

How to read a scientific paper:

a step-by-step guide to help you get the most out of what you read

Questions to answer when reading a paper

- 1 What do the authors want to know?
- 2 What do the authors conclude?
- 3 How do the authors reach their conclusions?
- 4 Are the conclusions valid?

Outline

- 1 What do the authors want to know?
- 2 What do the authors conclude?
- 3 How do the authors reach their conclusions?
- 4 Are the conclusions valid?

Where to go to find out...

- The title

OPEN ACCESS Freely available online

PLOS BIOLOGY

Transmission Dynamics and Prospects for the Elimination of Canine Rabies

Katie Hampson^{1,2*}, Jonathan Dushoff³, Sarah Cleaveland^{4,5}, Daniel T Haydon⁵, Magai Kaare⁶, Craig Packer⁷,
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Where to go to find out...

- The abstract

Rabies has been eliminated from domestic dog populations in Western Europe and North America, but continues to kill many thousands of people throughout Africa and Asia every year. A quantitative understanding of transmission dynamics in domestic dog populations provides critical information to assess whether global elimination of canine rabies is possible. We report extensive observations of individual rabid animals in Tanzania and generate a uniquely detailed analysis of transmission biology, which explains important epidemiological features, including the level of variation in epidemic trajectories. We found that the basic reproductive number for rabies, R_0 , is very low in our study area in rural Africa (~ 1.2) and throughout its historic global range (< 2). This finding provides strong support for the feasibility of controlling endemic canine rabies by vaccination, even near wildlife areas with large wild carnivore populations. However, we show that rapid turnover of domestic dog populations has been a major obstacle to successful control in developing countries, thus regular pulse vaccinations will be required to maintain population-level immunity between campaigns. Nonetheless our analyses suggest that with sustained, international commitment, global elimination of rabies from domestic dog populations, the most dangerous vector to humans, is a realistic goal.

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- What is unknown?

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- Clues!

- What is unknown?
- What is the approach?

Where to go to find out...

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- What is unknown?
- What is the approach?
- Will the approach address what is unknown?

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- Clues!

- What is unknown?
 - What is the approach?
- Will the approach address what is unknown?
- If so, you've likely identified the research question.

Where to go to find out...

- The introduction

Introduction

...

effective in these areas [7,8]. The critical question now is whether global elimination of domestic dog rabies is achievable. Keys to answering this question include: a quantitative understanding of the transmission dynamics of rabies in domestic dog populations, particularly the basic reproductive number, R_0 ; a quantitative understanding of domestic dog demography; and information about the practicality and effectiveness of various vaccination strategies. While recent data support the feasibility and practicality of domestic dog vaccination strategies [9–11], there are very little quantitative data on rabies transmission dynamics [12] and the underlying demographic processes.

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- The conclusions

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- The conclusions

- shouldn't have to work backward...

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- The conclusions
 - shouldn't have to work backward...
 - sometimes you do...

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- The discussion

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- The discussion
 - you may have to hunt for them

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- The discussion
 - you may have to hunt for them
 - near the beginning...

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- The discussion
 - you may have to hunt for them
 - near the beginning...
 - ... or near the end

Outline

- 1 What do the authors want to know?
- 2 What do the authors conclude?
- 3 How do the authors reach their conclusions?**
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The meat of the paper!

For **each** conclusion...

- What are the arguments?

The meat of the paper!

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- What are the arguments?
 - eg, if the research question is "E?"

The meat of the paper!

For **each** conclusion...

- What are the arguments?
 - eg, if the research question is “E?”
 - the argument might be:

$$A \rightarrow B$$

$$C \rightarrow D$$

$$B \wedge D \rightarrow E$$

A and C, so E

The meat of the paper!

For **each** conclusion...

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- What is the evidence?

The meat of the paper!

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A and C, so E
- What is the evidence?
 - in the example above, the data may be
A and C

Where to go to find the arguments...

The logic behind the study...

- The introduction

Where to go to find the arguments...

The logic behind the study...

- The introduction
 - should explain how the approach relates to the research question

Where to go to find the arguments...

The logic behind the study...

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- The discussion

Where to go to find the arguments...

The logic behind the study...

- The introduction
 - should explain how the approach relates to the research question
- The discussion
 - should explain how the results relate to the conclusion/s

Where to go to find the evidence...

The data that support the arguments...

- The figures and tables

Where to go to find the evidence...

The data that support the arguments...

- The figures and tables
 - a very good starting point...

Where to go to find the evidence...

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 - **read the axes!**

Where to go to find the evidence...

The data that support the arguments...

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 - read the axes!
 - **read the caption!**

Where to go to find the evidence...

The data that support the arguments...

- The figures and tables
 - a very good starting point...
 - read the axes!
 - read the caption!
- **The results**

Where to go to find the evidence...

The data that support the arguments...

- The figures and tables
 - a very good starting point...
 - read the axes!
 - read the caption!
- The results
 - add additional detail

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The most important part!!

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- If not...

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- If not...
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- If not...
 - what would it take to convince you?
 - **what can you take away from the article?**