Alphachat: Anne Case on mortality and morbidity

Cardiff Garcia Anne Case, thanks for being on the show.

Anne Case My pleasure, good to be here.

Cardiff Garcia Great. Here's what I thought we'd do. This is the roadmap I'd planned out for us and for our listeners.

We're going to go through the big recent paper that's generated all the attention and you've been talking about, but we're also going to go through the two prior papers [in the series] that that third paper is a part of. In other words in 2017 you published this paper, just a few weeks ago, called *Mortality and Morbidity in the 21st Century*.

What our listeners may not be aware of is that actually the first paper in this series was called *Suicide and Well-being: an Empirical Investigation*, published in the middle of 2015.

And I note the little bit at the end, "an empirical investigation", is doing a little bit of double-meaning work because it is also an investigation into the empirics of how this kind of economics is done.

So let's start by talking about that [first paper of the three]. It looks at, first, whether or not there's a relationship between suicide rates and self-reported well-being, and then it looks at whether or not either of those two is a useful indicator of overall societal well-being.

Anne Case That's right. We started because we were looking for a benchmark for self-reported well-being. If you ask people on a scale from zero to ten how would you say your life is going at present, most Americans would give themselves about a seven. But we wondered, if we're going to start to incorporate people's sense of well-being into public policy, we wanted to know*, does this actually pick up something meaningful?*

We thought that suicide might give us, way out in the tail, a measure of just how unhappy people could become and so we wondered, is it the case that in those parts of the country – say county by county, where people report themselves as having poorer well-being – are those the parts of the country where people are killing themselves? Because we thought that might be the ultimate sign of not being well.

Just to answer that question first, the answer was no. Actually it turned out that there was no correlation between places where people said their lives were going poorly and areas where people were killing themselves.

But along the way what we found was – which we weren't anticipating, although the [Centers for Disease Control] was writing data briefs on this – that suicide rates were going up in the States.

Then we wondered, relative to what… what is mortality doing overall? That's when we realised that mortality rates for white non-Hispanics in the US had started to rise and that no-one had actually written about that.

So that was the impetus for the next set of papers that we worked on. We were very surprised when we saw that mortality rates among whites are rising and we really couldn't believe that it wasn't already in the literature.

So we took that work on the road and we showed it to people at various medical schools. we talked to demographers that we knew around the country and it did turn out that it had happened under the radar. So the first paper, which was the suicide and well-being paper, then gave way quite organically to work on what the heck is going on here: Why are whites dying in middle age?

Just to be more specific, the paper that followed the suicide paper looked at mortality rates for white non-Hispanics in the US. We focused on an age group of 45 to 54 because we thought we should be precise but not look like we were cherry-picking by picking an even smaller group than that. And we started to peel the onion to try to find out what's going on.

Cardiff Garcia That's interesting, that actually it was the process of conducting this more specific paper that ended up catalysing the research that you did in your later papers. I was going to save that question for later: how did you decide to investigate rising white mortality rates? But

you just answered it in the process of talking about it. But I want to stay on this [first] paper for a bit, if you don't mind.

Anne Case Sure.

Cardiff Garcia You mentioned that you couldn't find a relationship between suicides and self-reported well-being geographically. But actually you also found that that relationship didn't hold in other dimensions.

I'm going to give you a couple of examples here. One was that suicide rates continue rising with age for men, whereas their self-reported well-being follows a U-shaped curve where they're happier when they're young, it dips in middle age and then they get happier again when they're older, so there's no relationship there.

Life evaluation is the same throughout the week but actually suicides tend to be bunched up on Mondays. And there were other dimensions. I thought it was just very clever the way you guys looked at these patterns because you had all this data and then essentially eliminated the possibility of that relationship – or [reduced] the likelihood [of that relationship], I should say.

Anne Case Yes, I should say that one of the things that we thought was interesting was what you just mentioned, which is actually called a circaseptan rhythm, which is what happens over the days of the week. When economists tend to look at suicide they like to think, well, could it possibly be rational? "I've looked forward and I've made a decision that my life actually isn't worth living and so when I look at the present, this value of all my future happiness or well-being, it's just not worth me staying alive for."

But if that were true, if people were making such a calculation, it's really hard to believe that people would end up bunching up on Mondays, so the lowest day of the week for suicides would be Friday and the highest would be Monday, whereas self-evaluation of how life is going is flat over all those days of the week.

So we think – well, we know for sure that suicide is not well-understood and we think that the idea that people are making a complicated calculation is probably not going to be dispositive in their decision to pull out a gun.

Cardiff Garcia You also frame this paper in a wider philosophical context at the beginning, where you write that economists are always struggling with the idea that these self-reported measures may or may not match observable reality. And you would think that life satisfaction as you report it yourself would be connected to suicides. This seems like another example where a relationship that seems common-sensical turns out just not to be true in real life.

Anne Case Yes. I don't really have a good explanation for why they're not better-related. It's a white phenomenon, it's a male phenomenon, and suicide in the US is something… There's a suicide belt that runs right up the spine of the Rocky Mountains, so from New Mexico, Arizona all the way up through Montana. Those are also the places where people report themselves being happiest, so it's really far from clear how you take those two pieces – that this is a place where people are killing themselves...

And if you think about white men, and historically it's always been white men, whether it's been a period when white men were top of the heap or whether it's a period when white men may feel under threat, it's white men who are killing themselves even though they have on average more income, on average more education, on average a lot of dimensions that we can quantify – would seem to have more material goods – and yet that's the group that is by a long chalk more likely to actually kill themselves.

Cardiff Garcia You mentioned something a second ago that reminded me that you and your co-author, Angus Deaton, strike a note of humility throughout these papers. In this paper what you write is that a lot of this data just isn't very well understood yet. In other words it is surprising, at least to somebody coming into this work who isn't familiar with it, that self-reported life satisfaction and suicide rates don't necessarily correlate to overall measures of societal well-being. Did that surprise you when you came to the end of this paper?

Anne Case It did and it pushed us to actually look to see whether or not we could find any markers we have that correlate with suicide, and the one marker that we could find is that in those places where people report more pain, those were places where people were more likely to kill themselves.

So we did find a strong correlation between suicide and something that we know from our friends in psychology, and from psychiatrists, we

know is a real risk factor for suicide, which is pain. So if we understood, we thought, pain better we could probably understand suicide better.

It's also the case that people when they think Rocky Mountain states immediately think, “well, that's where people have access to guns”. That indeed is true but we don't think that it's the access to guns in particular because within the Rocky Mountain states county by county, to the best we can measure this, it's not the places where guns are most prevalent that the suicide rates are higher.

So it's a complicated story. We know that social isolation is a risk factor for suicide and it's also the case when you're out there on the wide open range that you may be more isolated than you anticipated being. so social isolation and pain both being risk factors, and indeed we do see correlations there but not to the kind of quantifiable economic characteristics that we thought we'd find.

Cardiff Garcia It's also interesting to me that a self-reported measure of pain was strongly correlated with suicide rates but that suicide rates were not strongly correlated to a self-reported measure of overall life evaluation.

