

Extracting key messages from modeling exercises

MATHEMATICAL MODELING FOR INFECTIOUS DISEASE PLANNING IN
AFRICA

30 minutes

Learning objectives

- To understand how to arrive at the key messages of your results.
- To apply the concept of spotlighting in identifying the key messages from an example activity.

Outline

- What is the key message of your results?
- How to identify the key message: spotlighting
- Techniques for identifying key messages

What is the key message of your results?

- **The key message(s) should:**
 - Target a knowledge gap
 - Correspond to the study's aim
 - Highlight the clinical or scientific implications of the findings

Drafting the message- choice of words

- A strong message should be supported by solid evidence:
 - Words demonstrating a high level of evidence:
 - ‘showed’, ‘demonstrated’, or ‘indicated’
- However, for infectious disease modeling studies where results are mostly based on assumptions, your message should reflect some uncertainty.
 - Words like ‘might’, ‘suggest’, and ‘could’ reflect less solid levels of evidence.

Don't undermine your findings by understating your key message

- No need for conditional statements as they can cast doubt on the reliability of results.
 - Example: Our findings suggest that vaccination is effective for frontliners under 40 years who work in district hospitals during the first 60 days of an outbreak.
- You would have described the setting, limitations, assumptions, etc. of your study, hence no need to repeat them in your message to cast doubt.

How to identify the key message-spotlighting

- The technique allows you to scan through your data/results, screen them and develop a shortlist that could trigger further thoughts.
- It works by:
 - Gathering data into one place
 - Scanning
 - Over-viewing
 - Speed-reading the data
 - Identifying trigger spot

Spotlighting

- Works best if you produce results in “physical form”:
 - Print off tables, charts, and diagrams (or have them all in one space)
 - Try to identify patterns or spots
 - Highlight anything that seems intriguing to explore
 - Look at other results to see if the patterns you observed are consistent.
 - At this step, you can try to identify the meaning and implication of each hotspot.
 - Which of the “hotspots” answer your questions/hypothesis?
 - Write your thoughts on each hotspot or combination- link to the research question(s).

Techniques to identifying key findings

- You should summarize the key findings. For example, you should start your findings section like this:
 - The outcome of research suggests that ...
 - The investigation represents the correlation among...
- *Do not include information that is not important.*
- Provide a synopsis of outcomes along with a detailed description of the findings. *You should use graphs, tables, and charts for presenting the finding.*
- While writing the findings section you need to highlight the negative outcomes.

Tips to finding the key message

- Where to start from ideally?
 - What was your question/objective?
 - What were the outcomes of interest?
- List three to five main points of your paper in clear jargon-free language.
- Summarize your whole paper in one sentence (or two!).
- Explain your work to a friend in one minute.

Example: age-stratified model study

- Objective: to determine which age group should be prioritized in the case of limited vaccine supply under different rollout speeds.
- Outcomes of interest: cumulative infections and deaths averted.

EMERGING INFECTIOUS DISEASES®

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Research

Age-Stratified Model to Assess Health Outcomes of COVID-19 Vaccination Strategies, Ghana

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Abstract

We assessed the effect of various COVID-19 vaccination strategies on health outcomes in Ghana by using an age-stratified compartmental model. We stratified the population into 3 age groups: <25 years, 25–64 years, and ≥65 years. We explored 5 vaccination optimization scenarios using 2 contact matrices, assuming that 1 million persons could be vaccinated in either 3 or 6 months. We assessed these vaccine optimization strategies for the initial strain, followed by a sensitivity analysis for the Delta variant. We found that vaccinating persons <25 years of age was associated with the lowest cumulative infections for the main matrix, for both the initial strain and the Delta variant. Prioritizing the elderly (≥65 years of age) was associated with the lowest cumulative deaths for both strains in all scenarios. The consensus between the findings of both contact matrices depended on the vaccine rollout period and the objective of the vaccination program.

