

# Statistical modelling for zoonotic diseases

**Sih-Jing Liao**

**Supervisors: Professor Martin Hazelton  
Dr. Jonathan Marshall  
Distinguished Professor Nigel French**

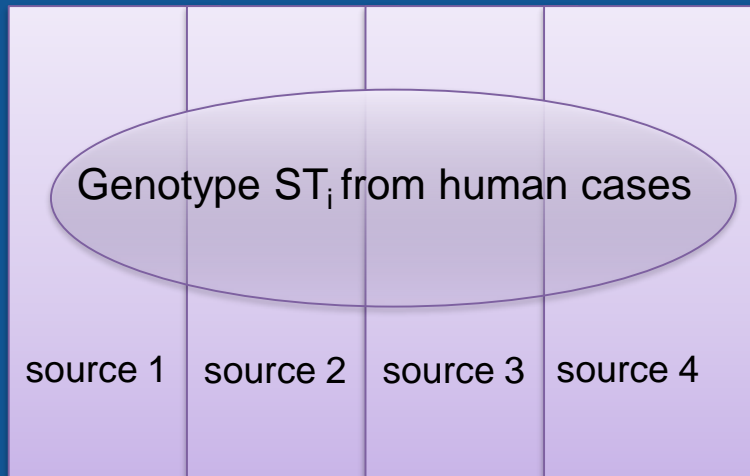
**Massey University**

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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



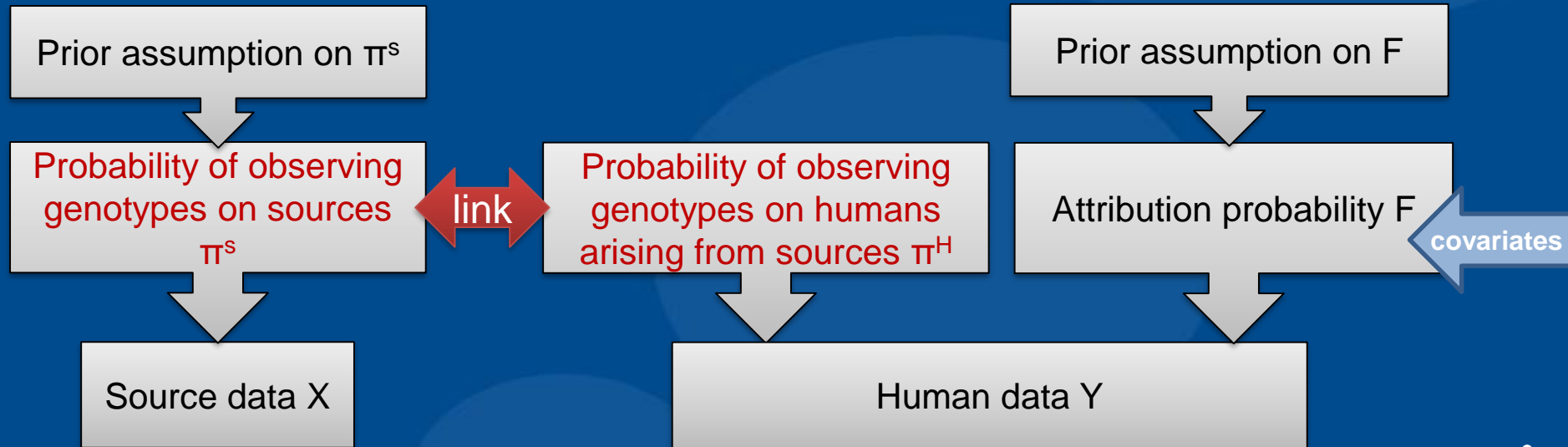
$$P(ST_i) = \sum_{j=1}^4 P(ST_i \mid \text{source } j)P(\text{source } j)$$

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

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

# Modelling scheme

## ➤ Direct or indirect link between $\pi^S$ and $\pi^H$



## 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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