



**TRANSCRIPT**

**Sydney Ideas podcast**

Why climate change and unsustainable development are health hazards

Tuesday 11 August 2020

JOEL NEGIN

Welcome to the Sydney Ideas webinar on climate change and unsustainable development. My name is Joel Negin.

I'm the Head of the School of Public Health within the Faculty of Medicine and Health at the University of Sydney.

The Sydney Ideas public talks are conducted by the University of Sydney on topics that are of importance to us as a community in Sydney and New South Wales; in Australia and globally.

This one is presented by the School of Public Health at the University of Sydney, as part of our 90th birthday celebrations this year in 2020.

The school was founded in 1930 as the first School of Public Health in the country, indeed the first School of Public Health outside of Europe and North America, and a school that has been tackling health challenges for 90 years.

I'll do a quick Introduction and then we'll hand over to our panel of speakers quite quickly because I'm very much looking forward to hearing from them as well.

Obviously, as we find ourselves in 2020 COVID is consuming all of our oxygen and all of our attention as public health thinkers and practitioners. It is all COVID all the time.

But it was only a few months ago, that bushfires dominated the headlines and the public consciousness. It literally consumed the air that we breathe.

These twin hazards COVID and the bushfires have placed public health at the front of public debates, and made us debate here in Australia in particular, what kind of society we can live in, survive in and where we want to be as a society.

Of course, these twin hazards are not unrelated. They both emerged from unprecedented human intervention into our environments. They both emerge from unsustainable development. They both hit the vulnerable in our communities especially hard as public health threats almost always perniciously do.

They've short term and long-term impacts and they test our conception of community, families, local communities, states and federal. This session today embraces this wider challenge of unsustainable developments and climate and environment.

We have three great speakers who will present evidence and perspective on the challenges ahead of us as a society as we approach our next summer season.

All three speakers are based at the University's Lismore campus; the University Centre for Rural Health, and all bring a critical regional perspective on this issue that is often missed when we talk about these issues.



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Our first speaker today is Associate Professor Geoff Morgan from the School of Public Health and the University Centre for Rural Health. He has more than 25 years' experience in epidemiology, environmental health, policy engagement and education.

His research in environmental epidemiology specialises in the use of state-of-the-art bio-statistical and geographical information system techniques, applied to routinely collected health data. He works on a number of critical areas around bushfires, heat, built environments and health.

Our second speaker is Dr. Jo Longman. Who's a research fellow at the University Centre for Rural Health in Lismore. She's a social scientist works across a diverse range of rurally focused qualitative and mixed methods research and evaluation.

She's done a lot of work on the community recovery 'After Flood' project in northern New South Wales after the 2017 floods in the Northern Rivers area. She's currently leading a project by the New South Wales Department of Planning Industry and Environment.

Our final speaker is Dr. Veronica Matthews also from the University Centre for Rural Health. She's from the Quandamooka community. The Minjerribah community of North Stradbroke Island, and she's currently a Wingara Mura leadership programme Fellow at the University.

She's passionate about improving health and well-being for Aboriginal and Torres Strait Islander people through community-led research and leads the Centre for Research Excellence in strengthening systems for indigenous health care equity.

#### GEOFFREY MORGAN

Thanks, Joel. Good afternoon, everyone. And I just like to say thanks to the Sydney Ideas forum for the opportunity to present today.

Australia's landscape is shaped by fire. We've known that for the history of Australia. Bushfires have immediate health effects. The summer bushfires are an inherent feature of temperate Australia. Over the last 50 years, there's been around 430 deaths from the direct effects of fire fronts.

And the greatest loss of property and human life occur during relatively uncommon and severe bushfire disasters, driven by extreme and anomalous weather. The highest danger to people is on fleeing the fire.

And there's a whole range of injuries and trauma, obviously associated with fire. There's also inhalation of smoke at the fire front.

And it's complicated by increasing development around urban and rural interface near bush land. Bushfires can have a range of water, soil and ecosystem impacts as well. The erosion of soil leads to loss of storage capacity. In water catchments, chemical contamination can increase new nutrient load and lead to algal blooms.



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There's regrowing regions of vegetation can decrease water runoff in the catchments for many years and of course, we've all seen the ecosystem disruptions that have occurred, with an estimated 1 billion animals killed in the 1920s Australian fires.

Bushfires are increasing our exposure to fire smoke. Fire smoke consists of a range of pollutants, including particulate matter and a range of chemical compounds. And fire smoke pollution can cause exposures to large populations or across wide geographic areas.

We know that bushfires are likely to increase with global warming. Fires are increasing globally. Fire weather is increasing and predicted to get worse. And there's huge greenhouse gas emissions associated with fires.

