Message #2 : *backward* contact tracing

- following links in the network in their opposite direction over-samples individuals that will cause a larger number of secondary cases


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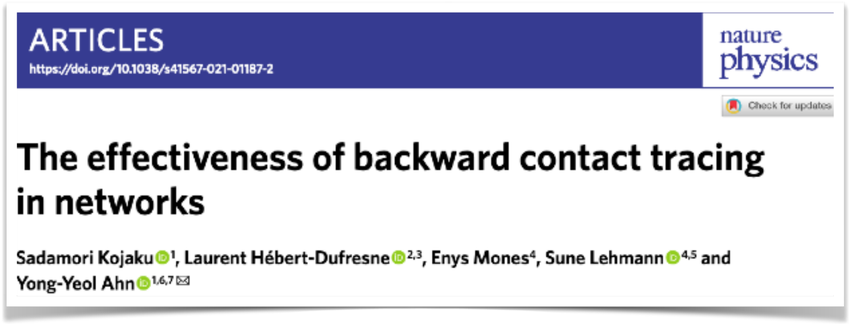
Montréal et la troisième vague | La prudence a payé

Ariane Lacoursière La Presse


ARTICLES

https://doi.org/10.1038/s41567-021-01187-2

nature physics

Check for updates

The effectiveness of backward contact tracing in networks

Sadamori Kojaku[1], Laurent Hébert-Dufresne[2,3], Enys Mones[4], Sune Lehmann[4,5] and Yong-Yeol Ahn[1,6,7]

Message #3 : connection with structured differential equation models

- mass-action assumes the risk for individuals to become infected is uniformly distributed (i.e. in-degree in the network is distributed according to a Poisson distribution) and is independent of spread
- the final epidemic size can be mapped to a mixture of Poisson in-degree distribution

$$\dot{S}_i(t) = -\beta\sigma_i \sum_j M_{ij} \frac{I_j}{N} S_i \,,$$

$$\dot{I}_i(t) = \beta\sigma_i \sum_j M_{ij} \frac{I_j}{N} S_i - \gamma I_i \,,$$

$$\dot{R}_i(t) = \gamma I_i \,,$$

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