**Hello and welcome to Just Have Another Think, our twice monthly look at the ecological, environmental and social issues that we’re facing as a consequence of the twenty first century climate emergency.**

**In December last year, the highly respected medical journal The Lancet published a comprehensive paper looking at health and climate change. The research was carried by an international collaboration called Lancet Countdown – a global monitoring system dedicated to tracking what they describe as the ‘emerging health profile of the changing climate’**

**The report covers forty three indicators across five sections :-**

**Climate Change Impacts, exposures and vulnerabilities.**

**Adaptation, planning and resilience for health.**

**Mitigation actions and health co-benefits.**

**Economics and finance**

**Public and political engagement**

**That’s way too much for a single video of course, so today I’m just going to have a think about those impacts, exposures and vulnerabilities, which are closer to all of us than we may think.**

**According to the Lancet paper,**

**“the changing climate threatens to undermine the past fifty years of gains in public health, disrupting the wellbeing of communities and the foundations on which health systems are built”.**

**It impacts the food we eat, the air we breathe, the water we drink and increasingly in many areas the shelter that our societies depend on. Climate change doesn’t care if you live in a hut on the Bangladeshi coast or a multi-million-dollar condo in California, but the ability to recover from the damage and destruction is really showing up the inequities around the globe, with vulnerable populations affected more frequently and with a more long-lasting impact.**

**Increasing temperatures and heatwaves mean that some people are already living in regions at the limits of human habitation today. The Lancet charted heatwave exposure in numbers of people days, measured in billions, from 1980 to 2019.**

**It’s not difficult to see that there’s a very obvious upward trend over the last decade. India overtook China by some margin in 2019, as a result of a month-long heat wave that was one of the hottest and longest since that country began recording weather reports.** [**Churu**](https://en.wikipedia.org/wiki/Churu%2C_Rajasthan) **in**[**Rajasthan**](https://en.wikipedia.org/wiki/Rajasthan) **hit a temperature of fifty point eight degrees Celsius, which is just over a hundred and twenty three Fahrenheit. Extreme**[**droughts**](https://en.wikipedia.org/wiki/Drought)**and**[**water shortages**](https://en.wikipedia.org/wiki/Water_scarcity)**across India (and Pakistan) caused** [**reservoirs**](https://en.wikipedia.org/wiki/Reservoir)**to run dry, depriving millions of people of fresh drinking water.**

**Those temperature levels obviously cause higher levels of heat stress and heatstroke, but they also affect cardiovascular and respiratory systems especially in people working outdoors or in non- cooled environments and in people older than 65 years of age, or those with disabilities or pre-existing medical conditions.**

**Annual heat related deaths around the world have almost doubled in the last two decades.**

**The Lancet research data suggests that the global average heat-related mortality per year in people older than 65 increased by nearly fifty four percent between two thousand and four and twenty-eighteen, when nearly three hundred thousand people died from heat related illness. And it’s not just a problem somewhere far away either. More than a hundred thousand of those deaths were in Europe. In fact, the European region was the most affected of all the regions monitored by the World Health Organisation.**

**And from a hard-nosed economic point of view, the picture isn’t much brighter. According to the report a potential three hundred and two billion work hours were lost in 2019. A hundred and three billion hours more than in the year 2000.**

**Once again, India is the worst affected country in this category, mainly due to its high numbers of agricultural manual workers, but even in high-income countries like the USA there’s been an uplift, particular in sectors like construction.**

**The Lancet study compared the risk of wildfires during the period two thousand and one to two thousand and four, with the risk between twenty-sixteen and twenty nineteen. In no fewer than a hundred and fourteen countries the risk had increased. Based on area affected, rather than population, Australia actually got the biggest kicking, mainly due to the devastating 2019–20 fire season. But record-breaking fires in the States in 2017 and 2018 also resulted in more than four hundred and seventy thousand additional daily exposures to wildfires. And increases are happening across large areas like Siberia and vast swathes of the African continent, most notably in Kenya, Angola, Namibia, Botswana, and South Africa.**

