Hi all and welcome to the Yale Center on Climate Change and Health seminar series.

So today is our first spring seminar series and we are very fortunate to have Dr. Sarah Lowe joining us today.

Dr. Sarah Lowe is assistant professor at the Yale School of Public Health the Department of Social and Behavioral Sciences.

Her talk today will be mental health after natural disasters, state of the research and a future directions.

I was told that this seminar was one of the most popular seminar series we had.

There were more than 80 participants registered and we have another roughly 10 students.

So hopefully we can have a large audience today.

And before handing over to Sarah,

I want to mention that we will have our Q&A section at the end of this seminar.

So if you have any questions please type in the chat box and I will raise the questions in the end.

So without further ado, Sarah the stages is yours.

All right, thank you very much for that Kai

I’m going to share my screen and get to it.

Okay, so you can see my slides, yes?

Yes, yes.

Okay, awesome.

So as Kai said, I’m going to be talking about
the research on mental health after weather related disasters, the state of the research and future directions. And you’ll know what that I actually changed the name of my talk because the field is really moving away from referring to weather related or climate related disasters as natural disasters and acknowledgement of increasing findings showing that human beings are contributing to climate change and in turn increasing the frequency and severity of these types of events. And also that these disasters affect human-made structures and systems and people. So it’s really an interaction between the environment and humanity. So I wanted to start off by giving an overview of my talk today. I’m going to be first introducing myself and discussing my program of research. Then talking about the state of the literature on mental health after disasters, as well as some of the limitations they’re in. And then give some examples of recent trends in the literature. I’m gonna end by discussing some of my current and hopefully future work. So starting off with my program of research. So I am a clinical psychologist by training.
I received my doctorate at the University of Massachusetts Boston which has I think, unprecedented attention to social justice and multiculturalism.

After getting my PhD, I did a post-doctoral fellowship in psych Epi at Columbia Mailman School of Public Health. And I stayed on there for a year as an associate research scientist. And that’s where I really caught the public health bug and discovered that this would be a good home for me. I then actually spent four years in the department of psychology at Montclair State university in New Jersey before coming to Yale.

This is my second year at the school of public health. And I’ve had a really great experience so far and I’m happy to be here today and to be affiliated with the center for climate change and health. My research program focuses on the long-term impacts of a range of potentially traumatic events. So much of it has focused on climate related and weather related disasters. But I’ve also been involved in research projects after the deep water horizon oil spill, projects focusing on the impact of gun violence, sexual assaults, child maltreatment, and community violence. Work-related potentially trauma exposures among first responders, the impact of discrimination.
And most recently I’ve been involved in studies of the intergenerational impact of the 1994 genocide against the Tutsi in Rwanda and the impact of the COVID-19 pandemic on vulnerable groups including healthcare workers and persons with disabilities. I’d be happy to talk about any of this research in the Q&A.

So in 2018, my colleagues and I were asked to do a review of a year of research on the mental health impact of environmental disasters. When agreeing to do this I thought back to the Seminole Review by Fran Norris and colleagues in 2002, that reviewed all of the literature on mental health and disaster.

