Adapting Expert Elicitation Methods for Global Study of Foodborne Disease

Expert Model Analysis

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Why use the Classical Model?

- Calibration variables enable **empirical validation**.
- The CM was **scalable** to the size of the problem, given the study's constraints.

- But, this wasn't a classic implementation of the CM.
  - Remote elicitations
  - Novice elicitors
  - Massive scale

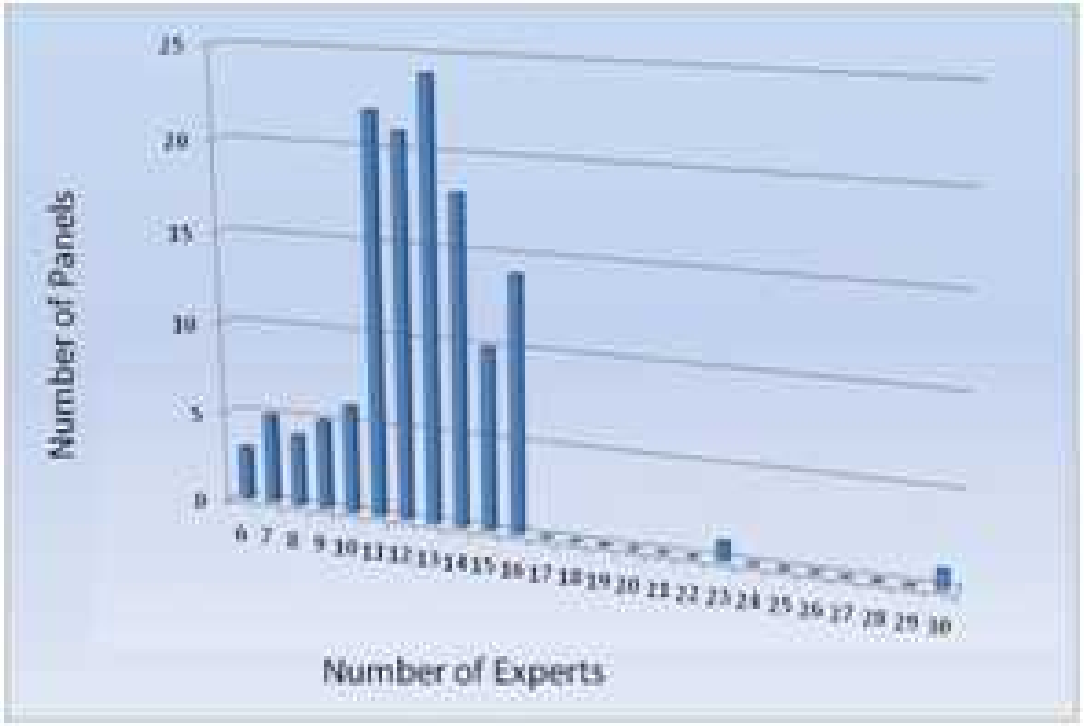
Elicitation Details

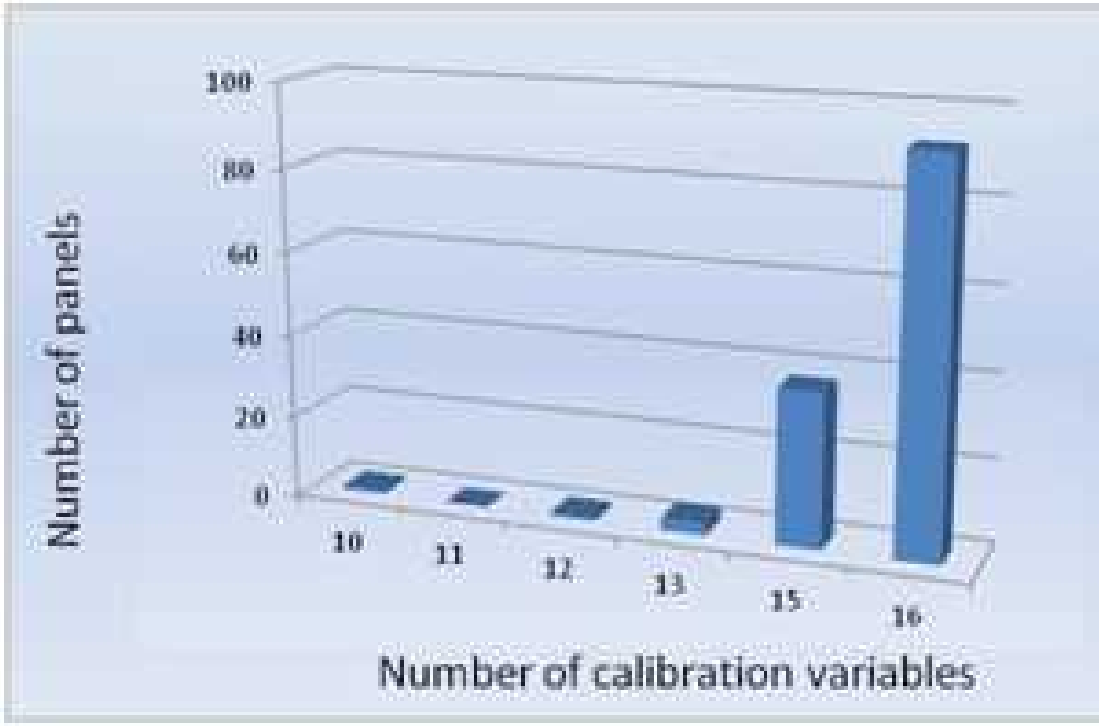
72 Experts

134 subject-matter panels (112 distinct)

Seed questions elicited online

Experts filled out spreadsheet for targets





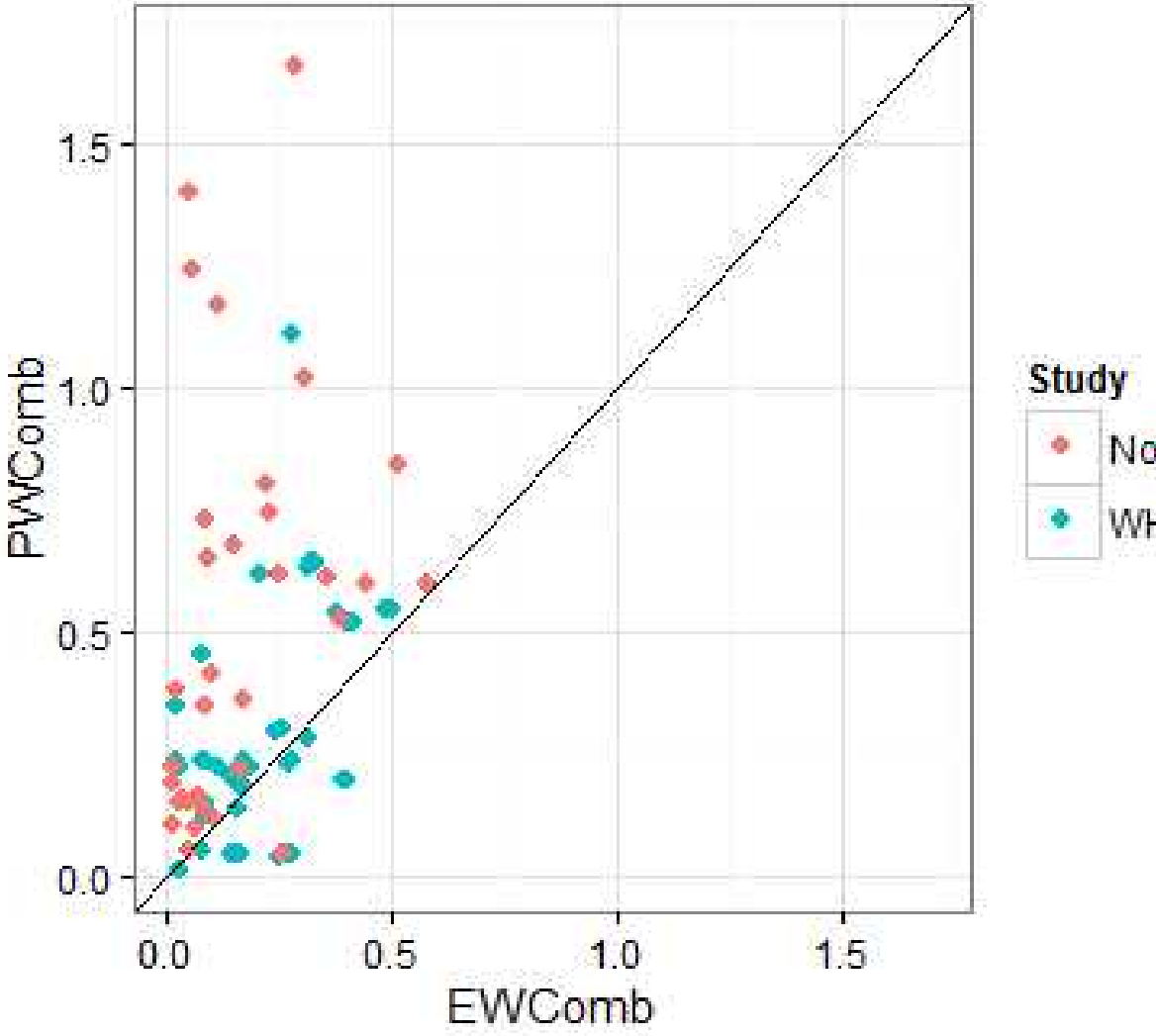
How does performance of WHO panels compare to past studies?

