V. Introductory Presentation: Competing Goals of Industrial Innovation and Health Policies?

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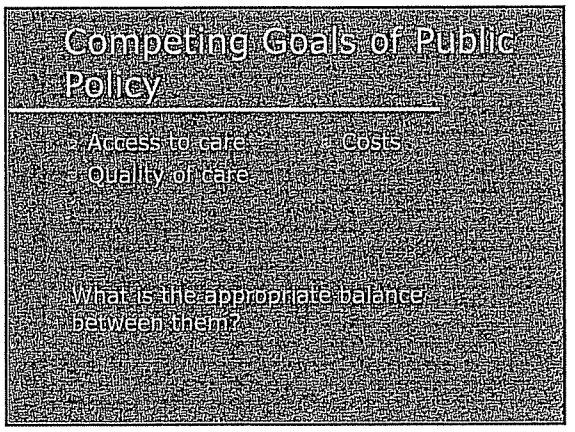
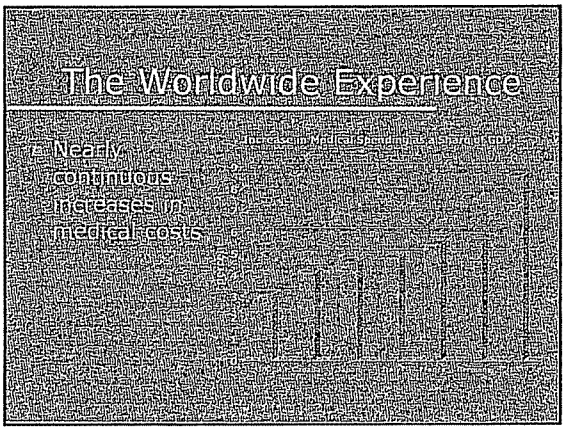
Thank you very much, Ted and Martin for inviting me. This is my first Four Country Conference and I am delighted to be here and I am trying to give you some thoughts on how to make the gizmo science of health economics be slightly less gizmo. Along the way I will be quite interested in hearing what you have to say. I want to talk about the general issue of innovation in medical care and health policy. Let me start off by saying that I am going to try and compress a lot of different strands of work into one topic. Some of what I am going to talk about comes from the paper that was distributed and some comes from other projects, in particular from the book that I have been working about for the past couple of years on the role of medical technology in health care and on how to evaluate medical spending. Actually, the book doesn't have a title yet. Most people have a title for whatever they are doing and then they decide what it is that they want to say about. I have done it backwards: I wrote the book and now I don't have a title. So whatever suggestions you have, I would be most grateful to hear your thoughts on that.

Let me tell you a little bit about the substance of the technology issue, about the competing goals of public policy. And this is really the structure of this conference and the structure of a lot of health policy research: the benefits of thinking of this in terms of spending more, i.e. the range of what countries do to make medical care more accessible. One thing they do is that they get access to care for more people. In potential they improve the quality of care. And then, balanced against that, is the cost of providing a more generous system. The question is how should countries balance those different goals?



What we all know is that the costs of medical care are increasing a lot. The costs are going to dominate the public agenda not just in the US, but in all different countries. One of the basic questions of most countries is how to balance the cost side of health care in line with what we think we can afford. My argument is that that is actually not the right way to do it, and I am going to try to explain this and make it as provocative as I can.