Anne Case Yes. You would think that those three things might go together and the thing about self-reported pain, like self-reported life evaluation, is you're the only person who can report it. Pain isn't something where we can put somebody up on an examining table and say, yes, indeed this person is in pain.

Cardiff Garcia Feeling pain.

Anne Case Yes. So that also makes it difficult to try to... There's some pushback from some economists because it is self-reported, both these measures, which I think also brings us back to why one might want to look at self-reported life evaluation to see whether or not it correlates with things we think we know how to measure. If it only picked up things we knew how to measure it wouldn't be all that useful because we're measuring those things anyway. But if it doesn't correlate with anything we think is useful, then it raises some questions.

It's also the case – this would be a Amartya Sen’s point – if someone becomes accustomed to various degradations, to living a really difficult life, and they adapt and they say that their life is going well because they've adapted to the insults that they face day in and day out, is it really

clear that we want to use life evaluation? If it's the case that a person is starving to death or watching their children die or doesn't have a warm place to get in out of the cold? It's not clear that we would want to use that measure for public policy anyway if it's the case that people adapt to their circumstances to that extent.

Cardiff Garcia Here's one final question about this paper and it'll serve as a jumping-off point to the paper you published a few months after that [in 2015]. You write in the paper that it's possible that the dip in life evaluation is a recent phenomenon and – quote – "that it is indeed linked to the rise in suicide in middle age with both driven by increasing physical and mental distress in middle age" – unquote. That seems to be the impetus for the next body of work.

Anne Case Yes, absolutely. When we were finishing up that paper but were already hard at work at trying to figure out, *why are people in middle age dying in larger numbers?*, we started knowing we had suicide on the go because that was a place where rates were increasing.

But going into the CDC, the Centers for Disease Control, which has a website you can query and look at causes of death, we thought, maybe it's heart disease, maybe it's cancer, or maybe it's diabetes with the obesity rates rising as they are. And the answer kept coming back, no, actually those rates are falling.

What was rising? External causes. Okay, what are external causes? It wasn't traffic accidents and it wasn't homicide. It was largely suicides and something called poisonings. So what are poisonings, we thought, is that like drinking Draino when you thought it was milk or something? But no, that's the bin into which the CDC puts drug overdose.

So then we thought, oh my gosh, drug overdose and suicide. And that led us to think another possible cause of death that might be related would be from alcohol-related diseases.

Cardiff Garcia Liver disease.

Anne Case Liver diseases, and indeed what we found was alcoholic liver disease and cirrhosis rates were rising as well. So those three causes went up quite rapidly and as we thought about them, we thought they were all ways in which people killed themselves, either quickly with a gun or slowly with drugs or alcohol.

That led us into an entire, new line of work which is trying to figure out, what the heck is going on here, why is this happening? The CDC had been reporting all of those things but in different places. So if you go back to CDC reports, there is a report that says, alcoholic liver disease and cirrhosis is on the rise among whites; different report, suicide is on the rise; different report, opioid epidemic is really taking hold especially among whites.

So the information was there, it just was not being put together in the way that we thought seemed most natural to put it together.

Cardiff Garcia Should note for our listeners by the way, CDC is Centers for Disease Control here in the United States.

Okay, then let's talk about the paper you published a few months later, which was the result of these trends that you were studying, that you've just mentioned. This one was called "Rising Morbidity and Mortality in Mid-life Among White, non-Hispanic Americans in the 21st century" and it was published in the PNAS, that's the Proceedings of the National Academy of Sciences journal.

I thought we'd start just by going through what it found because this paper was one where essentially you just presented the facts. You didn't get into the detail that you'd get into in the paper that you published this year. So why don we just go through each of those?

Here's the first quote that I pulled from it. Quote, "This paper documents a marked increase in the all-cause mortality of middle-aged white, non-Hispanic men and women in the United States between 1999 and 2013" and the proxy for middle age you use is ages 45 to 54. This was a reversal after decades of progress for this category.

Anne Case That's right, it was more than just decades. Actually if we go back to the 20th century for whites in America aged 45 to 54, the mortality rate fell from 1,400 per 100,000 people in, say, 1900 down to 400. So a drop of 1,000 per 100,000, in just a steady decline.

There were little blips like the 1918 flu epidemic and there's a little plateau around 1960 where people in middle age who had smoked like chimneys in their 20s and 30s were dying of cancer and heart disease. But aside from those two little blips we had come to expect progress and that progress would continue.

When you look at countries that we might think of as being comparison countries – other English-speaking countries, Canada, Australia, the UK; other rich countries in Europe – mortality rates after the turn of the 21st century continued to fall in middle age. But the US whites decided to leave the herd.

So, like these other countries, we had been enjoying a 2% per year decline in mortality rates. And name your favourite European country – that is what characterises people in middle age.

But among whites in the US, first progress slowed and then it started to go the wrong way. So this yawning gap opened up between the US whites and European countries, and I should say that Hispanic mortality continues to fall like the European countries' fall. One thing that some reporters tend to misreport, is that Hispanics in the US actually have a lower mortality rate than whites. This is even though they're on average poorer, on average have less education, but they have always had rates that looked a lot more like European countries.

Cardiff Garcia Sorry, when you say that reporters misreport it, you mean that it is the case that Hispanics have lower mortality rates than whites, but reporters sometimes say that Hispanics have a higher mortality rate incorrectly.

Anne Case Yes. Incorrectly.

Cardiff Garcia It's called the Hispanic paradox.

Anne Case Yes, that's exactly right and it's not well-understood because people tend to think these good things go together – income, education and health.

African Americans have always had a higher mortality rate than whites but those mortality rates have been falling at an even faster clip than what we see for the European countries, so they made real progress. Hispanics continue to make progress but for white non-Hispanics things started to turn around.

Cardiff Garcia Can I put some quick numbers on the mortality rates for white Americans versus African Americans? Normally it's not a good idea to use numbers in a podcast because everybody goes to sleep, but just because I think these are important numbers…

As you just said, black mortality rates are still much higher as of 2013 but it's also the case that black mortality rates through 2013, according to this paper, had been falling so here are the numbers.

As of 2013 there were 582 deaths per 100,000 for black Americans, versus 415 deaths for quite Americans.

But in that same amount of time – between 1998 and 2013 – black mortality rates had fallen by 27%, whereas white mortality rates had climbed by about 8%.

Anne Case That sounds right. Not to jump ahead to the most recent paper, but what we find is that among blacks and whites with a high school degree or less – which is about 40% of the population in middle age from the period from, say, 1998 to 2015 – black mortality rates fell enormously, whereas white mortality rates rose.

So there's been an almost complete convergence between black and white mortality for people with a high school degree or less. To the extent that that's happening because black mortality rate is falling, that's fabulous. But to the extent that some people are celebrating equity, which is an equalisation of these rates – celebrating it because white mortality is rising – that strikes me as being really off the mark.

Cardiff Garcia Right. It seems strange that you'd want equality for its own sake when equality means that one of those groups is dying at a faster clip.