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to those focused on PTSD and depression as our two key outcomes and only including quantitative research just to manage our workload. So I think this reflects the burgeoning interest in mental health after disasters, which is very exciting. Nonetheless, what we saw in the literature was consistent with prior research in that most studies were cross sectional and some included representative samples, and some did not. So I just wanted to review some of the mental health conditions that have been found across studies of mental health after disasters. So our review specifically focused on post-traumatic stress disorder and major depression but we know that these events are associated with increases in a range of mental health conditions such as acute stress disorder which is sort of a precursor to PTSD, other conditions like generalized anxiety disorder and substance use and other clinical phenomenon. And these are symptoms that are concerning but don’t necessarily map nearly on to psychiatric diagnoses. Such as non-specific psychological distress internalizing symptoms, such as mood and anxiety symptoms in children. Externalizing symptoms including attention and conduct symptoms in children and adolescents,
suicidality and adverse health behaviors including disruptions in sleep, eating and exercise. And what I would say is that across all of the studies today, there’s been considerable variation in the prevalence estimates of these conditions. And this is likely due to divergences across the studies for example, in the timing of assessment relative to the disaster, the exposure severity of the sample included as well as the disaster itself as well as other characteristics samples. However, across this literature something that has been consistent is that we’ve identified individual level risk factors at least at the cross-sectional level of adverse mental health outcomes. And here I’ve organized them by timing relative to the disaster, starting with a predict disaster factor. So what we know about people going into these types of events. So studies have pretty consistently showed that women, those of low socioeconomic status, those who have preexisting health conditions and in particular mental health conditions who are socially isolated, who have experienced previous exposure not only to disasters but other events are at increased risk for mental health adversity. Whereas findings regarding race and ethnicity and age have been mixed.
Turning to the peri-disaster period. So this is the period of the disaster itself and its immediate aftermath, we know that a range of experiences including the perception that one’s life was in danger experiences of physical injuries and bereavement and so on. We also know increasingly that media exposure, so exposure to versus details and images of disasters in their aftermath are associated with increased severity of psychiatric symptoms. Reflecting the potentially broader impact of these types of events. And then post disaster we know that when the storm clouds have cleared and the earth has stopped shaking disaster related stressors tend to persist. And those who experienced financial strain, unemployment, continue disruptions in their work and school lives, stressors in their relationships tend to be at increased risk. And that other stressful and traumatic life events, whether or not they’re related to the disaster tend to exacerbate disaster related mental health conditions. So that in a nutshell is the research to date. And I think what we’ve seen in the past five years or so are some exciting ways in which researchers are trying to push the boundaries.
0:09:15.92 –> 0:09:18.61 of disaster mental health research.
0:09:18.61 –> 0:09:22.14 So I have here some examples of recent trends.
0:09:22.14 –> 0:09:24.24 I know for those of you who read the review
0:09:24.24 –> 0:09:26 as part of the seminar
0:09:26 –> 0:09:28.061 you’ve seen examples of these already.
0:09:28.061 –> 0:09:30.98 But I’m gonna be focusing on on four trends
0:09:30.98 –> 0:09:33.24 and how my colleagues, students and I
0:09:33.24 –> 0:09:37.55 have in our work tried to push the field.
0:09:37.55 –> 0:09:40.2 So first focusing on long-term responses
0:09:40.2 –> 0:09:43.77 both in the general population and among vulnerable
groups.
0:09:43.77 –> 0:09:47.23 Pathways to adversity, characteristics of communities
0:09:47.23 –> 0:09:49.68 and their impacts on mental health and treatment.
0:09:51.63 –> 0:09:54.43 So first off long-term responses.
0:09:54.43 –> 0:09:58.09 So what happens in terms of effective populations
0:09:58.09 –> 0:10:00.27 mental health not just in the immediate aftermath
0:10:00.27 –> 0:10:02.283 of disasters but in the longer term.
0:10:04.07 –> 0:10:05.55 And in this work, my colleagues and I
0:10:05.55 –> 0:10:07.29 have been very much influenced
0:10:07.29 –> 0:10:10.062 by the work of clinical psychologists and other scholars
0:10:10.062 –> 0:10:12.81 such as George Bonanno at Columbia
0:10:12.81 –> 0:10:15.23 and their theories about resilience
0:10:15.23 –> 0:10:18.71 and other potential trajectories of mental health symp-
toms
0:10:18.71 –> 0:10:21.737 after exposure to a potentially traumatic event or
PTE.
0:10:22.78 –> 0:10:24.39 And what Bonanno and colleagues have said
0:10:24.39 –> 0:10:27 is that most people when exposed to trauma
0:10:27 –> 0:10:30.11 will experience what has been termed resilience.
0:10:30.11 –> 0:10:32.38 And resilience here means a trajectory
0:10:32.38 –> 0:10:36.733 of chronically low symptoms of distress and well being.
0:10:37.57 –> 0:10:39.75 So across studies, more than 50%
tend to fall into this trajectory. However, other trajectories are common. About 25% on average experience what has been termed recovery. So short term elevations and symptoms and then smaller percentages have exhibited directories of chronic elevations and distress as well as delayed onset distress. So my colleagues and I have worked within this area while also trying to push its boundaries and question some of the key tenants of this theory. So as a first example, I’m going to be presenting data from the Galveston Bay Recovery Study. This was a study of disaster mental health studies that Sandra Golia and Fran Norris led where they were able to gather data from a representative sample of areas that were most severely affected by Hurricane Ike. And they collected three waves of data within the first two years. So it’s a really fantastic dataset. So what we did is we ran a trajectory analysis not just of PTSD, but also of depression, functional impairment and days of poor health. So I have our trajectory results here but they’re very small and with good reason, which is that I want to put across the takeaway message. Which is that when we looked...
0:12:00.98 –> 0:12:02.54 within each of these four domains
0:12:02.54 –> 0:12:05.05 resilience was indeed the modal outcome
0:12:05.05 –> 0:12:10.05 ranging from 45.1% to around 75% for PTSD.
0:12:10.33 –> 0:12:12.49 However, when we looked across all of these domains,
0:12:12.49 –> 0:12:14.932 we found that only 25% of our participants
0:12:14.932 –> 0:12:19.54 thereabouts had resilience across all four.
0:12:19.54 –> 0:12:22.73 Suggesting that a focus exclusively on PTSD
0:12:22.73 –> 0:12:26.15 or one other symptom domain might outscore
0:12:26.15 –> 0:12:28.87 the suffering and impacts of disasters
0:12:28.87 –> 0:12:30.84 on affected populations.
0:12:30.84 –> 0:12:34.52 Now, something I would know here is that all the data
0:12:34.52 –> 0:12:37.9 for the study were collected prior to Hurricane Ike.
0:12:37.9 –> 0:12:41.607 So we don’t know how the participants were doing
beforehand.
0:12:41.607 –> 0:12:43.32 And it’s fairly likely
0:12:43.32 –> 0:12:46.483 that those who were experiencing elevated symptoms
0:12:46.483 –> 0:12:49.22 that this had something to do with their wellbeing
0:12:49.22 –> 0:12:51.47 and health beforehand.
0:12:51.47 –> 0:12:53.91 So in another study, I’ve been a part of
0:12:53.91 –> 0:12:56.7 the Resilience in Survivors of Katrina Project,
0:12:56.7 –> 0:12:59.25 we’ve been able to address this limitation.
0:12:59.25 –> 0:13:01.34 And so what the RISK project is,
0:13:01.34 –> 0:13:04.48 is a longitudinal study of about 1000 women.
0:13:04.48 –> 0:13:08.15 Most of them are single low-income African-American
mothers
0:13:08.15 –> 0:13:10.8 who all experienced Hurricane Katrina.
0:13:10.8 –> 0:13:12.39 What’s very interesting about this study
0:13:12.39 –> 0:13:14.38 was that all of the participants
0:13:14.38 –> 0:13:17.58 were part of a study that was already going on
0:13:17.58 –> 0:13:20.92 prior to the hurricane called the Opening Door Study.
0:13:20.92 –> 0:13:24.39 But the Opening Door Study was a multi-site RCT
of a community college intervention that sought to increase retention and graduation rates from community colleges throughout the country. And two of those colleges happened to be in New Orleans.

