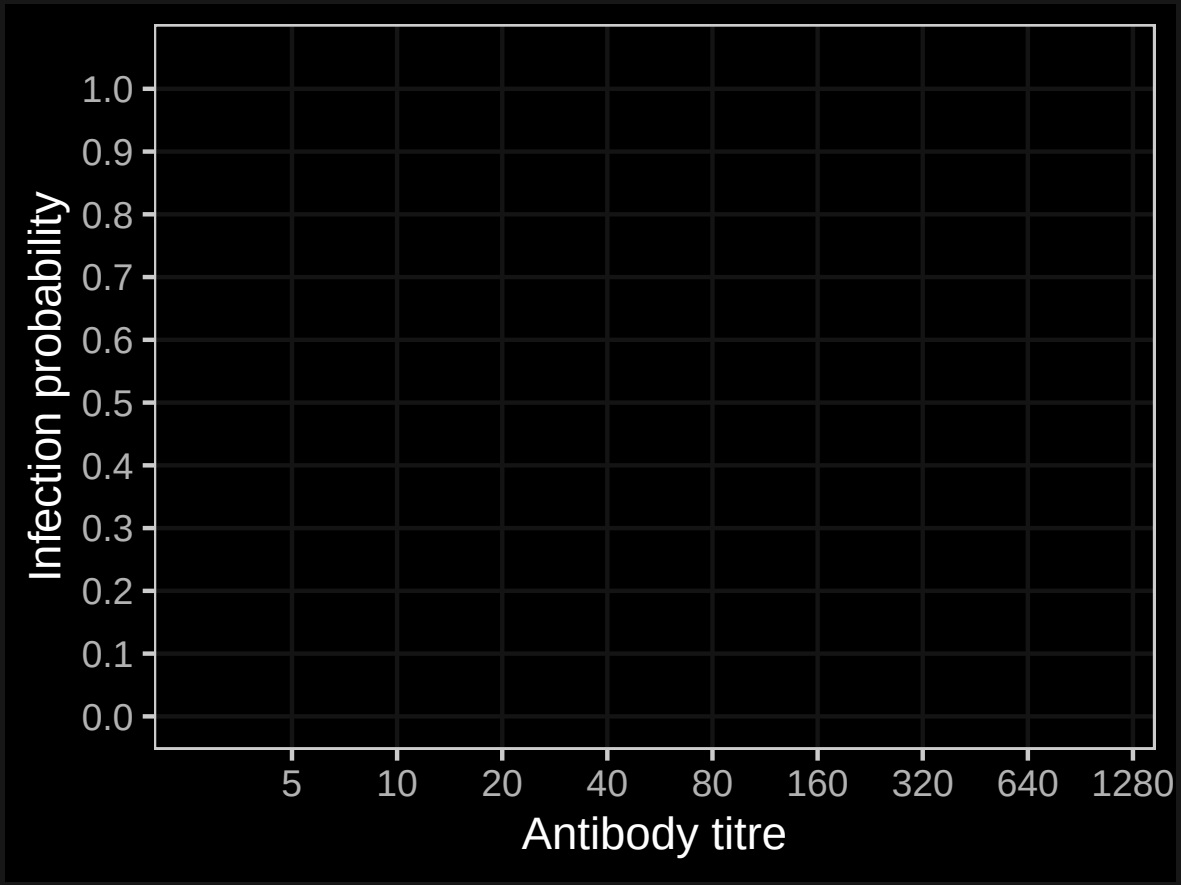
Models for Antibody Data

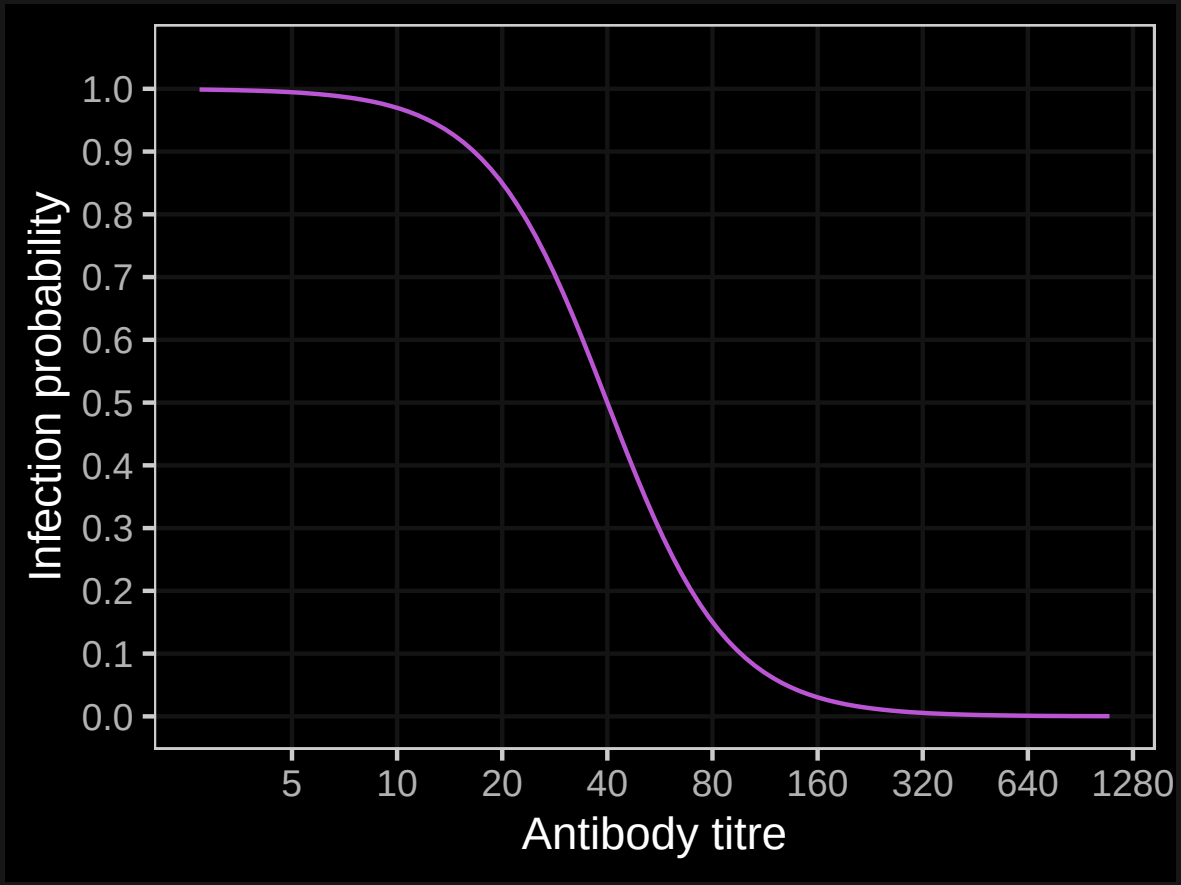
Data example

Infection status	Antibody titre
1	5
0	20
0	40
1	10
0	80
...	...

