know, you are going to get people who are enthusiastic about tobacco control wanting to have studies demonstrating the hazards of passive smoking and, as a result, you will get some claims that are not justified. It is when you look at the totality of the evidence and try to get all of the evidence together, and try to assess the extent to which selective publication of positive results could cause problems, then I think you do get a consistent picture that there is some excess risk of lung cancer among those who are exposed to passive smoking, from other people's smoke, on a regular long term basis. The comment by the tobacco manufacturers is okay as a comment on some particular studies, but it is not okay as a comment on the totality of the evidence. When you start putting the data from several dozen studies together, the fact that one or other of them individually claims significance or not is just point-scoring, and that is what this is, it is just point-scoring.

Q401 Lord Skidelsky: Could I draw you out on one further thing. You have been unwilling to quantify the risks from passive smoking.

Professor Sir Richard Peto: Yes.

Q402 Lord Skidelsky: You say there is an increase in risk but you do not know how much it is.

Professor Sir Richard Peto: Tobacco smoke is far and away the most important cause of human cancer in the world, and chronic exposure to it, even at low levels, is going to produce some increase in the risk of developing cancer, not only among lifelong non-smokers but also, more importantly, among ex-smokers, who are well off the zero on a dose-response curve.

Q403 Lord Skidelsky: You may not want to give your opinion on legislation, but would you say that the risk justified the legislation which is now being proposed, or some legislation that may be more proportionate to the risks?

Professor Sir Richard Peto: I am sorry, I am not trying to be evasive, but when we document the extent to which smokers kill themselves, I do not try to say what laws should or should not be made about what smokers themselves do. I think trying to get evidence as to what hazards are is not the same as proposing legislation.

Q404 Lord Skidelsky: But legislation should be based on some measure of hazards. That is the basis of all ----

Professor Sir Richard Peto: We know this is the most serious of all human carcinogens. In terms of numbers of deaths, just lung cancer alone is causing about one million deaths a year worldwide and smoking kills a lot more people by other diseases than by lung cancer. This is the most serious of all human carcinogens. It has to be causing some risk. Whatever risk it is causing, there is going to be uncertainty about it. It is difficult to measure small risks reliably, particularly on heart disease and particularly in people who are ex-smokers and have some substantial exposure previously. But, environmental tobacco smoke has to be causing some risk. In this country alone, we are talking about 100,000 deaths a year from smoking – actually, it used to be more than 100,000. These are really big numbers. Trying to minimise exposure or to limit exposure to such agents seems attractive to many people. The fact that it is difficult to measure these low risks is always going to be the case. Whatever those risks are, it is going to be difficult to measure them.

Q405 Lord Vallance of Tummel: Sir Richard, I wonder if I may change the subject a little bit because you have already answered the question I was going to ask on smoking *en passant*. Could we move on to hospital acquired infections.

Professor Sir Richard Peto: I have been fairly useless on the previous questions and I am probably going to be even more useless on this.

Lord Vallance of Tummel: That is fine. Do not think that because you are being useless it is not helpful.

Chairman: You may take some comfort from the fact that with some people who are very assertive about what they believe we are not very convinced they are right either. We think you are more likely to be right if you are somebody who shows a little doubt about something.

Q406 Lord Vallance of Tummel: If you shed doubt on an area where there is apparent clarity before, that may be very useful indeed. Media reports have highlighted the risks of contracting MRSA.

Professor Sir Richard Peto: Yes.

Q407 Lord Vallance of Tummel: Do you have an assessment of the scale of this problem in the UK versus, say, other European countries? Do you think the media reports are accurately conveying the scale of the problem or are they exaggerating it?

Professor Sir Richard Peto: I am sorry, I can only make an uninformed comment. I suspect that there is a considerable exaggeration. And, very often, when things are actually going quite well in this country in terms of medical benefits, it gets represented otherwise. We have the best decrease in the world in lung cancer mortality, and we have the best decrease in the world in breast cancer mortality, but these do not get emphasised. You are always told how bad things are. In some respects we do very well but this does not come across. There is a tendency, it seems to me, to seek fault in the hospital system. The hazards of infections acquired in hospital causing the death of patients who otherwise would have had some chance of a reasonable life, it seems to me, have probably been exaggerated. My impression on

reading about them is that they probably have been, but that really is not a serious scientific comment.

Q408 Lord Vallance of Tummel: Are you aware of any international comparisons between the UK and other countries?

Professor Sir Richard Peto: Not serious ones, but that does not mean that there have not been any. I am sorry, I just cannot help you.

Q409 Lord Vallance of Tummel: This could be helpful. You are really saying -----

Professor Sir Richard Peto: I am talking about my ignorance. I am not saying it is not known. I am saying that I do not know it.

Q410 Lord Roper: The same problem may arise on this question, as this is one, more generally, on methodology. A report by the National Audit Office, *Improving Patient Care by Reducing the Risk of Hospital Acquired Infection* published in 2002, suggested “there has been limited progress in improving information on the extent and costs of hospital acquired infections” and that “progress in preventing and reducing the number of infections acquired while in hospital ... continues to be constrained by lack of data”. Looking at this more generally, could you give us your views about the quality of data collection and statistical analysis provided within the National Health Service? Does current statistical practice within the NHS adequately support health care risk assessments and cost-benefit analysis? If not, do you have any suggestions as to what could be done to improve the situation?

