# Changing Minds

- Claim: statement that answers the original question
- Evidence: data, e.g. from an experiment
- Reasoning: explanation that connects the claim to the evidence

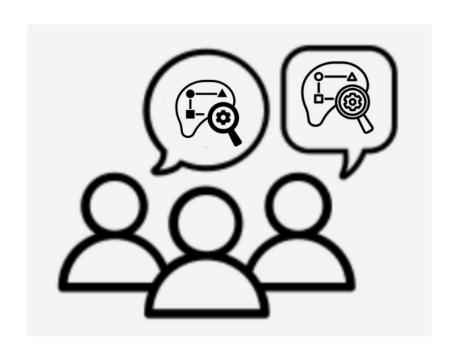
What makes opinions different from evidenced claims...

## **UNFOUNDED OPINIONS**



- can be about values
- have not been carefully vetted
- are not based on evidence

#### EVIDENCE-BASED CLAIMS AND REASONING



- Claim: statement that answers the original question
- Evidence: raw data, results from data experiments; looking for countervailing evidence, not just supporting
- Reasoning: explanation that connects the claim to the evidence

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2022: We have the "germ theory of disease".

1854: No established scientific theory explaining how diseases spread.

Should we be explaining or arguing? It depends...

How is 2022 different than 1854?

2022: We have the "germ theory of disease" - VETTED EVIDENCE

1854: No established scientific theory explaining how diseases spread - OPINIONS WITH SOME EVIDENCE BUT NO RIGOROUS TESTING

## Anatomy of a good argument

- Clearly state the question/problem
- State your claim
- Provide data and visuals (evidence)
- Explain your reasoning
- Provide a critique of the alternative explanation(s) including:
  - How it may not be supported by the data
  - How the data that supports it is not good

#### Persuade the Londoners

- Develop a poster to make your argument
- Mentors will revert back to their 19th Century selves and will be supporters of different versions of the airborne theory
- Londoners will meet individually with each group and rotate between posters every 3 minutes.

#### **Directions**

- Each group will be give the following:
  - Printouts of data and visualizations from the notebooks
- Advice
  - The poster is just a visual aid.
  - Sketch the layout of your poster beforehand
  - Present your argument clearly and concisely
  - Be prepared to counter arguments from the Londoners:
    - Have data and the appropriate reasoning ready
    - Find the flaws and weaknesses in their arguments