
The Case for Evidence-Based Testing

Stuart Reid

Scope

- Evidence-Based Medicine
- Evidence-Based Testing?
- Getting the message across
- Some testing 'evidence'

Gurus or.....facts?

- Do you believe everything you hear at conferences?
 - who do you trust?
- What about school or university
 - *or text books*
- How easily do you change your mind?
- Don't believe me – try using the evidence...

Evidence-based medicine (EBM)

- EBM aims for the ideal that healthcare professionals should make "conscientious, explicit, and judicious use of current best evidence" in their everyday practice

– Wikipedia



Evidence-based practice

what do you need to know?



finding the evidence



appraising the evidence



applying the results

Medical Evidence - sources

1

- meta-analysis (of randomized controlled trials)

2

- randomized controlled trials

3

- controlled studies without randomisation

4

- well-designed quasi-experimental studies

5

- case studies, etc.

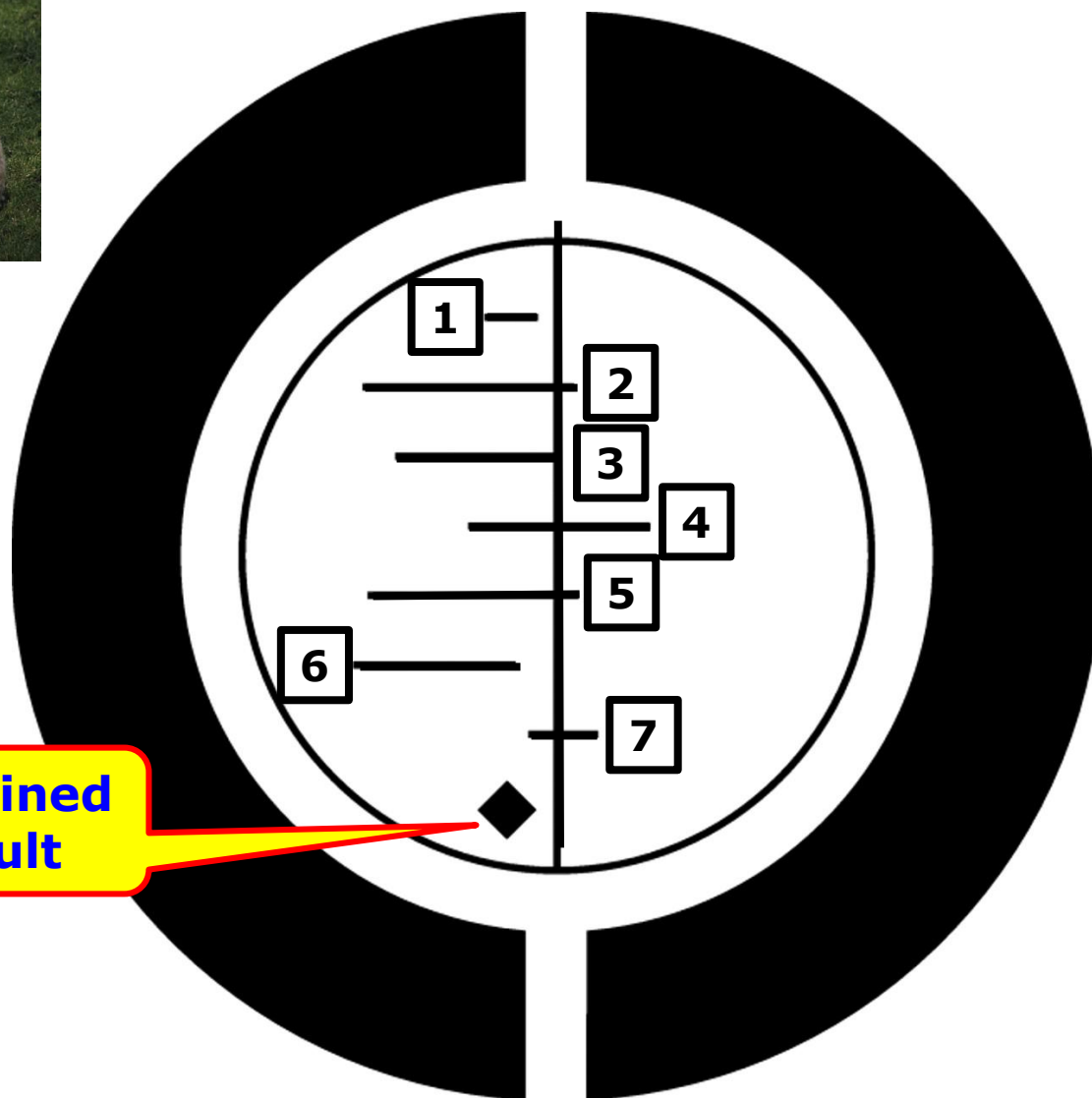
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- expert reports, opinions and/or clinical experience

Gathering evidence

confidence in evidence





**combined
result**

Meta-analysis.....

