

Statistical modelling for zoonotic diseases

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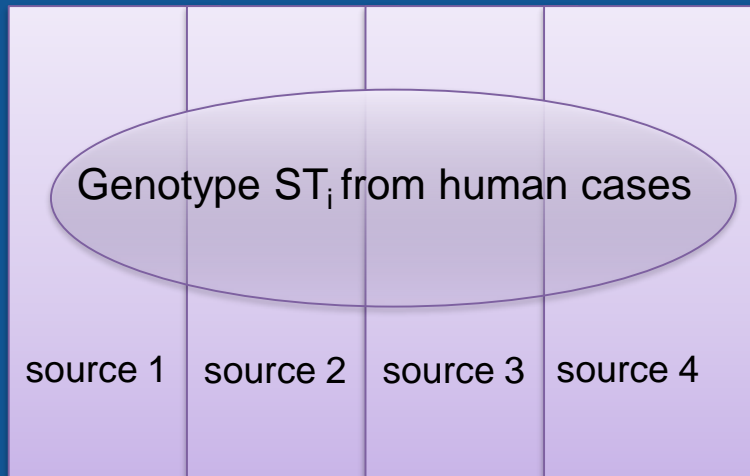
Massey University

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Research questions

- Is the distribution of genotypes in source and human isolates different?
- Do complex (genetic) models yield superior attributions to simple models?
- What role does water play in the transmission of the pathogen?

The Law of Total Probability



$$P(ST_i) = \sum_{j=1}^4 P(ST_i | \text{source } j) P(\text{source } j)$$

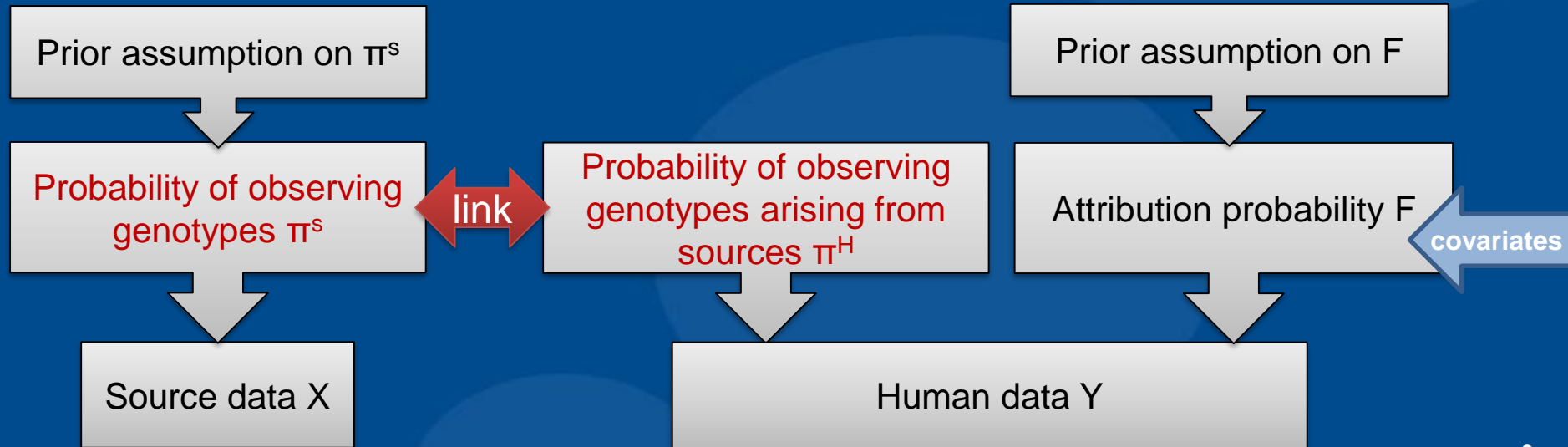
$$= \sum_{j=1}^4 \pi^H_{ij} F_j$$

$$\pi^S_{ij} \quad ? \quad \pi^H_{ij}$$



Modelling scheme

➤ Direct or indirect link between π^S and π^H



Research findings

- The distribution of genotypes differs from sources to human cases
- A simple (non-genetic) model works as effectively as a complex (genetic) model if data provide enough information
- The level of rurality at which a case is located may affect the pattern of source attribution of campylobacteriosis
- Water birds are highly likely responsible for water contamination in the transmission



Thank you for listening!

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