Anne Case Yes. And if the Centres for Disease Control – which every year in their big publication called *Health, United States* – they will tell you how much progress we've made toward equalising life expectancy between blacks and whites, and I think that if anything that is really a disservice to measurement of black progress.

If you want to measure the progress we're making on African American mortality, benchmark it to the Europeans. Don't benchmark it to the US whites, whose mortality is moving in the wrong direction.

Cardiff Garcia That's an interesting point and the framing issues on this are fascinating, but we're going to talk about those in the next paper. Let's stay with 2015 for a second, let's keep going through, yes…

Anne Case Okay, so all-cause mortality being literally as it suggests –

that's dying from everything – but the three causes of mortality that were rising most rapidly for whites in middle age were suicide, drug overdose and alcohol-related liver deaths.

However none of that would have come to light if we had continued to make the kind of progress we used to make on heart disease. So it was the case that the progress on heart disease we were making was masking the fact that these causes of death were rising and rising in their rates. But when our progress on heart disease first slowed and then flat-lined, then suddenly there was an opening for these causes of death to raise their heads and that's really what we saw happening in the US.

Cardiff Garcia I want to also emphasise that when you compare what's happening in the US to what's happening in European countries, that's not like some frivolous exercise in comparing us versus them. It's also because it gives us an insight into which causes can be ruled out, and you mention in that paper that European countries have been suffering from the same, for instance, productivity stagnation that the US has been suffering from, and certainly in the aftermath of the financial crisis at least the overall economic stagnation has been worse in many parts of Europe than it has been in the US.

And yet in Europe those mortality rates continue to fall. Not so in the United States.

Anne Case Absolutely. I think the comparisons are interesting both because of the fact that these are all wealthy countries and because they also went through the financial crisis and because they lost jobs to the Far East the way the US did in terms of manufacturing and yet people there are not killing themselves slowly or quickly so the next tranche of work will be to see to what extent can some of that be pinned onto universal healthcare which is available in Europe, what part of that is the fact that their safety nets are much stronger than the US...

Cardiff Garcia Pension systems over there are a little different as well; defined-benefit pensions are more common here than they are in the US.

Anne Case And the divine [sic] benefits pensions which used to be the way that US had a pension system meant that as you approached retirement you had a very strong sense of how much you would have every year to live on. Whereas with a defined-contribution system you bear the risk when you retire and that's a huge difference. …

Let's talk about morbidity.

Cardiff Garcia Morbidity, sure, yes, of course.

Anne Case So morbidity is sort of a catch-all for any markers of health that we think have an impact on a person's well-being or that may predict death later. For the body count that we get out of mortality, those are hard numbers, we know how many people died. With a lot less precision we know what they died of, but that's again with a lot less precision.

But underneath that body count there has been in the US a real surge in pain. So people year on year in the National Health Interview Survey – which is a large, nationally representative survey – year on year people are reporting more sciatic pain, which is lower back pain that shoots down your legs; chronic pain, chronic joint pain, and in a list of activities of daily living people are year on year reporting more difficulty doing such things as socialising with their friends, which we know is a risk factor for suicide, relaxing at home. They report more heavy drinking.

Oh, also mental health. The National Health Interview Survey asks a battery of questions and when you put the answers together it gives you a marker for whether someone is at risk for serious mental illness or serious mental distress. Those numbers have been getting worse.

So what we see is underneath the increase in mortality rates the sea of pain and mental distress. And when we put those together with the mortality numbers, the story looks pretty bleak.

Cardiff Garcia I had another question about the trend you just mentioned, and in particular putting together the mortality and the morbidity trends. In that paper – which was actually pretty short; people can read it, it's just a few pages long – you were, I think, more concerned with the presentation of the facts. I'm wondering if by the end of it you realised that it would be a good idea to start coming up with a theory that may not be easy to prove but would at least be consistent with these really astonishing trends that you were seeing, and if that was why you went into so much more detail in the subsequent paper.

Anne Case We were just so taken with the fact that all of this was happening and seemed to have been taking place under the radar. But there was no question but that we would follow it up.

As you can imagine, once that paper was published a lot of people asked us to come and talk about it. And everywhere we went to talk about it people knew what the answer was, but everybody's answer was different. So we knew that it was something that was causing people to have a very strong reaction. But it was like a Rorschach test because people tended to bring to it what was on their minds.

Cardiff Garcia It's interesting. It was as if you got a tour of everybody's confirmation biases.

Anne Case Yes, and we made lists of things that we had ourselves been thinking about. But we also made lists of things that weren't on our radar and, thank goodness, are now really fully on our radar, that we think are important to follow up. But it certainly was the case that we got a lot of opinions on it.

Cardiff Garcia What's an example of something that before when you were just trying to get the facts across was not yet on your radar, as you describe it, but later was very much. Was the opioid crisis one of those or were you already looking at that pretty carefully?

Anne Case That was already on our radar. Of all of these things that was something that was raising its head above the surface. So the Centers for Disease Control had put out these stunning numbers on the fact that in 2010, enough prescriptions were written for painkillers to medicate every American adult around the clock for a month.

As I read more I realised that when people started talking about prescription painkillers, they were being divided into categories as less strong than morphine or stronger than morphine – which seemed very strong to me – and that the balance between those two things had shifted in the 21st century toward the stronger-than-morphine variety.

The introduction of Oxycontin in the late 1990s and the workforce that was put out around the country to try to market this new wonder-drug, *no-one should be in pain, we have a war on pain*. That war on pain unfortunately became a different kind of a war – it became a war against the kinds of drugs that are causing addition.

We know for sure that part of the increase in drug overdoses was caused by the fact that people are prescribed very strong painkillers for chronic pain, which they may or may not ever should have been prescribed. They become addicted. The painkillers are very expensive. Maybe they get cut

off and then they turn to a drug that's now readily available and very cheap and very pure, which is heroin coming in from Mexico, and in the most recent wave of that, fentanyl.

So we think that turning off the taps of prescription pain that... It's not the answer, we don't think. We think it was an accelerant to what happened but it certainly is something we know that we can do, and probably should do. Oxycontin is heroin in a pill. It's actually apparently even a little better than heroin in a pill because it latches onto the receptors in your brain better than heroin would do, so heroin is a good but not a perfect substitute for these opioids.

Cardiff Garcia So the opioids - it does sound as if it was very much on your radar screen at the time. Was...?

Anne Case Yes, but what was not for example was what our friends in sociology have been talking to us about for a decade, which is the fact that people who don't have a good job find that they're not very marriageable. And so marriage rates were breaking down in the US among whites.

We think that if people need stability in their lives, one of the pillars for stability is being married and the marriage rates – if you look birth cohort by birth cohort for people with less than a college degree – marriage rates have been going down and then down and then down some more.

For example Andrew Cherlin writes about white women with a high school degree or less. It's unusual for them not to have a child out of wedlock now. Mores changes. People move in together but those cohabitations in the US are a lot less stable than they are, say, in Europe where cohabitation is quite the norm.

But if it's fragile because she may throw you out or you decide to leave because you both are looking for better economic prospects – and that happens repeatedly – that leaves you with much less of a safe haven when the labour market is pummelling you at the same time. So marriage is definitely something that's on our radar now and might not have been had we not taken this step farther.