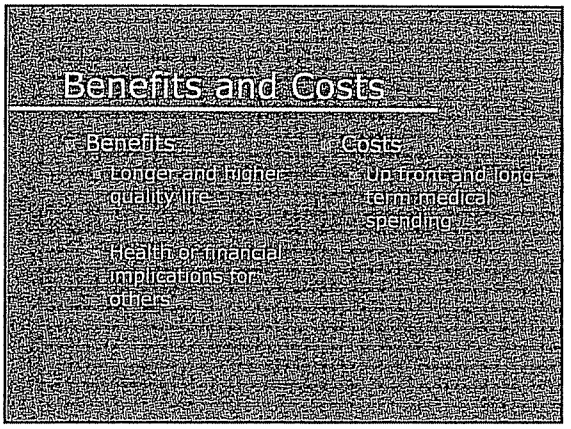
I think that governments worry too much about the costs of medical care and not enough about the access and the quality. The spending concern is overstated. Rather than thinking about on how do we can set up a system that we can afford and put as much into that box as we can, we should design a different box on the services that we want people to get the access to and the quality that we want. Then we can figure out what it is going to cost, and that may be more or maybe less, almost certainly more than the countries are spending, particularly over time. Thus, I want and try to push the argument that we are worrying about the wrong sort of things. Even the US, which spends much more than any other country represented in this room, is still too focused on the cost issue, and not enough on the access and the quality.

Martin Pfaff brought the right balance up and I was going to skim over it, but I am explicitly going to take an economic perspective here, because I am talking about the allocation of resources. There is an ethical issue about where money should be invested and what a social guarantee is within each country in terms of

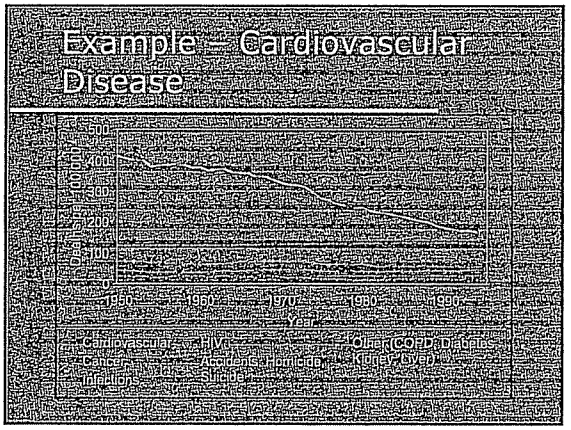
health care. I am going to take a sideway and say that we will at least give social guarantee for basic services. That may not be the case in the US; but let's leave the US out of that and say that we are really at the point where we are talking about discretionary services. Then the question is: What is the balance between money and services? And the optimal balance economically would be when the marginal benefits are equal to the marginal costs. Everyone has seen that many times. How do you make sense of that?

Let's start to lay out the benefits and lay out the costs. The cost side is easy. There is some upturn-cost and some long-term cost associated with treating someone. So think about someone with a heart-disease or a similar disease. There is an immediate cost of dealing with the problem and then there are the long-term consequences associated, positive or negative.

On the benefits side there are two sorts of benefits: The first fact is that people have longer and higher quality lives. That is ultimately what we want to get out of a medical system. That it makes us healthier or that it maintains our health. The second impact are the health or financial implications of a person being healthier. Those can be positive or negative. Mental illness for example is something that strikes the young, middle aged, the mid-twenties. People are in school or in the workforce. Treating mental illness better is getting people work more, get more education, earn more later on in life. There are positive financial benefits of treating mental illness. If you think about the cardiovascular disease, which I am going to tell you more about a little bit, there are negative financial implications, because most of the lives that we save are people who are retired. They are consuming more than they are producing, and so there is a drain on other people's resources. Now that is not to say that we shouldn't do it, because there are the benefits to the individual and the family of living longer but the benefits are less than if the person were not using resources that others were paying for.



Those are the two components of the benefits, and I just want to evaluate them in a particular case. I want to choose the case of cardiovascular disease mortality. The following picture is a picture for the US, although I think it would actually be relevant to essentially all the countries here.



