

Podcast transcript: Artificial Turf and Health

[Theme music]

Ashley Ahearn (AA): You're listening to Environmental Health Chat – a show from the National Institute of Environmental Health Sciences that explores the connections between our health and our world.

I'm Ashley Ahearn.

[Music fades out]

There are more than 16,000 artificial turf athletic fields in the United States. With their bright green color, crisp white paint lines, and springy surface, they can make even the amateur athlete feel like a big shot professional.

Artificial turf has become an appealing alternative to traditional grass playing fields. When compared to natural grass, artificial turf uses less water and requires less maintenance.

But we may want to take a closer look at the list of materials used to make artificial turf fields...

Dr. Homero Harari (HH): Many studies have found metals like aluminum, zinc, arsenic, lead, manganese. Many studies also have found volatile and semi-volatile chemicals. And that's also very, very concerning.

AA: Dr. Homero Harari is an assistant professor in the Department of Environmental Medicine and Climate Sciences at the Icahn School of Medicine at Mount Sinai in New York. He's also the principal investigator on a new study, funded by the NIEHS, that seeks to understand and address community concerns around artificial turf.

If you've ever played sports on a turf field you've seen the black crumbly infill material used to cushion and surround the plastic blades of fake grass. It's also commonly used on playgrounds. Most of the time, that crumbly infill is made of chopped up rubber tires, which contain toxic chemicals.

HH: If there is a chemical that is known to cause cancer, and we are in contact with it regularly because we play – well, we should be concerned, right? And if we find many of these products together, then we should be very concerned and at least try to understand how these products get into our body. And that's the main interest of my work.

AA: Dr. Harari's research is centered around engaging community members around the Northeast – parents, caregivers, decision-makers, local leaders – who may be considering installing artificial turf fields or playgrounds, or already have them in their community and want to know more about the potential risks.

HH: We have been receiving calls from parents and from town officials. So, many, many years of different calls asking for information and for guidance... so we decided to start having conversations with many community groups.

AA: Dr. Harari has connected with five key community groups to guide his research – Nontoxic Portsmouth and Nontoxic Dover from New Hampshire, the Lowell Center for Sustainable Production in Massachusetts, Clean Water Action in Connecticut, Grassroots Environmental Education in New York, and Women for a Healthy Environment in Pennsylvania.

These groups and others gathered in New York in 2018 and attendees shared their concerns and unanswered questions about artificial turf. Dr. Harari says it was that meeting – and his ongoing exchanges with these groups – that have shaped the focus of his research.

HH: As scientists, we felt that there's so much that we can learn from them. And definitely this partnership will be a two-way street where we can explain some of the science, but I have to be honest with you, I think we have probably learned more from them than they have learned from us.

AA [on tape]: What concerns are you hearing from your community collaborators?

HH: Chemical concerns and exposure to chemical ingredients in infill and blades. I think that is the number one concern and has been the number one concern for many years. And we agree with that concern, but given climate change, I think that heat exposures are also a big part of the concerns from different community groups.

AA: As global temperatures rise and extreme heat events become more common, Dr. Harari's community partners wanted to know just how hot is artificial turf, when say, compared with a field of grass?

HH: So, we designed a study where we selected many fields across New York and Pennsylvania and we went with thermometers and we measured the temperature of the fields throughout the day.

AA: They gathered temperature readings from 200 artificial turf fields as well as ambient temperatures. They also gathered temperatures at grass fields and asphalt parking lots, for comparison.

And they found that on days where the ambient temperature was between 75-85 degrees Fahrenheit, the temperatures on grass fields stayed pretty close to the ambient temperature. But the temperature readings on the artificial turf fields could get up to 160 degrees! Hotter, even, than asphalt, Dr. Harari found.

HH: This is concerning. Not only because this is a source of heat exposure, but this can lead to burns in players and in small children. And this is something that we have documented when we have talked to many users of artificial turf fields and playgrounds, and I think that this is important.

AA: They double checked their findings using satellite imaging and geolocating the 200 fields where they gathered temperature readings and the results were similar. Dr. Harari and his team will be publishing these findings soon.

To answer questions about the chemicals in the artificial turf and infill, Dr. Harari and his team will be tapping their network of community groups once again. They're in the early stages of recruiting community members from across the Northeast to collect artificial turf samples from

fields they normally play on. Then, Dr. Harari and his team will analyze the samples and survey participants about their exposure pathways.

HH: Many of the athletes and subjects who have collaborated with us report ingestion of little pieces of plastic that come from the infill. And that's something that we are also investigating.

AA: When a goalie slides, mouth open, to make a great save, or a small child puts their fingers in their mouth at the playground, tiny particles of that rubber infill and microplastics in the artificial turf may make their way into their bodies.

Dr. Harari says that he doesn't want to discourage anyone from getting out and being active – even if it means using a turf field or playground. Exercise is an important part of staying healthy...but...

HH: There's a lot of evidence from parents, when they drive their kids around, they find infill in their cars, in the car seat, in their homes, around their cleats, around the shoes. So, we recommend that they take a shower, and they try to clean their skin because it's not okay to have all these chemicals lingering around their bodies.

AA: The contamination risk doesn't stop there, unfortunately. Many community members have also voiced concerns about what to do with the artificial turf when it needs to be replaced – and what happens when those tiny pieces of artificial turf escape – or are washed into the surrounding environment.

HH: So, this infill that is used to reduce surface hardness tends to migrate off the fields when we play, and we slide tackle, or when we step off the field, there's all these microplastics that are leaving the field. And they end up in the sewage system, in the street, and they can also end up in water sources.

AA: An April 2024 study by the U.S. Environmental Protection Agency found that although chemicals are present in the tire crumb rubber used as infill in artificial turf – and exposures can occur – they are likely limited.

Dr. Harari says communities are still concerned. His goal, as an environmental health scientist, is to gather as much data as he can, and make it readily available to his community collaborators in the hopes that sound science will inform the decisions around whether or not to install artificial turf. It's a tricky question that communities and organizations are wrestling with around the country – and there's not always a clear answer that everyone can agree on.

HH: What about the social environmental conflict? What about the conflict that is created in communities where some parents are against the installation of these artificial turf fields, because there is not enough information to prove that they are safe, versus those parents who want their kids to play in a professional looking field?

AA: Dr. Harari has a personal stake in this issue. He plays pickup soccer on an artificial turf field himself – as do his kids – and he says he wishes he had other options, and more information about the risks.

HH: It is important for us at least to understand – and I'm doing my best to do that with good science – to understand what is the best playing surface that we can use to play. So, I am very

thankful for parents and town officials and neighbors who really just want to know whether this is a good surface for all of us to play on.

[Music comes up]

AA: I'm Ashley Ahearn. Thanks for listening to Environmental Health Chat.