



Artificial turf: Contributions and limits of health research in decision making

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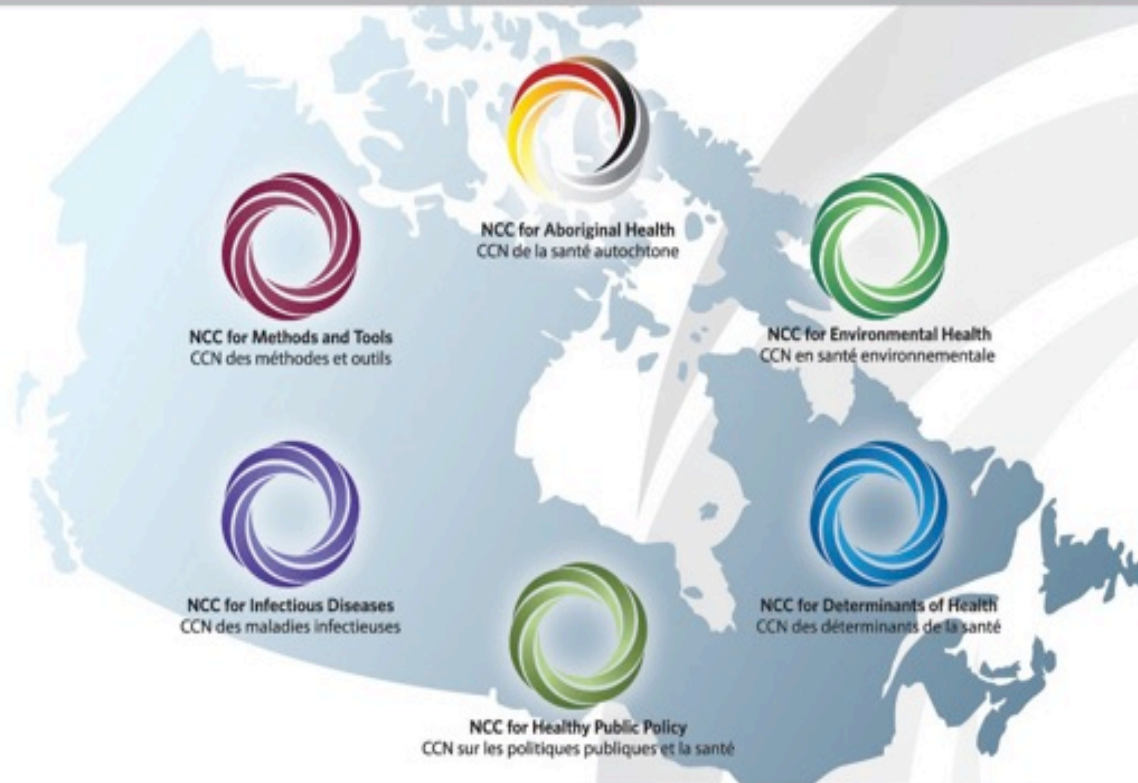
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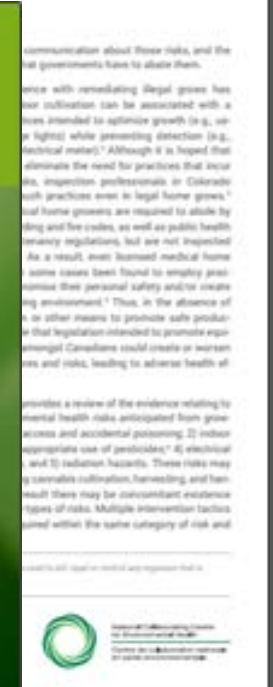


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Why does artificial turf elicit such alarm?

- Risk-amplifying factors (Ropeik 2002):
 - Not natural, a recycled waste product
 - Externally imposed
 - Affects personal sphere, esp. children
- Post-trust era, cognitive bias
- Strongly established narrative
 - List of WSU soccer players (esp. goalies) with cancer (news and social media)
- Hazard vs. Risk



What does the research say?