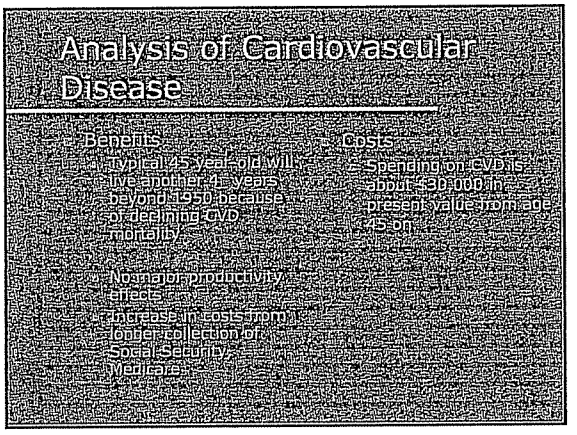
This shows mortality from various conditions over time, starting in 1950, working up to pretty much now. The line right at the top is cardiovascular disease mortality, which has declined by about 2/3 since 1950, and that pretty sure across all countries. For a long time cardiovascular disease has been the cause of many deaths. Since we have got rid of infectious diseases, and you can see that, cardiovascular disease has been declining so rapidly that it's basically catching up with the line in the middle, which is second and potentially assumed to be first: cancer mortality.

Actually, it is very interesting that President Richard Nixon in the US in the early 1970s declared war on cancer. It is not even a speed bomb or a pothole in the mortality. For the moment I want to choose the best case scenario: Let me evaluate how well medical spending is doing and to do that I want to consider a case where we know that health has changed a lot. I can say how much of that is because of medical equipment and how much because of other things.

I am going to look at the cardiovascular disease component. Then I'll briefly mention what happens if you try and expand it. But to my knowledge and sense the real way to

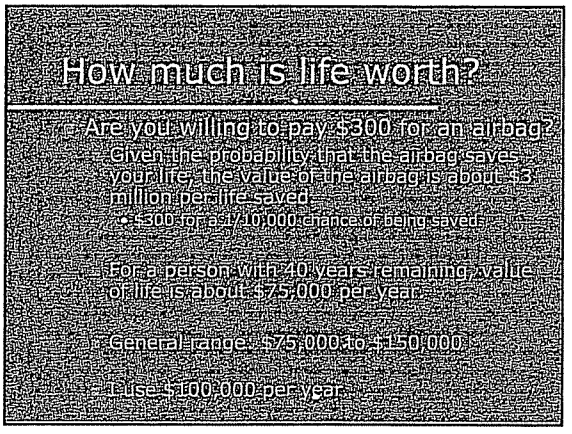
evaluate what we are getting is one has to go through it condition by condition. I think of this as the house to house combat version of evaluating what we are spending. This is a hard aggregate. So I want to do it on a condition level.

All of this is for the US; but I don't think anything here would be dramatically different for any of the developed countries. So the typical 45 years old in the US will live another 4 ½ years in 1950 because of the declining cardio-vascular disease mortality. That is quite a lot. For most of human history life expectancy at age 45 was more or less flat. Once you reached 45 you had about 20 years left or so, and so adding another 4 ½ years to something like 20 years is really important. This is almost the only recorded time in any human history that life expectancy among the elderly population has in-creased. There have been no major productivity effects, but there have been increasing costs from people living longer and collecting social secu-rity in medical care and in disability insurances in Europe as well. There has been much more spending to treat cardiovascular diseases. My calculations – which I will not go into, but would not deny that I have done them - are that the spending on cardiovascular diseases increased by about $30,000 in present value for a typical person. If you add up the entire amount that one is going to spend on cardiovascular disease from the age 45 on, and you compare that to what the typical person would have spent in 1950 – approximated here by zero – medical spending in 1950 was about 1/10 of what it is today. The result is an increase of about $30,000. Now here is the question, if the 4 ½ years longer life are worth the $30,000.



First let me deal with how much is life worth. I have got a quiz for you. Are you willing to pay $300 for an airbag in a car? How many people would be willing to pay $300 for an airbag in their car? How many people would not? Congratulations, most of you value their lives at at least $3 million.

Because the airbag has a one in ten thousand chance roughly of saving your life, I have scientifically determined that the average person in this room has a remaining life expectancy of 40 years, a very scientific estimate. If you take that $3 million and you spread it over 40 years, you get a number like $75,000 a year. If you repeat that study a number of times, looking at various different conditions, what you get is a general range of a year of life being worth about $75,000 to $150,000. The vast number of studies say that this is a pretty sensible range we are thinking about. Thus, I am going to value years at $100,000 each.