**And then there’s extreme drought. The Lancet research found that in 2018,**

**“there was a larger number of exceptional drought events affecting all populated continents and the global land surface area affected by an excess number of months in drought was more than twice that of the historical baseline.”**

**From 1990 to 2019, the Lancet found what they described as ‘clear, significant, increasing trends in the number of occurrences of weather-related disasters.’ And here again, global inequality reared its ugly head. In countries that had a reduction or minimal increase in health-care expenditure between two thousand and twenty seventeen, there was a significant increase in the number of people affected by extreme weather events. But in countries with the greatest increase in health-care expenditure the number of people affected actually went down, despite an increasing frequency of events.**

**Climate change is tending to make dry areas drier, but it’s also making wet areas wetter. And when the rain does come to those regions, it falls in huge deluges that cause localised flooding. Those floods can obviously injure or even kill humans and animals that get caught up in the water or hit by debris. But an even bigger impact comes from the spread of water borne infectious diseases, just to add to the already existing problems of air borne and food borne disease.**

**All the diseases tracked by the Lancet Countdown team show an increasing trend from their historical baselines.**

**Although mosquito borne diseases did decline in the four most vulnerable regions (the Western Pacific region, the African region, the South-East Asia region, and the region of the Americas) between twenty ten and twenty sixteen reflecting considerable improvements in treatment and prevention in those countries, that trend began to halt from twenty sixteen onwards, and work is going on right now to try to establish exactly why that is.**

**One important function of climate change that the Lancet report has already identified is that fact that a warmer atmosphere is reducing the altitude barrier to malaria transmission in densely populated highland locations in four of the five regions where Malaria is endemic. Between twenty fifteen and twenty nineteen there was a thirty nine percent increase in African regions and a one hundred and fifty percent increase in the Western Pacific, compared to the nineteen fifties baseline.**

**And, among other things, those pesky mozzies can also transmit dengue, with symptoms including high fever, vomiting, muscle and joint pain and a nasty skin rash. In extreme cases, patients can experience bleeding and dangerously low blood pressure. The paper found that 2018 was particularly favourable for Dengue with a global rise of nearly nine percent in a strain called *A aegypti* and fifteen percent in *A albopictus* compared with a 1950s baseline. Dengue is not all that common here in Europe, but nevertheless, we saw a twenty six percent rise in *A aegypti* and a forty one percent rise in *A albopictus*.**

**And then there are nasty little things called Vibrio Bacteria, which live in certain coastal areas, and that generally come out in force between May and October when the waters are warmer. They can cause a variety of symptons in humans including gastroenteritis, wound infection, sepsis and cholera, sometimes leading to hospitalisation, intensive care and in severe cases, even limb amputation. Most people pick up the Vibrio bacteria either by exposing open wounds as they swim in infected waters, or by eating undercooked seafood, especially Oysters.**

**The Lancet research showed that, as our seas and oceans have warmed, the coastal areas containing *Vibrio* bacteria have increased by more than fifty percent in the northern latitudes in the last five years compared with a 1980s baseline. Along the Baltic coastline that number is more than sixty percent and the Atlantic Northeast has seen an increase of almost ninety nine percent.**

**One of the main targets of the United Nations Sustainable Development Goals is to put an end to hunger. We currently produce more than enough food to feed our global population, but as I’m sure you’re only too aware, most if it gets hoovered up by those of us living in the rich industrialised nations. And we are so mind bogglingly wasteful that we actually throw away thirty percent of all our food while the number of undernourished people around the world is projected to increase to more than 840 million by 2030.**

**According to the Lancet Countdown research, climate change threatens to exacerbate this crisis further, with rising temperatures, climatic shocks, and ground level ozone affecting crop yields, and sea surface temperature and coral bleaching affecting marine food security. As usual, these effects will be experienced unequally, disproportionately impacting countries and populations already facing poverty and malnutrition and exacerbating existing inequalities.**