Cardiff Garcia Maybe also not if you hadn't also been in touch with sociologists about this.

Anne Case Yes. Our friends Sarah McLenahan and Irv Garfinkel, who

run something that's known as the Fragile Families Survey, have been following young couples, mostly young couples who are not married. And the children of those young couples are now about to turn 14, and they've been following the relationships of these men and women from the time she gave birth in the hospital up until the kids are 14. And they're watching the uncoupling and recoupling and the negotiation, and how people try to manage their lives. We realised that's a really important part of our story as well.

Cardiff Garcia I'm going to cite one more point from the paper and then we're going to talk about the methodological back-and-forth you had with some people, because this is really just a shocking number.

You write that if the previous trends of declining mortality had continued in the time when they ended up reversing, that the US would have avoided almost another half a million deaths. Then you compare that to the AIDS epidemic, I think the latest number is that it had about 650,000 deaths – but at the time it got a lot of attention, there was a lot of flocking to try to treat it properly, whereas this ended up going under the radar a little bit.

Anne Case That's right and the numbers that you just gave out are our best estimates of what did happen. All of those deaths, those half a million deaths, those people who got to age 45 but never saw their 55th birthday, a lot of those are from what we call deaths of despair – suicide, drug overdose, alcohol – but part of that is also the fact that heart disease mortality flat-lined.

So part of this is due to something that we certainly don't understand, which is why, unlike European countries where heart disease progress continues, why in the US heart disease progress flat-lined.

So you put those together and you get something that is large enough that it should be getting people's attention. I think partly it's the stigma. People don't want to tell you about losing a brother or a mother or a sister…

Cardiff Garcia To a death of despair, you mean.

Anne Case To a death of despair. We get a lot of emails from people who will say, "thank you very much, you told my story", or "I thought I was alone", or... and you realise the stigma's still alive and well in America in talking about these things.

Cardiff Garcia Probably also similarly with those mental distress trends that you mentioned as well, something that people don't like to talk about, the psychological problems.

Anne Case People don't like – exactly, and also if they're not in a stable relationship where they've got another person who they know is in for the long haul, you don't have someone to talk about it with at home either, which I think can be really devastating and put someone at really high risk for suicide.

On the heart disease – I just want to back up one second if that's possible – when the numbers came out that show that heart disease has flat-lined in the US, there were recent reports now that, well, this is finally the obesity crisis coming home to roost, that we've been telling you for 20 years that you were going to pay for the fact that you were all getting obese and now this has come and that's the underlying cause.

We think obesity may play a role, but it doesn't match very well in the sense that 28% of white non-Hispanic adults in America are obese. Well, 25% of Brits are obese yet their heart disease rates continue to fall at a good clip, whereas ours have actually stopped falling and in the last couple of years started rising.

So we don't understand why we stopped making progress with heart disease. That is a huge issue, that is a huge killer in middle age so without a better understanding of that, we're just in a position to report that if progress had continued on heart diseases, and if these deaths of despair hadn't started rising so rapidly it would have saved – just between the ages of 45 and 54 – half a million deaths.

But beyond that, people in early middle age are dying in higher and higher numbers from deaths of despair, so once you add in all of those as well the number gets to being much, much larger than that half million we reported in the paper, being conservative, just looking at that one group.

Cardiff Garcia Very sobering stuff. Let's talk about methodology because you had a very fun back-and-forth with – I think the two most substantive critiques were from Andrew Gellman and from the Urban Institute. I think I'm going to combine their critiques because they were very similar.

Here's what Gellman, a statistician and writer who I like a lot, said in response to the paper, and I should note at the very beginning [that] he didn't say that this overturns the importance of the paper. He was pretty respectful about it. He said that in that cohort from 45 to 54 over those years from '98 to 2013 that the average age of the people in that cohort would have increased naturally just due to demographic trends – in other words the people within that 45 to 54 category – and that because of that you would have expected, relative to the baseline you used, higher mortality rates anyway just because of the increasing average age.

So when you adjust for that he found a couple of things. One was that there were still rising mortality rates for white people but it happened between '99 and 2005, and then after that it was flat – which is itself, again, even a flat trend is still an incredible stoppage of the progress that we had before that, not just decades but as you mentioned, for centuries, so that was one thing.

But that also when you made that adjustment and then you looked at the differing trends between men and women, you would see that in 2005 you had rising mortality rates for both until then, but then afterwards [ie after 2005] mortality rates for men would start to decrease, but for women they would continue increasing. So those were, I think, the two main points that they bought up. The Urban Institute had, I think, almost the same critique with slightly different numbers.

Then you responded. Why don't you tell us what your response was?

Anne Case Well, in part… Let me do this in two bits. In the new paper we actually show what a different age adjustment makes, which is very little.

We think that just a mechanical age adjustment in this particular case doesn't make as much sense because it's not as if there's some natural force at work that causes people as they get older to kill themselves or to take drugs until they overdose, so it's not as if there's a kind of force of nature underneath that, and that if you age-adjust without adjusting for other things as well, in a sense you privilege the age adjustment. You're just saying, okay, for some reason people aged 50 are more likely to kill themselves than people aged 45, so let's age-adjust it and then take out that bit, in a sense.

We found – and we tried to do this very carefully in the new paper – if you age-adjust, it is true that within that band, aged 45 to 54, going from

1990 to 2015 people within that band got a half-year older on average so you would expect some more deaths, the age adjustment does tend to flatten out the increase.

But for us – and I think you've alluded to this – whether or not it actually increases or just flat-lines isn't the most important thing. The most important thing to us is the fact that all of these other countries and Hispanics in the US and blacks in the US are continuing to make progress, and progress for whites has stopped. That's probably the most important finding.

Cardiff Garcia In fairness, Gellman also said that, and he said it was still a monumentally important paper. He just disagreed on this one thing.

Anne Case That the age adjustment… So in the new paper what we do is we show some results by single year of age and we also look at five-year age bands instead of ten-year age bands. But as you can imagine, once you're looking at education and race and sex and age and cause of death, you've got a lot of balls in the air. So instead of doing it single year of age by single year of age, we just used five-year brands now where the age adjustment within the band would make basically no difference at all.

But I think the male-female difference comes from the fact that for both men and women, there have been these marked and really disturbing increases in suicide, drug overdose, alcohol-related deaths. But when you look at all-cause mortality, there's a lot more that goes into that mix because deaths of despair are becoming an ever-increasingly important part of all-cause mortality. But in middle age a lot's going to depend on what happens to heart disease, on what happens to cancer – and women started smoking later than men in the US, and they stopped smoking later than men in the US. So women still have this bulge of smoking-related mortality that they're working through which is causing their mortality rates to rise, whereas the men's rates from cancer have fallen.

So until that works its way through the system there certainly will be differences in what happens to women's and men's all-cause mortality. We try now to make a distinction between what's happening in terms of deaths of despair and what's happening in terms of all-cause.

Cardiff Garcia And for capturing those common forces it still made sense to keep men and women together in your paper, in other words.