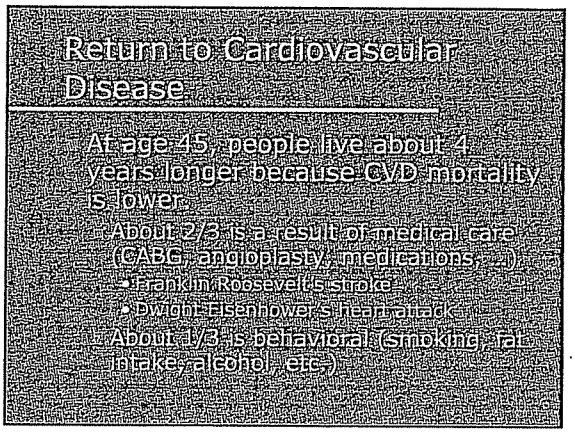


It is interesting that you cannot actually afford very many of those years, most people cannot afford any of those years at that price. There is nothing contradictory about that by the way. You can value things in small amounts more than you would value them in bigger amounts. For example, most people that I know, spend more money on vacation than they could afford to spend if they were permanently on vacation but still under salary. For two weeks of vacation you sort of multiply that by 26 and you get that that exceeds your salary. Then you say: How could that possibly be? The answer is: Because you are not buying exclusively vacations, that is only one component of what you are buying and so you add some components to that. You evaluate some of that very heavily. If you apply that on our case and if you spent more and more of your money on medical care, you wouldn't evaluate it so highly. But from where we are, that is roughly a value that one gets in a developed country.

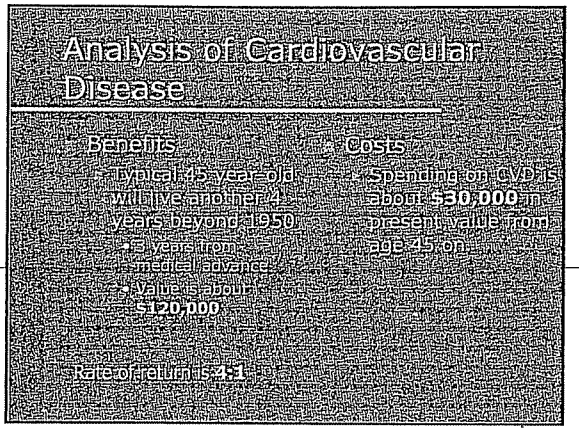
Let's return to the cardiovascular disease. I said that at age 45 people live about 4 ½ years longer. Now let me come to the question on how much of that is because of medical care. I rather linked these calculations: I have determined that about two-thirds of that results of medical care. Roughly one-third or half of that is what I would

call fancy stuff for people who have a heart-attack. The most famous heart-attack I can tell you about is the one of US President Eisenhower. He had a heart-attack while he was president in 1955. The standard therapy at that time was to keep him in bed, immobile, for six weeks. Then you gingerly carried the patient home and kept the patient in bed for six months. You gave him morphine if he was in pain. You kept him warm if he had a shock, and you gave him oxygen. That was all. By the way, the theory behind it was that it was not a heart-attack but that the heart was ruptured. So you had to reduce the strain on the heart and the way you did that was that you made the person not move at all. That turned actually out to be an incorrect theory and to be technologically kind of backwards. Nowadays, the person is out golfing within two weeks, after they have a number of fancy things done to him or her. In the US we have a recent example of our vice-president: Richard Cheney has pretty much everything on this slide. Another one-third of the improvement to treat cardiovascular diseases is the result of medications used to prevent diseases. These are largely anti-hypertension drugs and cholesterol drugs, aspirin and various other similar things. Here my best example is Franklin Roosevelt. Roosevelt was president during World War II. He had very high blood pressure. During the last year of his life he took five weeks of vacation. He had headaches. When he was on work he took 4 or 5 days of weekend, because he had difficulties to concentrate. His doctor didn't really know what to do, because there wasn't much therapy. At the same time he was fighting World War II, he went to Yalta where Churchill's personal physician looked at him and said he didn't belong there. This were very big implications of not having any effective treatment. And he ended up dying of a stroke, which is a major complication. Nowadays we could probably cure him. He would not have had the stroke.

