

Flies selected for increased post-infection survival invest less into reproduction, but only when infected.

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An evolved cost of immune deployment in *Drosophila melanogaster*

INTRODUCTION

Cost of immune defense:

maintenance costs (cost of maintaining a functional immune system) which manifests as lower fecundity of resistant genotypes, and **deployment costs** (cost of mounting an immune response when challenged with a pathogen) which shows up as reduced fecundity post-infection.

We tested for costs in replicate populations of *Drosophila melanogaster* experimentally evolved to better resist a bacterial pathogen, *Enterococcus faecalis*, by measuring their fecundity with and without infection.

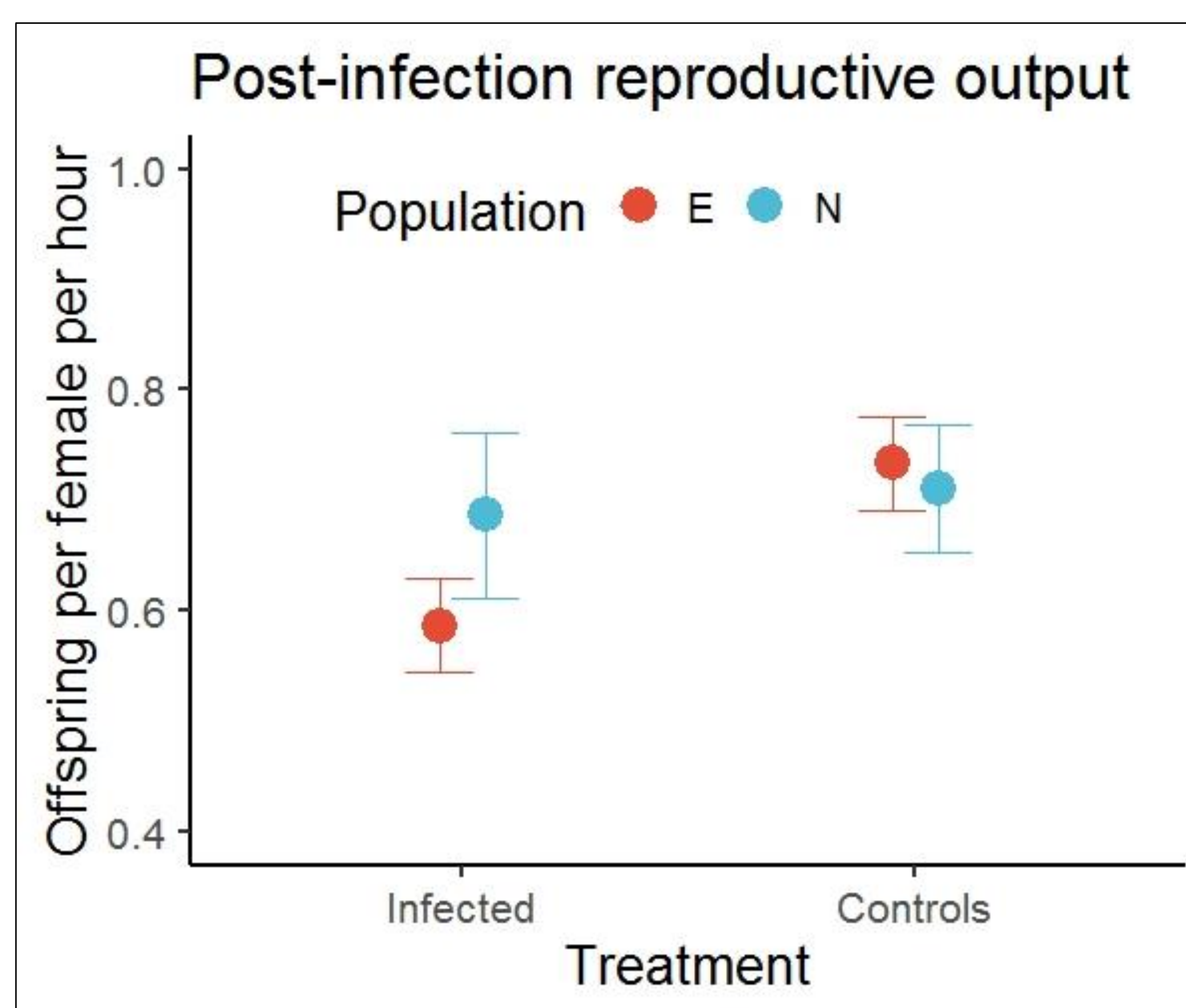
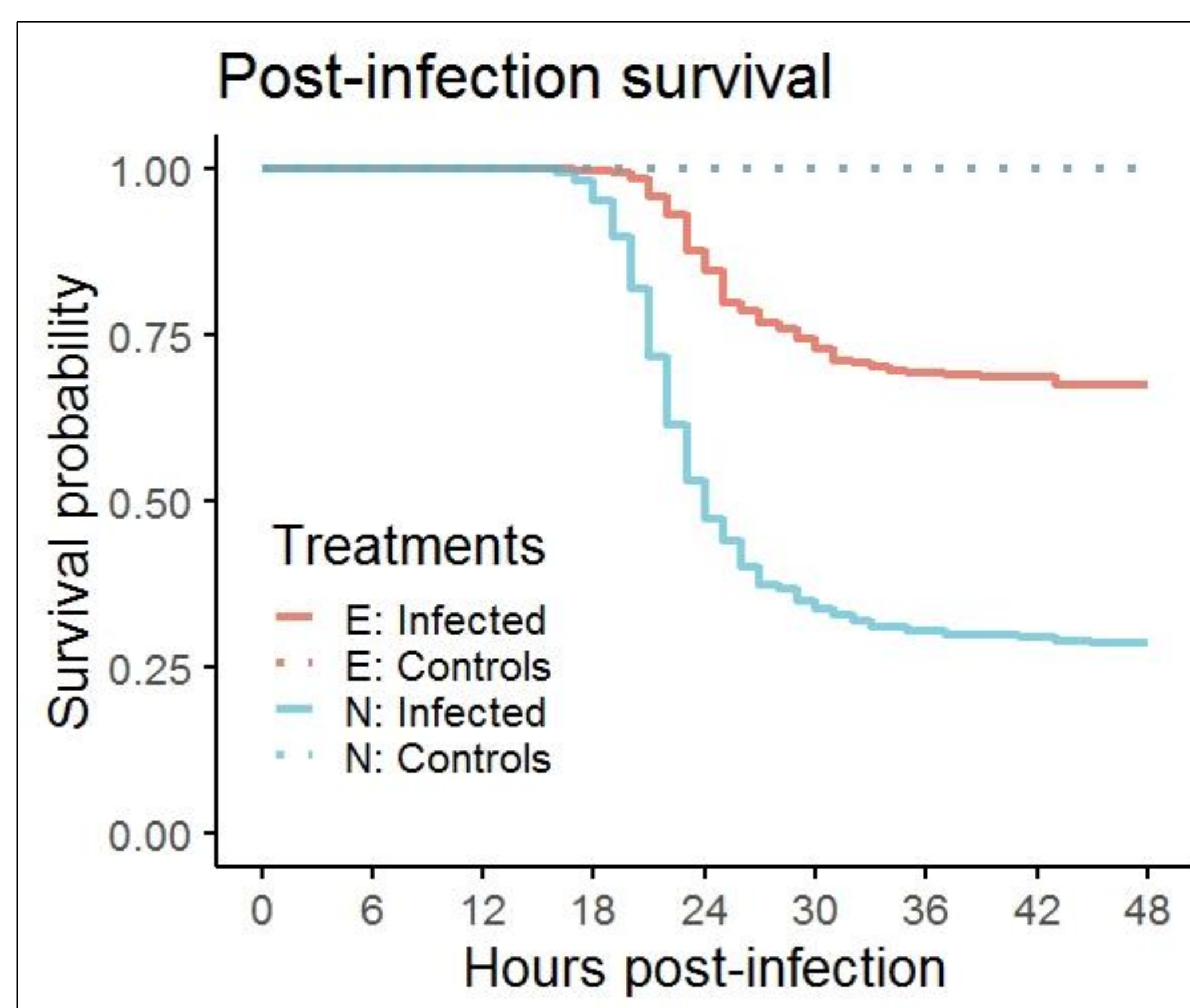
Selection Regime

E₁₋₄: *Selected populations*; flies are infected every generation and survivors are allowed to reproduce.

P₁₋₄: *Sham-infected controls*; flies are sham-infected every generation.

N₁₋₄: *Uninfected controls*; flies are not subjected to any selection pressure.

RESULTS



Without infection, females of the evolved and the control populations have similar reproductive outputs, but when infected the evolved population females show a significant decrease in reproductive output while no such reduction is observed for the control population.

METHODS

4-5 days old females from the selected (E1-4) and control (N1-4) populations were subjected to infection (n = 80) or sham-infection (n = 40). Infection was done by pricking flies in their thorax with fine needles dipped in bacterial slurry. Sham-infection was done by pricking with needles dipped in sterile buffer. Females were hosted individually in food vials so that they may oviposit, and their mortality were recorded every hour for 48 hours, at end of which all survivors were discarded. The number of progeny produced by the females were counted 14 days later. Experiments were done after 70 generations of forward selection.

REFERENCES

- McKean *et al.*, 2008, *BMC Ecology and Evolution*, 8: 76
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