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Research brief: VulneraCity: the most comprehensive database of urban vulnerability drivers and dynamics.

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VulneraCity: the most comprehensive database of urban vulnerability drivers and dynamics.

Highlights

- We present **VulneraCity,** the most comprehensive urban vulnerability drivers database. It contains 1460 vulnerability drivers for six different hazards, gathered from over 400 scientific articles.
- Around one third of all the identified vulnerability drivers are empirically derived.
- Additionally, six types of directional vulnerability dynamics are identified and conceptualised, describing the relationship between the driver and the impact.

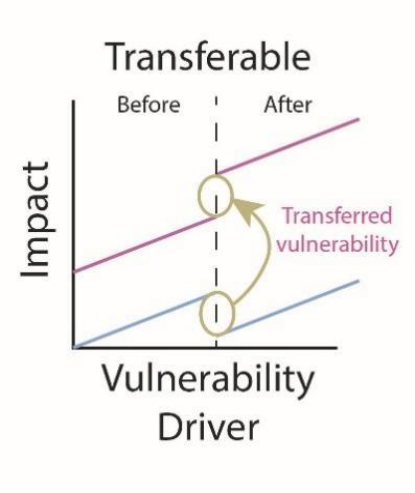
Recommendations

1. Vulnerability research should be evidence-based, for which VulneraCity provides a solid theoretical foundation. It can be used to scope potentially relevant vulnerability themes and to identify the most important vulnerability drivers and stakeholders that one may not have thought about before.
2. Vulnerability dynamics are of utmost importance in any vulnerability assessment, but difficult to implement due to data constraints. VulneraCity can guide or inspire research into vulnerability dynamics, as is currently being done in the MYRIAD-EU risk software.
3. Vulnerability is strongly context dependent. The actions above should therefore ideally be conducted in close collaboration with scientists, policy makers, urban practitioners, and the subjects of vulnerability to ensure that the local vulnerability situation is captured.

Context

Vulnerability research is fundamental to understand how people and objects are impacted differently by the same hazard. Past research has shown that 85% of all vulnerability assessments are not clearly founded on theory. We therefore need a comprehensive overview of what drives vulnerability in order to reconsider the indicators that we use to assess it. Additionally, we often assume a linear or monotonic relationship between a driver of vulnerability and the impact of a hazard, but this is too simplistic. We need to account for vulnerability dynamics to develop fitting policies. Both the drivers of vulnerability and the dynamics of vulnerability are found from an extensive literature review of over 3000 articles.

Illustration/Graph/Picture



*Example of transferable **vulnerability dynamics**: The house on the right is raised to prevent water from entering during heavy rain, but also causes additional water to flow towards their neighbours, making the neighbour more vulnerable to damage from heavy rain events.*

Want to know more?

Article:

Database:

- **Full reference**: Tristian R. Stolte, Elco E. Koks, Hans de Moel, Lena Reimann, Jasper van Vliet, Marleen C. de Ruiter, Philip J. Ward, Report on VulneraCity–drivers and dynamics of urban vulnerability based on a global systematic literature review, MYRIAD-EU project.
- **Link to paper**: https://www.sciencedirect.com/science/article/pii/S2212420924002978

- **Link to database:** https://zenodo.org/records/11074142

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