Anne Case Yes, and actually in the new paper we look by level of education – high school or less, some college, BA or more – and then we look at five-year age groups from 25-to-29-year-olds up to people in their 60s.

What we see is that for both men and women analysed separately, for those groups without a BA, mortality rates have increased between 1998 and 2015 and they look quite similar between men and women. So we think that the commonalities are more important than the differences. The commonalities tend to come from these deaths of despair, and the differences tend to come from behaviours that are moving at different rates for men and women.

Cardiff Garcia Yes, that's interesting and it makes sense. I should say, one of the reasons I like these back-and-forths is that I wouldn't have known about the differing effects of smoking habits. I like knowing that, that's interesting to me, so I'm glad that you engaged with the people who were making these critiques at the time because I just find this sort of thing to be helpful.

Anne Case Yes. In our new paper there's a really interesting graph that looks at mortality rates of women in their late 40s from lung cancer, and those rates increased in the 2000s. So it's clearly the case that that has to work its way out of the system.

Cardiff Garcia Versus men.

Anne Case Versus men, for whom it appears… I just want to say it appears that the smoking rates and the cancer rates associated with that, and the heart disease rates associated with that, may have fallen.

However most recently – and again this is for future work – it's been mentioned to us that whites with less education may have started smoking again in larger numbers, so that's something in the new work that we want to go have a look at because year on year what gets reported is that smoking rates have been falling and maybe that's true. Maybe that's true overall but maybe the people we're most worried about, the people with less income...

Cardiff Garcia That's interesting.

Anne Case So that's for the future.

Cardiff Garcia That's interesting though in other words because this would be an example of a trend on which societally… overall measured in the aggregate it looked like we'd been making progress, but actually there's a subgroup that's not making progress and it might be enough to affect the data in aggregate as well.

Anne Case Yes. Just on the point about the difference between looking at deaths of despair and looking at all-cause mortality, one of the places that we like to highlight is the difference between Utah in the US and Nevada. So they're both in the West, they have about the same amount of population, they're both big western states – but two-thirds of people who live in Utah are Mormons so they don't drink alcohol, they don't smoke and they don't drink coffee. Two-thirds of the people who live in Nevada live in the Las Vegas metropolitan statistical area, so we tend to think of that as being the home of happy vice. And indeed if you look at heart disease mortality rates they're twice as high in Nevada as they are in Utah for whites of middle age, and all-cause mortality rates are much higher in Nevada*.

But if you look at their deaths of despair, in Utah the rates of drug overdose and the rates of suicide have skyrocketed, so there's very little daylight between deaths of despair in Nevada and deaths of despair in Utah, which to us is a stunning finding. Friends of ours in the Mormon church have told us that the Mormons are having a very difficult time figuring out how to get their heads and their hands around the opioid crisis there.

[* Case mistakenly said “Utah” here in our chat, but she certainly meant Nevada, as confirmed in the 2017 paper itself, so we’ve amended the transcript accordingly.]

Cardiff Garcia Let me pause here before we go on to the 2017 paper to ask you how you personally process all the pessimism that's inherent in the conclusions of your papers. Because you don't shy away from saying, these are not happy conclusions, there's no hopeful out at the end of it.

You try to think of things that might help but none of them are easy, and even if they were implemented right away, you wouldn't see the difference for quite some time. How do you as a social scientist process this – personally, I mean?

Anne Case Personally it's hard for me when I'm drawing figures and I'm looking at people with less than a bachelor's degree, and especially the people I now consider the youngsters, the people who were born, say, in 1980. And you see their mortality rates from drug overdose and suicides just going up and up.

It's tough, it actually is very hard. I come from a hard-scrabble part of New York State so I think of this as also being something I watch happen when I go back to my home town.

Cardiff Garcia You have family and friends that are suffering from some of these trends?

Anne Case Not suffering from the trends, suffering from the economic part of it for sure, not as much the deaths of despair part but understanding the kind of struggle that takes place in what used to be a thriving manufacturing centre, original home of IBM where a lot of the jobs moved out. And trying to keep body and soul together gets harder and harder. So I feel I understand part of this from the fact that I've watched upstate New York depopulate and watched the manufacturing jobs disappear.

Cardiff Garcia You mentioned earlier in our chat that you sometimes get letters from people saying, "thanks for pointing this out, it helps me to know I'm not alone". What's the impact of getting feedback from – I don't want to say "real" people, but people who aren't in the economics or social sciences professions?

Anne Case Sometimes people give us really good ideas. A woman wrote to me and said, "I can really relate to your paper. When I was having dinner with my friends I made a joke that when I retire I'm going to be a greeter at Walmart, because basically I'm going to have to work for the rest of my life".

She said no-one laughed because that was their retirement strategy as well, that a lot of people getting toward the second half of middle age don't see how they're going to be able to finance a retirement, and are trying to change their focus or change their expectations accordingly.

So I would not have thought of it in quite so graphic terms. And so I think it's really helpful to me because then it sends me back to the data and thinking it would be really useful to be able to look at how much

people set aside for retirement, and to what extent they're at risk. A lot of the people we're talking about probably have set not very much aside.

Cardiff Garcia Okay, let's talk about the most recent paper. There was a reason that I wanted to talk about the two earlier papers first, which is that you can start to see now how each subsequent paper builds on the findings of the last.

In this paper you reinforced the findings from earlier, but then you also provided a lot more detail. And then this paper was published by Brookings, and then it was publicly discussed but it also got a ton of attention.

Let's go through some of the things first that were reinforced from the earlier papers. You looked again at the three deaths from despair – suicides, overdoses and then alcohol-related illnesses, deaths from those illnesses – and then you add in more explicit terms that declining mortality from heart disease has stopped. And when you look at those four causes, those largely explain the trend of rising mortality for middle-aged whites.

Anne Case That's right. It helped us to think about heart disease along with these deaths of despair because it's these two trends that are going in opposite directions.

It was the case that heart disease mortality had been declining, deaths of despair had been rising, and what happened was the decline in heart disease flattened out, which allowed then the deaths of despair to cause mortality to go up.

But if you want to find one explanation for this U shape in all-cause mortality in the US among this group, among whites, it's going to be one cause that's going to have to explain both the heart disease on one side and the deaths of despair on the other.

And so to paraphrase our President, it's complicated, who knew it was going to be complicated? We think that we need to understand more about both parts of that, but pinning it in one economic change, I think, is more difficult knowing that it's these two long-term trends at work.

Cardiff Garcia You get into a lot more detail in this paper where you break down mortality rates by gender, by education, by age. The findings

around education seem to be the most dramatic, new thing that you discuss in this paper.

Anne Case That grew out of the paper that came out in the PNAS in the sense that when we looked at the numbers of the mortality rate changes for people with a high school degree or less, relative to people with a BA it was right there saying the people who are getting hammered here are the people with less education. So we decided that that was where we should look in greater detail, and that indeed turned out to be, I think, a really important way to slice up the data.

