

Exploring individual variation in pace-of-life in Svalbard reindeer

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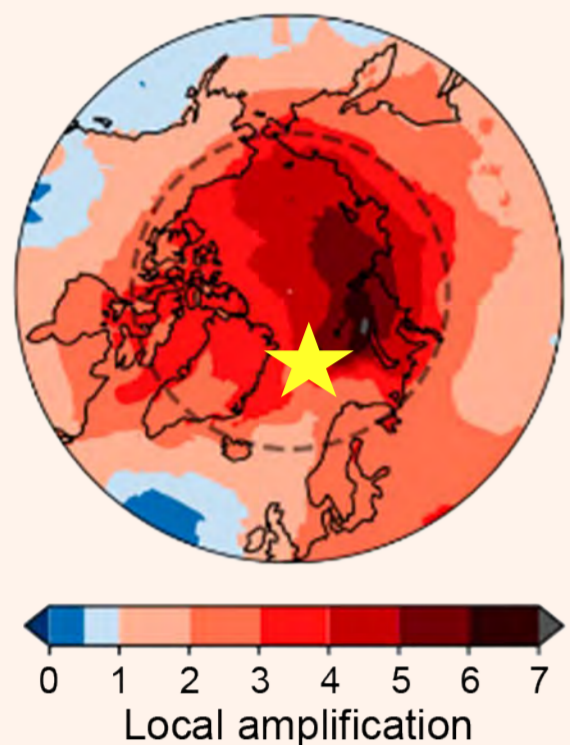
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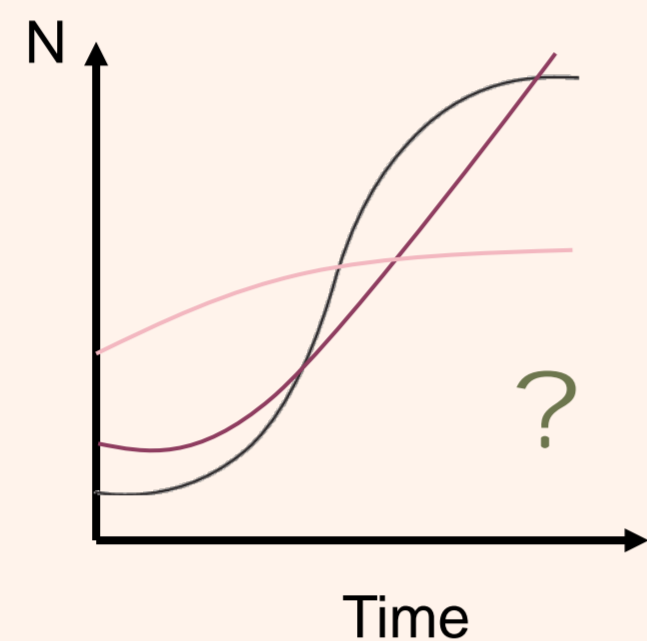
Background

Climate change



The Arctic is the biome where the increase in temperature is the fastest.

Population dynamics



Arctic species population dynamics raises concerns: how will they adapt and what will the impacts on their ecosystems be?

Phenotypic variability



The potential for adaptation might contrast between individuals within the same population if they show different life-history strategies and pace-of-life. Nevertheless, phenotypic variability is rarely included in population dynamics models.

Svalbard reindeer



Svalbard reindeer is a key arctic species for which preliminary analyses suggested phenotypic variability.

Objective

To characterize the phenotypic composition of the Svalbard reindeer population.

CHAPTER I

Do individuals have different life-history strategies characterized by different pace-of-life?

Did you know?

Reindeer (Europe) and caribou (North America) belong to the same species: *Rangifer tarandus*.

Material & Methods

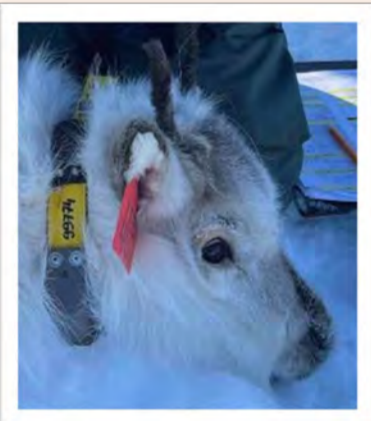
1

Data collection in Nordenskiöld Land (Svalbard)



→ Between 1994 and 2024, **972** reindeer were captured and/or recaptured annually...