In 33 post-2006 cases:

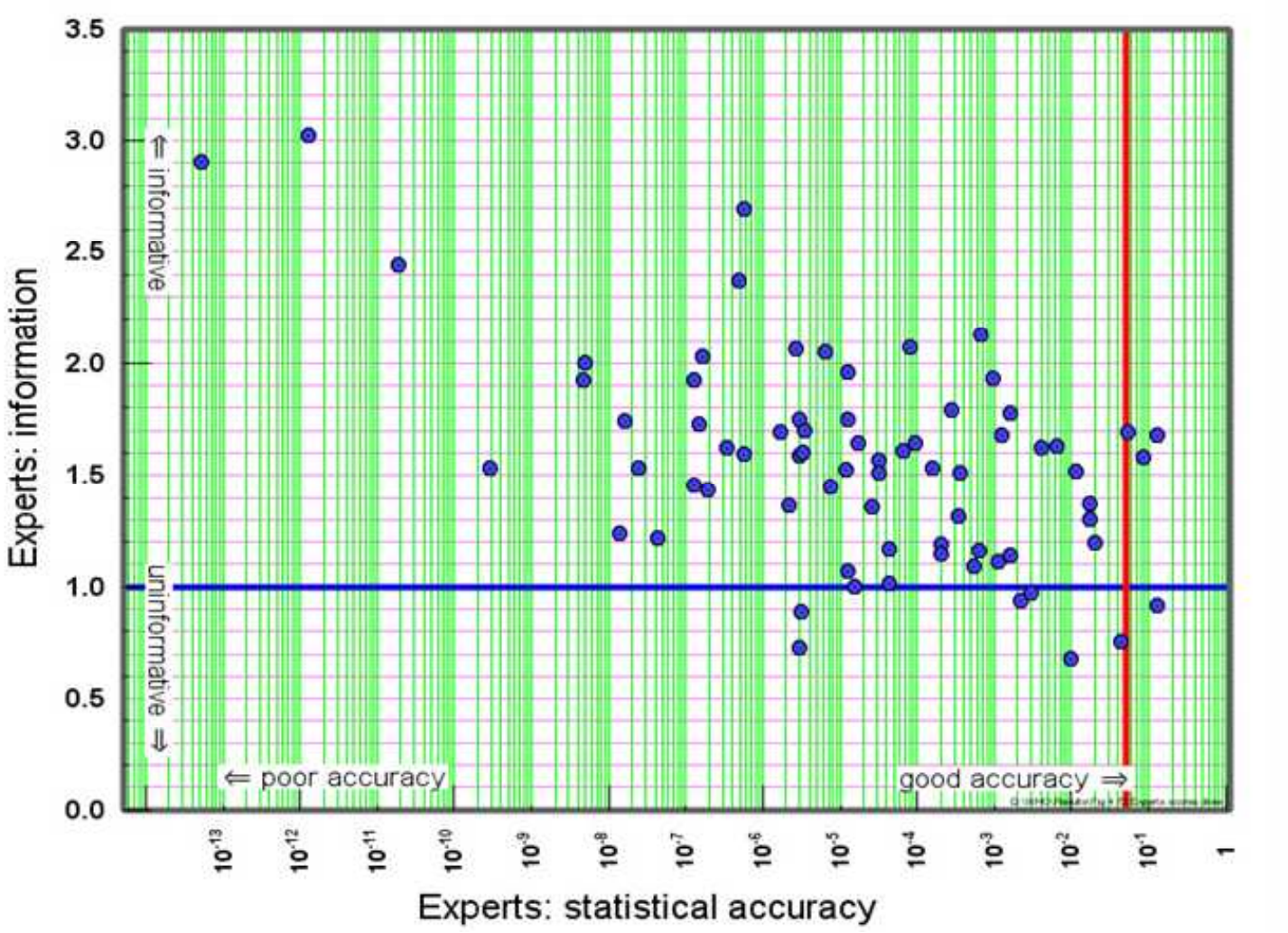
PW outperform EW 97%

In 112 distinct WHO panels:

PW outperform EW 69%



Statistical accuracy and information of experts

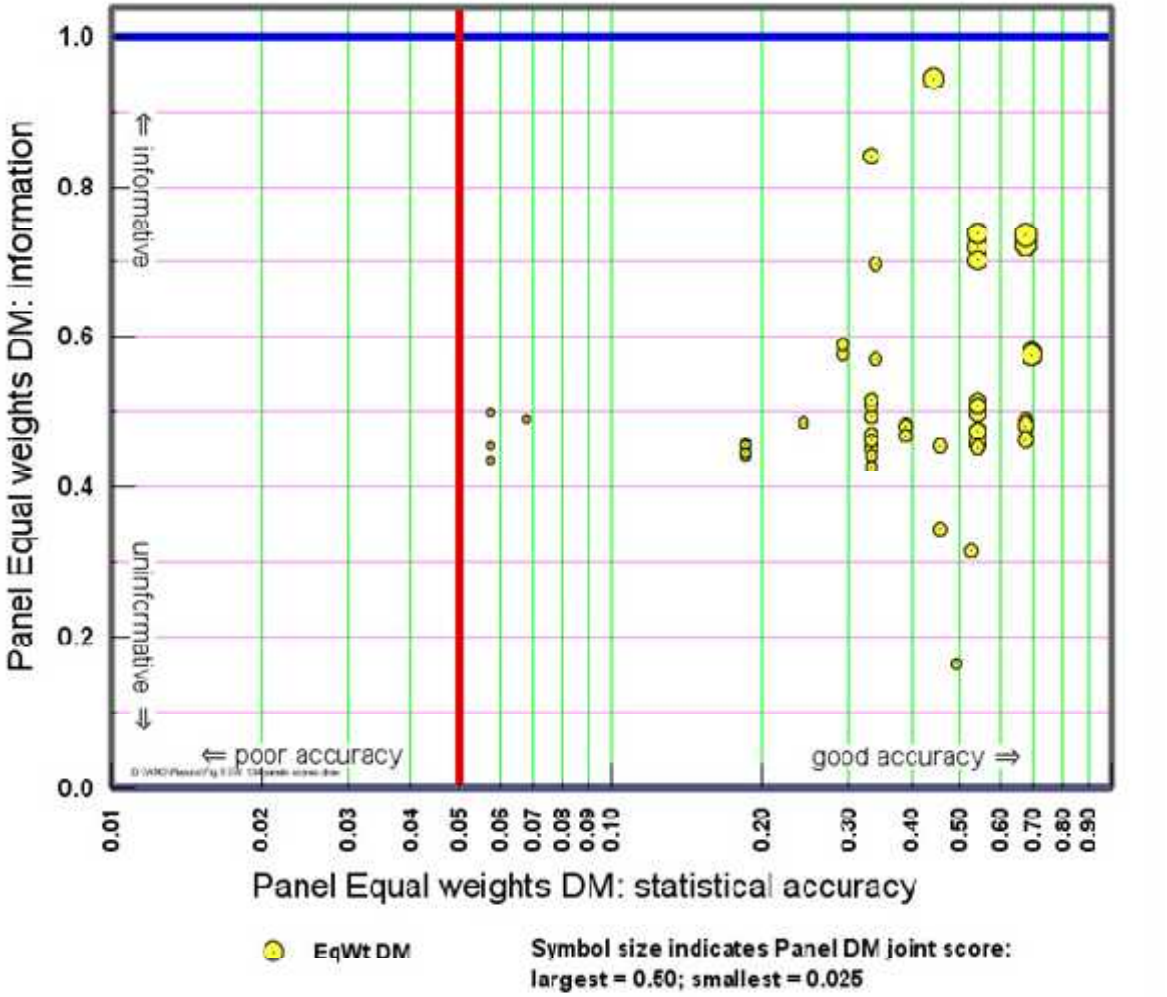


Red line: SA = 0.05

Blue line:
information = 1

Average information
= 1.56

Statistical accuracy and information of Equal Weight DMs