We had to be careful because earlier work by other authors looked at people who had less than a high school degree, and looked at change in mortality rates for people with less than a high school degree. That group became smaller and smaller and more and more negatively selective over time as the fraction of the American population without a high school degree just plummeted.

So we knew we had to look at at least the group with a high school degree or less, and over the period between the mid 1990s and 2015 for people in the original age band, 45 to 54, you could break that into about 40% of people who had a high school degree or less, 30% some college but not a BA and then 30% with a BA [Bachelor of Arts degree, ie a college graduate].

So those groups weren't changing proportions by more than one or two percentage points, which allowed us to rule out the fact that that group was becoming more and more selective in a negative way. Then what we found was that it was the people with a high school degree or less who are a lot more likely to be dying of deaths of despair and it's hitting everyone but that group. It just dwarfs what's happening to people with a BA.

Cardiff Garcia I want to stay with this issue of adjusting to make sure that you don't succumb to selection bias, because this is, I think, one of your points of disagreement with some other health researchers in particular. I think you cited the work of John Bound in your paper and you concluded that your findings were simply more pessimistic than those of [him] and his colleagues.

Specifically I think the adjustment he makes – and you talked about this just now but I want to spell this out in layman's terms as well for our listeners – the idea here is that if you're looking at mortality rates for

people with no college, you have to be careful to account for the fact that more people started going to college, so naturally you would expect that group left behind, so to speak, would be more vulnerable and, just because of these selection effects, would have higher mortality rates. You'd have to adjust for that.

They adjusted for it and they found that, I think, mortality rates weren't climbing. You adjusted for it and you found something different. What do you think accounts for the discrepancy?

Anne Case Well, we don't actually adjust for it. What we do is we actually say, for this group over this period of time there's no adjustment necessary because the fraction of people in each of these bins isn't changing.

So we had to be very careful. A lot of the new paper is based on birth cohort, what happened to the birth cohort of 1945, 1950, 1955 and so on up to 1980.

It turns out between the birth cohort of 1945 and 1965, 30% of white adults got a BA or more, that was flat. Then between 65 and 70 that number went from 30 to 40%. But it's been stubbornly at 40% between the cohort born in 1970 and then the latest cohort we have, which is 1980.

Cardiff Garcia I see, that's what you were saying earlier.

Anne Case Yes. So what we say is that it's possible that for the movement between 1965 and 1970, part of that might be due to a change in composition. But when you look at the whole range of it from 45, 50, 55, 60, 65 what you see is deterioration, deterioration, deterioration, and that cohort is not being more or less negatively selected through that period.

In fact most of the paper now is looking at people with less than a BA because we find the people with some college are actually having the same kind of social dysfunctions, the same kind of difficulty in the labour market, the same kind of health outcomes as people with just a high school degree.

So when we divide the world into people who went to college for four years and people who didn't, we can pretty cleanly say no adjustment is

necessary for at least those cohorts born between 45 and 65, and that we see a lot of deterioration there.

I also just want to make the point that there's something which you may know, the Will Rogers effect.

Cardiff Garcia Tell our listeners what the Will Rogers effect is.

Anne Case The Will Rogers effect is that if you have two groups – let's just say a lower group and an upper group – if some people from the lower group make their way into the upper group it lowers the average in both groups because the people at the high end of the low group are moving into the upper group, where they're now at the low end of the upper group, and so the mean can fall in both places.

There are much wittier ways to make that point. I think some of them have to do with batting averages and such. But I think... "So-and-so's leaving Princeton and going to University X, thus raising the IQ in both places."

Cardiff Garcia A point made in response to this critique by a previous guest of this podcast named Noah Smith was that we shouldn't lose the forest for the trees on this one, that you can very easily get rid of selection bias issues just by combining the two groups and you still see the increase, and that's the main point of the paper.

Anne Case And in fact now in the appendix of the new paper, for all the places that we've divided the world up between BA and not-BA we show what it looks like when you look at the group as a whole. And it's going to look more muted because we think that the people who went to school for four years have different behaviours and different outcomes, so adding them to this group is going to mute the effects but they're still really apparent.

Cardiff Garcia Let's go over also, again, what you were talking about earlier, which is a comparison between white mortality rates and black mortality rates.

You get into this a little bit more in this paper, and specifically the second graph in the paper shows that shrinking gap – that shrinking racial gap – and it shows that this is partially the result of black mortality rates coming down, partly the result of white mortality rates coming up.

Towards the end, though, you still see that *both* of them have started to climb in very recent years. That's gotta be concerning.

Anne Case That is quite concerning. After a very long period where black mortality rates were falling – even for people with just a high school degree or less – in 2012, '13, '14, '15 you do begin to see in younger age cohorts a rise in mortality.

When I pull the data and I look at that, it looks like drugs. It looks like the drug epidemic, possibly the one that whites were coming to, or possibly a different one but a new one that's taking its place, possibly fentanyl.

Cardiff Garcia It could be a migration of the fentanyl and heroin epidemic, then going to… not just from white Americans but now going to African Americans, affecting them as well…

Anne Case Yes.

Cardiff Garcia …Or you think it could be something else but the data's not yet specific enough for that?

Anne Case It's also a little early to tell whether or not this is something that's going to keep climbing or whether this is something that's going to bubble back down again. But it is certainly something that should be on everybody's radar. Because it's a problem both in the white community and in the black community.

In fact what I would do is say, *maybe we're just slicing this up the wrong way now* and instead of slicing it up first by race, what we should do is first slice it up by education, given that the mortality rates for blacks and whites converge for people with a high school degree or less. Let's just look at class rather than looking by race.

Cardiff Garcia You propose a theory in this paper behind these trends which you didn't propose in the earlier paper. You call it "cumulative disadvantage" and here's what you write, quote: "The story is rooted in the labour market but involves many aspects of life including health in childhood, marriage, child-rearing and religion", unquote. Tell us about that.

Anne Case We think that the data are consistent with a model in which people leave high school, or they may even get an associate's degree to

go out into the labour market, and they find a very hostile environment. And that environment is becoming more and more hostile for each successive birth cohort. It's almost as if you leave high school and they hand you a weight and you have to carry that weight around with you, and the weight may be the extent to which jobs, good jobs, have disappeared for people with your educational background.

And the longer you have to carry that weight the worse, the weaker you get, because what happens is your girlfriend doesn't want to marry you, maybe you move in with her, maybe it doesn't work out, maybe you've had a child, maybe she re-partners. And it's really hard for you to even see your children. Maybe you've left the religion of your childhood. Legacy churches are giving way to these churches where there's more encouragement to seek on your own rather than be part of a more rigid structure.

The kinds of jobs that you are eligible for are jobs where there's no ladder up. So the idea that if you worked at this company for five years or ten years you could pretty confidently expect that your wages would rise, the longer you were there, so real returns to experience either with that employer or with your new set of skills, move to another employer [no longer applies].

So if between the birth cohorts that kind of a lifestyle becomes less and less likely, then in your personal life, in your religious life, in your working life you don't have the kind of structures that can help you to hold body and soul together. And so we think of that as the longer you have to bear that, the harder it is for you – which is why we think between the birth cohorts, if they're observed at any given age people who are born in a later birth cohort are more likely to commit suicide or die of drug overdose or take to drink.

