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Thank you very much for inviting me to speak to you today. It is often said that climate change is the most serious problem facing humanity in the 21st Century. This is not an exaggeration as I and the other speakers will be making clear during the course of today.

My task this morning is simply to set the scene, to layout the landscape of how climate change and health interact and to say something about the role the medical professions might play in helping the world tackle this problem.

Climate change conferences are occurring with increasing frequency at the moment but I think this one is particularly important for a number of reasons. Perhaps most significantly because its focus is on what a rapidly changing climate means for human beings.

You could be forgiven watching recent media coverage of this issue for thinking that climate change was really bad for polar bears but was not yet something that should concern most of us very much. All too often the language we use and the effects we highlight make this issue sound remote from the everyday concerns of most people.

The public is largely unaware that climate change is already having some damaging effects on human health and that we are seeing today only the very earliest signs of what is to come.

Furthermore, investing the authority of this distinguished institution in articulating the link between climate change and the daily lives of ordinary people sends a powerful signal to politicians and public alike.

The medical professions have, in some ways, an unenviable task in human affairs. All too often, it is to you that we turn first to deal with the human consequences of policy failure. It is to you that we look to repair the damages of our ignorance and lack of foresight or self-discipline both as individuals and as society.

The consequences of policy failure on climate change will fall very immediately on the medical professions and they will be on a scale unlike anything humanity has seen before. What is at stake is not just the health of very large numbers of human beings, but, potentially in many parts of the world, the integrity and capability of the whole infrastructure that supports health.

The medical professions also have something few other actors in this debate possess in such measure – public trust. Success in tackling this problem is going to require a mobilisation of human effort and resources of an unparalleled magnitude.

The addition of your trusted voice to that mobilisation effort adds to our chances of success. So, I was particularly pleased to see you have a session this afternoon devoted specifically to addressing that question.

Climate change is a bad problem that is getting worse. For the moment, it remains a manageable problem. But it is now clear that within the next few decades it will become an unmanageable problem unless we act decisively.

There is a very broad and deep consensus within both the scientific and policy making communities about the science of climate change. It is now accepted everywhere that human activities are changing the climate and at an unprecedented speed.

You will hearing later in much more detail about the science of climate change so all I will do at the moment is pick out some of the key numbers that illustrate the nature of the challenge we face.

Europe's political leaders have been clear that a 2⁰C rise above pre-industrial levels in global average temperature is the threshold of dangerous climate change. Jim Hansen, the climate scientist who has done most to alert the world to the dangers of climate change, and who you will be hearing from later, thinks that even this may be too high.

We have already observed a 0.7⁰C rise since the beginning of the 20th Century. Such is the nature of the climate system that even if we were to halt all further emissions of greenhouse gases today, we would see another 0.7⁰C before temperatures stabilised. You do not need to be a better mathematician than i am to agree that 1.4⁰C is awfully close to 2⁰C.

To be very confident of staying below this threshold – as Nick Stern pointed out in his landmark report - we need to keep the concentration of greenhouse gases to between 450 and 550 parts per million (ppm) carbon dioxide equivalent. That is the measured carbon dioxide plus the effect of all the other gases we are adding to the atmosphere expressed as their carbon dioxide equivalent.

At the lower end of that range our best estimate currently is that we would have only an even chance of staying below 2⁰C. At the upper end, the odds would be about 5 to 1 against staying below 2⁰C. The concentration is now 425 ppm and rising at more than 2ppm every year.

There are three ways in which climate change is different from any other problem that humanity has ever faced.

The first is the sheer scale of the problem. Climate change threatens to undermine the prosperity, security and well being of literally every single one of the six and a half billion people on the planet.

No other problem does this. Millions of us are threatened daily by crime and conflict, but millions more lead lives of peaceful security. Many more of us lead poorly educated lives of unhealthy poverty but millions of others lead lives of well educated, healthy affluence.

No-one will escape the consequences of a rapidly changing climate.

Second is the urgency. To have any chance of avoiding dangerous climate change total global carbon emissions have to peak within a decade and then decline rapidly. And they have to do this while meeting the rapidly expanding need for the energy to fuel economic development.

No-one will trade-off energy security for climate security so we must achieve both together

Because agriculture, deforestation and land-use changes produce large carbon emissions which are very difficult to control this means, in effect, that we must develop a carbon neutral global energy system by around the middle of the century.

This will require transformational changes in energy technologies on a scale that makes the Apollo or Manhattan Projects look unambitious.

Third, the nature of the climate system means we cannot afford policy failure. Humanity learns predominantly by trial and error. We make mistakes and then try again and again until we get it right.

This often takes a long time. But for most problems the goal remains the same and we can keep moving towards it however erratically.

The long life of carbon in the atmosphere and the very large lag between stimulus and response in parts of the earth system mean that climate change is irreversible on human timescales. There is no rewind button. Once a given concentration of greenhouse gases is in the atmosphere we are committed to living with whatever climate it produces.

In other words, the goal we can reach changes with time. If our policy efforts fail, we cannot go back and try again for the same goal as it is no longer available. All that remains is the next worst option.