The recent Australian fires I mean 200 and 50 million tonnes of CO<sub>2</sub>, almost half our annual emissions in Australia. Fire smoke has a range of human health effects. There's small and immediate immunological and stress related changes to the lungs, blood, heart and blood vessels.

And then these lead to a broad scale population effects, with some people or groups being at more risk than others. Those with medical illness like chronic lung, chronic heart or chronic vascular disease are at higher risk.

Pregnant women, infants and those in the older age groups that are also at higher risk, lower socio-economic groups are at higher risk.

And there's some uncertainty about early life exposures to fire smoke and the long-term impacts. Most information about air pollution and health comes from urban air pollution, which is at relatively low levels over long periods of time.

Whereas the pattern of fire smoke exposure is quite different to that; high exposures over days, weeks, or as we saw in the recent bushfires over months.

In the recent mega fires in Australia, last summer, there were 34 lives lost. And we should remember, of course, that the huge amount of destruction that occurred and that loss of life, with 3000 homes destroyed, and 8 million hectares of land burned.

The trauma experienced by the affected communities including serious risk to live homes and livelihood have ongoing psychological, physical, health, social and economic impacts in those communities, and more broadly.

But there's also been a whole range of health impacts from fire smoke from the 1920 fires. Recent studies have estimated the health burden attributable to bushfire smoke in Southeast Asia from those fires was around 417 excess deaths, and over 3000 hospital admissions that occurred because of the fire from that smoke event

And population exposure to bushfire smoke was almost an order of magnitude greater than the last previous decades from that 1920 smoke event. So it was quite an anomalous episode.



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One of the ways of controlling or trying to control out of control bushfires is prescribed burning. Land management interventions are aimed at reducing harm caused by fire, with the specific aim of saving life and property. With saving life being paramount.

Hazard reduction burning has been highlighted as the land management tool, an important land management tool, in every bushfire inquiry since 1939.

The 2009 Victorian inquiry recommended that 5% of public land be burned to reduce fire intensity. And *The Australian* recently reported that the New South Wales black summer fire inquiry will recommend substantial increases to hazard reduction burning.

But it's important to look at the evidence and the public benefit of hazard reduction burning, including the effectiveness of burning and the feasibility of doing them safely.

And of course, it's important to consider smoke pollution because hazard reduction burns do produce smoke that can expose large populations.

So the evaluation of effectiveness of interventions is central to good public health practice. Hazard reduction burns, as I was suggesting, have been identified as having a range of health effects from smoke.

The May 2016 hazard reduction burn event in Sydney that exposed the population of Sydney to extreme air pollution over six days, was estimated to have been responsible 14 excess deaths and around 90 hospitalizations. And the most serious impacts of a health prevention intervention need to be considered.

So how can we reduce our exposure to smoke. How can we reduce the health impacts from smoke? There's a range of information available on how vulnerable groups particularly should aim to protect themselves during smoky events.

People with pre-existing disease need to have their personal health information plans, health management plans up to date and any medication with them. It's important to reduce exposure with some recommendations to stay indoors.

So there's a range of information available on the web and more broadly, about reducing your exposure and minimising the health impacts of fire smoke.

But longer term we need to learn to live with fire and improved fire management is one of the important ways we're going to have to do that.

We need to understand the fire how fire interacts with human activity. We need community education, programmes housing and land use policies that reduce exposure to fires.

And land management, in particularly fuel management is a central part of bushfire management. But there's multiple sometimes conflicting views on the implementation of that land management.



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The air pollution risks need to be evaluated in the wider context of the effects of bushfire and community safety. But managing smoke is integral to planning hazard reduction burning programmes.

That requires close collaboration between health, environment and fire management agencies. It's essential for improving community well beings.

It's important to note that a recent study in the US identified that mortality associated with wildfire smoke will double by 2100. And that the increased smoke pollution over the next century will likely offset the gains of reduced pollution from other sources. So thanks to everyone.

JOEL NEGIN

Thanks very much, Geoff. And we'll move swiftly now on to Jo.

JO LONGMAN

So good afternoon, everybody. It's fantastic to be here. Thank you so much to Sydney Ideas for this opportunity.

So before I start, I'd like to acknowledge the traditional owners of the land that I'm coming to you from today; the Wudjeebal Wiyabal people of the Bundjalung nation and to pay my respects to elder's past, present, and future.

So Geoff's just described there a very clear link between climate change and physical health, and also mental health. And it's my job on the panel today, to briefly talk through a case study of an extreme weather-related event, a flood; and the mental health effects of that.

So as researchers, we're rural researchers, Geoff, Veronica and I have the incredible privilege of living and working on the beautiful far north coast of New South Wales.

However, this part of New South Wales is also a known hotspot for disaster declarations, particularly floods.

So our staff at the university Centre for Rural Health we're active, social and professional members of the community here and when in 2017 Northern Rivers suffered a huge flood following Cyclone Debbie. it was our own community that was affected.