So the hurricane hit in August of 2005 and both of those colleges were closed for the fall 2005 semester. But my colleagues, Jean Rhodes and Mary Waters were able to secure funding to launch a new study of resilience among those participants. And we’ve not collected data three times after the hurricane at approximately one, four and 12 years after Katrina. And we just got back in the field last week to do an additional assessment of how they’re fairing amidst the pandemic. So I’m gonna be talking about two analysis we did with these data, looking at trajectories over time. The first was actually my dissertation. And for this project, we looked at patterns of non-specific psychological distress from prior to the hurricane to four years after the hurricane. So at the time, and actually I would say probably still it’s one of the few trajectory studies that had access to pre trauma data. So we were really able to look at how the patterns over time might have been influenced by how people were doing before. And in a nutshell, we found a six trajectory solution.
and I know that this is a lot to look at. So I’m gonna try to break it down a little bit. So consistent with prior research, the modal trajectory was what we called resilience exhibited by over 60% of our participants. But what we can see is that those participants actually were doing well in terms of having low distress prior to the hurricane. Similarly, other common trajectories in our sample were marked by consistency from pre to post disaster. So we had a coping trajectory which may have looked like recovery and an increased trajectory which may have looked like chronically elevated symptoms. But again, here we see that prior to the hurricane they had significantly higher psychological distress than those who were resilient. Despite this consistency, we saw evidence for meaningful changes in distress. So we actually had two trajectories that were marked by decreasing symptoms. The first which we turned simply decreased had severe distress prior to the storm that decreased pretty consistently thereafter. Another trajectory that we termed improved also had a severe distress prior to the storm. And post disaster distress that was indistinguishable from those in the resilience trajectory. So had we only had post-disaster data we would have assumed resilience. And then we had a delayed trajectory.
consistent with prior research. In a more recent analysis, we used our latest data to run a trajectory analysis this time specifically of PTSD symptoms. So because their PTSD symptoms had ties to the disaster, we only have them after the disaster. And here we did a trajectory analysis and examined pre trauma predictors of our trajectories.

What was notable here is that we did not find what would typically be termed a resilience trajectory. That is a trajectory of consistently low symptoms. The healthiest trajectory in the sample had actually moderate PTSD symptoms that consistently decreased over time. So in my more recent work, I have been trying actually not to use the term resilience although I hate to muddy the waters. I think that resilience as a trajectory of consistently low symptoms maybe does not capture what it means to be resilience in terms of people’s lived experiences. So that’s one thing.

The other thing we found in this analysis that is notable is that the most robust predictor of trajectory membership was having probable pre disaster mental illness. Disaster related exposures, including bereavement, lack of vital resources like food, water and medical care were also predictive.
Whereas other pre trauma factors seem to be mediated by either pre trauma mental illness or disaster exposure. So for example, we looked at pre disaster social support and at the university level this was associated with trajectory membership but not when we controlled for pre trauma mental illness. Similarly, we had access to data on pre disaster physical health conditions. And we found that its association with trajectory membership reduced to non-significant once we control for disaster exposure. Suggesting that there might be some mediational pathways from these risk factors to outcomes.

Which brings me to the second area that I’m gonna be talking about today that I’ve observed in the disaster mental health literature which is an increasing focus on pathways. So pathways to both disaster exposure and even more so to post disaster mental health problems. Here my colleagues and I used what’s called a pre peri post disaster framework thinking about how risk factors at these different time periods work together to shape disaster mental health. So for example, we would think that pre disaster factors not only increase post disaster mental health directly but they also increase adversity.
by influencing the extent to which people are exposed as well as the stressors they experience in the aftermath of disasters. Similarly, we think disaster related experiences are important for post disaster mental health both directly and in so far as they increase risk for further stressors downstream. And then finally we see the relationship between post-disaster stressors and mental health as being bi-directional in that post disaster stressors likely increased risk for mental health symptoms, but mental health symptoms in turn, make it more difficult to cope with post disaster stressors and actually can lead to more stressors in the post disaster environment. My colleagues and I recently published a paper testing such a model using data from the risk project. And we were specifically interested in the pathway from pre disaster trauma. So we assessed trauma exposures separate from disasters including assaulted violence, bereavements, physical assaults, that sort of thing. And then we looked at both PTSD symptoms and generalized psychological distress symptoms. And today I’m just gonna be presenting the results from PTSD. So what we hypothesized was a bit of a complex model at least to look at. But we essentially thought that pre disaster trauma exposure
0:20:23.6 –> 0:20:25.33 would be directly associated
0:20:25.33 –> 0:20:29.01 with long-term post-disaster PTSD symptoms.
0:20:29.01 –> 0:20:32.04 So PTSD symptoms directly tied to one’s experience
0:20:32.04 –> 0:20:35.55 of Hurricane Katrina assessed at around 12 years
0:20:35.55 –> 0:20:37.24 after the hurricane.
0:20:37.24 –> 0:20:40.17 But we thought even more so there would be indirect
pathways
0:20:40.17 –> 0:20:42 to variables downstream.
0:20:42 –> 0:20:45.73 Among them pre disaster psychological distress
0:20:45.73 –> 0:20:48.16 that these would work together and the likelihood
0:20:48.16 –> 0:20:51.03 of exposure to disaster related trauma,
0:20:51.03 –> 0:20:54.4 to short term post disaster PTSD symptoms
0:20:54.4 –> 0:20:58.363 and then also to post disaster trauma experiences.
0:20:59.32 –> 0:21:00.42 - And in a nutshell,
0:21:00.42 –> 0:21:03.01 we found support for this type of model.
0:21:03.01 –> 0:21:04.69 The model had good fit with the data
0:21:04.69 –> 0:21:07.48 and most of our pathways were significant
0:21:07.48 –> 0:21:09.12 and they expect a direction.
0:21:09.12 –> 0:21:11.12 Although notably in this model
0:21:11.12 –> 0:21:12.83 the path from pre disaster trauma
0:21:12.83 –> 0:21:15.583 to long-term symptoms was non-significant.
0:21:16.97 –> 0:21:19.5 - However, it had a significant indirect effect
0:21:19.5 –> 0:21:24.07 on long-term PTSD through other variables downstream
0:21:24.07 –> 0:21:27.15 and in particular by increasing risk for disaster related
0:21:27.15 –> 0:21:29 and post disaster trauma.
0:21:29 –> 0:21:32.48 Suggesting that people might have factors that increase
0:21:32.48 –> 0:21:36.24 their vulnerability to trauma across the board
0:21:36.24 –> 0:21:38.803 disaster related trauma and other types of trauma.
0:21:39.74 –> 0:21:41.96 Which brings me to the third area of research
0:21:41.96 –> 0:21:44.34 that my colleagues and I have been focusing on,
0:21:44.34 –> 0:21:47.01 which is attention to community level factors
and characteristics and exposures of communities that could increase or mitigate the impact of disasters on mental health.