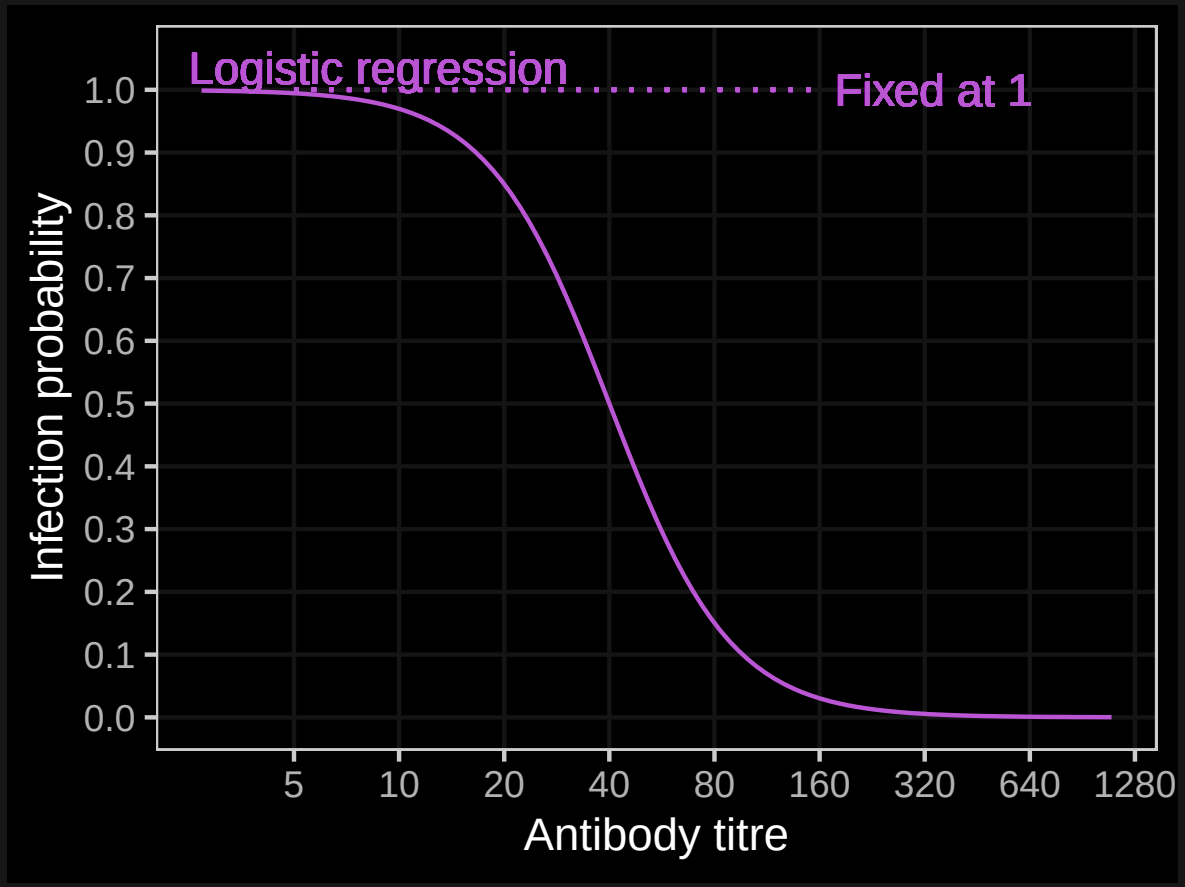
Probability profiles



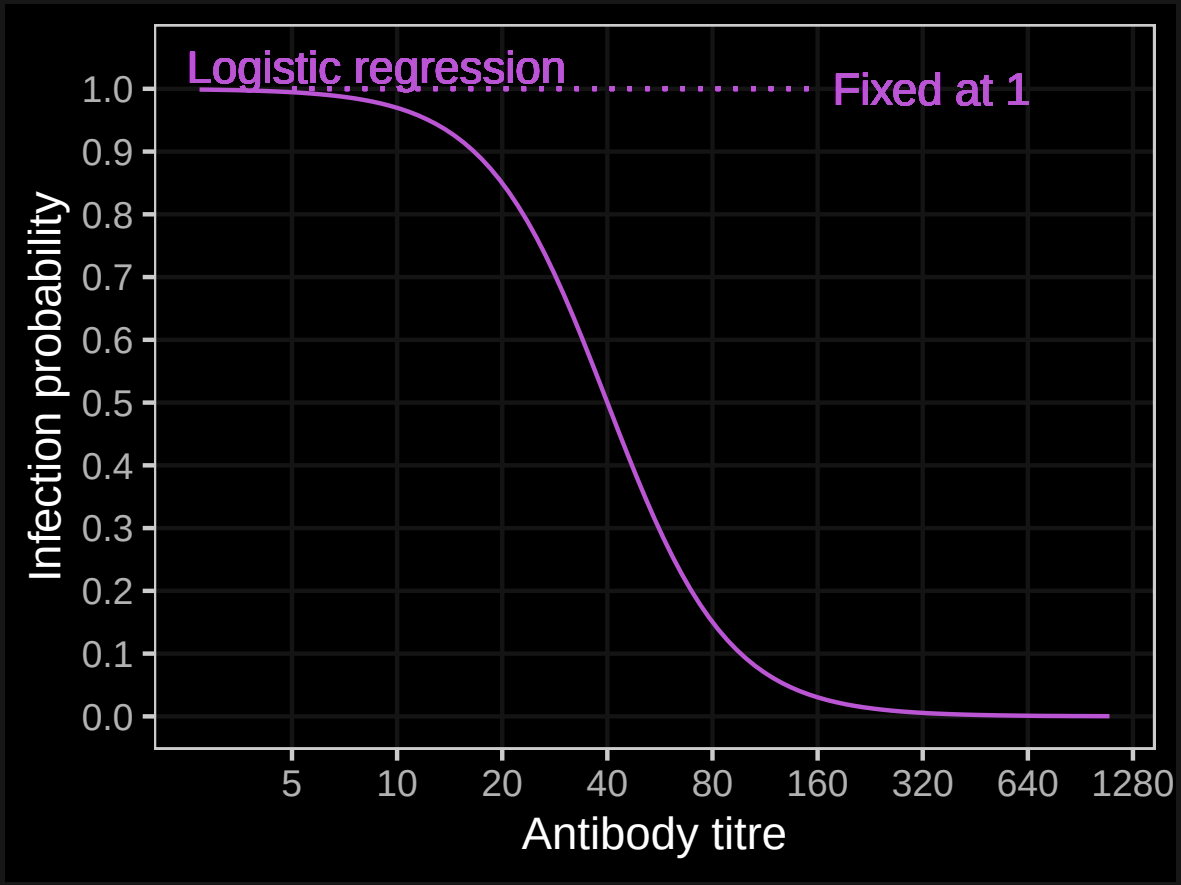
Probability profiles



Probability profiles

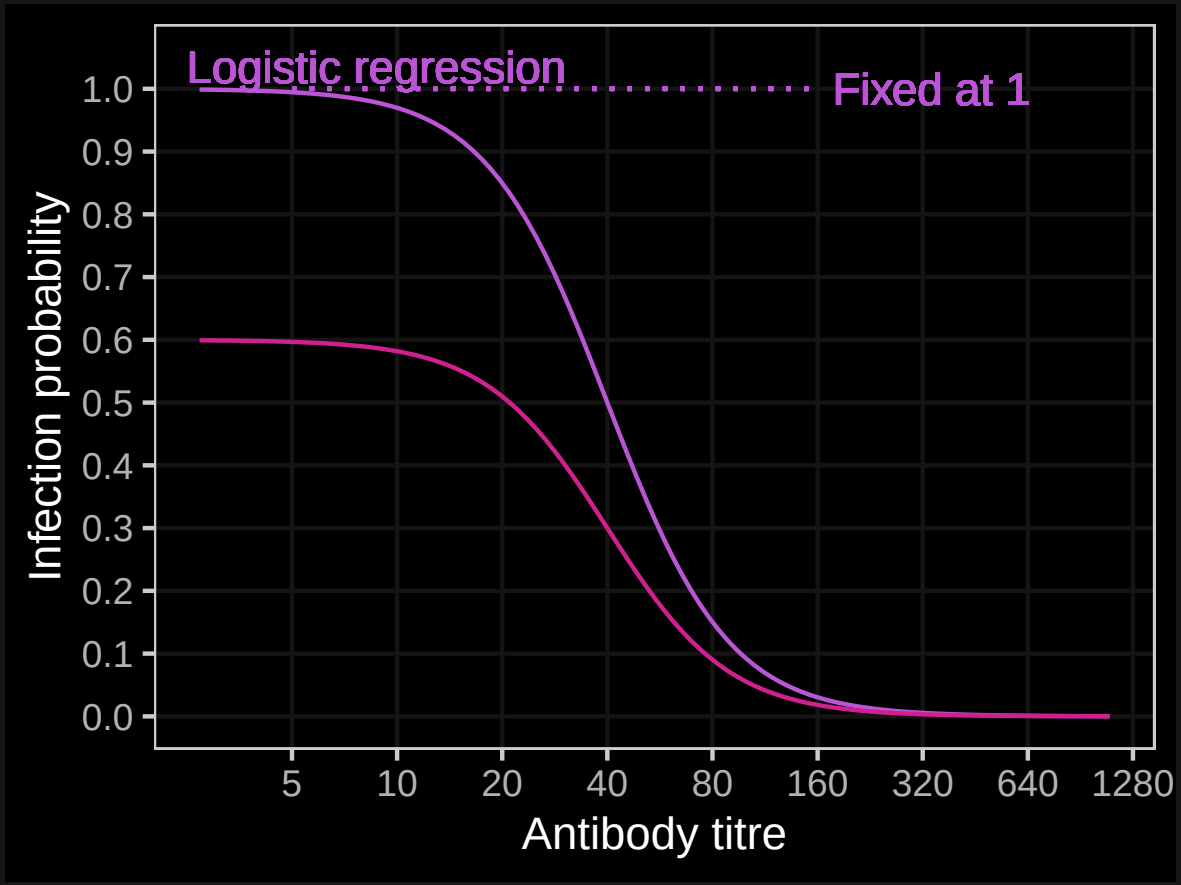


Probability profiles



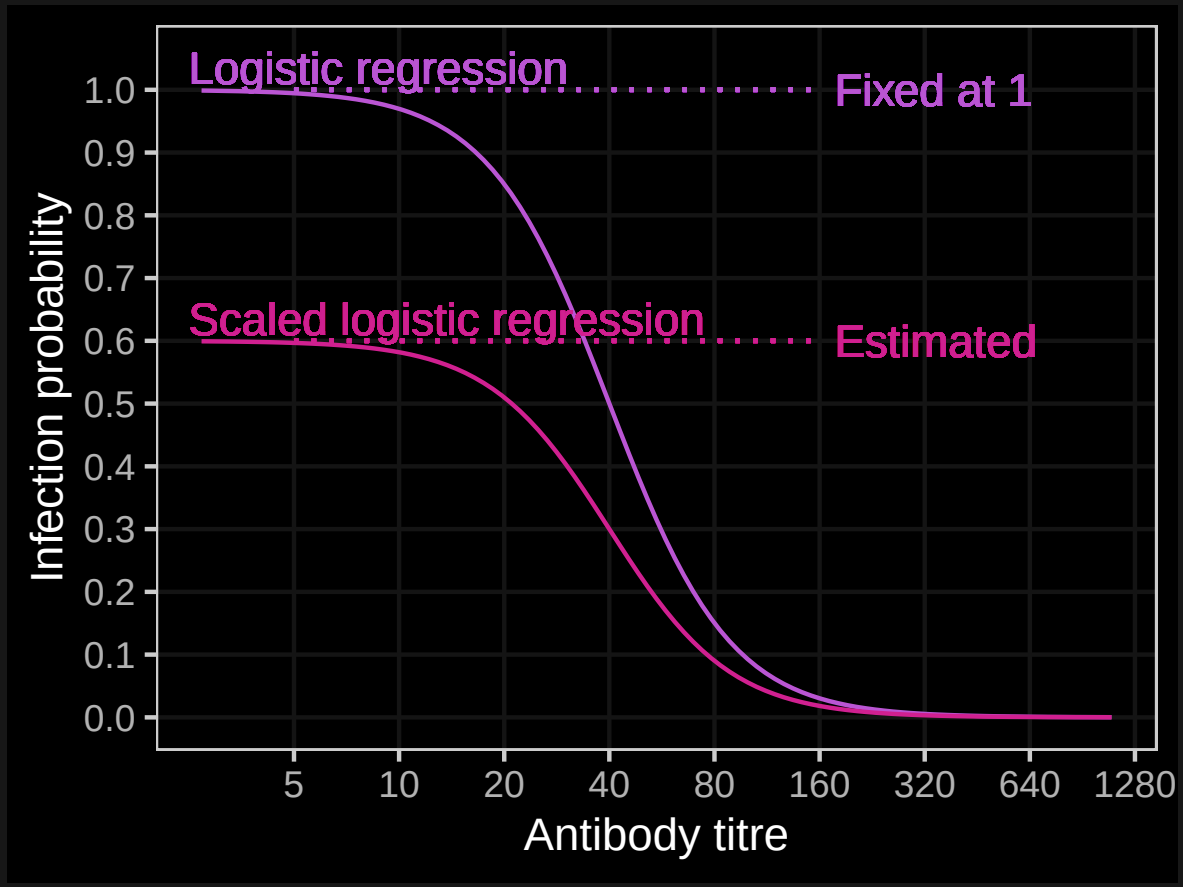
	Top	Bottom	Change
Logistic	Fixed at 1	Fixed at 0	S-shape

Probability profiles



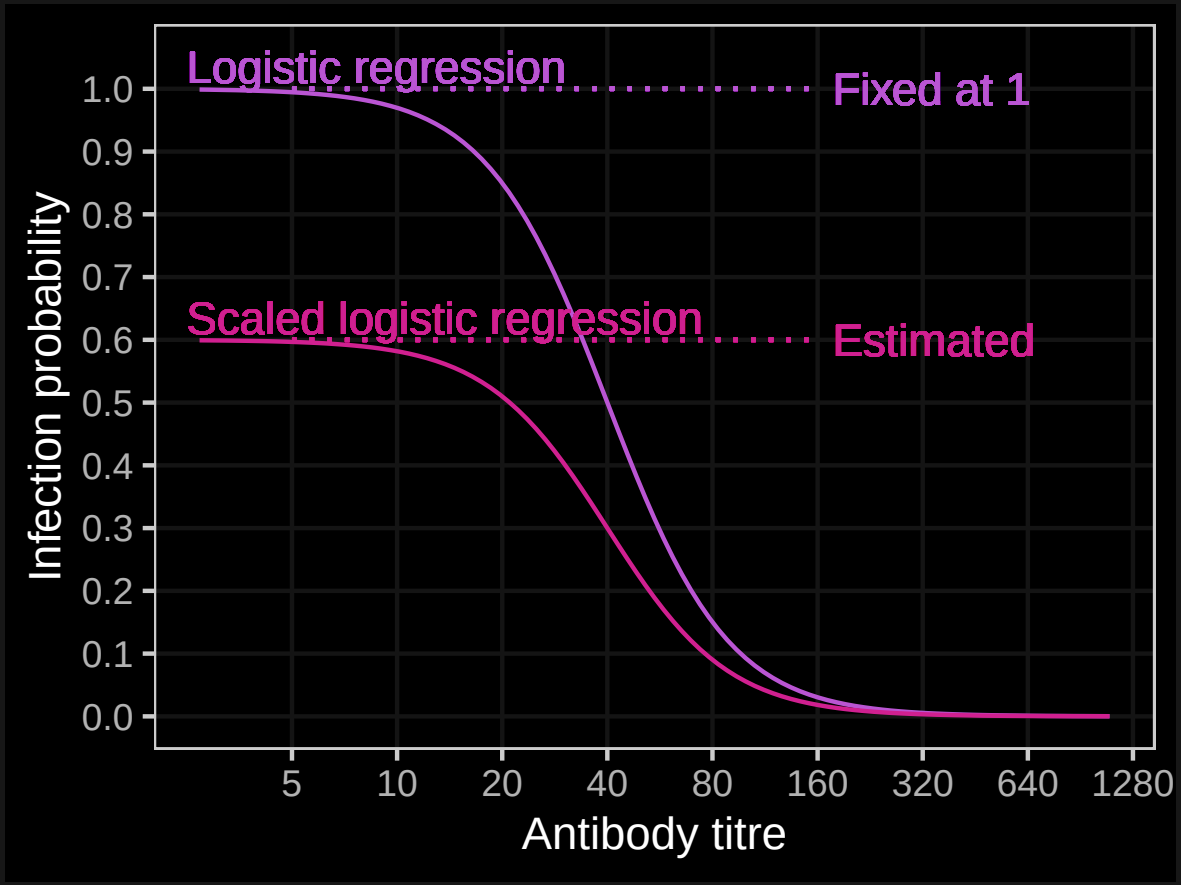
	Top	Bottom	Change
Logistic	Fixed at 1	Fixed at 0	S-shape

Probability profiles



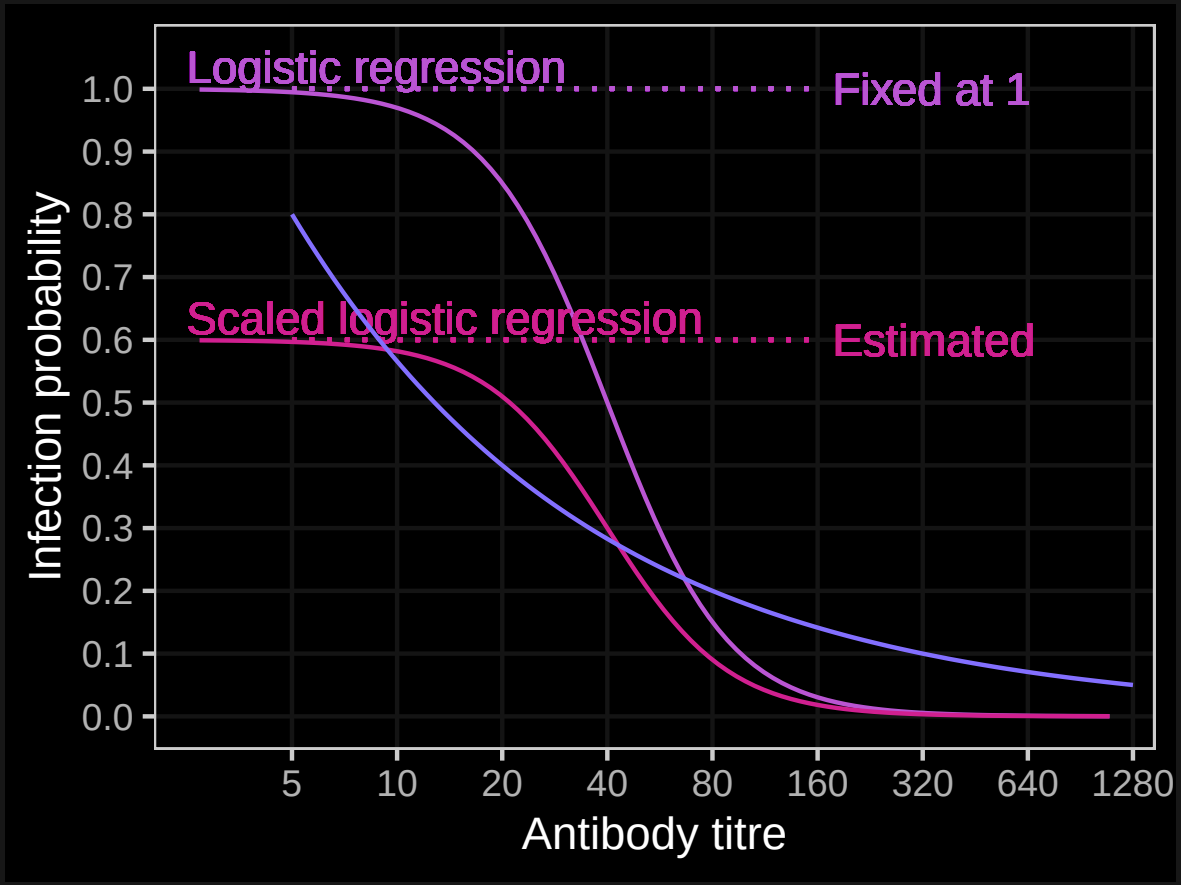
	Top	Bottom	Change
Logistic	Fixed at 1	Fixed at 0	S-shape

Probability profiles



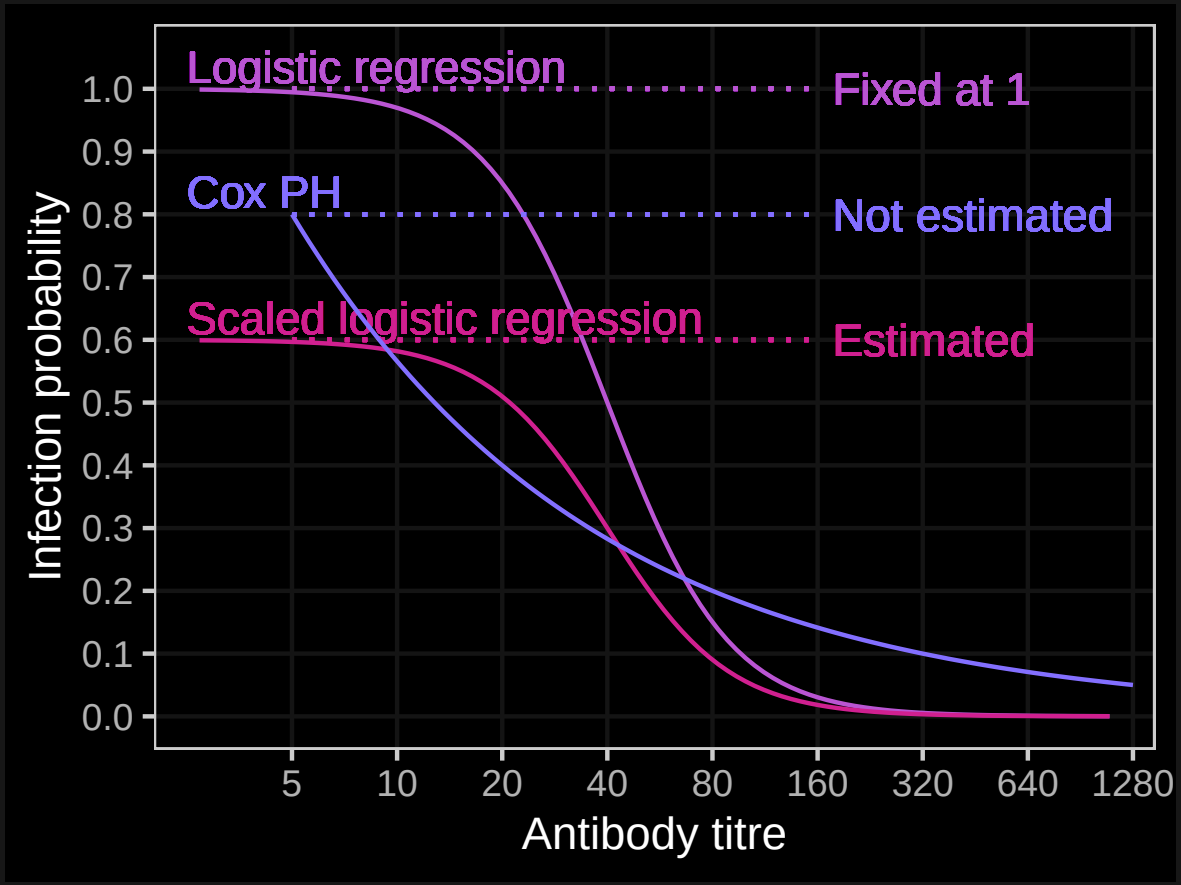
	Top	Bottom	Change
Logistic	Fixed at 1	Fixed at 0	S-shape
Scaled logistic	Estimated	Fixed at 0	S-shape