Almost all of the rain that we had, fell in 24 hours and inundated the major population centres and it caused terrible damage. For many areas, it was the worst, the most severe flood, as the worst flood on record.

So damage from flooding in this way to the built and the natural and also the physical environment, and to physical health tends to be immediately evident.

But floods can also harm mental health, at the time of the flood and also afterwards; and these harms can be substantial.



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So as an integral part of the community and a key Local Health research organisation, we felt strongly compelled to do something at the time of the flood.

And so we developed and implemented a community recovery after-flood study, a cross sectional survey six months after the flood and also a follow up two years after the flood.

And those surveys aim to measure the mental health of the community after the flood. And to all of this work, we took a very strong community academic partnership approach, to the way that the study was designed and implemented, as well as the way that we disseminated our findings.

So over two and a half thousand people took part in the first survey and of those 500 people took part in the follow up. And what this slide is showing you that almost all of the respondents to the first survey so 91% were affected by some kind of flood exposure.

And what we mean by that is, the home of a significant other was flooded, the suburb was flooded, the non-liveable areas of your home was flooded, the liveable areas, or your business or farm was flooded.

And we were able to compare those respondents to respondents who didn't have any sites damaged or flooded. And almost half of our respondents to the first survey reported exposure in three or more of those sites.

So an unsurprising finding from our work is that the more people were exposed to the flood, the worse their mental health outcomes. And here's a simple graph that shows that. So the red line here is a line showing anxiety.

And you can see that, for respondents who had one exposure, around 7% of those people had probable anxiety. And that compares with 49% of respondents who had five exposures.

And this is a really important relationship, the relationship between how exposed you are to an event like a flood, and your mental health outcomes; given that floods are predicted to increase both frequency and intensity.

So maybe not such a predictable finding, I guess was that respondents who were socio-economically marginalised, were more likely to have floodwater in their home, they were also more likely to be evacuated, and they were more likely to be displaced from their home.

And I want to just say a bit more about displacement because being displaced from your home, especially for a long time, has particularly negative mental health effects.

So in our survey, those respondents who was still not home six months later, after the flood, they were twice as likely to have symptoms of post-traumatic stress, anxiety and depression; and twice as likely to still be distressed about flood when we compare them to people who were displaced for a short period of time. So just three or four days or so.

So socio-economically disadvantaged groups were more likely to be flooded in their home, and more likely to still be displaced six months later, and Veronica is going to pick up from this and talk a bit more



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about this in a moment. So I mentioned at the start that we did a follow up study, and the findings of that follow up showed that the mental health effects of flooding are still being experienced by people two years after the event.

So most of the mental health outcomes have reduced a bit over time. But actually, interestingly, they were still very much evident for people who have been exposed, in comparison to people who were not exposed to the flood.

And actually, the still distressed measure was increased; it increased over those two years for the 500 people who took part in the follow up survey.

So these findings about this kind of long tail of mental health effects are in line with the international literature. They really illustrate an important point about not removing support from communities too soon after an event like a flood.

So I don't want this presentation to be too gloomy. There were some important positives to report from this study that we did. For example, it was very common for respondents to describe the incredible community spirit that really got them through the flood experience.

And some respondents were able to describe some positive flood stories to us; around changes that they've made to their lives, or changes in perspective that they'd had following the flood.

Sorry, I also want to share that in general, for our respondents, those who reported higher levels of social connectedness, and sense of belonging had less risk of negative mental health outcomes than respondents not reporting that kind of connection. So there's something very important about being socially connected.

So my key messages this afternoon are around the fact that floods affect mental health as well as physical health. And that effect can persist for a long time after a flood; that there's a disproportionate effect across groups. And it's important that we bring an equity lens to all of this kind of work.

And finally, that in general, those with higher levels of connectedness had fewer negative mental health outcomes. And the implication of that really is around interventions which may develop social capital, which may be key to helping support develop preparedness and recovery in communities. Thank you, Joel.

JOEL NEGIN

Thank you very much, Jo. Veronica, over to you.

VERONICA MATTHEWS

Great, thanks. Thanks, Joel. And I also would like to acknowledge that I am on Bundjalung country and pay respects to the traditional owners, the Wudjeebal Wiyabal people.

And my thanks as well to Sydney talks for allowing us to share our work a bit more broadly. I just wanted to preface this next stage of the discussion by highlighting First Nations holistic view of health,



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it's more than just physical and mental health, it encompasses health of our land, our culture, and our community.

So we are deeply connected to country so much so that if country becomes sick through climate change impacts or environmental degradation; that Aboriginal people also feel the sickness themselves.

So our traditional lands are among the fundamental determinants of our good health and wellbeing. So in addition to close connection with country, there are a couple of other factors too, that that can lead to disproportionate effects from climate change.