Those two components, the pharmaceuticals and the intensive care, together account for about two-thirds of health improvements. Then the remaining third is largely behavioural, in the US at least a decline in smoking.

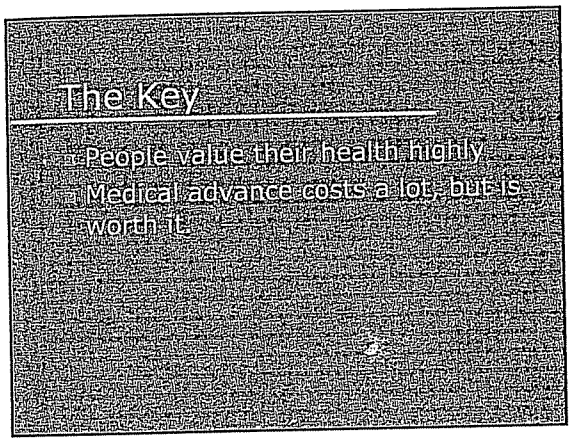


Every time I come to Europe I am impressed that Europe has not had any decline in smoking, the US has lower fat intake, reduced alcohol, a variety of things like that. Now when you all evaluate your life so highly and you believe my calculation, I can show you the answer. There is 4 ½ years, two-thirds of them give the tribute to all the medical care input, which is three years. There is a hundred-thousand value per person, less money associated with caring for people, because they are elderly, so I am taking that out. You put the whole thing in present value and you count it back to age 45, and it is a $120,000 of benefit. The cost is §30,000. Thus, the rate of return is $4 of benefit for every dollar spent. This proves that spending more over time was a good idea. That is the kind of calculation that underlies most of what is in my paper, and a lot of what I think the evidence suggests.

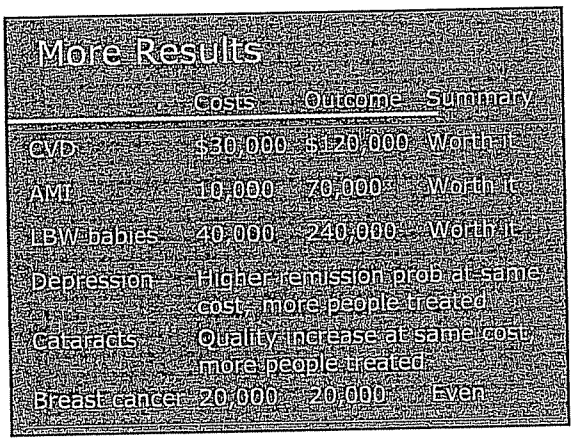


I have given you a number of case studies, I will not go through them all. Most of the cases show that we spend more over time, because we develop more and it costs more and we do it on more people. But there are health benefits and it looks like it is worth it. If you try and add these up to a total, which is very hard, because I don't have enough for a total, if you just take a couple of these, the cardiovascular disease and the lowbirthweight infants, then you say, what are the benefits of caring those two groups of the population? Then you compare that to the entire increase of medical cost in the US, which is far bigger than the increase of medical costs everywhere else in the world. The benefits from just those two conditions are about

equal to the entire increase in medical spending for everything. So if you threw in any other benefits, it would clearly have to be worth it. So my conclusion is that all the money that has been spent in total has been worth it.