So much of this research has been using data from the community resilience after hurricane Sandy study. Which is a study we launched in New York City after the hurricane in 2012.

And what we did is a serial cross-sectional approach where we sampled two representative sub samples of survivors from highly effective neighborhoods within New York City.

We gathered data from around 500 participants a year after the storm and 500 participants two years after the storm.

We would have loved for the study to have been longitudinal but we did not have the funding to run that type of study so we took this approach instead.

And we also gathered data on where our participants were living and community characteristics including property damage within the communities as well as demographic data.

We were fortunate to have a health geographer on the team who did geospatial analysis including spatial autocorrelation analysis in which we were able to identify clusters of low and high PTSD that were related to exposure but not entirely so.
Suggesting that there might be unique characteristics of these different neighborhoods that could have increased or mitigated risk.

In another study, we looked at the interaction between exposures experienced at the individual level. These included stressors like financial losses, displacement, and bereavement. Participants in communities that either experienced high or low levels of damages.

And what we found was perhaps not surprisingly that individual and community level exposure had a synergistic effect on the likelihood of perceived need for mental health services. It was those who experienced both stressors themselves and who lived in communities that were highly damaged who had the greatest mental health needs.

We’ve also been able to look at interactions between individual and community level factors in shaping mental health risks over time. So there’s one example we looked at the interaction between again individual level disaster related stressors in participants who are living in communities with either high or low unemployment. And what we found was that a year after the hurricane it didn’t matter whether our participants lived in higher or low unemployment areas at least for their PTSD symptoms.

Across the board, hurricane related stressors...
were associated with elevated risk for PTSD symptoms. However, two years after the storm, the picture dramatically changed. And at this point, a disaster related stressors experienced at the individual level, their impact on post-traumatic stress disorder symptom severity was grossly exacerbated among our participants who were living in a high unemployment neighborhoods. And what this suggests is that the impact of community vulnerability might not manifest until the longer aftermath of disasters. And this is problematic because oftentimes the resources that are funneled to vulnerable communities are cut off at about the one-year anniversary. So this suggests greater needs over time. Which brings me to my fourth area that I’ve been seeing Burgeon in the research, which is a focus on treatment approaches. And I should say, I have not been involved in this research as much as I would like. But there are many different treatment approaches that I have received empirical support, including Psychological First Aid, Skills for Psychological Recovery, Project Hope in New York City, Bounce Back Now which is a smartphone-based app that focuses on a variety of mental health symptoms that could be experienced after disasters. And TF-CBT and cognitive behavioral interventions
in schools have also been investigated in literature. So I’ve been involved, not in these treatment studies, but in studies using a system science approach to simulate populations or communities exposed to disasters and the potential impact of different ways of providing care.

In this first study, we use data from our Hurricane Sandy study as well as studies of the effectiveness of different treatment approaches to create an agent-based model of New York City after Hurricane Sandy. And we tested two different approaches to providing care.

First was termed care, which was skills for psychological recovery applied broadly irrespective of our agent’s PTSD symptoms. We also then tried a step care approach where our agents were screened for their levels of PTSD. And those with lower moderate symptoms were given the skills for psychological recovery intervention. And those who had the PTSD were given a more intensive treatment of cognitive behavioral therapy.

And through the simulation study, we found that the step care approach had benefits in decreasing the prevalence of PTSD over time as well as lead to cost savings.

We did a follow-up using the same data.
0:27:27.91 –> 0:27:31.95 and adding on a social service case management ap-
0:27:31.95 –> 0:27:34.02 And what we found here was that this approach
0:27:34.02 –> 0:27:36.9 had even greater benefits and reducing PTSD
0:27:36.9 –> 0:27:40.82 and across our population of agents in our simulation.
0:27:40.82 –> 0:27:45.29 And in particular for those who experienced greater
0:27:45.29 –> 0:27:48.09 to the hurricane characterizes having been displaced
0:27:48.09 –> 0:27:50.00 or losing income.
0:27:50 –> 0:27:51.72 So while this is not a direct test
0:27:51.72 –> 0:27:54.14 of these types of interventions
0:27:54.14 –> 0:27:57.93 it represents an approach to system science to simulate
0:27:57.93 –> 0:28:01.833 and test different possibilities in effected populations.
0:28:03.36 –> 0:28:05.7 So now I’m gonna turn to some of my current
0:28:05.7 –> 0:28:07.39 and hopefully future directions.
0:28:07.39 –> 0:28:09.513 And for these, I have three.
0:28:10.7 –> 0:28:14.08 The first is considering cumulative exposure
0:28:14.08 –> 0:28:16.15 which we think is important given that
0:28:16.15 –> 0:28:19.01 we know that there are some areas within the United
0:28:19.01 –> 0:28:21.35 and beyond that are disaster prone
0:28:21.35 –> 0:28:23.049 and have unfortunately experienced
0:28:23.049 –> 0:28:25.93 more than one environmental disaster
0:28:25.93 –> 0:28:27.793 as well as other stressors.
0:28:29.17 –> 0:28:31.44 So one example of this is an analysis
0:28:31.44 –> 0:28:33.08 my colleagues and I did using data
0:28:33.08 –> 0:28:35.58 from the Gulf long-term follow-up study.
0:28:35.58 –> 0:28:38.16 And what we did is we looked at exposure
0:28:38.16 –> 0:28:41.07 amongst the sample to hurricane Katrina
0:28:41.07 –> 0:28:45.09 to clean up work after the deep water horizon oil spill.
0:28:45.09 –> 0:28:48.49 And then the combination of these two different expo-
And what we found was that participants who were exposed to both disasters, both oil spill cleanup and to hurricane Katrina tended to have higher mental health symptoms, including PTSD, depression, and anxiety symptoms, as well as physical health symptoms, including headaches, back pain and digestive problems.