Probability profiles



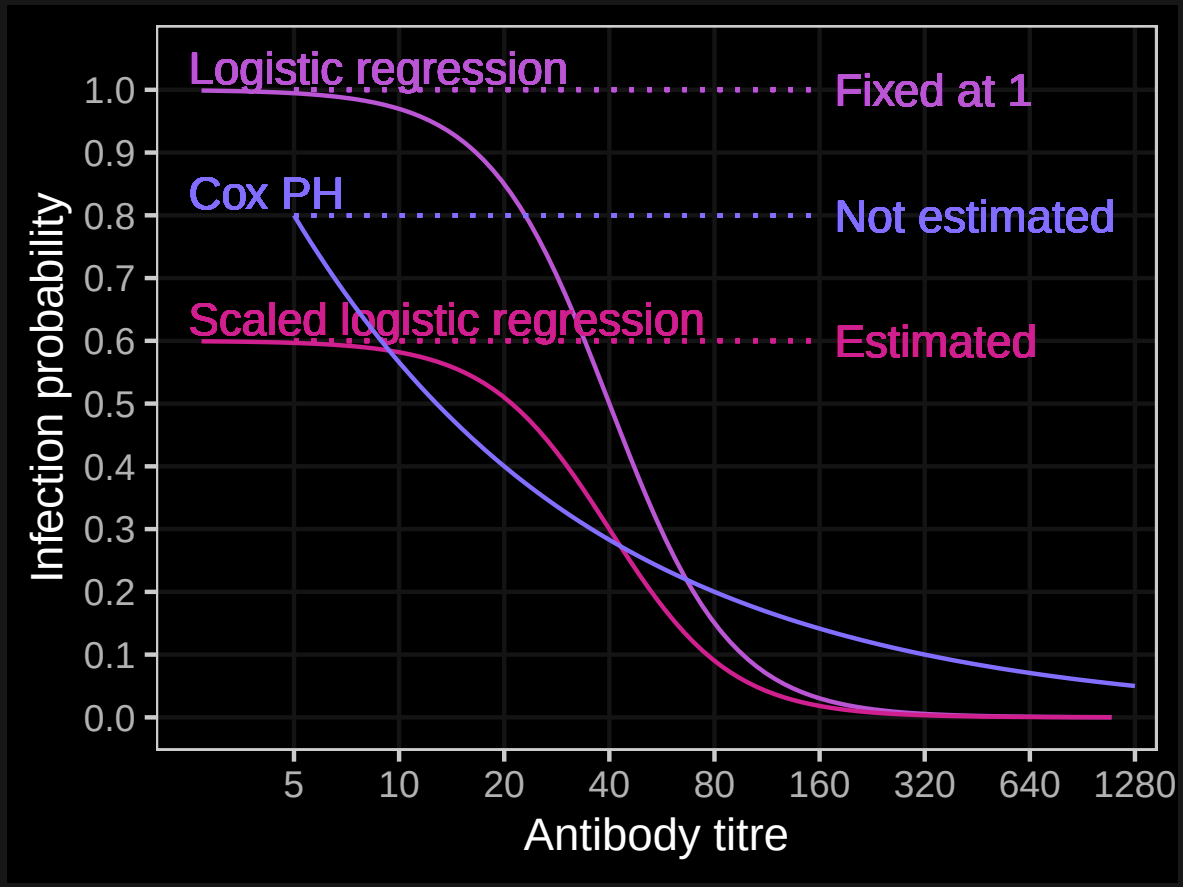
	Top	Bottom	Change
Logistic	Fixed at 1	Fixed at 0	S-shape
Scaled logistic	Estimated	Fixed at 0	S-shape

Probability profiles



	Top	Bottom	Change
Logistic	Fixed at 1	Fixed at 0	S-shape
Scaled logistic	Estimated	Fixed at 0	S-shape

Probability profiles



	Top	Bottom	Change
Logistic	Fixed at 1	Fixed at 0	S-shape
Scaled logistic	Estimated	Fixed at 0	S-shape
Cox PH	Not estimated	Not estimated	Exponential

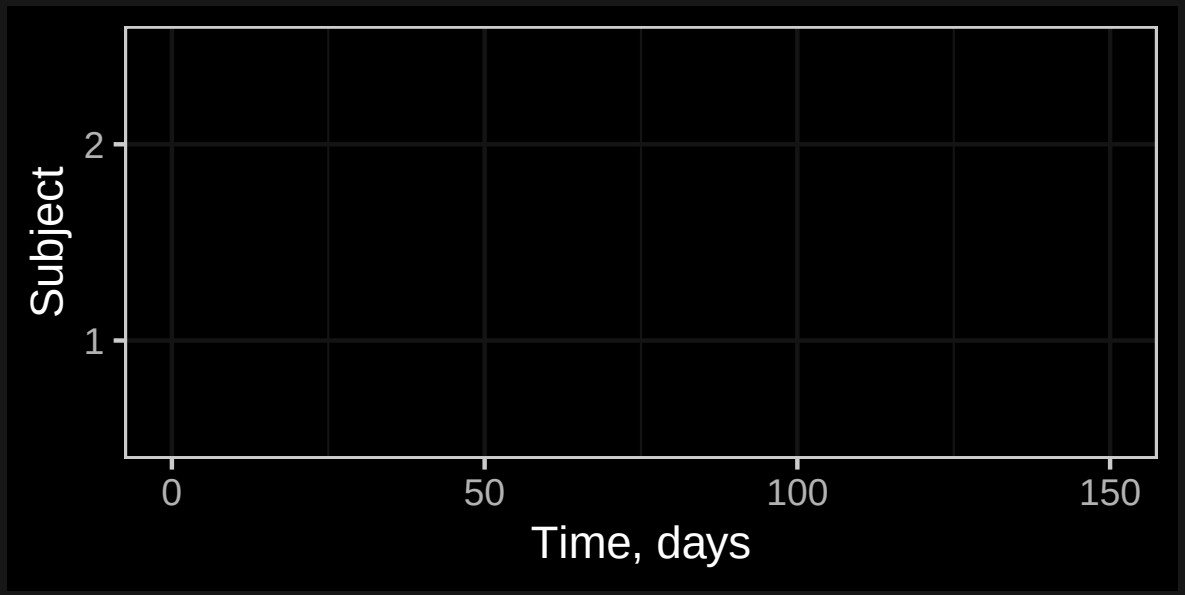
Cox model data

Infection status	Antibody titre
1	5
0	20
0	40
1	10
0	80
...	...

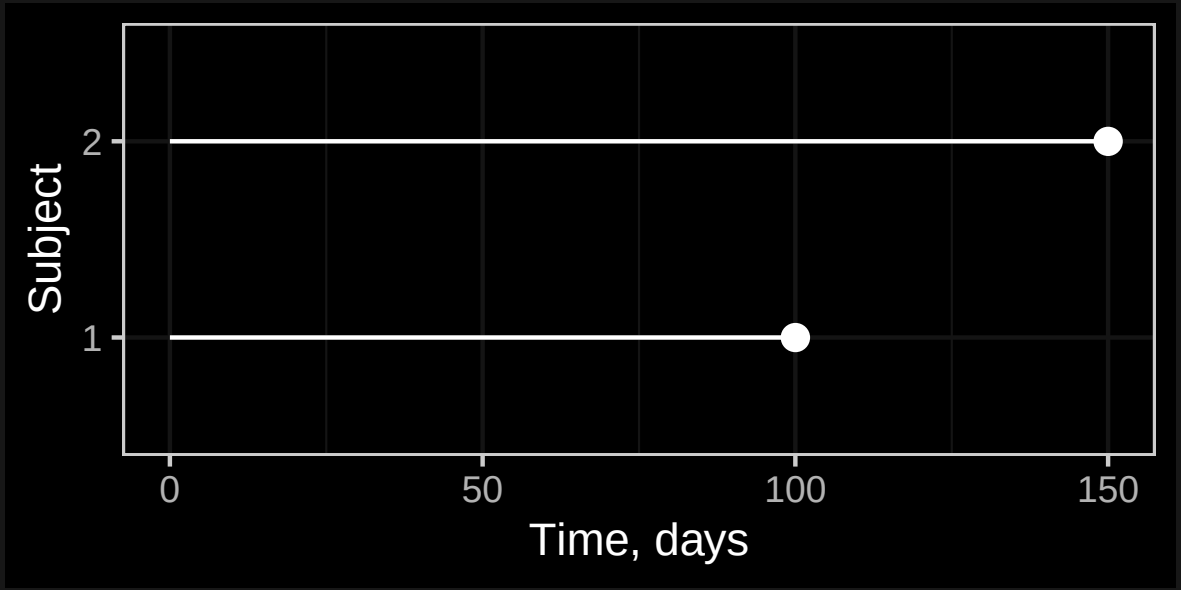
Cox model data

Infection status	Antibody titre	Time
1	5	78
0	20	97
0	40	85
1	10	110
0	80	133
...	...	...

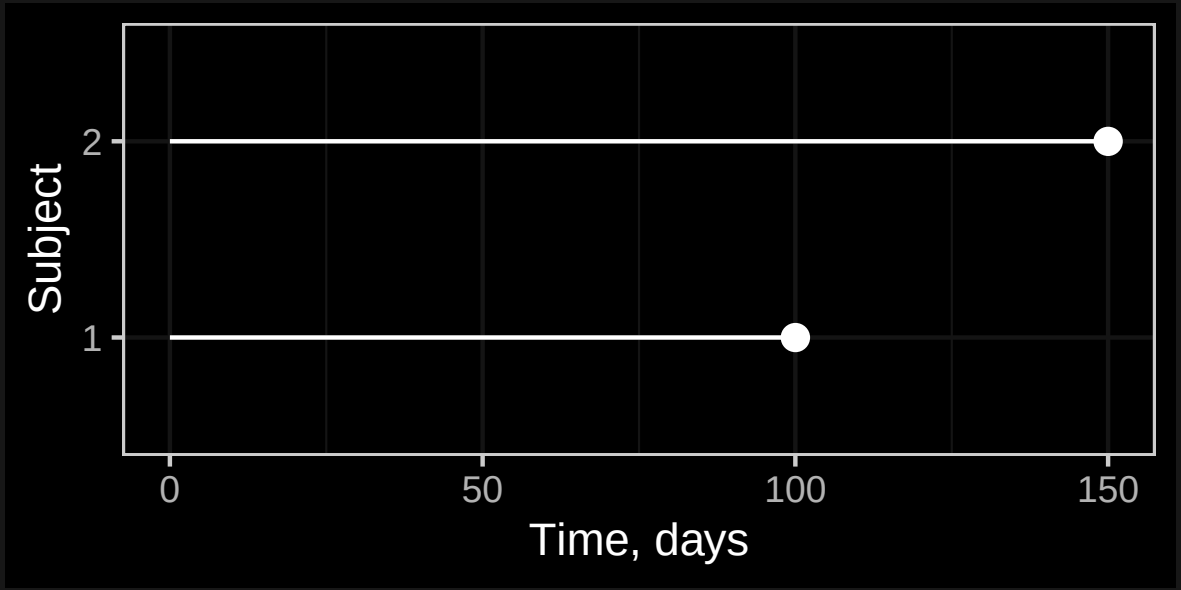
Cox model time



Cox model time

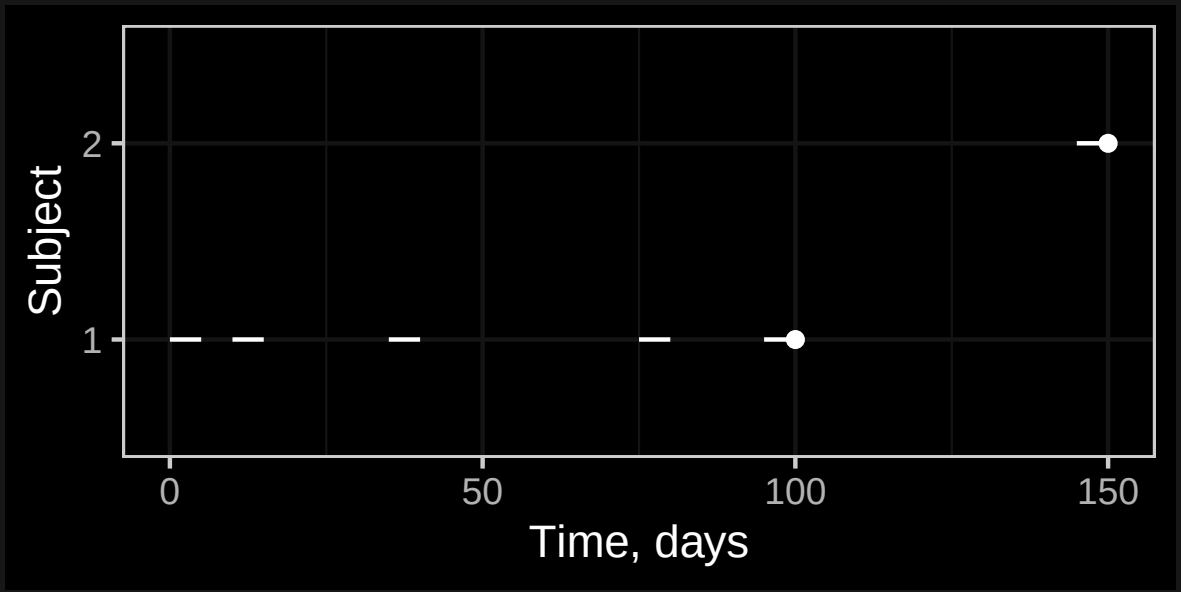


Cox model time



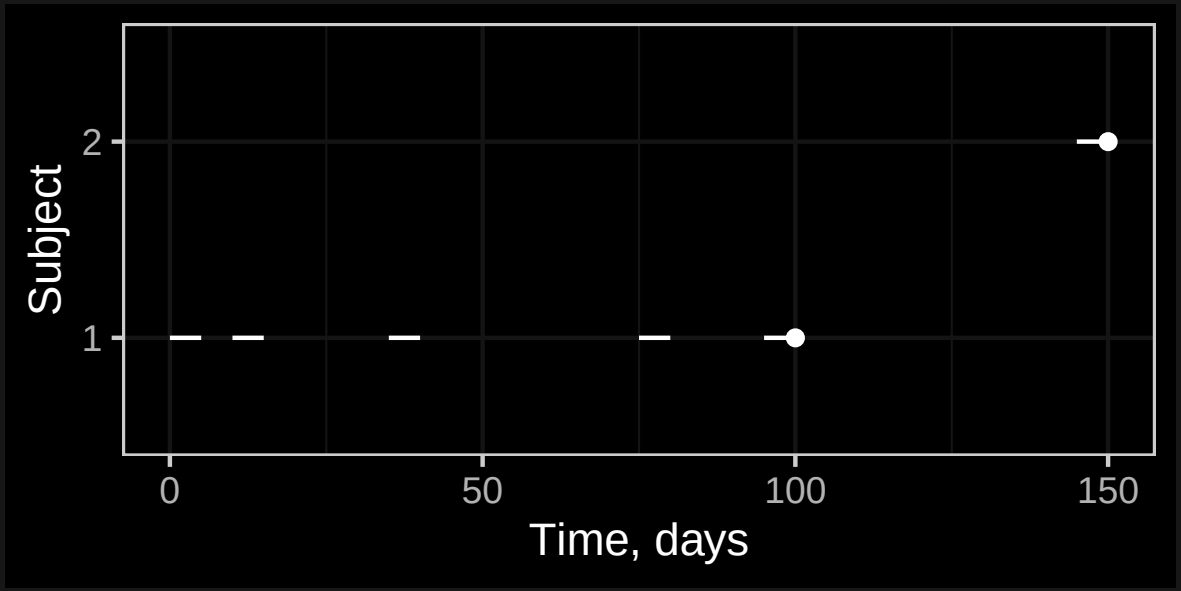
Cox model assumes that time is: time at risk of an observable event.