This also changes the politics. Urgency is not the same as immediacy. We successfully fought the Cold War because the Soviets had their tanks on our lawns and their ideas in our factories. So we spent billions of pounds on weapons we hoped never to use and when they became obsolete, we threw them away and bought newer and more expensive weapons we hoped never to use.

The threat of climate change to the security, prosperity and well being of Britain's citizens is a lot more certain than was the danger of the Cold War turning hot. Responding successfully will take an even bigger effort than winning the Cold War but such is the nature of the problem that by the time the tanks are visible it will be too late to respond.

Which is why it is so important that people quickly come to understand the impacts of climate change on their health. Health is personal, intimate, immediate. All the things that climate change is not.

You will be hearing a lot more of the detail about the interaction between climate change and health later this morning. As research continues and our understanding of the many impacts of climate change on our lives grows, it is becoming clear that the impacts on our health will be among those that are earliest and most widespread.

There is often a rather sterile debate about whether climate change causes a particular harm to human beings – conflict in sub-Saharan Africa for example. Climate change does not work in such a simple way.

It works by stressing all the other stressors on human well being. Conflict in Darfur has many causes of which climate change, by altering precipitation patterns, is one. The excess deaths in Europe observed during the 2003 heatwave were not caused by climate change alone but climate change was responsible for making the outcome worse than it might otherwise have been.

We are beginning to get a good understanding of some of the direct effects of climate change on infectious disease vectors, on allergies and air quality as well as heat stress. But the indirect effects are less well understood if potentially more significant.

Hurricane Katrina gave us all an unforgettable insight into what an increase in the frequency and intensity of extreme weather events might mean in even the most organised of societies. Less noticed in the immediate horror of that event was the long term damage to hospitals and the essential public health infrastructure on which so much of human well being depends.

The systemic impacts on health will over time be even more significant. One third of the world's population currently experiences water stress. Two thirds of China's cities, that is 400, already suffer water shortages. The glaciers that supply Lima in Peru with water will at current rates of melting be gone before the middle of the century.

The rapid rise in global food prices last year were partly a consequence of a prolonged drought in some parts of the world and floods elsewhere. Those prices rose 37% globally and that was on top of a 14% rise the year before.

In China, both floods and drought played their part in driving food price inflation to 18%. These pressures were exacerbated by the growing demand for grain to convert to ethanol in order to meet energy security anxieties.

A warmer world makes dry areas drier and, in much of the world, lowers crop yields. Poor nutrition and a lack of access to water for hygiene and sanitation increases vulnerability to other health stresses.

What is clear is that a changing climate will add considerably to the pressures on health services already over-burdened. Katrina is a warning that in the most extreme events they could be completely overwhelmed.

A subtler stress will come as pressure grows to find the public funds necessary to finance the response to climate change. We cannot avoid some climate change and will have to pay to adapt to its consequences. This will not be cheap and we will have to pay for it at the same time as we are paying to cut emissions dramatically.

The medical professions could well find themselves caught between a rock and a hard place. Climate policy failure could well lead to a squeeze from both ends as demand for health services grows in the face of the impacts of climate change at the same time as governments need to divert funds from healthcare in order to stop climate change becoming even more dangerous.

A little while ago I was interviewed for a Channel 4 film on climate change. At the end of the session, the interviewer asked if the situation was really as bad as I was portraying.

Without really thinking I said, 'Don't be under forty. That's my advice if we fail to solve this problem.' needless to say, that made it into the film.

On reflection, I meant exactly what I said. Anyone in Britain under forty today has, thanks to the medical professions, a very good chance of living beyond the middle of the century. By that time if we have failed to get a grip on this problem the visible prospect for humanity will be looking very bleak.

Kofi Annan, speaking at a climate meeting in Nairobi shortly before he left office pointed out that there was a large and growing gap between what the science of climate change was telling us we needed to do and what the politics of climate change seemed capable of delivering. Despite the intense level of climate activity throughout last year, that gap has grown rather than shrunk.

Climate change is a problem well within the envelope of our technical and economic competence to solve. The technologies we need are already available or within reach. The policies to deploy them in time to avoid high risk climate change are not yet in place.

Not all the available technologies are important – nuclear power, for example, has at best only a limited role to play despite the government's obsession.

Not all of the available policies will make a significant enough difference – we are relying more than we should on the arcane magic of a carbon price. What is needed is very rapid transformational change in the deployment of low carbon energy technologies. This is unlikely to be accomplished by policy measures designed to achieve incremental change.

The missing element is simply the political will to do what we know can be done. To paraphrase a saying from the Clinton years, it's the politics stupid.

This is all too easy to say. It is somewhat harder to say how that is to be assembled. This is already, and will become more so, a highly contested area of policy.

If you believe in smaller government, less regulation, lower taxes, more personal freedoms, and that markets are wiser than governments you are going to find it hard to come up with a political programme for dealing successfully with climate change.

There will be winners and losers in the changes that must be made to take us very rapidly to a low carbon economy. The climate debate is already so loud with the complaints of the few who might lose that we hear little from the many who would win.

In this highly contested cacophony, the trusted voice of the medical professions reminding everyone of the true cost of policy failure on climate change will be central to building that political will.