In a future project, I mentioned that we’re collecting data on the COVID-19 experiences of our risk sample. And what we’re hoping here is to investigate the impact of the pandemic on this group that has already been exposed to a major disaster and their perceptions of whether having experienced hurricane Katrina exacerbated the impact of the pandemic or help them cope.

Another future direction is that I’ve been increasingly interested in the broader impacts of climate change both on people living in areas that are affected by disasters and other climate change indicators, but more generally in the population even in less affected areas. So for this work, I have had the honor of working with Susan Clayton, an environmental psychologist at the college of Wooster. And she, this past year developed and validated a measure of climate change anxiety.
So the two of us are working with a former classmate of mine, Sarah Schwartz, who's a psychologist at Suffolk University on a study looking at college and graduate students climate change anxiety, its relationship with mental health indicators such as depression and generalized anxiety disorder. And the protective role of constructs such as climate hope and climate activism, and mitigating this relationship. And some of you in the climate change and health seminar may have been invited to participate in this study last semester.

And then finally, I've been increasingly interested in other climate change indicators beyond disasters including some of those that are more chronic and persistent as well as other environmental exposures that are likely to affect mental health. An example of this work I have had the honor of working with Kai Chen from the Yale Center for Climate Change and Health on a study looking at particulate matter, air pollution and its association with outpatient visits for mental health problems in Nanjing China. And what we found that was on days where there was greater levels of particulate matter the use of outpatient services increased. Suggesting that this environmental indicator could increase the demand for mental health services.
and also impact the likelihood of mental health symptoms.

And then I’ve been collaborating on a systematic review trying to conceptualize climate change indicators and look at their impact on mental health. This has been sort of slow going. I think in our initial screening we looked at around 12,000 abstracts and in doing so recognize the challenges of measuring chronic climate change impacts and their potential influence on mental health.

So, hopefully that will come out in the next few years. So that is actually all I’ve got for today. I think that was faster than I expected. But I have my email here and I would be happy to answer questions about this work both today and offline. So feel free to email me and reach out.

I love connecting with people, hearing from students and so on. So, thank you very much.

Great, thank you Sarah for this wonderful presentation, giving the state or the knowledge regarding the mental health after all these weather related disasters. And thank you very much for sharing your future and the current directions in this field. It’s all, it’s very fantastic. And I’m sure the audience will have a lot of questions. So while the audience is preparing the question and typing in the chat box,
we do have already clacking a question from the students. So there are a lot of student questions. But the first question the student is wondering is you have shown different types of disasters especially in your review paper. Several students are kind of wondering is there a way to compare the mental health matters across different types of disasters? Like when you compare the different types of disasters, does this matter? Is a particular type of disaster has a strong effect on a particular mental health outcome? That is a really good question. So I know that it used to be said that disasters that were clearly human made such as oil spills and terrorism we’re likely to trigger more severe impacts on mental health because there was someone to blame and they seemed less fateful. However, I don’t think that has been shown empirically although perhaps someone else in this seminar knows more than I do. And I do think that it is again worth emphasizing that what we’ve typically seen as natural disasters do have a clear tie to climate change and human impacts and affects human made systems. And I think that that can lead to feelings of anger and blame and neglect that can exacerbate risks sort of in the same way that would happen after a technological disaster or terrorism.
0:34:45.52 –> 0:34:50.2 So I think it’s difficult to really make the comparison.
0:34:50.2 –> 0:34:53.13 But my sense is that both have the potential
0:34:53.13 –> 0:34:55.743 to trigger symptoms across the board.
0:34:57.63 –> 0:35:00.76 - Thanks, so another type of question follows
0:35:00.76 –> 0:35:03.72 the interventions you mentioned.
0:35:03.72 –> 0:35:06.29 So the students are wondering,
0:35:06.29 –> 0:35:08.46 you mentioned give some examples
0:35:09.33 –> 0:35:13.1 more from the clinical science clinical based interventions.
0:35:13.1 –> 0:35:16.667 And you have also mentioned your own research
0:35:16.667 –> 0:35:21.667 and other papers has shown some individual level
0:35:21.72 –> 0:35:25.16 or community level characteristics
0:35:25.16 –> 0:35:27.97 such as the employment rate
0:35:27.97 –> 0:35:30.91 that it can kind of modify the risk.
0:35:30.91 –> 0:35:34.19 So is there wave, can you talk about
0:35:34.19 –> 0:35:38.27 more this nonclinical intervention strategies?
0:35:38.27 –> 0:35:42.44 And are there community-based programs are happening
0:35:42.44 –> 0:35:45.703 or are there any further readings for the students?
0:35:47 –> 0:35:49.48 - Yeah, so that is a really good question.
0:35:49.48 –> 0:35:54.35 So yeah, so as a clinical psychologist, I’m most well-versed
0:35:54.35 –> 0:35:58.61 in trauma-focused CBT and those types of treatments
0:35:58.61 –> 0:36:03.4 for people who have moderate or severe symptoms.
0:36:03.4 –> 0:36:06.1 But I think that there are public health approaches
0:36:06.1 –> 0:36:08.25 to treating mental health across the board
0:36:08.25 –> 0:36:10.56 including psychological first aid.
0:36:10.56 –> 0:36:13.46 And I think a key here is that psychological first aid
0:36:14.368 –> 0:36:17.94 acknowledges that most people are going to be resilient
0:36:17.94 –> 0:36:19.75 in terms of their mental health.
0:36:19.75 –> 0:36:24.53 And so aren’t going to benefit from more intensive services.
And in fact, you know, therapeutic approaches might actually impede their coping processes and increase their risk. So psychological first aid as I understand, I have not been trained in it and I would love to at some point, focuses on assessing how people are doing, providing them information and then referring them to resources that help them either with their mental health problems or other social service needs. I think a social service approach that integrates both psychological first aid and that assesses the broader range of post disaster needs and provides some case management in navigating the various systems that disaster survivors come into contact with is very important. And I know that in our Katrina study so that was a mixed methods project a lot of our, not a lot, some of our survivors talked about how their encounters with social services after Katrina was actually their first touch point to getting mental health services for preexisting problems. So I think the post disaster period could actually be in some cases, an opportunity for people to get help that they needed all along. And it’s unfortunate that it takes a disaster to do that but could actually facilitate not just psychological growth.
but access to social and economic resources that foster their wellbeing across the board.