Cox model time



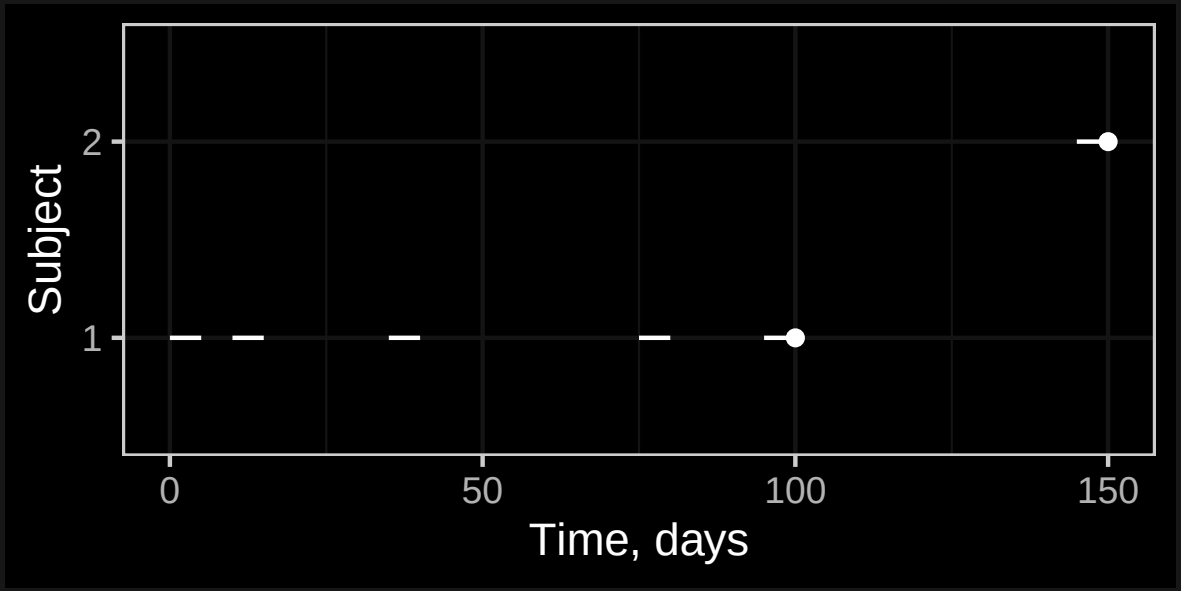
Cox model assumes that time is: time at risk of an observable event.

Cox model time



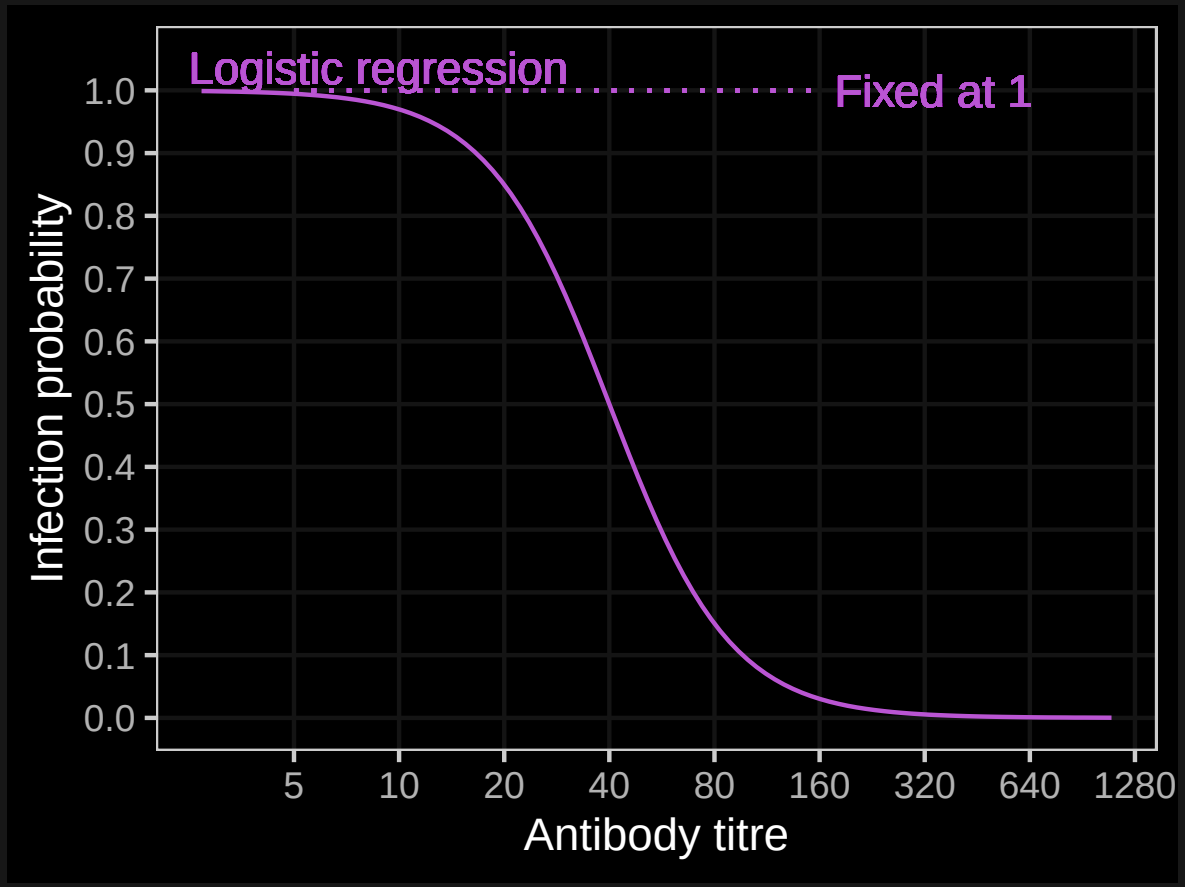
Not necesarily a problem with an additional assumption.

Cox model time



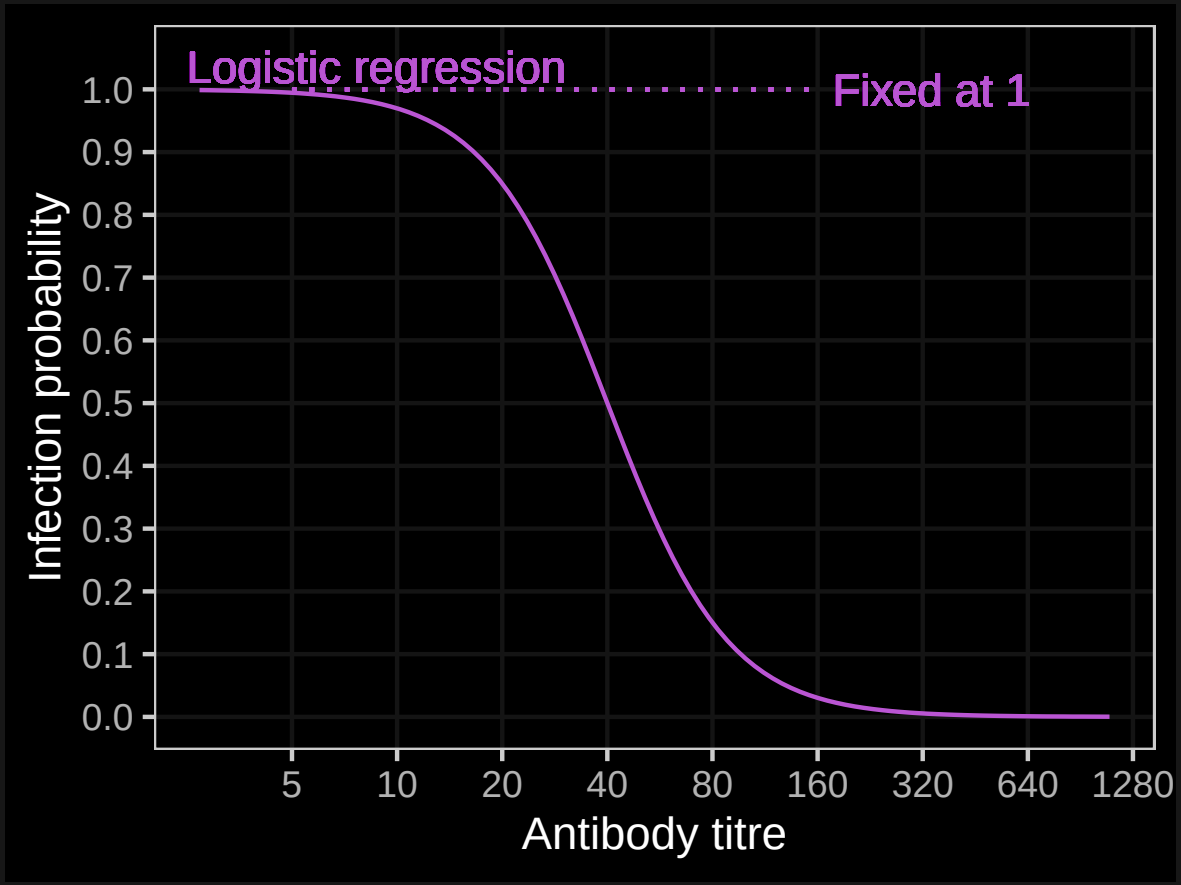
Not necesarily a problem with an additional assumption.
Time of follow-up is proportional to time at risk.

Logistic regression



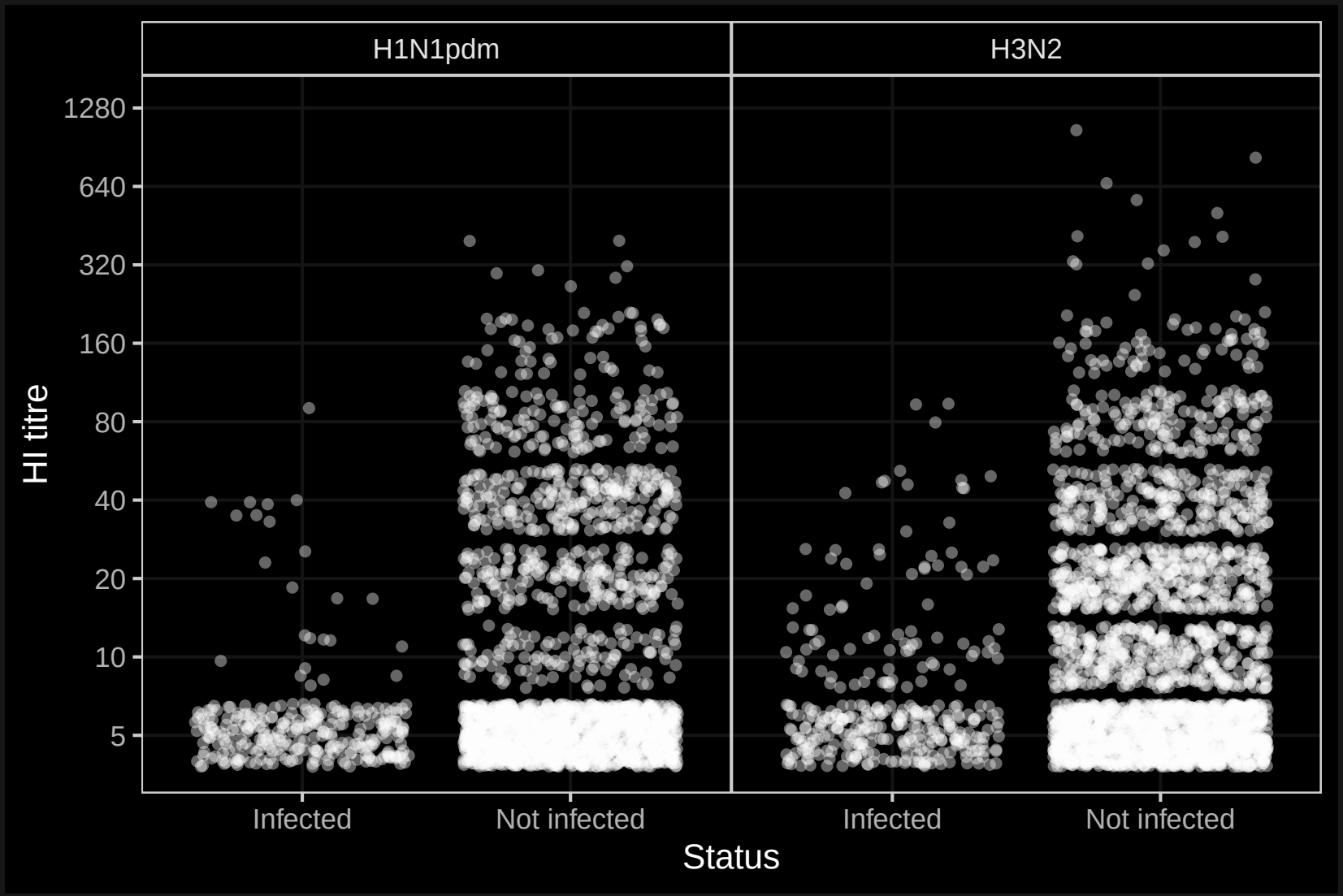
	Top	Bottom	Change
Logistic	Fixed at 1	Fixed at 0	S-shape

