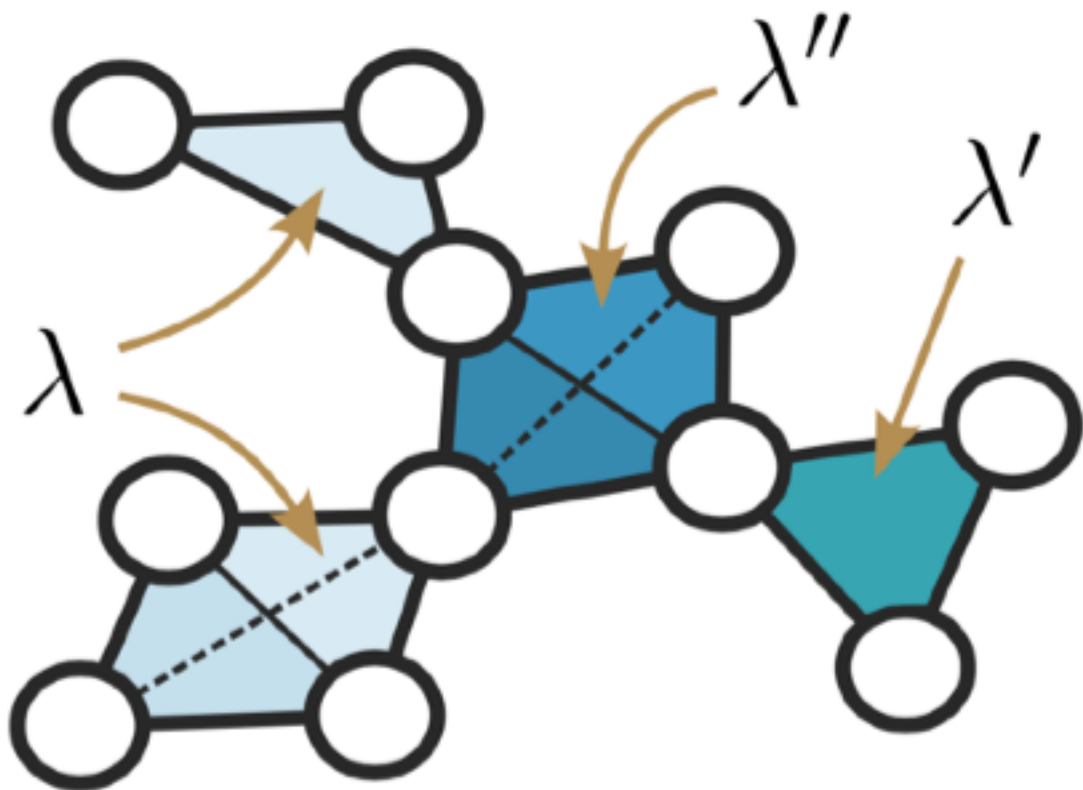






# A Weighted hypergraph



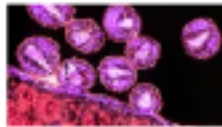
$$\lambda'' > \lambda' > \lambda$$

Heterogeneous transmission settings

**JAMA Insights**

# Indoor Air Changes and Potential Implications for SARS-CoV-2 Transmission

Joseph G. Allen, DSc, MPH; Andrew M. Ibrahim, MD, MSc



# Reviews in Medical Virology

REVIEW



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José Miguel Robles-Romero, Gloria Conde-Guillén, Juan Carlos Safont-Montes,  
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Thomas P. Weber<sup>a,\*</sup>, Nikolaos I. Stilianakis<sup>a,b</sup>

Original Article

# Sex, synchrony, and skin contact: integrating multiple behaviors to assess pathogen transmission risk

Stephan T. Leu<sup>\*</sup>, Pratha Sah, Ewa Krzyszczyk, Ann-Marie Jacoby, Janet Mann, and Shweta Bansal



Notation:  $\lambda \equiv \beta$ .