...collared...



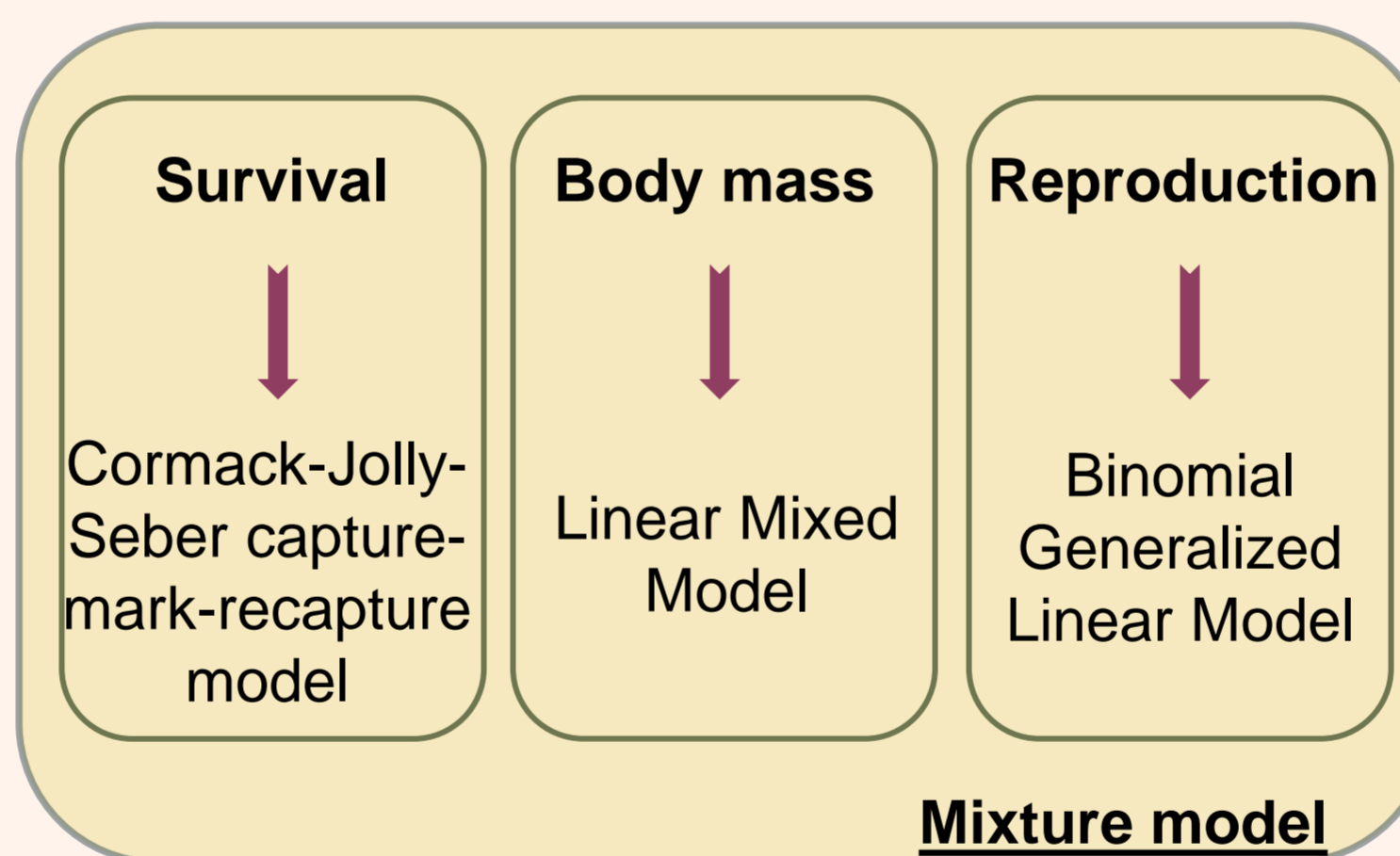
...and weighted.



