

*Audio Podcast about the Symposium on the Science of Disproportionate Environmental Health Impacts*

CHRISTINE GUITAR: With us now we have Dr. Pamela Tucker and Dr. Charlton Coles to discuss their paper on psycho-social stress. Dr. Tucker and Dr. Coles, can you tell us who you represent, who you work for, and what your area of expertise is?

PAMELA TUCKER: I work for ATSDR, which is a small sister agency within the Centers for Disease Control and I work in the Division of Toxicology. I am a psychiatrist by training and I have worked as a Medical Officer at ATSDR for 15 years. My area of expertise has been the effects of stress on communities exposed to hazardous substances.

CHRISTINE GUITAR: Dr. Coles?

CHARLTON COLES: My name is Charlton Coles. I also work with Dr. Tucker at ATSDR. I'm a behavioral scientist and my area of expertise is in the area of stress as it relates to technological disasters. My specific area is community and clinical psychology.

CHRISTINE GUITAR: Great, and can you explain to us a little bit about what your paper was on, but also what you mean when you say psycho-social stress?

CHARLTON COLES: The paper broadly addresses psycho-social stress as it affects a community impacted by a technological disaster. We talk about the concept of stress, and we talk about all the various social and psychological implications of that stress as it goes across different social levels, you could talk about the community level, the family level, and the individual level. So when we talk about community-level stress, we can think about how that community will view the stress, or perceive the stress, all the way down to how the family can look at stress in terms of its impacts on such things as economic strain, discrimination, family conflict, and family changes. When we think about individual stress, we can think about stress as it affects a person across other, sort of, levels as well in terms of their thought patterns, their emotions, their behaviors, and their bodily reactions. So we want to take a look at how this sort of stress makes its impact on the mental and physical health of an exposed community.

CHRISTINE GUITAR: And, Dr. Coles, real quick, can you describe what you mean when you say "technological disaster?"

CHARLTON COLES: OK, Dr. Tucker can actually talk about a little.

PAMELA TUCKER: Yes, that was a term originated by one of our co-authors on the paper. There are actually 4 co-authors, myself, Dr. Coles and also Dr. Steven Couch from Penn State and Dr. Bruce McEwen. Dr. Steven Couch is one of the originators of the term "technological disaster". It's essentially a disaster that's caused by a failure of man's technology. It can be

things like hazardous waste sites or chemical spills, or it could be something like Three Mile Island or Chernobyl where there was a radiation leak. Or, it could be the deliberate use of man-made technology to hurt others like a terrorist attack such as 9/11. I guess for stress, my definition would be a physical and mental reaction to a change in the environment. And, stress can cause both psychological and physical health effects if it goes on too long, or if it's too suddenly intense. That's why it's of interest to scientists who study human health, because it does have health impacts.

CHRISTINE GUITAR: Okay, and can you tell us what the outcomes were and how this paper can help communities?

PAMELA TUCKER: Yes, what does it really mean? What it is is we were very blessed to have one of the originators in the field, Dr. Couch and a very famous scientist, Dr. McEwen from Rockefeller University. He presented in the beginning of the paper the allostatic load theory, which is how the body reacts to the stress and strains of everyday life and how the burden of stress on the body actually leads to health effects. This is a grand synthesis of about 100 years of thought on what psychological stress does to human health.

The reason this is of importance to communities is that it will give scientists a better opportunity to more closely approximate how the interaction of low-level toxins and psychological stress, how it might have an impact on human health. Part of risk assessment is essentially to come as close to estimating the health effects of exposures as humanly possible. This kind of adds another factor into it that there might be enough known about how stress impacts human health, especially as it interacts with low-level toxins. It might give us a better idea, eventually—the science is not quite there yet—it might give risk assessment a more accurate picture of how these communities' health might be impacted.

CHRISTINE GUITAR: OK, great. Dr. Coles, is there anything else you wanted to add?

CHARLTON COLES: I think Dr. Tucker talked about it very well. I'd just like to add that the identification of psycho-social stress factors at the different social levels is critically important and it's an ongoing, evolving kind of science. We're getting a better picture of it and our models are improving but hopefully, like I said, in the near future, we'll be where we can paint a more accurate picture of stress as it happens in a community impacted by a tech disaster.

CHRISTINE GUITAR: Great, thank you both very much.