And that's the fact that we do have a higher burden of disease, generally poorer access to health care and lower socio-economic status. So coming back to their case study that Jo was just talked about, we did see the disproportionate effects.

So Aboriginal respondents were more likely to have their homes flooded, be evacuated and experience that lengthy displacement. And they're also more likely to report symptoms of distress, anxiety and depression.

And on top of these personal effects, Aboriginal respondents were also more likely to report damage to a home of a loved one.

So this indicates that their extended community networks were also living in the flood zone. And it says close community network so a form of social capital that is generally beneficial for Aboriginal and Torres Strait Islander community, as it provides family and cultural support.

So when a flood or any type of disaster impacts on the whole of community, it's like a double whammy or even a triple whammy considering the level of pre-existing ill health and economic deprivation that exists within our communities.

So, I wanted to touch on this some more this idea of social capital; of how community connections and cohesiveness can work to build resilience to disaster impacts.

Now, social capital is one of a number of other forms of capitals that interact together to influence how disaster resilient rural community is; and they include things like human resources, natural resources, physical infrastructure and technological resources and financial resources.

And research has shown that social capital is linked to positive health and well-being. So as a result it has been received in increasing attention in disaster preparedness and management planning, due to their recognition of the value of close social networks for logistical, financial and emotional support; those handy sort of resources to have during and after traumatic events for individuals.

So in our flood study, we looked at social capital amongst the different respondent groups. By measuring level of community participation that is, what people do.





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And that can be things like informally having a chat with a neighbour or volunteering; and also how people feel about their connection to community such as their feelings of belonging, trust, and optimism.

And social capital theory suggests that the more participation, the greater the feeling of connectedness, the more collective resources people have to draw upon, which positively then influences mental health and well-being.

So our survey results on the whole reflected that; that those with more social capital have better mental health outcomes six months after the flood. However, there were differing levels of social capital amongst respondent groups.

And as the table there on the right-hand side of this screen shows that Aboriginal respondents reported lower levels of social capital. However, this isn't to say that that social capital is not important to them.

And because as the table on the left-hand side show, those Aboriginal participants that reported a greater level of community connection and feeling of belonging tended not to report post-traumatic stress.

So this inequity in social capital, like any form of capital, can present a problem in terms of climate change adaptation strategies, and the ability of a whole community to prepare for and bounce back from weather related disasters.

However, a simple strategy to tell somebody to go and boost their participation in community isn't likely to work. As I mentioned, there are strong bonds within Aboriginal networks. So they're the family and Cultural support, the type of supports that that people use to get by.

And while this is important for well-being, it doesn't necessarily translate to social mobility, meaning to get ahead in life.

So to do that, social capital needs to extend out to other social groups, which can be difficult if there's systemic racism or exclusion; perpetuating inequality and poor mental health.

Just a couple of points. My take home messages if you like, is to understand how resilience operates within a community.

A system-levels focused, grassroots approach, I think is required to plan actions that move beyond individual change intervention, which is highly dependent on individual capacity, opportunity and resources; towards group level change strategies that can involve everyone regardless of circumstance and build a whole communities social capital and underlying resilience.

Such strategies must be developed in partnership with Aboriginal communities just to ensure alignment with cultural values.



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And I think Indigenous knowledge in voices have been pretty much ignored in in health policy for a while. Our existence over the last 60,000 years in this country suggests that we have more to offer that Indigenous knowledge could be a critical foundation for climate change and health solutions.

And there are great examples out there; Indigenous-led initiatives on country, cultural burning; that simultaneously address health, cultural, environmental, and economic and social needs, and ultimately benefits the whole community. Therefore, I feel that participatory approaches are particularly critical. Thank you.

#### JOEL NEGIN

Thank you. We're approaching the end of our seminar today. I'd like to thank our three speakers and I think there's been some fantastic commentary that brings together a whole bunch of complex areas around equity, around climate, around disaster, around resilience around social capital, mental health.

But obviously these are these are complex issues that are going to continue to face Australia and the world.

And the ones we'll continue to be working on as a University and within the Faculty of Medicine and Health. Thank you very much, everyone. Have a good day.

#### ANNA BURNS

Thanks for listening to the Sydney Ideas podcast. For more information head to [sydney.edu.au/Sydney-Ideas](https://sydney.edu.au/Sydney-Ideas).

It's where you'll find the transcript for this podcast and our contact details if you'd like to get in touch with a question or feedback.

If you haven't already, subscribe to our podcast so you never miss a new episode, such as Sydney Ideas on Apple podcasts or SoundCloud.

Finally, we want to acknowledge that this podcast was made in Sydney which sits in the land of the Gadigal people of the Eora nation. It is upon their ancestral lands at the University of Sydney is built.