Logistic regression

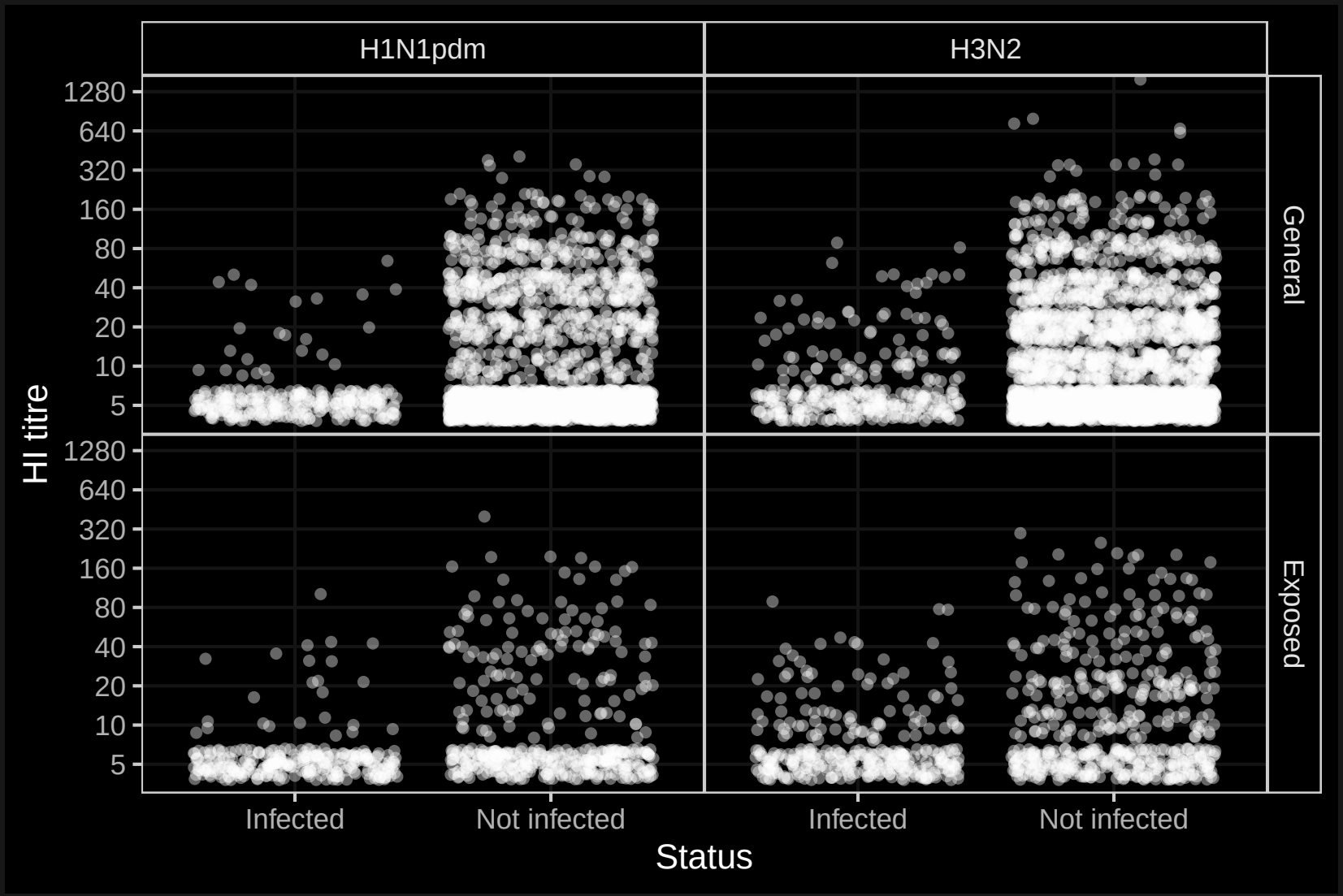


	Top	Bottom	Change
Logistic	Fixed at 1	Fixed at 0	S-shape

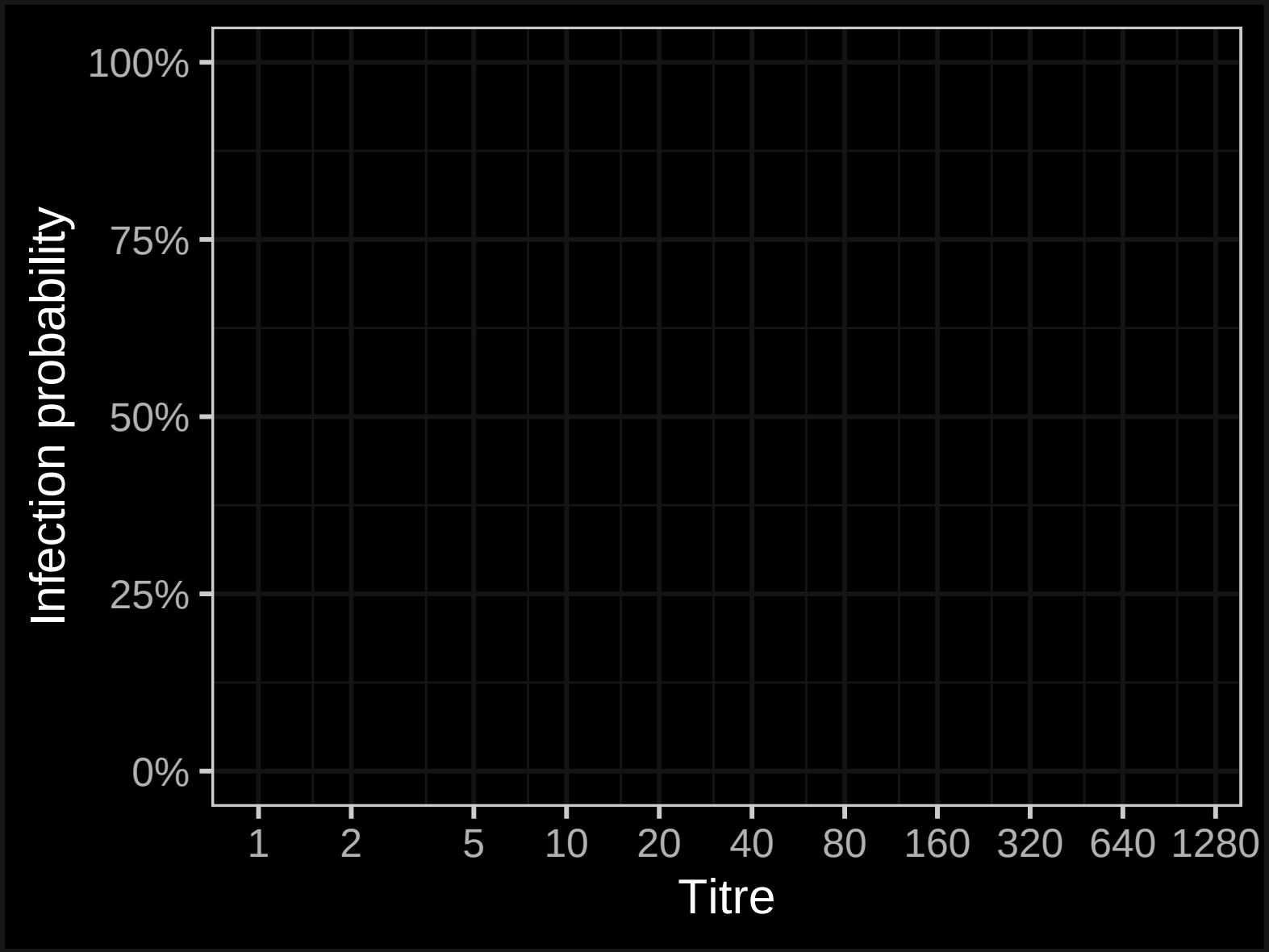
Hanam cohort — everyone



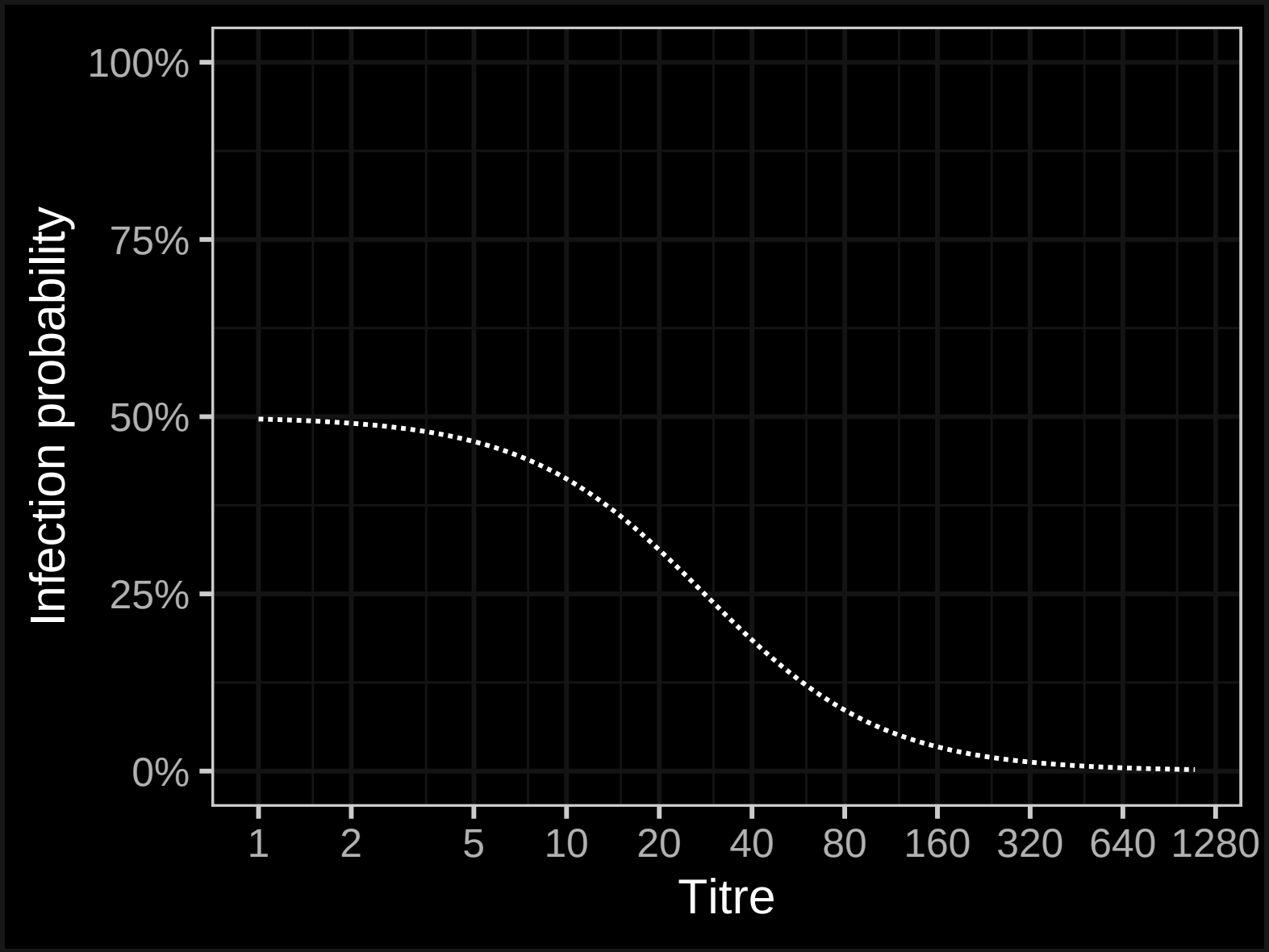
Hanam cohort — exposed



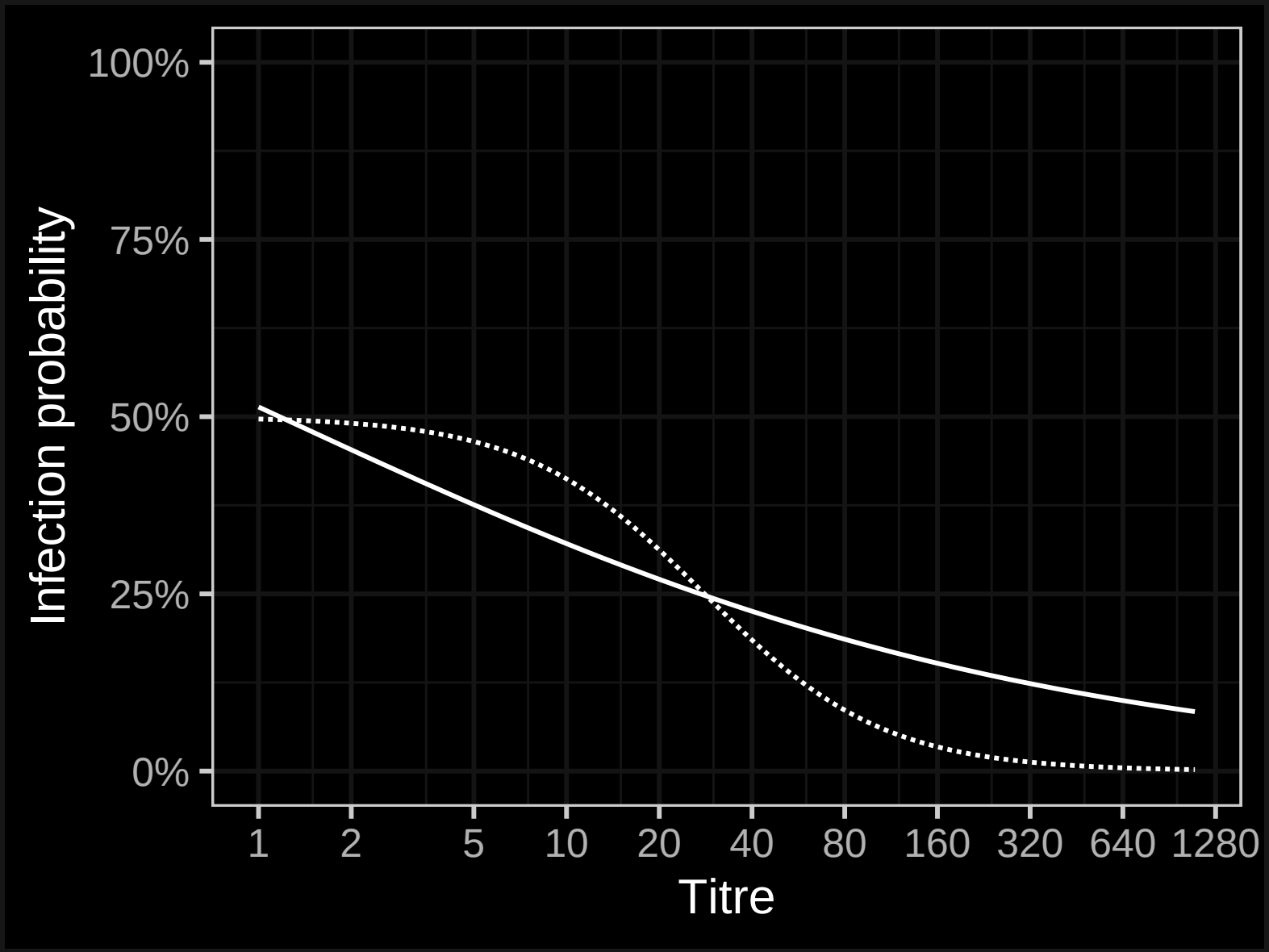
Logistic fit



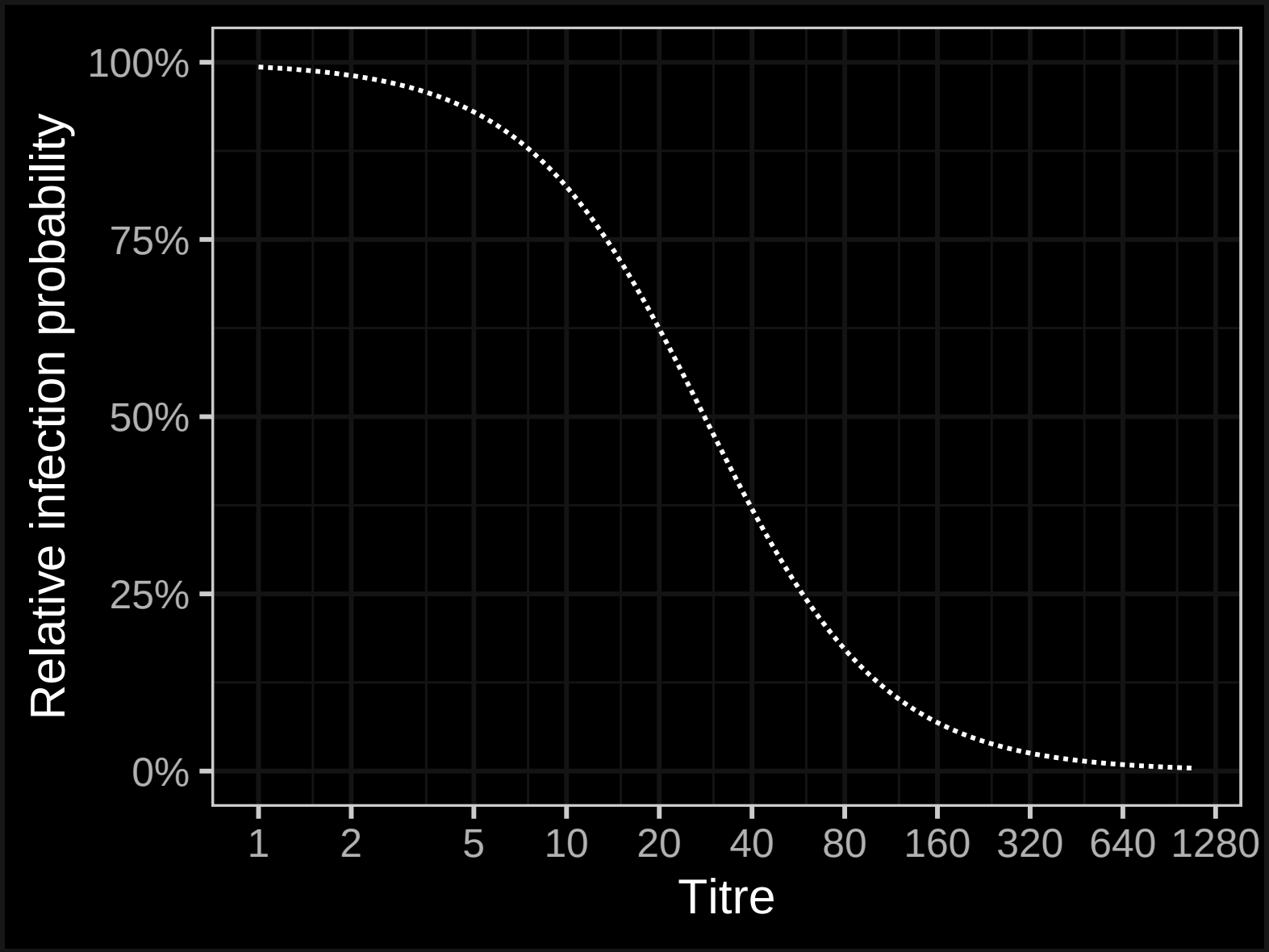
Logistic fit



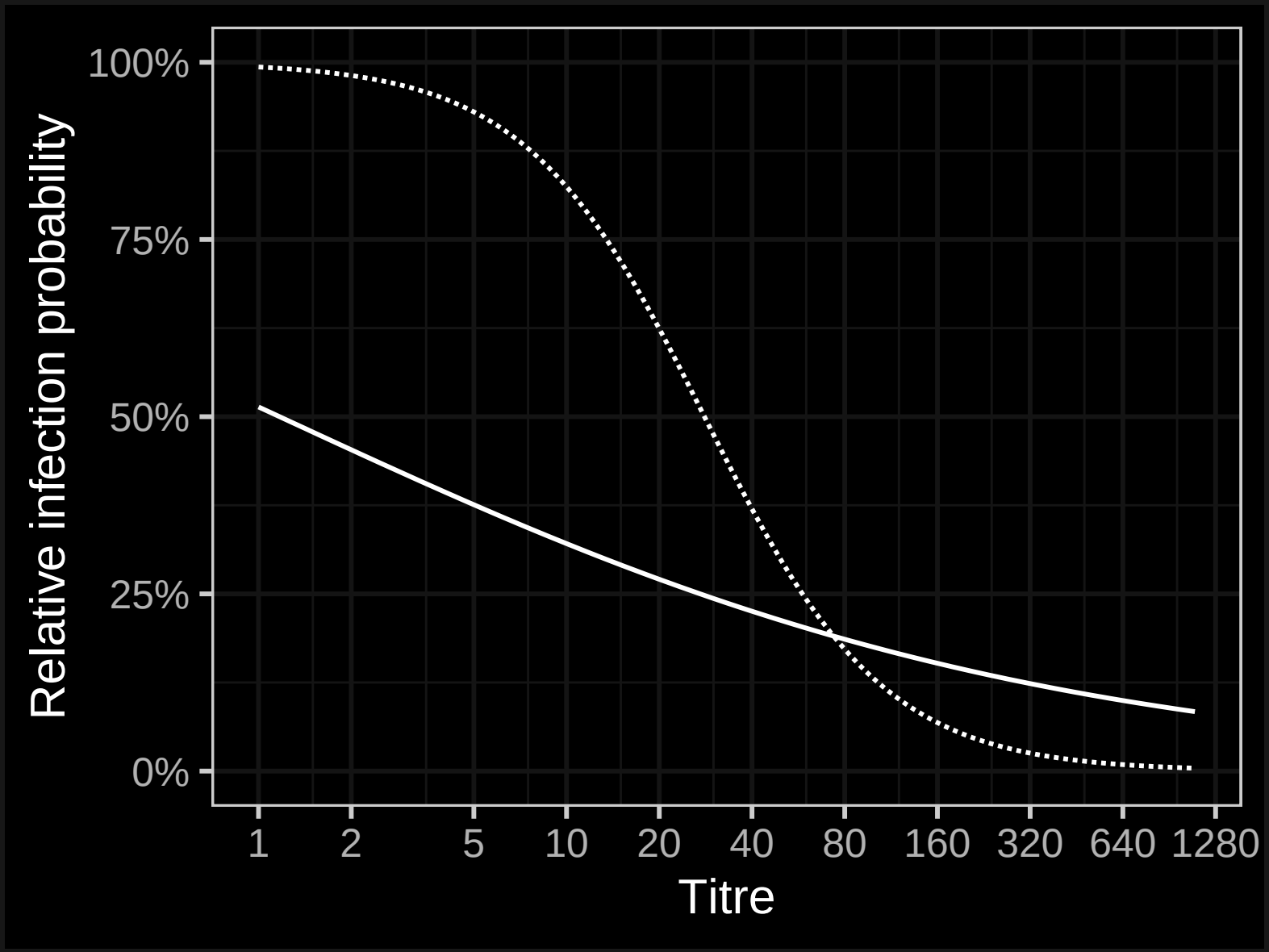
Logistic fit



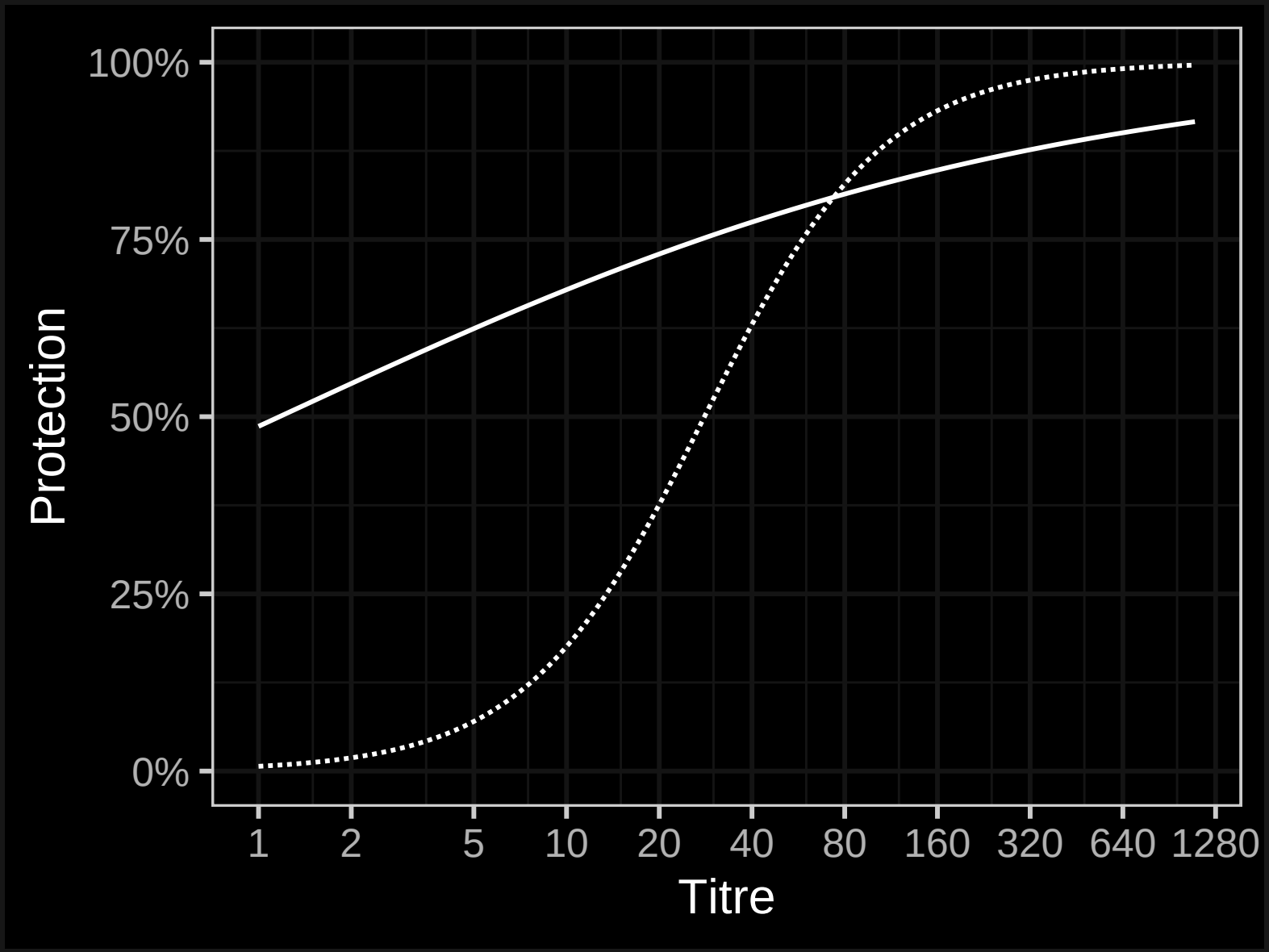
Logistic fit



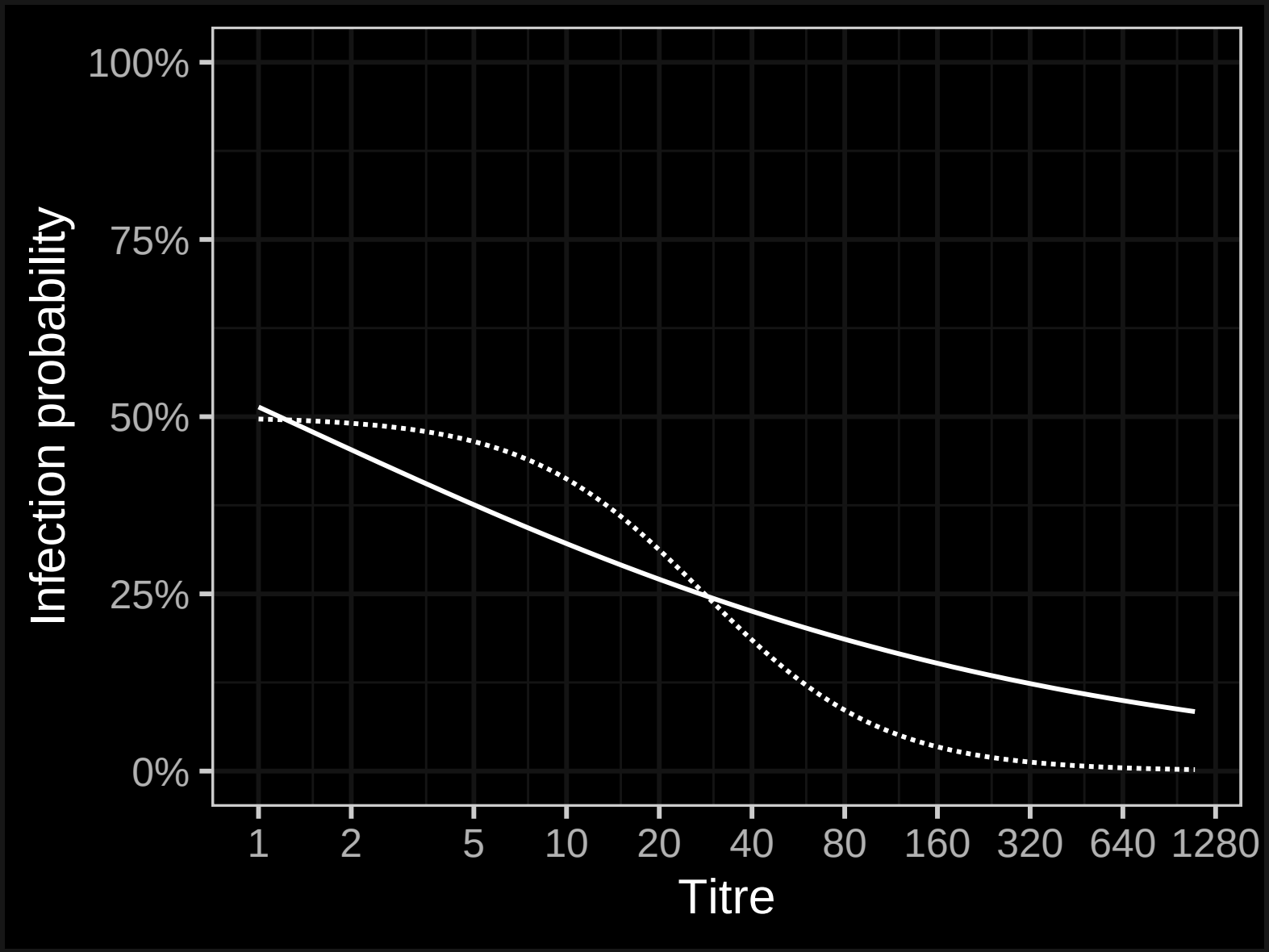