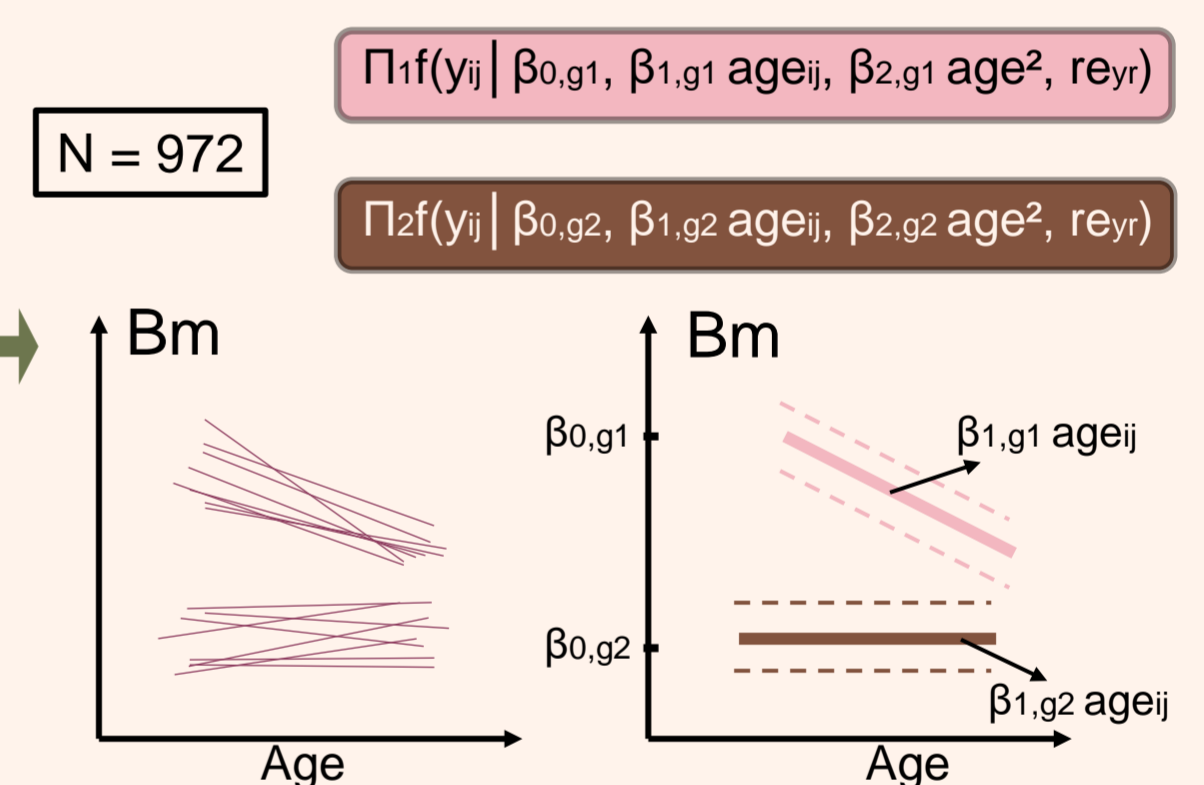
→ The presence of calves was assessed each year.