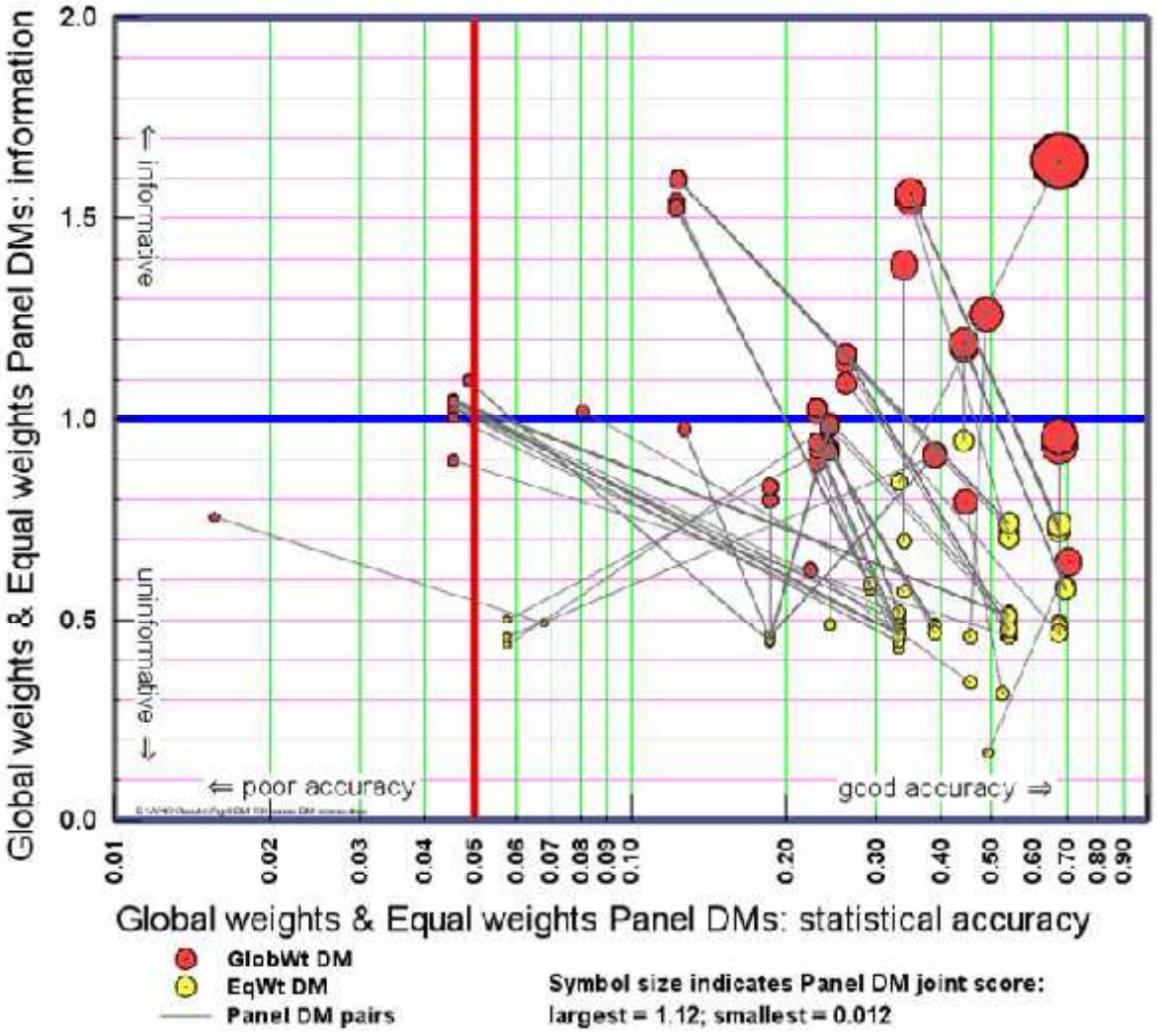


Red line: SA = 0.05

Blue line:
information = 1

Average information = 0.51

Statistical accuracy and information of Performance Weight DMs (red dots)