**The report found that the yield potential of the four staple crops maize, wheat, soybean, and rice continues to decline in most individual countries and as a global average. Maintaining global production is becoming more and more difficult because of the changing climate. 2019 saw a global average reduction of about 9 days in crop growth duration for maize relative to the 1981 to 2010 baseline. That’s a six percent decrease. And large areas of South Africa, the USA, and Europe suffered reductions of more than twenty days, or fourteen percent.**

**Wheat growth duration dropped by six days or five percent, and Soybeans and rice were both down by two days or about two percent. They may not sound like dramatic numbers right now, but climate change is causing that the trendline to continue in a relentlessly downward direction.**

 **A large proportion of the global population, especially in low-income and middle-income countries, is highly dependent on fish sources of protein, and Omega-3 oil to help prevent cardiovascular disease. Between 1990 and 2017, diets low in seafood omega-3 increased by nearly five percent globally, with more than seventy percent of countries seeing a rise in exposure to this risk factor. In 2017 one point four million cardiovascular deaths worldwide were attributed to diets that were low in seafood omega-3 fatty acids.**

**The report points out that rising sea surface temperatures are harming marine populations through numerous mechanisms, including the bleaching of coral reefs and reduced oxygen content. It says that farmed fish consumption has increased consistently during the past four decades, with a corresponding decline in capture-based fish consumption, exacerbated in part by these evolving temperature trends.**

**What it doesn’t say, but that I’m going to add anyway, is that the impact of climate change on the marine ecosystems around the world, and on subsistence fishermen in many of the affected areas, is greatly exacerbated by the breathtaking scale of industrial fishing and the ruthless efficiency of the machines we humans have created to literally hoover up unsustainable quantities of fish species from our seas. Addressing those problems will require major systemic overhauls of how we manage fisheries, with far more stringent conservation measures – something we’ll look at in more detail in a future video.**

**On our current trajectory, estimates for the average global sea level rise by the end of the century range between one and two-point five metres, and in some regional coastal areas, projections rise as high as five metres.**

**Based on the population distributions in 2017, the Lancet suggests that the lives and livelihoods of a hundred and forty-five million people will be threatened by a metre of sea level rise, and at five metres, that number shoots up to five hundred and sixty-five million.**

**The report explains that a range of health impacts related to rising sea levels are likely to occur. Flooding is an obvious cause, as we’ve already seen, but the quality and availability of fresh water and the health of our soils are also both very likely to decrease significantly as a result of saltwater intrusion further and further inland.**

**The consequences of these effects on the health of the folks living in those areas will depend heavily on mitigation and adaptation policies implemented by their governments, and sadly, on mass migration strategies that will need to be agreed between different states and even between nations. And we’ve all seen how well refugee migration has been going in recent years.**

**According to Lancet Countdown research, by 2020 there were forty- three national policies across thirty-seven countries that connected climate change with migration. Forty of those policies also explicitly referenced health or wellbeing. There was a general acceptance in all the policies that mobility would have to be both domestic and international, but very few of them made any mention of what happens to people who are simply unable to move from their current locations, for whatever reason. The options for those folks would appear to be extremely limited indeed, and none of them are good.**

**So, in a nutshell, that’s the first section of this comprehensive report.**

**Essentially, we’ve got a warming world that’s affecting human health both directly and indirectly and putting already vulnerable populations at a high risk. Extreme weather events are worsening global crop yield potential and increasing the transmission of infectious diseases.**

**The Lancet Countdown team argue that the data described in section one of their report**

**“provide a compelling justification for an accelerated response to climate change. There are clear limits to adaptation”, they say “necessitating increasingly urgent interventions to reduce greenhouse gas emissions.”**

**So how will our societies, our governments, and our health systems adapt to meet these increasingly urgent deadlines?**

**Well, that’s something we’ll look at in the next Just Have Another Think video in a couple of weeks’ time.**

**In the meantime, I’ll be back this Sunday with my regular Just Have a Think programme looking at the latest technological developments that might help us reach some of those climate mitigation goals.**

**See you then.**