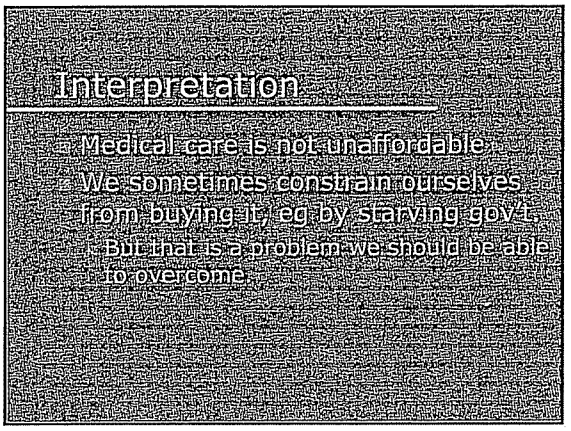


If you think about public policies which are still quite common in Europe, and we occasionally talked about in the US, of "let's hold medical care to x percent of the GDP", or "let's make it grow two percent less rapidly than the GDP" or whatever it is, over the time this is going to cut out the average stuff which is going to increase the medical expenses. That proves that this is a bad thing to do. It wouldn't be so bad if you would get rid of all the least valuable things. But there is actually no reason to think that that would be what would happen. If it was more like this, the system wouldn't expand the way it has expanded. And so that is going to show up here as being something that saves money, but takes away something of a very high value. What I want to say is that governments focus far too much on the cost side, we don't calculate, we don't value, we don't compare it to the benefits' side. But if we did that, we would reach different conclusions.

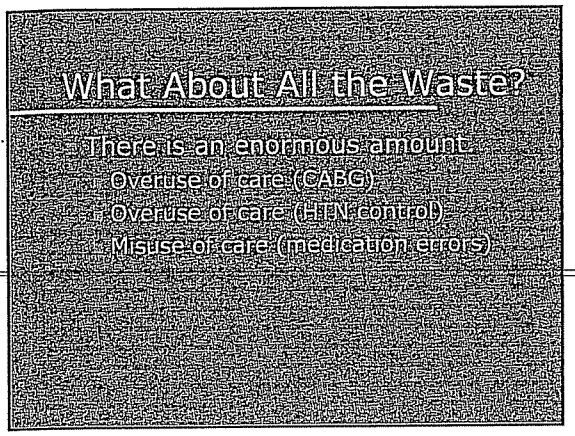


My interpretation is that medical care is not unaffordable. The value is reflecting the trade-off status. When you said your life was worth $3 million or the airbag $300, you were thinking about what else you could do with the money. And you said it is worth it. So it is not unaffordable. We sometimes constrain ourselves from buying something, for example by not giving the government the money that it

would need to buy something. That is sort of a stupid choice that our society makes. But I am not sure if it should change and how I feel about the underlying value of those services. Ultimately if it is worth it, we will have to get more money to the people who will have to buy it. Saying that we find it difficult is not necessarily a reason that we shouldn't go ahead and do that.