Logistic fit



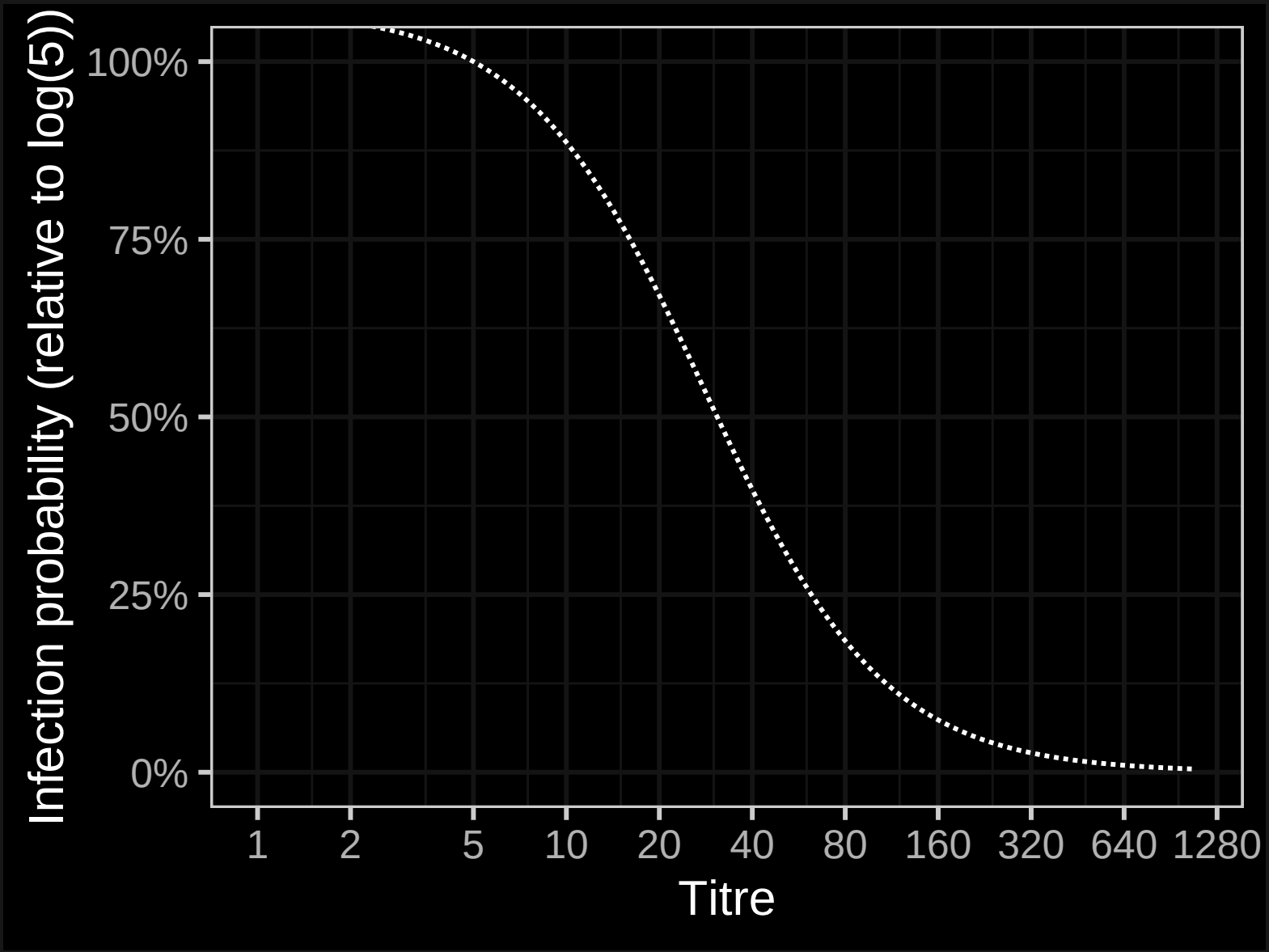
Logistic fit



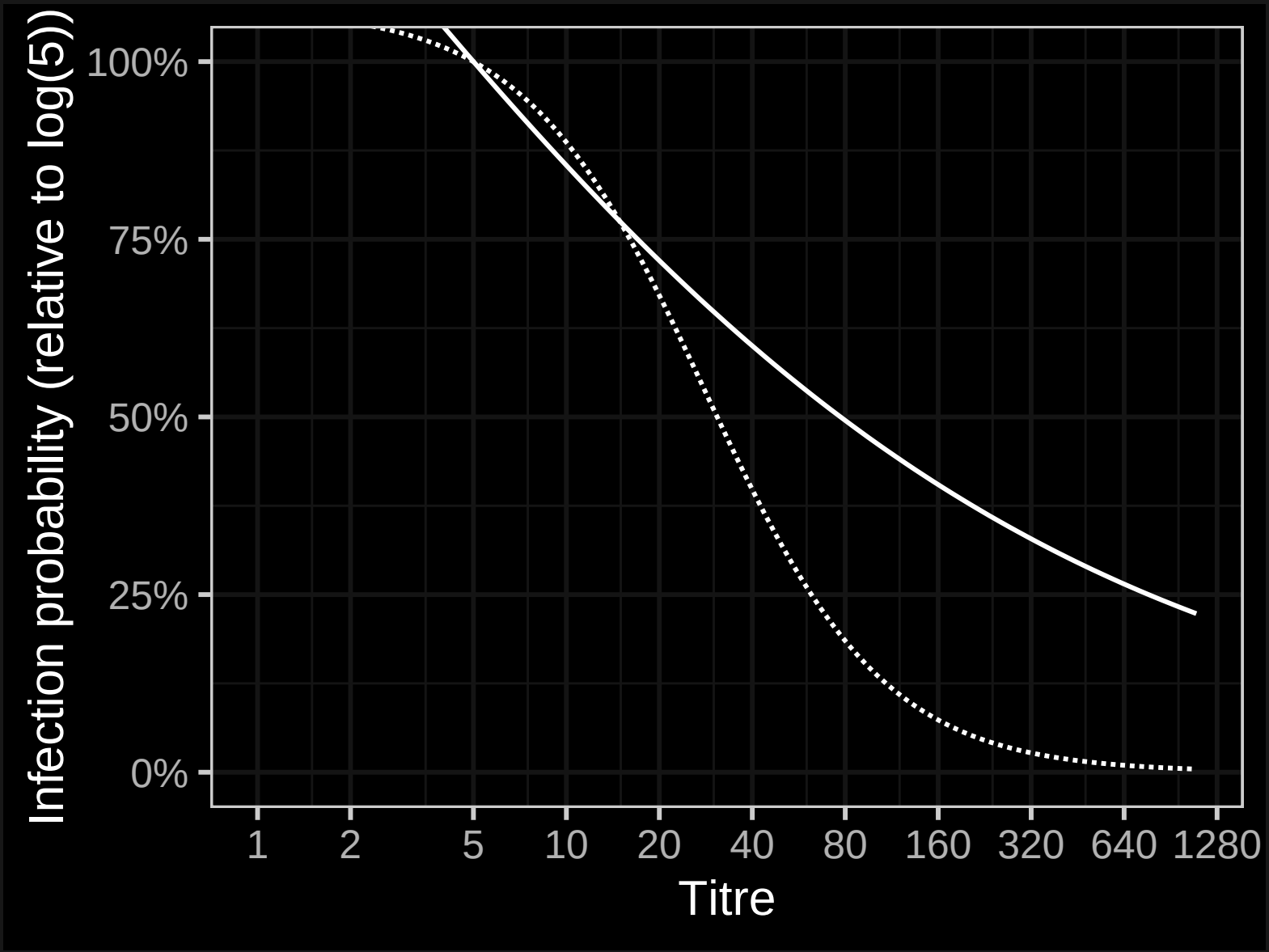
Logistic fit



Logistic fit



Logistic fit



Relative protection curve

Relative protection curve

- Unreliable with logistic regression

Relative protection curve

- Unreliable with logistic regression
  - Derived from fitted infection probabilities

Relative protection curve

- Unreliable with logistic regression
  - Derived from fitted infection probabilities
  - Titre of 5 is not a real measurement