- Oh, thanks, Sarah.

I think there’s a question from the audience relate to this

Oh, thanks, Sarah. can you give an explanation of the step heard care you discuss in your model?

Yeah, so that was a really interesting project to be a part of.

So we use what’s called agent-based modeling. So we distribute disaster exposure, you create a population within a computer programming software. We use Python and then you put in various inputs.

So intercept care approach, what I believe we did is we screened our participants meaning that we assign them different levels of PTSD. And then those who met a certain level who likely had the disorder were then given the simulation cognitive behavioral therapy for PTSD.

And that others who had non-zero but less than seven symptoms of PTSD were given quote unquote skills for psychological recovery. And based on the findings of prior research on the effectiveness of these two different intervention approaches.
our agents within the model, their symptoms declined in a way we would expect based on their socioeconomic demographics. So again, it was a simulation, it was not a test of an approach, but more of a demonstration that screening participants and providing services that meet their mental health needs could more effectively lead to decreases in PTSD over time.

Oh, great, I think another, it’s not maybe a question but a comment from Massey asking as a clinician and a public health practitioner how best to translate this information to first advocate clinician to be aware now of these issues. So I think it’s first within the interaction question. There has been other questions from students as well. So while the students is asking like we study the association between disaster and the mental health, is that a case that is some solution, will there be some underestimation of their mental health status due to the stigma especially in a lot of surveys you have performed? Yeah, so the question is whether mental consequences will be exacerbated if there’s stigma experienced? Or maybe underestimated in the service. Some people would maybe reclined to answer these questions, so. That is a good question.
I don’t think I have a good answer for you. I think it’s certainly possible that people who experienced mental health stigma might be less likely to report symptoms. That being said in these studies we use validated scales that ask about specific behaviors and experiences, not disorders. So for example someone who experienced mental health stigma might be more likely to say I haven’t had good sleep over the past two weeks, or I’ve been feeling like a lack of pleasure. Than saying that they experienced depression per se. So they are sort of behaviorally anchored questions. And it’s interesting ’cause I think people are more likely to report symptoms if they’re doing so anonymously, such as via an online survey or something like that. But a lot of, especially the epidemiologic studies are done over the phone, at least historically. And that having that personal contact could potentially be a barrier to reporting. And then absolutely stigma is a barrier to service seeking but you know, there are other barriers too. So in one study we looked at the frequency of different barriers and a major one was a lack of resources. So not knowing where services were, not having time, needing childcare, not having transportation. And I think those can get in the way as well.
0:42:23.38 –> 0:42:26.681 - Yes, another question kind of related
0:42:26.681 –> 0:42:29.1 to the respondents characteristics is,
0:42:29.1 –> 0:42:31.46 there’s one question from Peter asking,
0:42:31.46 –> 0:42:34.99 has any of the current research considered the difference
0:42:34.99 –> 0:42:38.781 in PTSD among first responders and long-term
0:42:38.781 –> 0:42:43.781 community responders versus those who are im-
0:42:43.97 –> 0:42:46.653 but did not assist them with the response?
0:42:47.53 –> 0:42:49.18 - Yeah, that is a really good question.
0:42:49.18 –> 0:42:54.06 So from the research that I’ve seen,
0:42:54.06 –> 0:42:55.79 epidemiologic studies have shown that people
0:42:55.79 –> 0:42:57.68 who are involved in the response
0:42:57.68 –> 0:43:00.59 tend to be at increased risk for mental health problems
0:43:00.59 –> 0:43:02.94 relative to the general population.
0:43:02.94 –> 0:43:05.92 However, there is substantial variability
0:43:05.92 –> 0:43:07.78 amongst first responders.
0:43:07.78 –> 0:43:12.78 So those who are exposed to atrocities, such as,
0:43:13.82 –> 0:43:16.06 dead bodies, people who are harmed
0:43:16.06 –> 0:43:18.1 really severe property damage,
0:43:18.1 –> 0:43:20.32 who are exposed to environmental toxins,
0:43:20.32 –> 0:43:23.333 like mold and things of that nature
0:43:23.333 –> 0:43:27.33 and who have not received adequate training.
0:43:27.33 –> 0:43:30.37 So I know for example, I think there was a study
0:43:30.37 –> 0:43:33.3 after the Deepwater horizon oil spill, or maybe not,
0:43:33.3 –> 0:43:34.133 I’m trying to think.
0:43:34.133 –> 0:43:37.05 This may have been a disaster in one of the ones in
Japan
0:43:37.05 –> 0:43:41.34 that was conducted that showed that people who were
0:43:41.34 –> 0:43:43.961 police officers or who had previously been involved
0:43:43.961 –> 0:43:47.653 in response work tended to have fewer
0:43:47.653 –> 0:43:49.23 adverse mental health impacts
0:43:49.23 → 0:43:51.123 relative to those who volunteered.