Professor Sir Richard Peto: Are all the statistics gathered that could possibly be useful? I am speaking now as a professor of medical statistics, and if you send everybody who is supposed to be treating patients and running around wards chasing statistics – more and more and more statistics – you may not be doing patients a favour. There are things which are

worth recording and there are some things which are not. There is one thing that can be done to reduce hospital acquired infections however, and that is at the time of surgery. There are cases where surgeons definitely choose not to use prophylactic antibiotics (just antibiotics in case the patient gets an infection) because they are afraid of encouraging the emergence of resistant strains. But I think that one could reduce peri-operative infection rates by the use of prophylactic antibiotics. Experts do disagree as to whether this is an appropriate strategy. My view however, is that at least we know that prophylactic antibiotics can help protect the individual undergoing surgery, and the future hazards are somewhat theoretical, although there are some clear examples of antibiotic resistance emerging.

Q411 Lord Roper: Would it be worthwhile for us to invest more in statistical analysis and data collection?

Professor Sir Richard Peto: I think you have to be very particular as to what it is you are going to do. If you lay down blanket rules about needing more and more and more information about this and that, and people have to run around completing tables and filling in forms, then this may not be helpful to effective patient care. There are times when things go wrong and they need to be recognised, and there are times when the collection of routine statistics helps with this. But you have to be quite careful when you try to insist on the collection of additional statistics. I would like to make one point about statistics in this country, if I may. Over the last half century, until the last few years, we have had a tradition of medical statistics being fairly freely available to *bona fide* medical researchers to help them do studies and to understand the causes of diseases. Concerns, mostly within the last ten years, over personal privacy have now produced a situation where really serious studies cannot be done; where they are so impeded by data protection regulation which really is not of benefit to anybody, that serious damage is caused to medical research that could save lives. I think it would be very useful if there were to be a serious reduction in the extent of the

control of the use of personal data for medical research by *bona fide* medical researchers. We have reached a situation where great damage is done to serious research. It is, of course, very difficult to point to specific examples of where research would have been done but was not, because you do not know what would have been discovered, but we can look at some things that were discovered in the past and realise that they would not be able to be discovered now. For example, the hazards of German measles in pregnant women were discovered, among other things, by an inquiry where they took the records of women who had applied for sick leave for measles or whooping cough or German measles and who then applied for maternity support later on, and then went back and tried to interview them to find out which of the children had any disabilities and to relate that to the illness that the mother had suffered. This inquiry confirmed that it was specifically German measles, not ordinary measles and not chicken pox, which was producing blindness and brain damage, and, as a result, pregnant women were protected. You could not do that now: it would be using records for purposes for which they were not obtained. And, the question is just: why not?

Q412 Chairman: This strikes me as being important.

Professor Sir Richard Peto: This is something which would be a really important area for concern.

Chairman: The law about unintended consequences of increased privacy produces this problem. Has there been anything published on that? Is there any documentation or article we could read? It is really quite interesting.

Q413 Lord Roper: It has come up in recent legislation, I think. We did debate it in the House.

Professor Sir Richard Peto: Yes.

Q414 Lord Roper: If Professor Peto has some other sources, that would be very helpful.

Professor Sir Richard Peto: Perhaps I could answer that in writing subsequently or I could refer to the article written by the late Professor Sir Richard Doll in 2001 in the *British Medical Journal* on the subject. It was a brief article and he argued very strongly that, for moral reasons, the amount of restriction on the collection of medical statistics has now reached a situation which he described as immoral. He was talking as somebody who had discovered quite a lot of things from the collection and appropriate use of routine statistical information.

Chairman: All right. We have one or two more questions, and we should get on.

Q415 Lord Sheldon: In talking about distortion by the media of medical risks, there is the example, of course, of the MMR vaccine.

Professor Sir Richard Peto: Yes.

Q416 Lord Sheldon: How are we going to get a balanced picture of the risks involved here?

Professor Sir Richard Peto: So far there seems to be no evidence of any risks involved, and yet that has not stopped it being a major scare. That is an extraordinary example because there is no good evidence of any such risks, yet it just runs and runs.

Q417 Lord Sheldon: Should the health care professionals not get involved with this with the media?

Professor Sir Richard Peto: Yes, but then the media will try to get a “balanced” view by finding somebody who says it might be dangerous. This is one of the prices of having a free press, that they print whatever rubbish they like in circumstances like this. In this case, to be fair to the media, there was, an eminent professor making the claim, so they are bound to report it, but it is an absurd story. It is an absurd episode, taken as a whole. I do not really

blame the media for it, it is just one of these things that happens, and more such things will happen again and again.

Q418 Lord Macdonald of Tradeston: As a supplementary to that, if we take the role played by politicians – which can sometimes seem political or innumerate or cynical – they perhaps have a greater duty of responsibility than the press. Is there a way in which medical professionals could try to add more weight and evidence to the kind of debates that are held in Parliament and to influence the politicians perhaps to be better informed and more responsible?