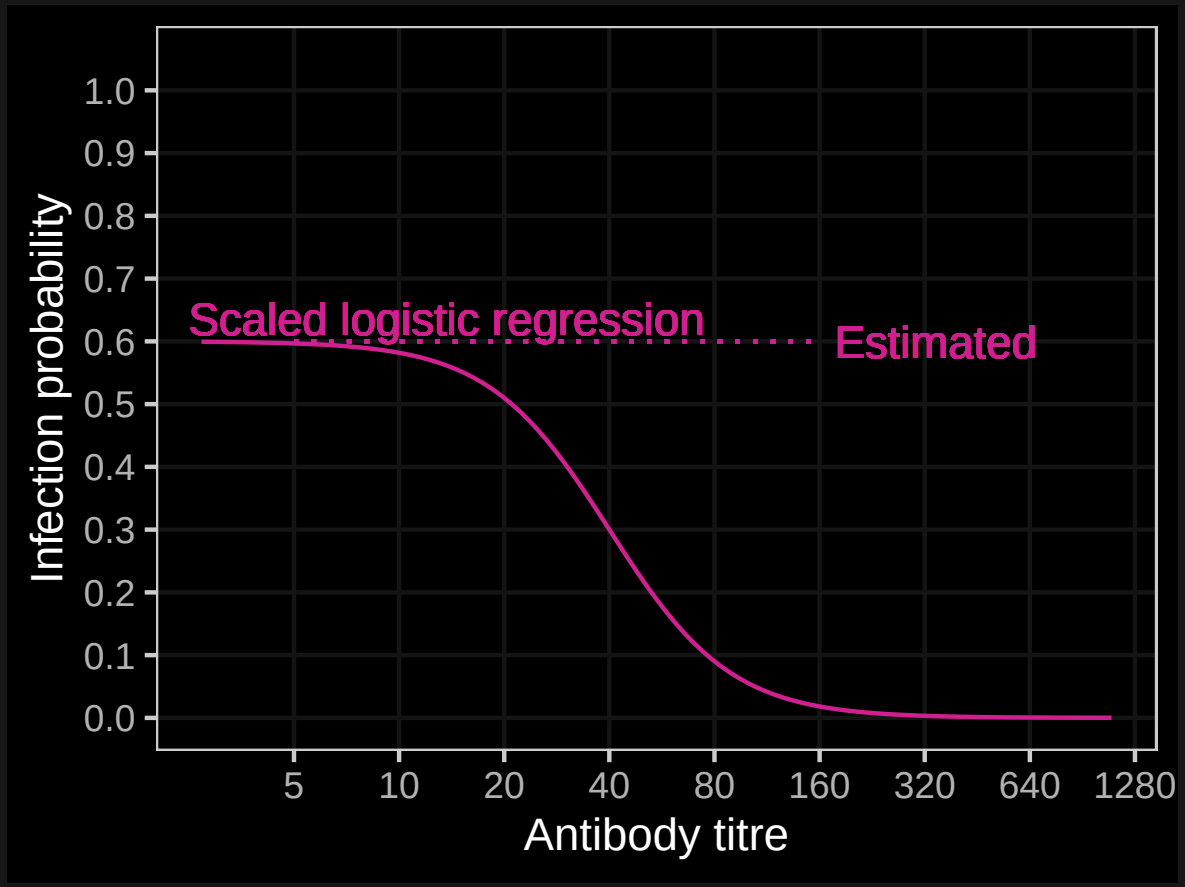
Relative protection curve

- Unreliable with logistic regression
  - Derived from fitted infection probabilities
  - Titre of 5 is not a real measurement
- Unnecessary with scaled logistic regression

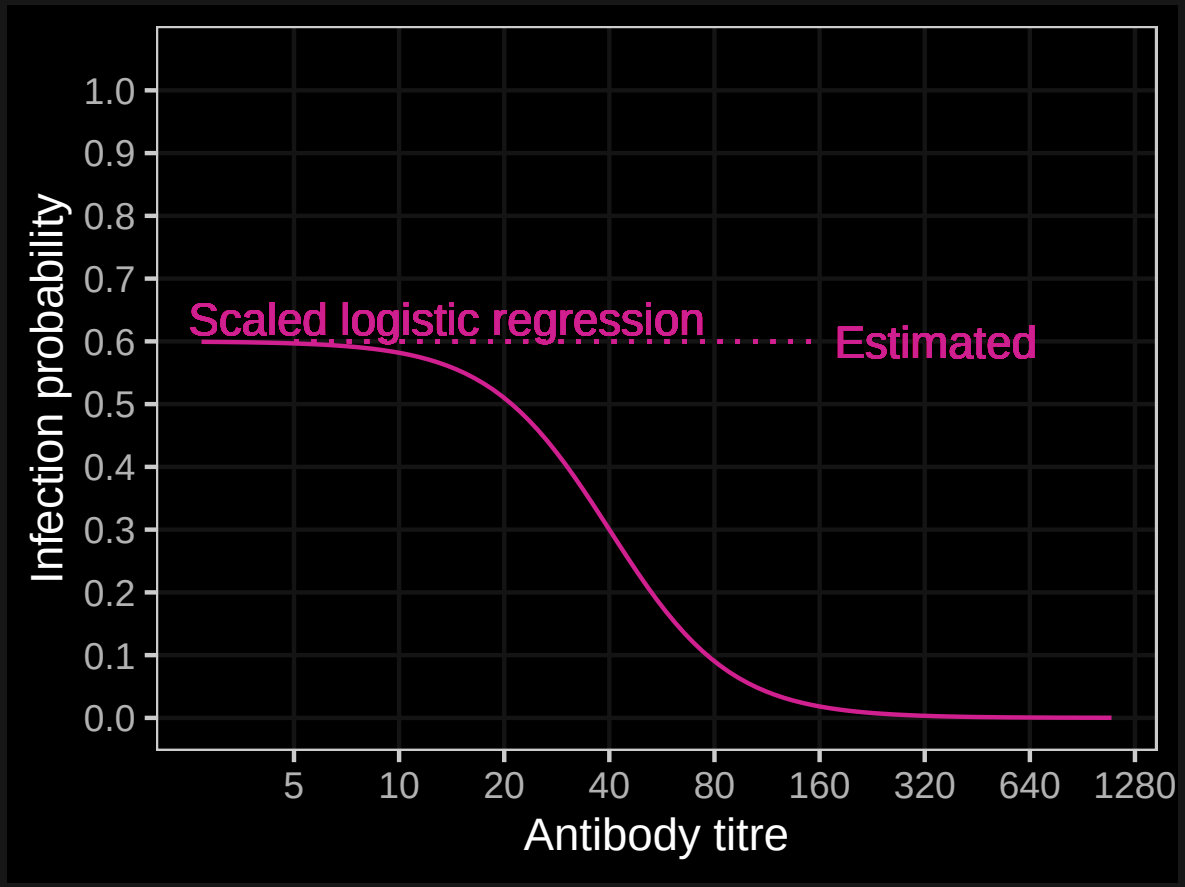
Relative protection curve

- Unreliable with logistic regression
  - Derived from fitted infection probabilities
  - Titre of 5 is not a real measurement
- Unnecessary with scaled logistic regression
  - Estimates baseline