0:43:52.04 → 0:43:55.07 Which suggests the benefits and importance of resilience training prior to these exposures,

0:43:58.68 → 0:43:59.86 which is really hard to do, right?

0:43:59.86 → 0:44:03.1 Because these events by their very nature are unexpected and people are going to volunteer

0:44:05.16 → 0:44:07.05 which is great to help out.

0:44:07.05 → 0:44:10.28 There might not be adequate time to really prepare them,

0:44:10.28 → 0:44:12.603 but probably at least some.

0:44:15.19 → 0:44:19.14 - Great, so there’s a couple of other questions relating to the study.

0:44:19.14 → 0:44:21.543 Actually to the review paper you presented.

0:44:22.99 –> 0:44:25.4 One of them is actually asking

0:44:25.4 –> 0:44:28.05 a question from the audience asking,

0:44:28.05 –> 0:44:31.64 about not weather related disaster, but a question from the audience asking,

0:44:31.64 –> 0:44:34.15 have you worked or research interests such as

0:44:34.15 –> 0:44:37.97 with manmade disaster, such as armed conflict?

0:44:37.97 –> 0:44:42.22 And looking into the displacement

0:44:44.33 –> 0:44:46.58 and how these may impacted them in the house?

0:44:47.82 –> 0:44:50.506 - Absolutely, that’s a very good question.

0:44:50.506 –> 0:44:54.77 So I have been involved in studies of human made disasters,

0:44:54.77 –> 0:44:57.09 namely the study, I mentioned with the workers

0:44:57.09 –> 0:44:59.24 after the deep water horizon oil spill

0:44:59.24 –> 0:45:00.4 but that seems very different

0:45:00.4 –> 0:45:01.7 than what the student is asking about

0:45:01.7 –> 0:45:04.68 which is armed conflict and displacement.

0:45:04.68 –> 0:45:07.39 I would love to get involved in this type of work.

0:45:07.39 –> 0:45:09.57 I haven’t yet had the opportunities.

0:45:09.57 –> 0:45:14.57 But what I can say is that there are some clear parallels
to weather related disasters as well as some clear distinctions. So a parallel is that being displaced from your community not by choice can be really stressful and potentially traumatic. And that we found in our Katrina study, that those who relocated which was a good percentage of our sample tended to be at increased risk for mental health problems. Both those who like stably relocated who found a new place to live in a different state and settled there and those who had unstable housing trajectories. I think another commonality is that both types of community level trauma involve exposure to death and destruction. But I think the particulars of it are very distinctive and the level of violence who is perpetrating it, the extent of displacement could be very different in ways that could exacerbate mental health risks. So I think that there are some ways are similar and some ways they’re very different. Yeah, I wanted a follow up. On the like displacement request. And we know what you also mentioned the kind of anxiety conscience is your future direction. So we know there’s issue on the counter refugees especially considering even the whiteflies in the West. A lot of people just were displaced due to the whiteflies. So when talking about to the mental health burden
of these kind of refugees, can you give more like an explanation on the state of the science on that? And are there any new directions that you want to ask?

Yeah, that is a really good question. In terms of the state of the science, I don’t know a lot of good literature on climate refugees and displacement aside from like domestic displacement after hurricane Katrina. That doesn’t mean that there’s not good research going on, I just might not know about it. But my overall sense is there’s probably not a lot of it going on and that this is to be a major issue ’cause being displaced from one’s home community either because your community has been destroyed or that it’s at great risk is incredibly stressful. And not only can impact mental health but it can impact the things that foster mental health. Such as social connections, employment, community attachment, things of that nature. So, you know, what I would say is that we need to be mindful that this is going to happen and trying to create communities that are accepting and supportive of people who are displaced.