Cardiff Garcia One final issue related to this paper that I want to bring up. There were more what I would call substance-l*ess* critiques of this paper, I think, than of the prior one, which was interesting to me.

But there was one fascinating presentational issue that you discussed not long ago with Jeff Guo of the Washington Post, and I want to talk about that a little bit because I think it's both intriguing for what it says about the ways that social science gets communicated, but also just tells us something about the culture now.

You guys took a bit of flak for this chart that you showed in the paper, showing rising mortality rates for white people with a high school education or less, and then compared it against the trends for all African Americans and all Hispanics. And the issue there was, why not compare like with like, why compare just this subset of white people for whom the mortality trends are going up with *everyone* from the other categories?

Anne Case It's true, we did take some flak for that. A couple of things.

One is that the very first figure in the paper is the one that you're talking about, and we say, look, African American mortality rate is higher than whites' and historically has always been higher than whites' but it is falling quite dramatically. And we say, look, Hispanic mortality is lower than whites', it's always been lower than whites' and it is falling at the same rate as Europeans'.

For white non-Hispanics it's been rising, but within that subset the people it's rising really dramatically for are the people with a high school degree or less. That's Figure One, so it's not as if we're not saying there's a real problem here for black mortality as well. Yes, it's falling rapidly but it's still way too high, it's still higher than anyone should have to face.

Figure two in the paper compares like with like. That's the one we had been talking about earlier with the converging. So the question I think you're asking me in an indirect fashion is why would you put the whites with a high school degree or less on Figure One.

Cardiff Garcia Right.

Anne Case I think in part for political economic reasons, that of working-class whites who started the new century with a mortality rate that was 30% *lower* than African Americans' and they're ending 2015 with a mortality rate that's 30% *higher* than African Americans'.

If the comparison that they're making in terms of how well they're doing is relative to African Americans as a whole then for political economy reasons it might be interesting to show what those two look like head to head.

It's also of course really important to look at it head to head with African Americans with a high school degree or less, so we show both but we think that if white working-class men and women feel that they've taken a big step down their comparison ladder, we're just presenting those facts.

We're not actually trying to say, to give it any… certainly no normative interpretation, more possibly in terms of why do people vote the way they do, what's happening in the rest of the country. It seemed it might be a useful statistic to have.

Cardiff Garcia You also brought up in your interview with Jeff something else that I think also explains why there's a sensitivity to these presentational issues. There was a kind of search for a - quote, unquote – "black culture pathology" 20 or 30 years ago when the crack cocaine epidemic was hitting the African American community. When something similar happens to white people, the explanation tends to centre around the economy or labour market issues. And I think either you or Angus in this interview – it was a joint interview so I don't remember who said it – one of you said, *but look, [our work] shows that actually we should understand, because this also happens to white people, we should revisit our assumptions from earlier when everybody was looking for something wrong with the culture; actually these are similar things that can happen to anybody.*

Anne Case Absolutely. I think that if it helps to change the conversation and to look at how is it possible for people to keep body and soul together, to what extent does the economy have an effect on that, and all the knock-on effects we were just talking about in terms of cumulative disadvantage, it can explain a lot. That doesn't go back and fix a lot of horrible things that were written 30 years ago. That I can't change, but hopefully it may help with the conversation...

Cardiff Garcia But we can hopefully be smarter about it this time, because looking back on it now it should have been obvious to all of us back then that this search for a pathological problem that was inherent to black culture was a flawed assumption. We should have been thinking a lot deeper, and hopefully we'll avoid that problem this time.

Anne Case Oh, absolutely. I think a lot of us knew [that]. Yes, let's hope. One of the things though that I think may have a cultural difference in the US relative to Europe – because when we look to our sister countries and see that they're not dying off, one of the reasons we think that might be happening is because they do have a much more generous safety net.

I'm not sure that America's ready for a generous safety net. I think that in a large part of America, possibly the majority of Americans who've been raised with this idea that I as an individual will take care of me and my

family, and you can take care of you and your family, and that's the way we like it and I don't want a handout. I don't want a handout, I want a job, get me a job but I just don't want this… And it's possible if that actually is a deep-rooted difference between Europeans and Americans, that's going to make it a lot harder for us to deal with what's going on and what's coming down the pike.

Cardiff Garcia I have a question about something that I suspect you might have changed your mind on, but I don't know so I'm just going to ask you. When I was doing the research or this interview I came across a quote of yours about blogs and the media as mechanisms for instant feedback. Here's what you said. You said, "In a peer-reviewed paper there's a referee, there's an arbiter of who's going to say this makes sense, this doesn't. But with a blog, the blogger always has the last word and if this is all people shooting from the hip, I don't think that's any way to move science forward, to move the research forward".

But you have now engaged with a lot of bloggers in the aftermath of the publication of your work. You do a lot of media. You take the time to talk to people like me. It seems now you're embracing the process.

Anne Case Not entirely.

Cardiff Garcia No?

Anne Case No, I have to say, and I want to set the record straight on one thing from somebody's blog, which is that Brookings papers are refereed. So one of the things about blogs is people can write anything and oftentimes do so. It becomes a very chaotic discussion oftentimes, and for me personally I don't do well in a chaotic setting. I do much better talking to you like this than I do trying to read and respond to tweets or blogs, but I...

Cardiff Garcia I did say there were a lot of substance-*less* critiques about this paper relative to the last one. I know which [blog post] you're referring to. Yes, you're right. This paper was refereed and some people said it wasn't. Wrong.

Anne Case Yes. I have to say, I think it is still very easy for a blogger to call the shots on what they're going to talk about or what they're going to actually entertain. And I'm not very good with snarky either, so I'm just not that kind of academic.

Cardiff Garcia Here's what I would say in defence of some of my bloggy comrades, which is that you get a couple of benefits. One is the immediate amplification of the work itself, it gets spread quite quickly. A lot of us who blog were pitched this paper before it went out by Brookings for instance. It gets out there.

The second thing is that it speeds up the time in which we discover where the points of friction are, where people disagree with each other, and we end up learning a lot about both the way that economics gets done but also the areas where we disagree. I don't mean you and I disagree, I just mean areas where people [generally] disagree. The questions on that PNAS paper in 2015 about the trends with men and women and smoking – that was really enlightening to me. I was happy that that was out there, and then we learned pretty quickly where those points of disagreement were.

Whereas if those disagreements had only taken place in the academic peer review process, it would have taken forever, and some things would just have never been got to.

Anne Case That is fair enough, but bloggers oftentimes write things when they haven't read the paper, and then they're spreading it to the people who are reading the blogs and so there's a lot of misinformation out there as well.

Cardiff Garcia A lot of leakage.

Anne Case Yes. I guess you could call it leakage. I would have called it polluting.

Cardiff Garcia Yes, that's a better way to put it.

Anne Case And saying, “are they so stupid they couldn't think of X?” Which of course doesn't...

Cardiff Garcia Of course you thought of it.

