# Testing a vaccine against avian cholera in albatrosses: combining observational and experimental data in a remote seabird community

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**Abstract**

The bacterium *Pasteurella multocida* is suspected to cause substantial chick mortality in dense albatross colonies on Amsterdam Island (Southern Indian Ocean). Given their long life span and site fidelity, a vaccination programme aimed at covering a significant proportion of the population could be fruitfully applied to albatrosses.

The objectives of this study were: *(i)* understand the temporal and spatial disease transmission dynamics, and *(ii)* test the efficacy of vaccination in eliciting a specific immune response and protecting albatrosses against *Pasteurella*-induced mortality.

Across the years 2013-5, blood samples were taken from several hundred Indian Yellow-Nosed Albatrosses on Amsterdam Island to assess serological response to pathogen exposure. A specifically designed vaccine was also used on adults and chicks, and tested for its effect on seroconversion and survival rates.

Serology suggested some natural pathogen circulation which varied between years, and showed that most birds responded to vaccination with an increase in antibody titres followed by a decline over time. Chick vaccination also proved effective to protect against *P. multocida mortality* the year when the epidemic was most severe. Finally, GPS-tracked skuas

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regularly visited albatross colonies, compatible with a role in disease circulation within and between albatross colonies.

Vaccination could be a promising tool to protect these and neighbouring endangered albatross populations in the face of this emerging pathogen, and similar approaches could be applied to other settings. Further analyses are required to refine our understanding of disease transmission and possibly design more targeted prophylactic measures.

**Keywords:** Albatross, avian cholera, Pasteurella multocida, vaccine, Southern Ocean