You know, I know for our Katrina sample one of the things qualitatively that was very difficult for them was moving to places where they were not welcome, where they were stigmatized,
0:48:16.75 –> 0:48:18.93 where they had difficulty getting jobs,
0:48:18.93 –> 0:48:21.927 because they were from New Orleans.
0:48:21.927 –> 0:48:24.86 Or heard people say things about people
0:48:24.86 –> 0:48:27.26 from New Orleans and the culture of New Orleans
0:48:27.26 –> 0:48:28.93 and this is within the same country.
0:48:28.93 –> 0:48:30.92 So I could only imagine, you know, when we’re talking
about
0:48:30.92 –> 0:48:32.39 people crossing international borders
0:48:32.39 –> 0:48:34.86 that these types of issues within communities
0:48:34.86 –> 0:48:36.06 are gonna be heightened.
0:48:39.65 –> 0:48:41.65 - Yeah, another question kind of related
0:48:43.09 –> 0:48:45.84 to the culture inference, one of the students is asking
0:48:45.84 –> 0:48:48.573 among these community level characteristics,
0:48:50.27 –> 0:48:54.48 do you expect these different characteristics
0:48:54.48 –> 0:48:57.97 such as the culture inference can be a factor
0:48:57.97 –> 0:49:01.04 influencing the substantial variability
0:49:01.04 –> 0:49:03.57 you observed in the review paper
0:49:03.57 –> 0:49:07.19 on the premise of the PTSD and the depression?
0:49:07.19 –> 0:49:08.357 - Yeah, that is a really good question.
0:49:08.357 –> 0:49:10.72 And I don’t know, offhand I’d have to actually look
closely
0:49:10.72 –> 0:49:12.56 at the review paper that you all read
0:49:12.56 –> 0:49:16.118 to see what literature was came out at that particular
year.
0:49:16.118 –> 0:49:18.64 What I would say having been involved in this research
0:49:18.64 –> 0:49:21.397 you know, we try to get community level data
0:49:21.397 –> 0:49:25.85 from the Census Bureau and the American Commu-
nity Survey.
0:49:25.85 –> 0:49:28.582 And oftentimes when you run these analysis
0:49:28.582 –> 0:49:33.21 they explained very little variability in outcomes.
0:49:33.21 –> 0:49:36.08 And I think part of the reason is because
0:49:36.08 –> 0:49:39.13 census tracks and census blocks don’t necessarily
0:49:39.13 –> 0:49:42.6 map onto what people perceive as their communities.
0:49:42.6 –> 0:49:45.45 Like I know in after Hurricane Sandy
0:49:45.45 –> 0:49:48.112 like I technically I was eligible for the study that we did.
0:49:48.112 –> 0:49:51.8 I have no idea what my census track was.
0:49:51.8 –> 0:49:54.02 And it would be hard to imagine
0:49:54.02 –> 0:49:57.36 that it really mapped onto what I saw as my community
0:49:57.36 –> 0:49:59.87 given that the people that I interacted with
0:49:59.87 –> 0:50:01.77 on a day-to-day basis didn’t necessarily even live
0:50:01.77 –> 0:50:04.463 in that particular census track.
0:50:04.463 –> 0:50:06.23 So I think it’s tricky.
0:50:06.23 –> 0:50:08.59 And then an alternative source that people sometimes use
0:50:08.59 –> 0:50:11.15 is they ask people about their perceptions
0:50:11.15 –> 0:50:13.36 of their own community and that’s going to be biased
0:50:13.36 –> 0:50:15.6 by their mental health and functioning.
0:50:15.6 –> 0:50:17.44 So I think, you know, there are advantages
0:50:17.44 –> 0:50:19.913 and drawbacks to different approaches
0:50:19.913 –> 0:50:23.27 and very likely community level characteristics
0:50:23.27 –> 0:50:26.4 do shape mental health after disasters.
0:50:26.4 –> 0:50:27.94 But I don’t think we’ve been able to
0:50:27.94 –> 0:50:29.563 very precisely estimate that.
0:50:31.91 –> 0:50:34.57 - Great, so due to the time limitation
0:50:34.57 –> 0:50:36.47 we will have the last two questions.
0:50:36.47 –> 0:50:39.983 So the one is from Diane,
0:50:41.31 –> 0:50:43.45 excuse me, if I pronounce it wrong
0:50:44.64 –> 0:50:48.19 from the audience, what might the considerations be
0:50:48.19 –> 0:50:53.19 for substance misuse services pre and post disaster?
0:50:53.19 –> 0:50:56.933 And what has to be ensured to help these populations most?
0:50:58.39 –> 0:51:00.253 - That is a really good question.
0:51:01.16 –> 0:51:06.16 So I am not super well versed in substance abuse services.
0:51:07.56 –> 0:51:09.37 I can say that there have been studies
0:51:09.37 –> 0:51:13.45 that have shown increases in alcohol use
0:51:13.45 –> 0:51:17.55 and use of other substances including non-medical use
0:51:17.55 –> 0:51:20.44 of prescription drugs after disasters
0:51:20.44 –> 0:51:23.52 and often they’re endorsed as a means of coping with stress.
0:51:23.52 –> 0:51:24.75 And I think certainly we’ve seen that
0:51:24.75 –> 0:51:27.7 with the COVID-19 pandemic as well.
0:51:27.7 –> 0:51:30.163 So I think in general a population-based approach
0:51:30.163 –> 0:51:32.84 could be to acknowledge that that is something
0:51:32.84 –> 0:51:34.37 that people do to cope
0:51:34.37 –> 0:51:36.91 as well as the potential negative consequences of that
0:51:36.91 –> 0:51:40.813 and alternative ways of coping if people feel like using.
0:51:40.813 –> 0:51:44.09 I do know anecdotally I have
0:51:44.09 –> 0:51:46.34 colleagues, not super close colleagues
0:51:46.34 –> 0:51:48.22 but contacts who have done some work
0:51:48.22 –> 0:51:49.93 with opioid and methadone maintenance after hurricanes.
0:51:49.93 –> 0:51:54.19 And I think it’s really challenging
0:51:54.19 –> 0:51:56.29 because the people who run these clinics are also impacted.
0:51:56.29 –> 0:51:59.68 And when people are displaced, they have disruptions in care
0:51:59.68 –> 0:52:03.69 that can be really devastating for their recovery.
0:52:03.69 –> 0:52:08.04 So I think it is a major issue
0:52:08.04 –> 0:52:09.85 both in terms of people using substances to cope
0:52:09.85 –> 0:52:12.4 and then people in recovery not only experiencing
0:52:12.4 –> 0:52:16.01 an additional stressor
0:52:16.01 –> 0:52:20.53 that can exacerbate their risk of abusing
0:52:20.53 –> 0:52:23.453 but also major disruptions in their care.
Okay, so last question is actually from the student is asking one of your future director is the community disaster exploring. So the students are wondering, do you know any study exploring the potential interaction facts from these individual characteristics you observed and also the community characteristics including some of the pre disaster finding? Yeah, so I'm trying to think if there are good examples other than the one that I presented today which looked at individual and community level exposures. I don’t know of any offhand that have looked at community level factors, such as indicators of socioeconomic status and individual level impacts. There is some work that has been done by Elizabeth Frankenberg and colleagues after the Nepal earthquake and tsunami that I believe found something in that effect. But I can’t remember offhand what exactly they found. And then there’s another study that was conducted after flooding in England by Compro, the author Winden and Compro, I know are their last names that found interactions I believe between exposure and social cohesion. But social cohesion in that case was measured based on the participant’s own perceptions of social cohesion across the area.
So, yeah, those are two examples but I don’t know a ton of literature in that area. And I think that is an open area for further explanation or examination.

Great, thank you Sarah. And I think there’s a lot of excitement to conduct research in this field and thank you all for listening today. And just a reminder that this seminar is recorded and will be posted online on the Yale Center for Climate Change and Health.

With that, thank you Sarah. Yeah, feel free to be in touch. Thanks Sarah. [Sarah] Thanks Rob. Bye everyone. [Sarah] Bye everyone.