We include context by allowing each group to have an individual  $\beta$  drawn from a density  $f(\beta|n)$ .

# The context of contacts matters for transmission

- ▷ COVID-19
- ▷ Influenza A
- ▷ STIs
- ▷ ...

## What are the possible effects of ignoring context?

# Heterogeneous transmission settings

The context of contacts matters for transmission

- ▷ COVID-19
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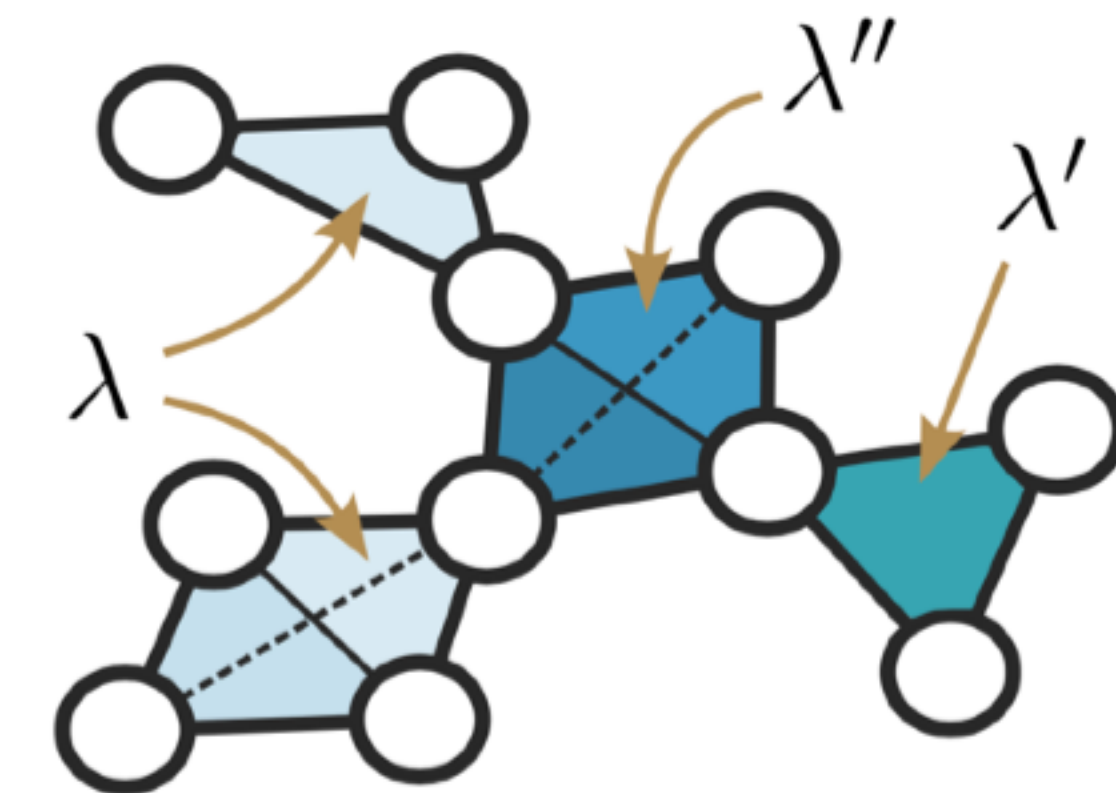
ELSEVIER

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## A Weighted hypergraph



$$\lambda'' > \lambda' > \lambda$$

Notation:  $\lambda = \beta$ .

# Heterogeneous transmission settings

Detailed description of the dynamics at the groups level with  $\Theta_{n,i,\beta} = i\beta$  (“simple contagion”)

$$\frac{dG_{n,i}^{\beta}}{dt} = \mu(i+1)G_{n,i+1}^{\beta} - \mu i G_{n,i}^{\beta} + (n-i+1)[(i-1)\beta + \rho]G_{n,i-1}^{\beta} - (n-i)[i\beta + \rho]G_{n,i}^{\beta}$$