Scaled logistic regression

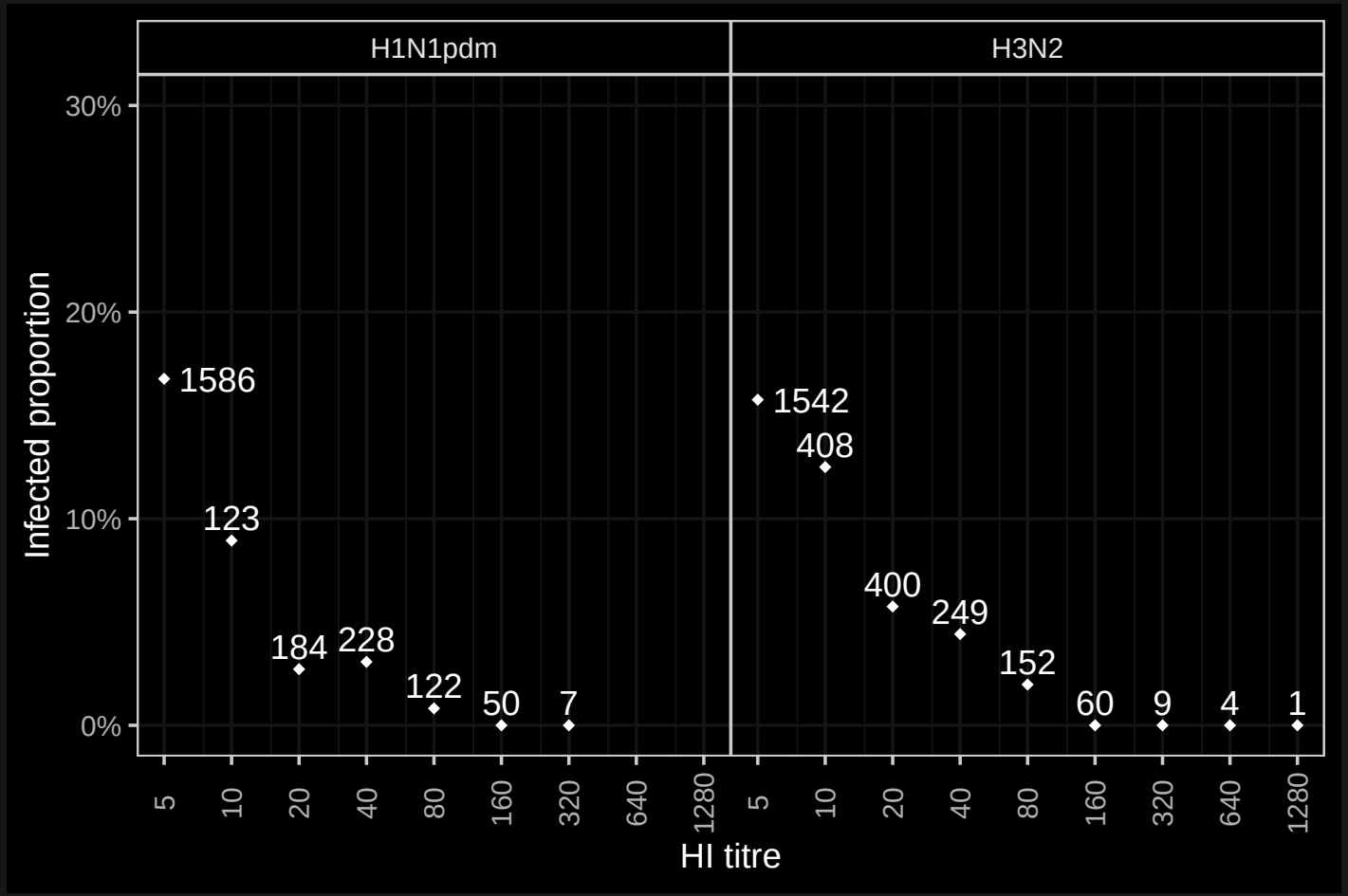


Scaled logistic regression



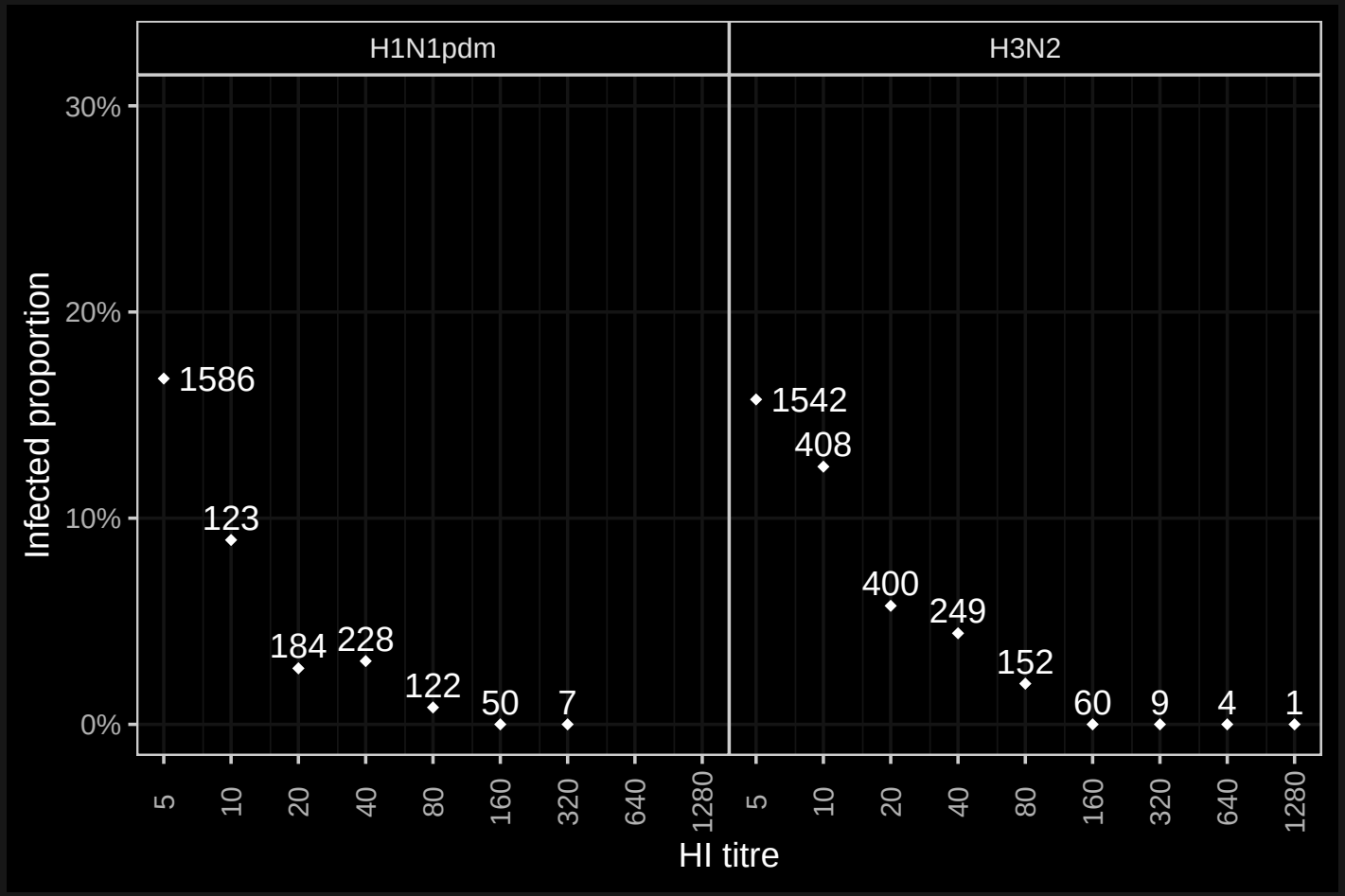
	Top	Bottom	Change
Scaled logistic	Estimated	Fixed at 0	S-shape

Scaled logistic regression



	Top	Bottom	Change
Scaled logistic	Estimated	Fixed at 0	S-shape

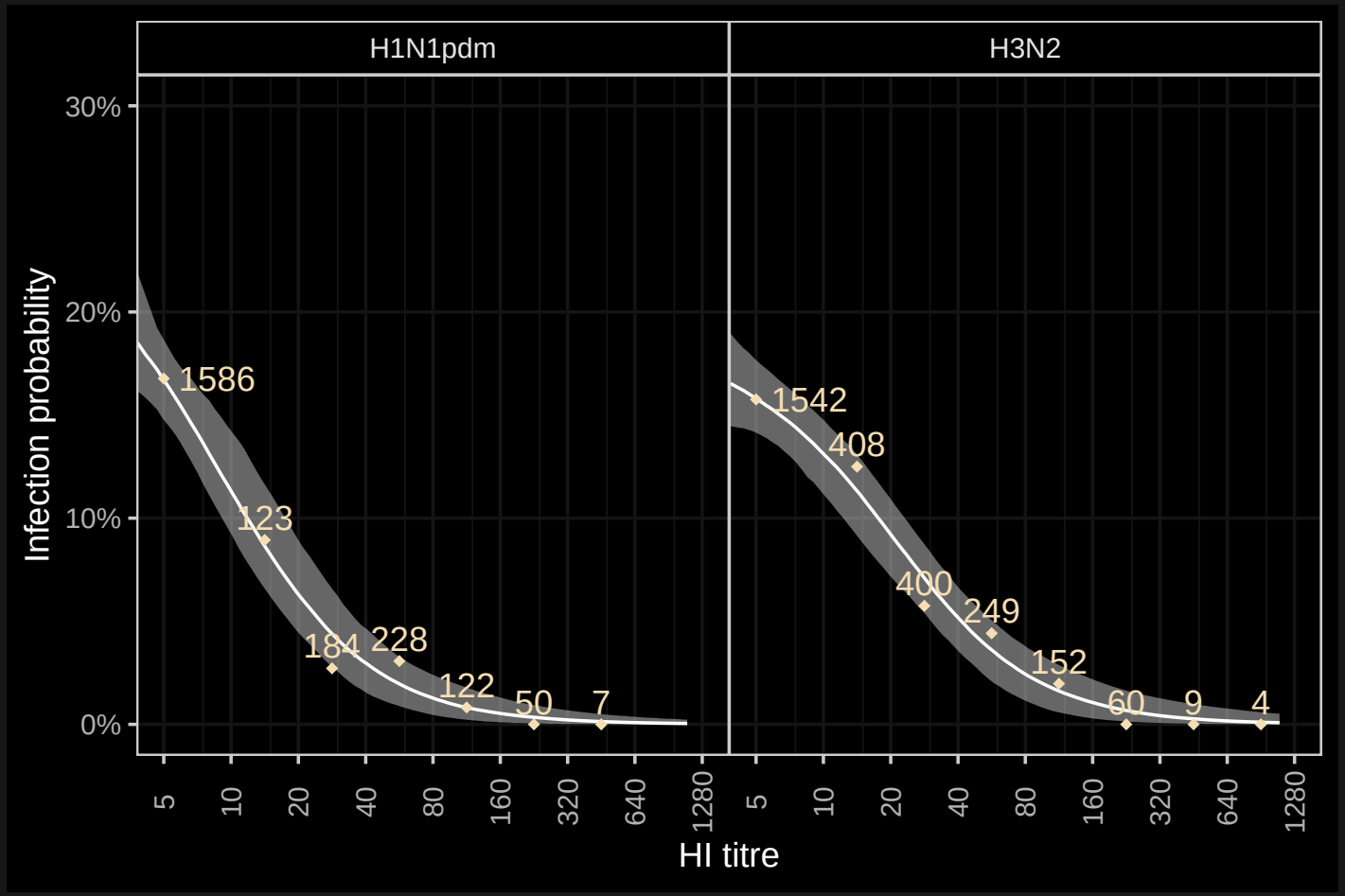
Scaled logistic regression



	Top	Bottom	Change
Scaled logistic	Estimated	Fixed at 0	S-shape

Scaled logistic regression

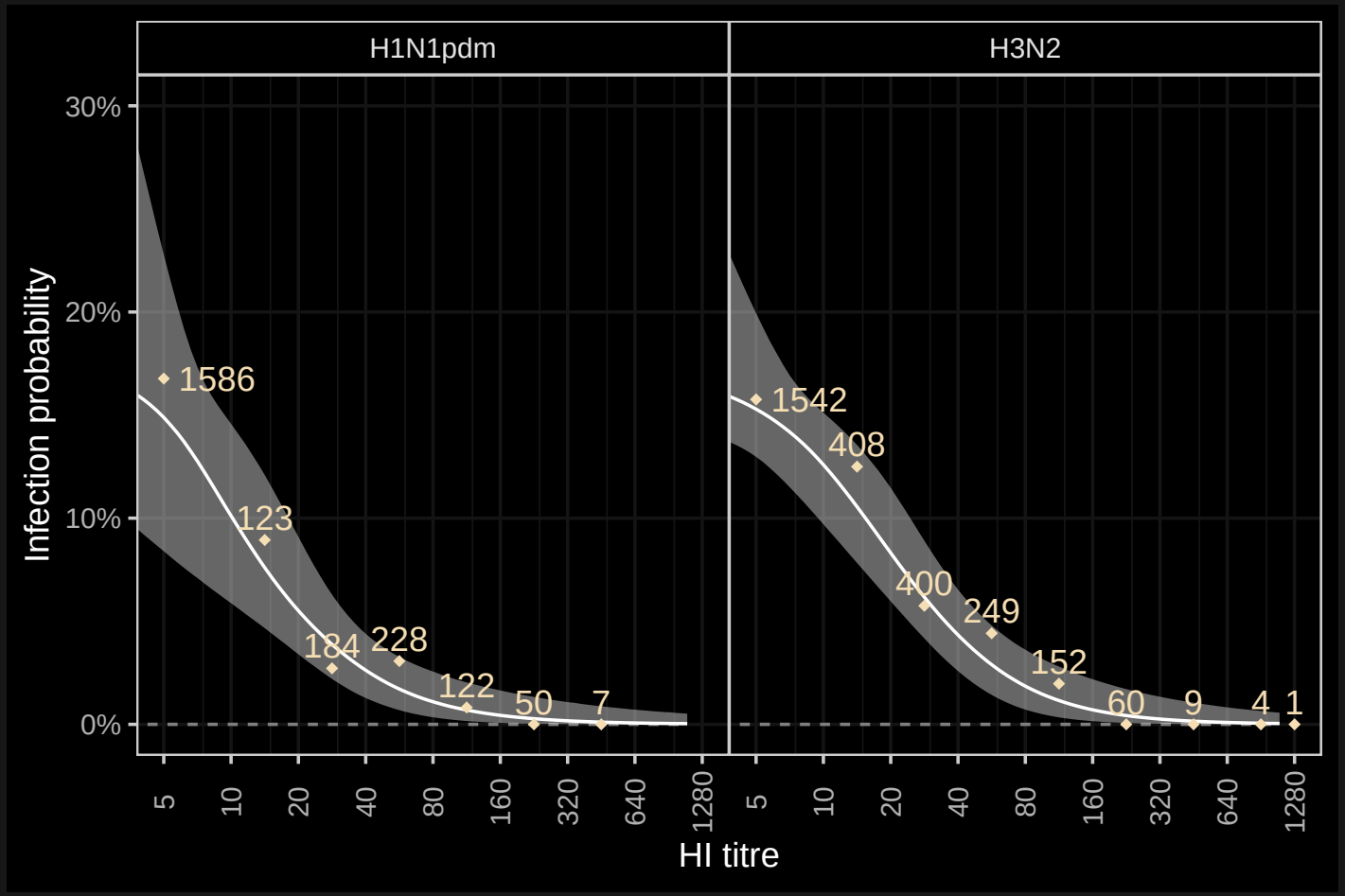
Maximum likelihood to midpoints



	Top	Bottom	Change
Scaled logistic	Estimated	Fixed at 0	S-shape

Scaled logistic regression

Bayesian



	Top	Bottom	Change
Scaled logistic	Estimated	Fixed at 0	S-shape

Models

Models

Cox PH

Models

Cox PH	Requires an additional assumption

Models

Cox PH	Requires an additional assumption
Logistic	Assumption not satisfied

Models

Cox PH	Requires an additional assumption
Logistic	Assumption not satisfied
Scaled logistic	Requires a larger sample size