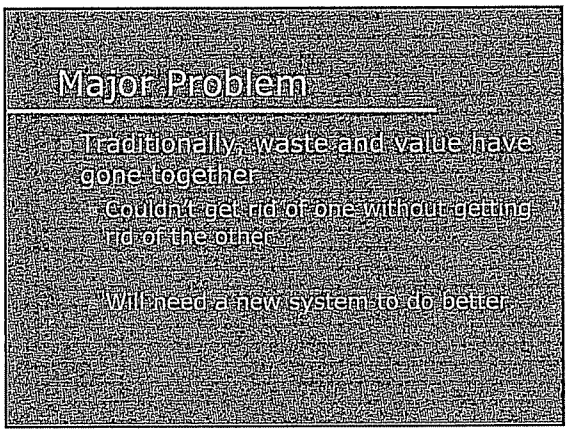


Let me get back to where I think most of the analyses go wrong. And why I think that what I have done here differs from what people commonly do. People usually focus on that there is a lot of waste in medical care. They say that not everything is worth it if I look at a point in time. People particularly focus on the overuse. The US spends for example a lot more than any other country in this room, and it would be hard to decide if that additional spending is worth it. Some parts in the US spend much more than other parts and you cannot find much evidence that that's worth it. That is sort of an overuse problem. The related problems of underuse of care are for example for people with chronic diseases who rarely get their disease controlled. I mentioned that hypertension treatment is cheap and save and effective. In the US a quarter of people with hypertension have their blood pressure under control, only a quarter of the people, despite the fact that for 40 years we have had save, cheap, effective medication. I think the best I can tell is that in Canada it is about a quarter as well. I haven't seen data from other countries, but I would be willing to bet that very few countries have very high rates of control of chronic diseases. There is lot of underuse of care associated with chronic diseases. Additionally, there are some things like medication errors that pop up as well. The policy is worried a lot about the first, the overuse of care, it is worried very little about the second, the underuse of care, and it starts getting concerned about things like medication errors at least in the US, and I am sure that it will spread over to other countries.

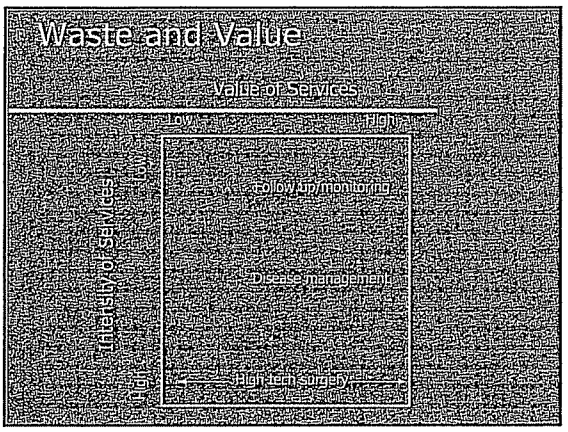


It is interesting that a lot of people extrapolate from the overuse of care at an appointed time, that therefore the increasing cost must come from the increasing care that is of low value. Thus, the fact that the US spends more than let's say Canada and doesn't appear to be much healthier must mean that the growth of the medical system is a bad thing. That extrapolation does not have to be right. I suggest that it is not right. Just because at an appointed time given the level of technology that is available, some countries use it more where it is not really worth it, which does not mean that over time – when the level of technology changes or the ability of the system changes – that those changes are not worth it. Those are two fundamentally different statements. They could both be true, but they both don't have to be true. In this case both of them are not true.

But I do want to take the waste part seriously, because it affects our public policy. The basis for that is that we use the way we currently pay for medical care. The waste and the value go together. We cannot get one without getting the other, we cannot give up one without giving up the other and so we are going to need to think about new kinds of systems to do better.

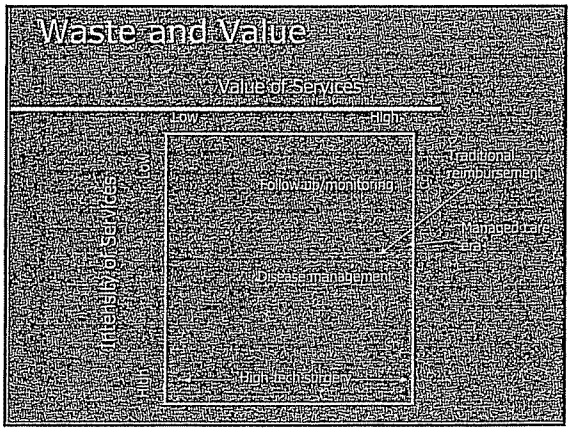


Let me show you what I mean by that: I have ranked medical services here along two dimensions:



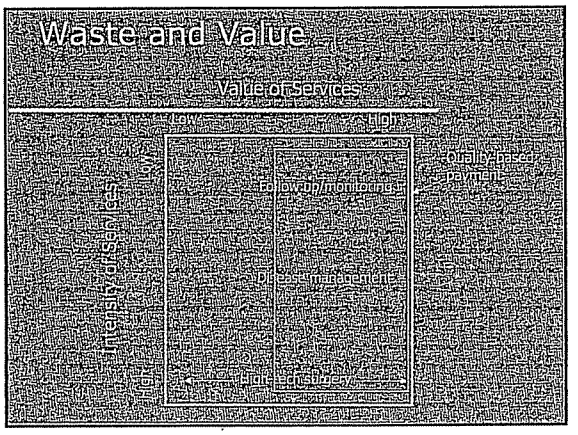
The first is the intensity of the services. The second is the value of the services. The intensity is ranging from low to high and the value is ranging from low to high as well. Let me give you three different kinds of services: High-tech surgery is down at the bottom, for example bypass-surgery. I am going to call that about as intensive as medical care can be, and sometimes it is very effective, and sometimes it is less effective. In some cases it has a high value, and sometimes it has a low value. In the middle range I have something like chronic disease management, at a physician's office, checking out the blood-pressure of a patient, doing cholesterol tests, screening for various things, demography etc. That is moderately intensive, involves physician time or trained technician time, but is not incredibly intensive. Generally but not always it has a very high value. Then the third kind of services is routine follow up and monitoring. These make sure that people take their medications, that they do not have any side-effects, make it easier for people to communicate with their doctors, using computer technology which no country does very well in health care. This includes follow-ups, easier kinds of appointment-schedules etc. This is as far away from rocket-science as it gets. This is sort of painting the letters on the side of the rocket. And generally these services have a very high value, because people have a lot of difficulties doing things on their own.

The traditional reimbursement system paid very generously the more intensive the service was. The following diagram shows the range where reimbursement was very generous.



Reimbursement doesn't determine everything in medical care, but it tells what has been done and what you have got. So there was a trend towards high-tech equipment at the bottom. This explains why the US with a more linear reimbursement system does more high-tech than most other countries do, and it also explains how you think about the overuse of care and the underuse of care. We observe overuse of things that are very intensive, and underuse of things like routine-management and chronic-disease management, that are not reimbursed nearly as well as the first. This translates into technology being developed for the one and not for the other. The whole dynamics of the medical system was driven by this. That is: the waste and the value went together. One of the things most countries have done, the US through managed care, and other countries through explicit government controls, is reducing the generosity of the payment system. A lot of countries decided to save money by reducing the waste. Since they had spent a lot of money on high-tech items, they decided to reimburse less generously for the high-tech items and more generously for the lower intensive services. They made it easier for people to see doctors, made it some more lucrative for doctors to do things that are related to chronic disease management. For sure you'll get rid of some of the waste when you do that. But the problem is you'll also get rid of some of the value. And what you observe is that the system is struggling with innovation, that is how we are going to pay for innovation.

So how do we make sure that these people really get the care that they need? And how do we solve the problems resulting from the fact that the two, the waste and the value, go together? That is why given the choice I would prefer the quality-based payment, even though there is more waste.



It proves that the incentives for the innovation that I showed you earlier are valuable. But none of that is really

right. When countries argue about that, they argue about which one is worse. And it is no surprise that every country that had that fight is unhappy about its decision. This diagram shows you the basic problem: You don't want to make services of high value and low value reimbursed the same. You want to differentiate the payment on that basis. It is ironic that medical care is the only industry you can think of where you don't get paid more for higher quality than for lower quality. There is no other industry in the world that does that. So the ideal system would not be a payment system based on intensity, it would be a payment system based on effectiveness. That system will have rapid technological change because the technological change is valuable. So here is my suggestion as to how countries can get themselves out of the bind: The first is not to worry to much about the cost. The second is to worry about it in a different sort of way, worry about it because they haven't yet found systems that differentiate the waste from the value. In practice one could think that this means to introduce some payment which is based on the value of what is provided and not on the quantity of what is provided. I have given you a few dimensions: Measure the process of care, measure the outputs, control various things, measure patient satisfaction with the system. Fundamentally, the result is to think about technology as good except for the waste that comes along with it. The question is how to get the things that are good and not get some that are wasteful? This reimbursement system is maybe the direction the countries should be thinking about, all countries, because I think that all countries have basically some more problems. They should not think about how to fit stuff in the box of costs, but how to set up a system that gives us what we want. Then they should decide that this is what they want and pay for it and set up an adequate financing system.

I want to stop here, and I am quite interested to hear people's reactions. Thank you very much!