- Human Health Risk Assessments (HHRAs)
 - Multiple pathways, multiple receptors
 - Designed to be highly conservative
- Downsides:
 - Theoretical
 - Require **trust** in expert judgement
- HHRA Summary on Artificial Turf page
 - [Bit.ly/artiturf](https://bit.ly/artiturf)



What do the HHRAs say?

- No indication of public health concern for single/multiple chemicals, in children or adults.
- Excess lifetime cancer risk:
 - No estimate approaches maximum acceptable risk
- Non-cancer hazard:
 - In some, child spectators approach an HI of 1
- **Critically...** turf fields **same or better** than natural turf fields impacted by **urban pollution** (Peterson et al. 2018; Ruffino et al. 2013).



What about epi studies?

- Washington State Department of Health:
 - Investigated the WSU list of soccer players
 - Cancers among the people on the list were actually less frequent than what is expected for the state.
- Ecologic study (Bleyer & Keegan 2018):
 - ATs have increased over time, lymphoma incidence has not in 58 Californian counties
 - No relationship between local density of ATs and malignant lymphoma.



What NEW research is coming out?



- Federal Research Action Plan (FRAP)
 - EPA, CDC, ATSDR, CPSC
 - Literature review ✓
 - Part I: Characterization ✓
 - Part II: Exposure Assessment (with biomonitoring?)
- California OEHHA:
 - Same idea

These large-scale studies will refine HHRA assumptions, but will not generate new risk estimates!

Will these new data solve our decision problem?

- The FRAP and OEHHA studies will greatly reduce uncertainty in future HHRA's.
 - No more uncertainty factors → estimates decrease.
 - Need to add other uncertainty factors → may increase.
 - Overall, may NOT be markedly different.
- Is another HHRA really going to answer what role artificial turfs should play in our communities?

Information bias is the mind-killer



- Holding off on a decision in the hopes that more information will make it easier.
- **The real gap:** community-level impacts of sports fields on physical activity and health
- How does the choice of playing field affect:
 - # people exercising (duration, frequency)?
 - Types/rates of injuries?
 - How much play can certain field types handle?
 - Model the effect of total permitted playing fields on obesity, diabetes, CVD.

Risk Communication and Management



1. Bring it to the people
2. Engage the community in meaningful abatement activities
3. Promote hand hygiene, all the time and everywhere



Health: toxicology, injuries, heat, abrasions, microbes vs. physical activity benefits against obesity & cancer



Meeting the demand for play space



Operations: cost, water, fertilizer, climate



Climate Goals: carbon credits & emissions



Resilience: floods, fires, & urban heat islands

What type of playing surface is going to meet our communities needs?

Bring it to the people

- Methods: health impact assessment or integrated impact assessment (www.ncchpp.ca)
- Benefits:
 - Solicits public input
 - Addresses misinformation
 - Work through the trade-offs together



Engage in Meaningful Abatement Activities



- Reducing chemical exposures is hard work!
- Re-direct public interest toward abatement activities that are relevant to that community:
 - Arsenic in well water
 - Radon in indoor air
 - Smoking
 - UV protection while playing soccer!

Hand hygiene, all the time & everywhere!



- CPSC: artificial turf is not a health risk, *but wash your hands anyway.*
- Needed some expanded context:
 - *Urban soils contain metals and PAHs*
 - Biohazards: geese, other animals
 - Player-to-player transmission

- Readily accessible **hand-washing stations** on all soccer pitches.

Maplewood Farms: petting zoo + picnic area

Hand-washing
stations and signage.



Natural & artificial
turf playing fields may
become contaminated
by air pollution and
animal feces.

Please wash your
hands!



More Artificial Turf Resources at:
bit.ly/artiturf

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www.ncceh.ca || www.ccnse.ca

It's not a
"natural"
material.

I heard it
causes cancer?

It gets in my
clothes &
my car...

How do
we really
know?

My kid
got some in her
mouth!