2

Traits estimation using a mixture model

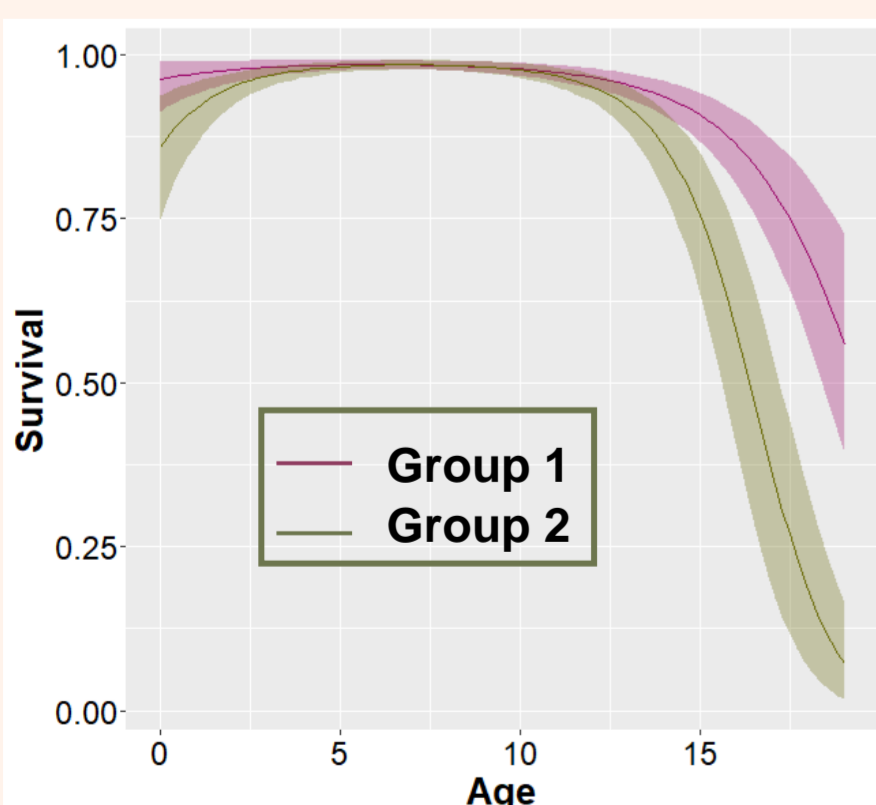


→ Example with body mass

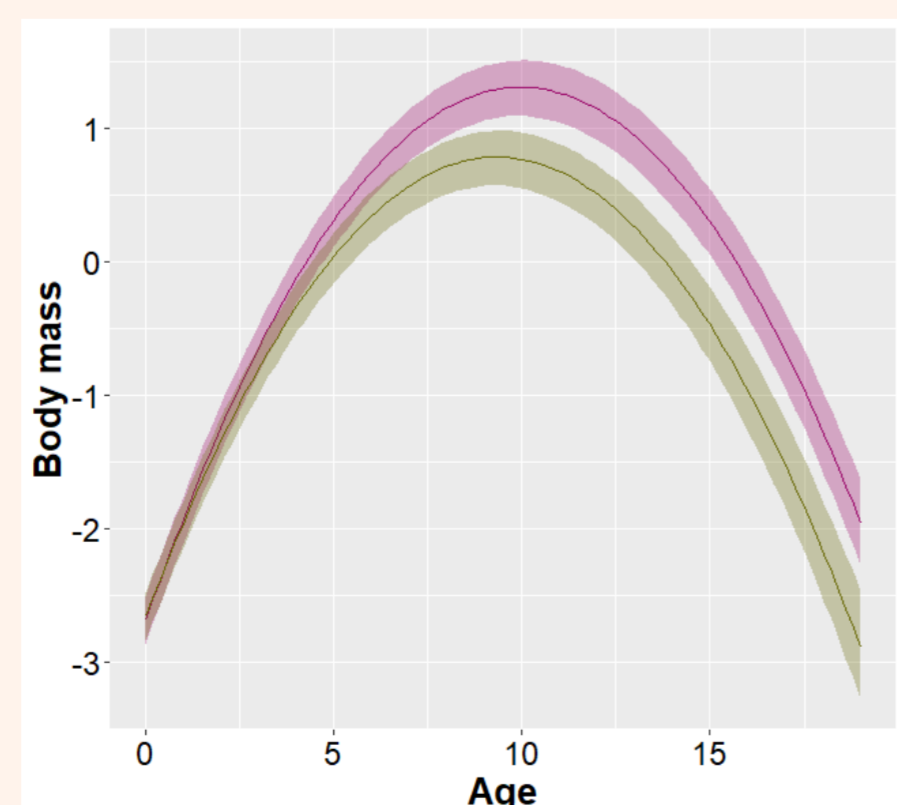


Results

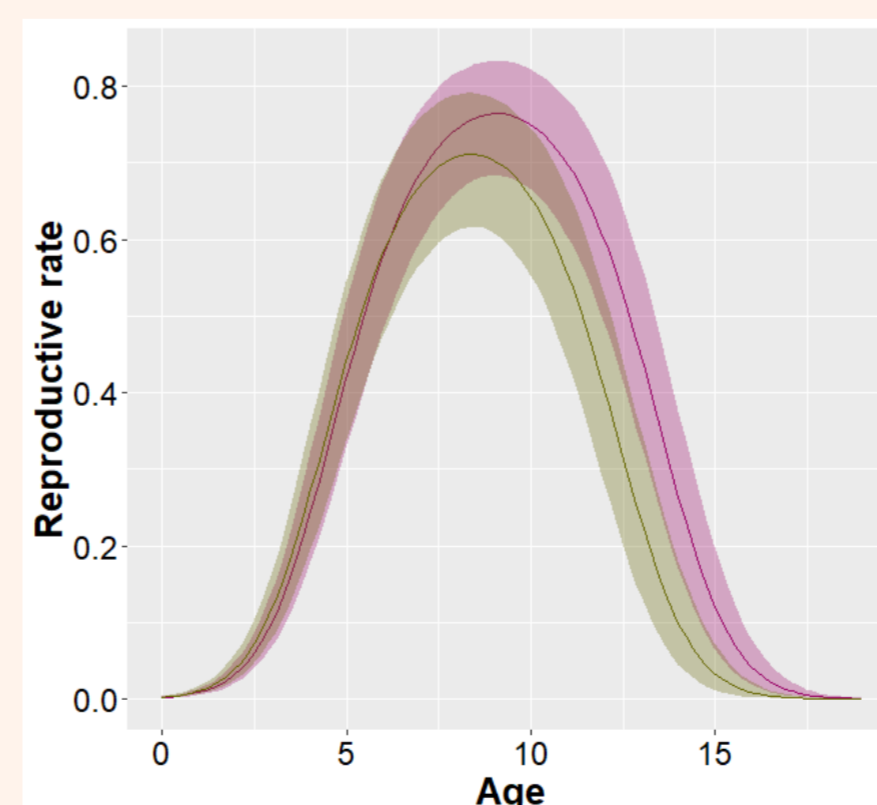
Survival



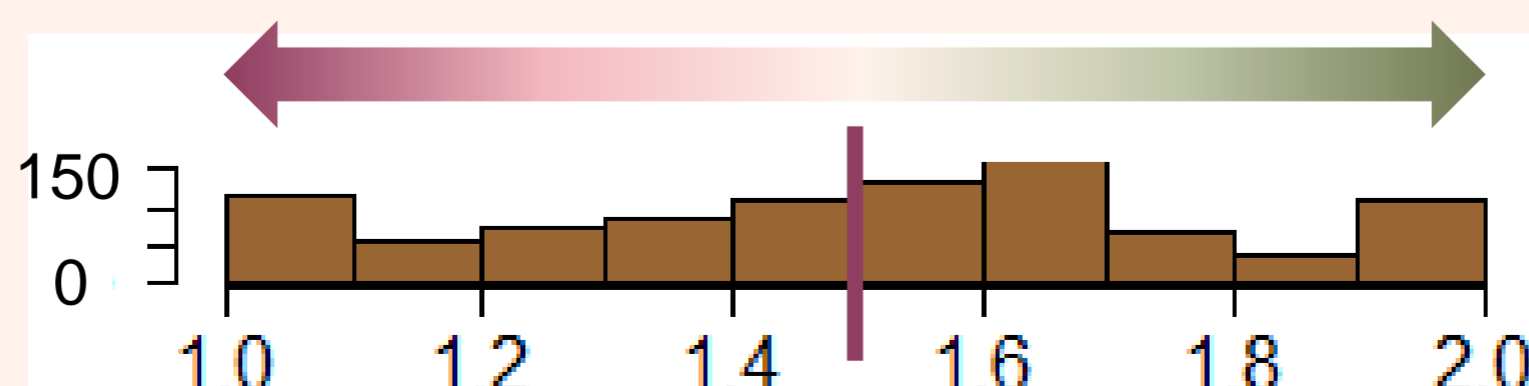
Body mass



Reproduction



Frequency of individuals as a function of their probability to belong to one group.



What's next?

- Incorporating other **life-history** traits, as well as **physiological** and **behavioural** traits to the CMR model. → CHAPTER I
- Testing other functions to determine how traits vary with age (e.g., broken stick, Siler, Gompertz) → CHAPTER I
- Determining how different phenotypes are impacted by **environmental conditions**. → CHAPTER II
- Modelling the future **population dynamics** and the impacts on the ecosystem, while accounting for **phenotypic variability**. → CHAPTER III

Acknowledgments

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