Anne Case Yes, and it's on page three. I find that frustrating and it doesn't match my personality very well. I'm kind of a quiet academic.

Cardiff Garcia In our closing minutes, can we talk a little bit about your background?

Anne Case Yes.

Cardiff Garcia You've been a health economist for a very long time. It's clear in your papers that you will sometimes trample onto the ground of sociologists, doctors, epidemiologists, that kind of thing. Was that something that was formative for you? Did you start by doing that or did you realise over time that that would be useful to you in your work, and it would also help inform the stuff that you produced?

Anne Case It was something that I purposely went and decided to do because I thought that economics… We bring these very sharp tools with us but they're only helpful in some situations. And where they're not helpful it's better, rather than just using blunt force to try to do something that's just not possible with them, to actually find out how other disciplines approach problems.

And for me that's been incredibly fruitful. I spent more than a decade with my research focused in South Africa where we worked with medical doctors and epidemiologists during a period when the AIDS crisis was devastating the country.

The medical doctors were in there trying very hard to figure out, using randomised-control trials, what's the best way to encourage women who have just had a child to either breastfeed or not breastfeed if they're HIV-positive, and doing it from a medical point of view which is obviously first-order important. But understanding whether or not that woman could follow the advice she was given means that you're going to have to know something about the home in which she lives and the society in which she lives. The society bringing in the sociology part, and the economic forces to bear bringing what I hope is my skill set.

So my whole umbrella is how do people hold body and soul together, so some of that work is in South Africa and trying to figure out, in a period where this dark cloud has come and landed on their heads, what can be done, what is being done, how effective is it. Part of that now is in the US, looking at how are we going to respond to the kind of crisis that I think we now face.

But for me it's all of a piece.

Cardiff Garcia Why did you choose South Africa initially?

Anne Case It was just a change of government. I was looking for a new project and at that point two things were clear. One is if you brought skills and were willing to listen, you could possibly do something that would be helpful. And I wanted to be helpful so it was a very heady time to be there.

I got to sit in on the discussions about how they were going to put together, for example, their child support grants for the whole country, which is kind of like saying, okay, you're sitting next to the woman who's going to come up with the entire social development programme for children.

Wow, that was a really... I was feeling quite jaded, that there was nothing I could say in Washington that could make a difference to anyone because things were so entrenched, whereas there [in South Africa] everything was young and everything was possible.

So it started like that and then it turned out I fell in love with the country.

I have great co-authors there and I think our ability to use the field sites that we developed there to try to fill in, with quantifying what's going on in all parts, from the very poorest people in the rural settings to the now better-to-do middle class in the cities was just a really exciting place to do it.

Cardiff Garcia There're a few undercurrents that seem to run throughout your work, both in South Africa and you also based some of your work on data sets in the US and in the UK, like the Whitehall 2 study that tracked British career civil servants. Here's what those undercurrents are, as far as I can see.

One is an interest in how childhood circumstances affect adult outcomes including pre-birth or prenatal circumstances, how those affect what happens to people later in life.

Another is an interest in how the safety net has consequences not just for the people who have it but for others. And in your most recent paper from South Africa you find for instance that giving a very generous old age pension to a household makes a young person in that household more likely to move in search of work. That was really interesting.

And then finally there's the finding that height can be a very useful variable. And you have a famous paper with Christina Paxton finding that

the reason tall people get paid more in adulthood is less to do with discrimination towards short people and more to do with the fact that height tends to be a marker of cognitive ability. As somebody who's average-heighted myself I should note that that is not obviously a sweeping generalisation, right, that's in the aggregate.

Anne Case Right, absolutely. That was a paper where I was amazed to find out what people would write to you from their own personal email accounts, pretty stunning stuff. We got a lot of hate mail, possibly because the press picked it up in a very bad way.

So we write the paper and we make what is an obvious point to our friends in developmental psychology, which is that better-nourished children who are healthier in childhood are more likely to hit both their physical potential – that would be their adult height – and their cognitive potential because when you're getting wired up it's your brain and it's your body all at the same time.

So it's not that hitting your physical potential might be… Your physical potential might be 5'8". That's great, but if you hit it then you're more likely to score well on cognitive tests which are going to carry on as it cascades down.

The press picked it up as "taller people are smarter, research shows". Oh, man, that's really not what we meant. Then we got a lot of hate mail – "it can't be anything to do with height, it has to do with, we're probably better nourished in childhood!" Yes, that's really what we said in the paper.

But it is a marker, from the time a child is old enough to be tested in a crib – which is something I didn't know about, but by nine months if you put something in the crib you can see whether the child recognises it as something they've seen before or doesn't. So from the time you can measure it in the crib all the way through adolescence, taller children on average score better on a whole battery of cognitive tests. And this happens actually even before they go to school. So explanations about the fact that the taller kids are more likely to be called upon by the teacher – well, actually even at age two, age three, we're seeing that, which we think means that... We want to get in early to help kids and sooner is better.

It's really hard to help kids at home. It's much easier once kids get to school, but by the time they get to school a lot of the wiring has been done.

So we know correlation between height at age three and height at adulthood is incredibly high. Does that mean you couldn't move someone to a different trajectory? It's possible. It doesn't happen but it's possible.

The same seems to be true for hitting your cognitive potential. If we took those kids and we put them all in a place where they got super-duper pre-K things going on, yes, it probably could have an effect but we're not doing that.

So as far as the relationship between that and the new work, height's flattened out in the US. Height's continued to grow in Europe.

So we think that it's possible also that part of what each of these birth cohorts is bringing into the labour market is possibly poor health in childhood and a skill set that's not ever going to be developed quite as much.

Cardiff Garcia Last question. What's next for you?

Anne Case Well, we see this research project [on mortality and morbidity] as having a lot of legs. The model of cumulative disadvantage is really still quite tentative, and what we want to do is document more fully whether or not people are finding the return to experience the labour market really has fallen for people with less than a college degree, to try to see whether or not that's happening in some occupations more than others.

We want to pursue pain, which we know has skyrocketed. What fraction of that pain comes from the fact that you hurt yourself on the job, what fraction of pain is associated with the fact that your life is much more anxiety-producing and you're storing anxiety in your body in the form of pain, which we know also does happen, and what part of the opioid crisis comes from the fact that people were in pain and what part of pain comes from the fact that they had access to the opioids. So those are just a couple of...

Cardiff Garcia Of the strands that you can pursue.

Anne Case Yeah. And the children, these children we were talking about who you may lose contact with because your relationship broke up. What happens to them when they get to be of labour market age. So is this going to actually get worse before it gets better?

Given that we have this baby-boomer cohort that's moving into retirement now and there had been a lot of worry in the early days – oh my gosh, we're going to have all of these people eligible for Medicare. And at first it was, oh relax, they're a lot healthier, they're going to need less medical care. But now we think, as the baby boomers birth cohorts and younger younger ages – those people may be in much worse medical shape and might need a lot more medical care moving into retirement and so better understanding that as well is on the agenda.

Cardiff Garcia Anne Case, what a treat this has been. Thanks so much for doing this.

Anne Case Thank you, my pleasure.