Ghana reported its first case of COVID-19 on March 12, 2020, and 171,065 cases and 1,445 deaths had been recorded as of December 31,

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Example: spotlighting

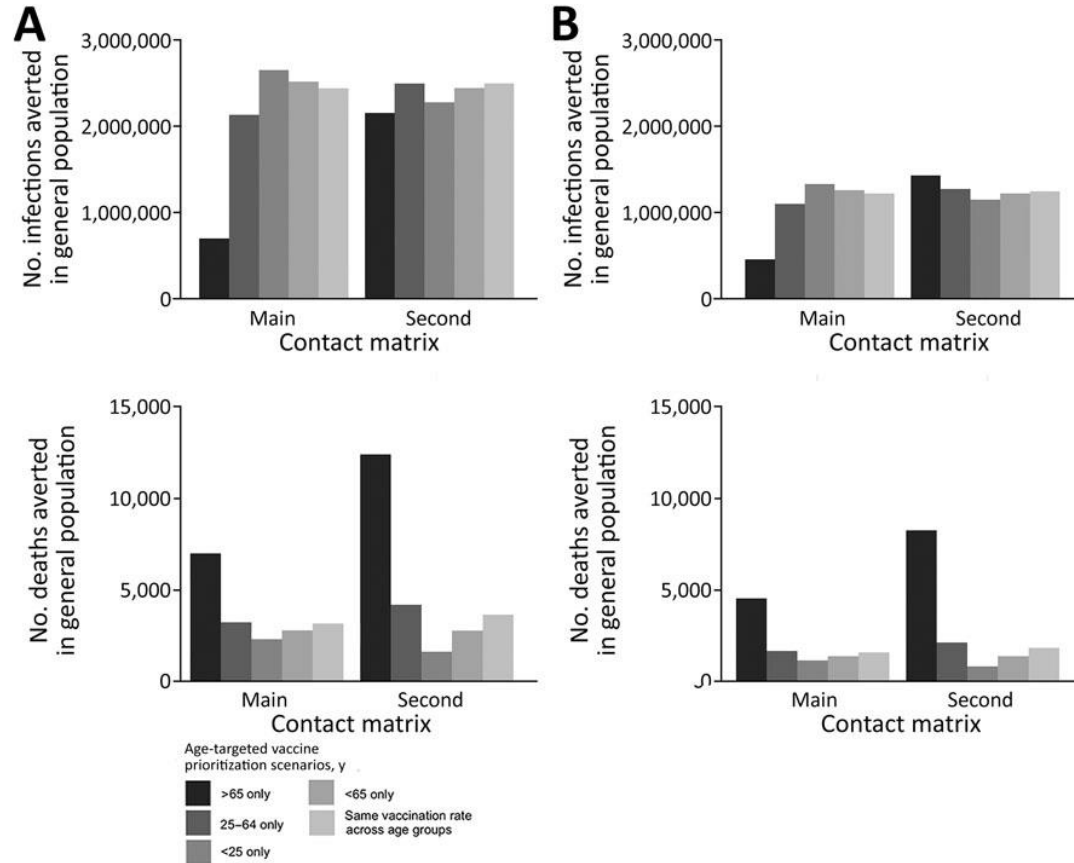


Figure 2. Effects of various vaccination scenarios on the number of cumulative infections averted (upper panels) and the number of deaths averted (lower panels) in the general population, Ghana. The assessment used 2 different contact matrices in the main analysis and an effective reproductive number of 3.13 for the initial strain.
A) Results assuming 1 million persons were vaccinated in 3 months. B) Results assuming 1 million persons were vaccinated in 6 months.

- Try to identify patterns or spots
- Highlight anything that seems interesting or intriguing to explore
- Look at other results: for example, other scenarios to see if the pattern is consistent to identify hotspots.
- At this step, you can try to identify the meaning and implication for each hotspot.
- Which of the "hotspots" answer your questions/hypothesis.
- Write your thoughts on each hotspot or combination- link to research question

References

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