Professor Sir Richard Peto: I do not know of any obvious steps, I am sorry. My main concern, still, is with the extent to which people are getting killed by tobacco in this country. I am sorry to come back to it, but it is such an absurd situation, where you have 100,000 deaths a year in this country alone. However, this country has done a lot better than many other countries. Indeed, have a very nice control group just across the Channel in France, where the French delayed about 20 or 30 years longer than we did before trying to take tobacco seriously. The result was a really marked contrast in lung cancer trends between France and Britain.

Q419 Chairman: I wonder if I could press you on a bit with another side to our interest: How serious is the threat to antibiotic resistance?

Professor Sir Richard Peto: Certainly there are bacteria that are difficult to treat and in some cases this has been produced by widespread use of antibiotics, but, overall, there is the most extraordinary decrease in mortality from infections. My colleague Dr Gary Whitlock has recently produced a graph describing the patterns of mortality in Britain, running back to 1838, when statistics first began to be collected. Because of possible health measures between 1850 and 1950 the death rates kept on dropping and dropping until the middle of the

20th century, at which point effective drugs came in, since when residual risks of death from infection have kept on dropping. For example, the probability of a five year old dying before age 15 is now only about one third what it was 150 years ago when some of the portraits in this committee room were painted. In looking at what is wrong, it is really worth remembering what we are getting right. We have had the most extraordinary reductions in the probabilities of death in infancy, death in childhood, death in early adult life and death in middle age in this country. There have been extraordinary changes over the last 100 years, and largely favourable. So when we do talk about the use of antibiotics and the encouragement of antibiotic resistance, remember that many people – I, for one – have had their lives saved by antibiotics. That is the main thing. They do work, but they do not work if they are not used. The damage that they do is a small fraction of the good that they do.

Q420 Lord Macdonald of Tradeston: In order to inform decisions about the allocation of limited resources, the Department of Health and NICE employed “quality adjusted life years”. In doing that, the gain to a 75-year old is treated the same as the benefit to, say, a 20-year old: giving an extra year to a patient in very poor health is seen as yielding the same benefit as giving an extra year to a person with normal health. Does that seem logical and appropriate?

Professor Sir Richard Peto: That is exactly what it avoids doing. The use of quality adjusted life years tries to give years different values, depending on how healthy the person is. If a person is not in good health, then a year of life not in good health is given somewhat less value than a year in good health. There is a discount, in that benefit in the distant future gets weighted somewhat less than benefit in the immediate future. That is arguable: you get much the same conclusions, however, with or without discounting. I think it is reasonable to try to say, “How many extra years are you gaining by this treatment, and, of those years, how many will be of a reasonable quality of life?”. The use of quality adjusted life years tries to avoid exactly the problem that you raised. Avoiding the death of a 20-year old not only gains a lot

more years of life than avoiding the death of an 80-year old, but in general those years will tend to be of better quality, human life being what it is. Attempting to quantify this is a sensible way of trying to proceed.

Q421 Lord Skidelsky: As a supplementary, one does not want to carry that to any extreme, like weighting IQ, for example? I just wonder what the measures of quality are or are they mainly physical attributes and some alertness?

Professor Sir Richard Peto: You can do the calculations with and without allowance for whether people are desperately miserable. If you just try to look overall, either globally or in particular countries, then in general the treatments that avoid death are those that produce big gains in terms of quality adjusted life years. The one mis-match is that if you do not put in some measure of the quality of life, then you underrate the relevance of musculo-skeletal disease and you underrate the relevance of various mental conditions. Roughly speaking perspectives based on what is most important in terms of quality adjusted life years, either globally or in particular countries, come out roughly like perspectives based on what is most important in terms of prevention of premature death. These two approaches match pretty well the things to which you would give priority. There are two things that do come out differently, however, mental illness gets seen as very much more important if you allow quality and also musculo-skeletal diseases get made relatively very much more important – although, actually, mental illness does cause quite a number of deaths worldwide. There are about one million deaths from suicide each year. In this country, suicide deaths outnumber traffic deaths. Suicide is a somewhat preventable cause of death: there are things one will do to reduce the likelihood of people dying by suicide. Returning to the main question, you can assess cost-effectiveness in various ways. It is surprising how robust the conclusions are. The approximate conclusion is that, apart from musculo-skeletal disease and mental illness, the things that are cost-effective for avoiding premature death are in general, much the same

as the things that are cost effective for gaining quality adjusted life years. Any such measure is imperfect. It has to depend on human judgment about the things you really value and the things you do not. But, use of quality adjusted life years does not seem to produce conclusions that seem to me widely wrong, in general, about the relative importance of things.

Q422 Chairman: I think we ought to bring it to a close there. On behalf of the Committee, may I thank you very much indeed for coming along, and, if I may say so, setting a good example by indicating there was some degree of uncertainty in some of the things we are looking into. That is helpful to us in our general inquiry. We are very grateful to you for what you have said and the way in which you answered the questions. Thank you very much indeed.

Professor Sir Richard Peto: Thank you for the opportunity.