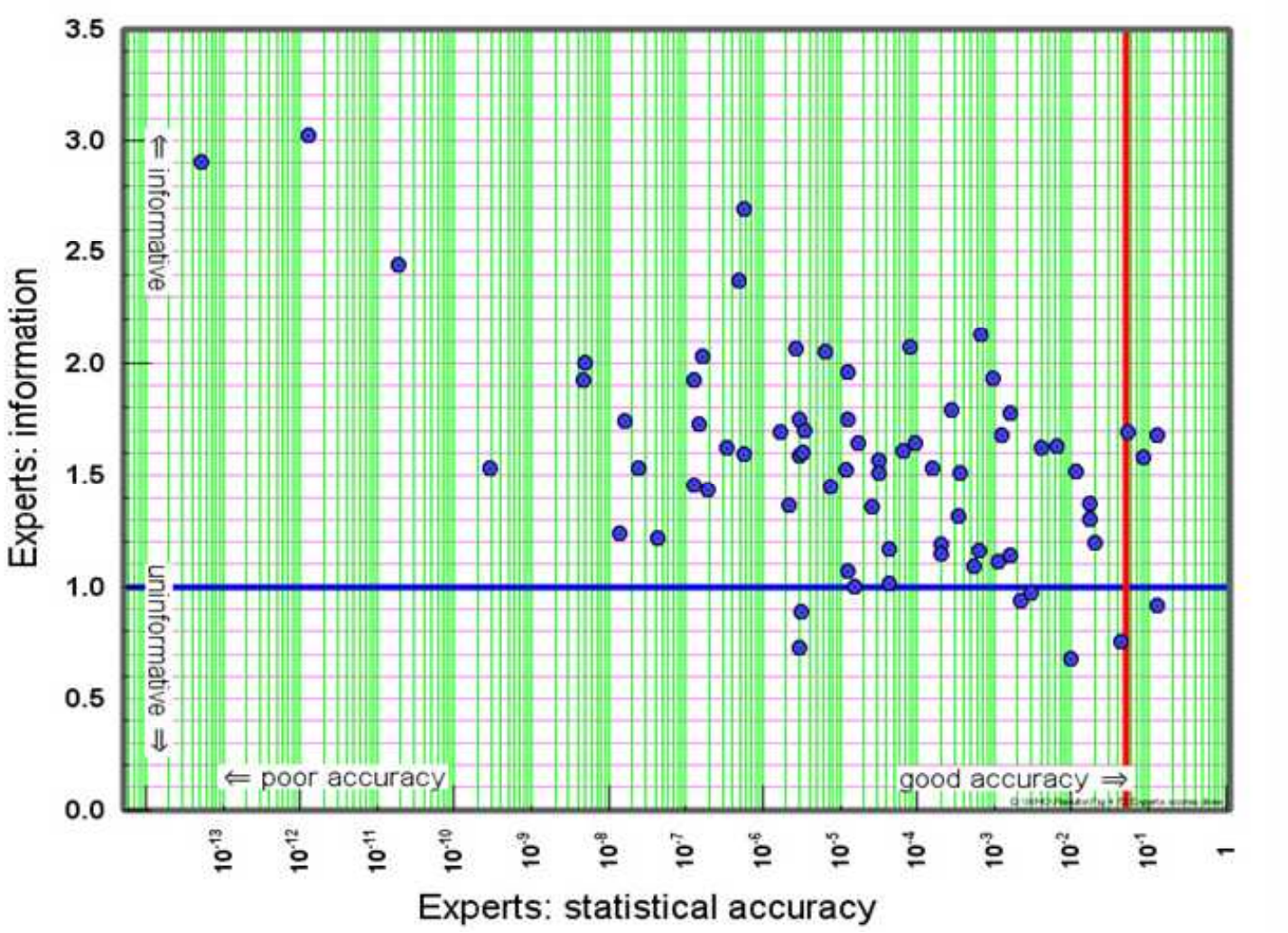


Red line: SA = 0.05

Blue line:
information = 1

Average information
= 1.14

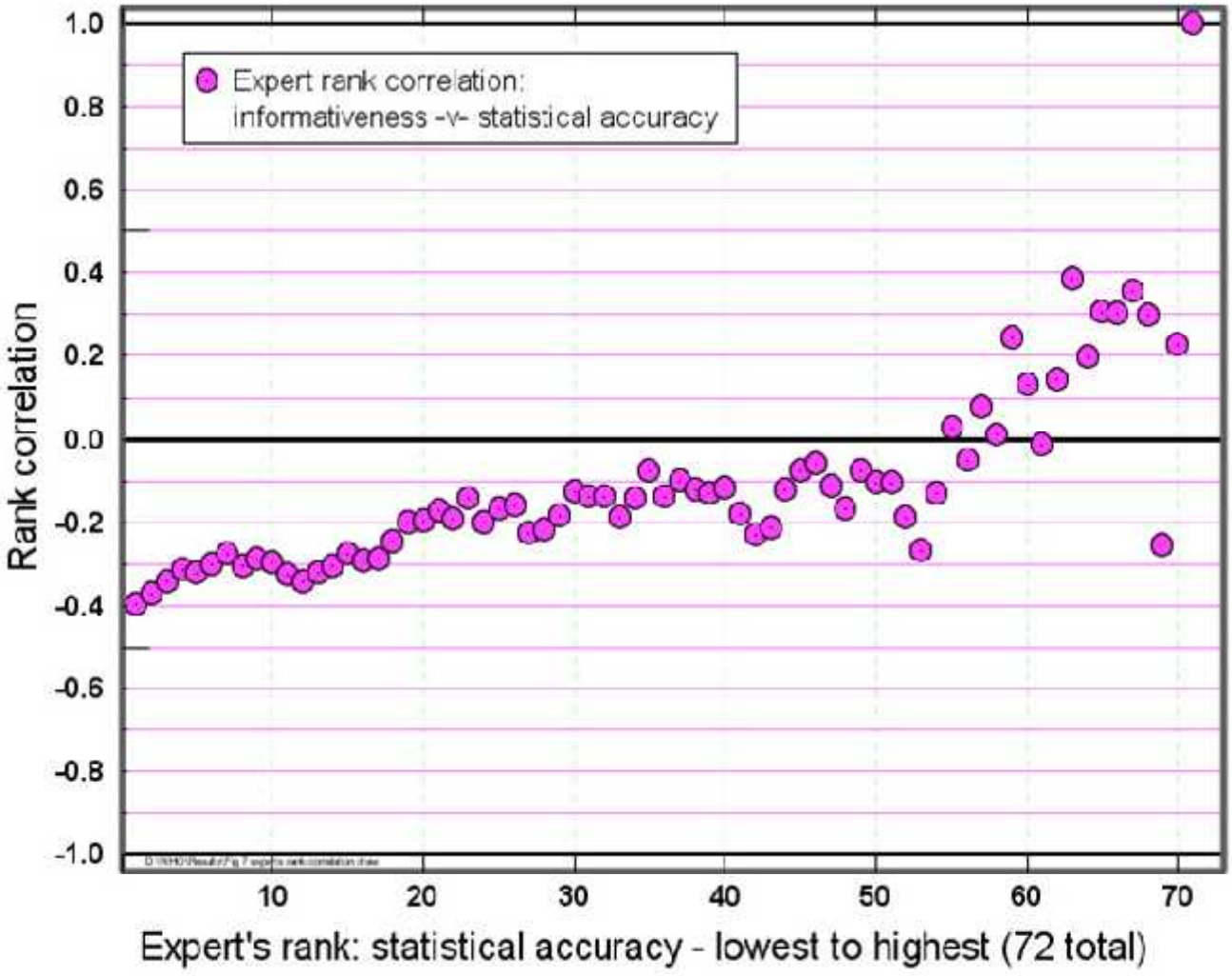
Data confirms what we've suspected: SA and information are negatively correlated



Rank correlation: -0.40

But…that's not the whole story.

The negative correlation DECREASES as SA INCREASES



Running rank correlation between informativenes and SA

The negative correlation is driven by the least accurate experts.

Conclusions

- CM applications on this scale are feasible.
- The DM combinations were statistically accurate.
- Information for PW DMs was comparable to the experts.
- Information and SA are negatively correlated, but the correlation weakens for more statistically accurate experts.

- Next: How do we improve remote elicitations to better capture expert judgments on this scale?

Additional References from WHO Study

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