

Pathogen evolution after vaccination in immuno-epidemiological models

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Several authors (see e.g. [2]) have analysed how vaccination policies may affect pathogen evolution. In this talk I review how the results depend on the model describing within-host pathogen-immune interactions. In particular, I will focus on a simple model, introduced in [1], and qualitatively consistent with more realistic models used for influenza [3]; it allows for multiple evolutionary stable states; depending on the rate at which a new vaccine is introduced, it is then possible that a pathogen evolves towards either higher or lower virulence.

References

- [1] André, J.-B., & Gandon, S. Vaccination, within-host dynamics, and virulence evolution. *Evolution*, 60(1), 13-23, 2006.
- [2] Gandon, S., & Day, T. The evolutionary epidemiology of vaccination. *J. Roy. Soc. Interface*, 4(16), 803-817, 2007.
- [3] Yan, A. W. C., Cao, P., Heffernan, J. M., McVernon, J., Quinn, K. M., La Gruta, N. L., ... McCaw, J. M. Modelling cross-reactivity and memory in the cellular adaptive immune response to influenza infection in the host. *J. Theor. Biol.*, 413(Suppl. C), 34-49, 2016.

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