...saves >10,000 babies from dying
in the last 20 years



Evidence-based **testing**

- EBT aims for the ideal that **testing** professionals should make "conscientious, explicit, and judicious use of current best evidence" in their everyday practice
 - Stuart



Gathering the testing evidence



Providing the testing evidence

- Academic evidence vs Practitioner evidence
- We need to know its:
 - context - where is this evidence valid?
 - level of confidence
- We need to be able to find it
 - searchable tags
- In a standard format.....?

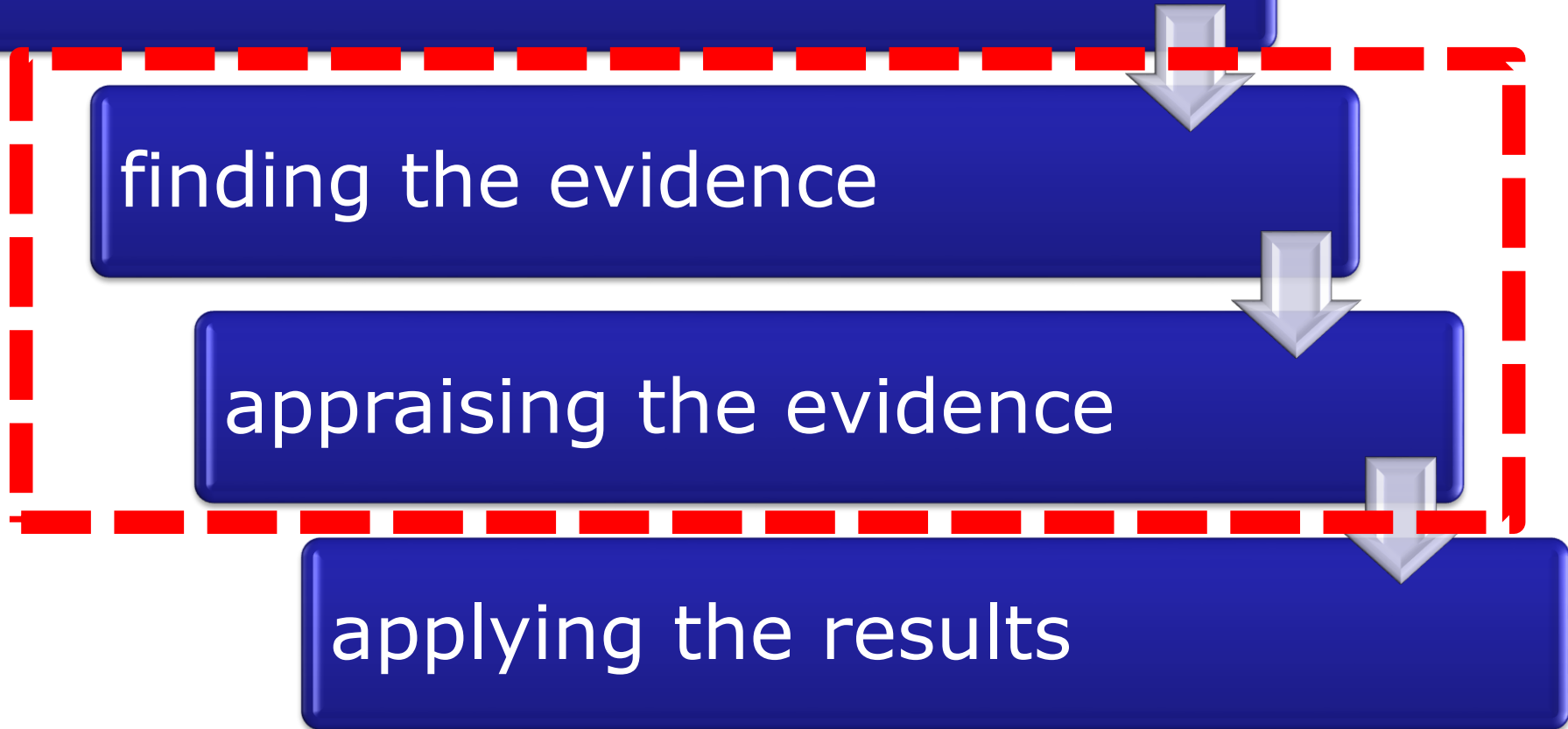
Evidence-based testing practice

what do you need to know?

finding the evidence

appraising the evidence

applying the results

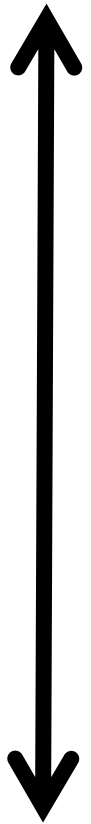


Finding & appraising the evidence



Confidence in the evidence

most confident



least confident

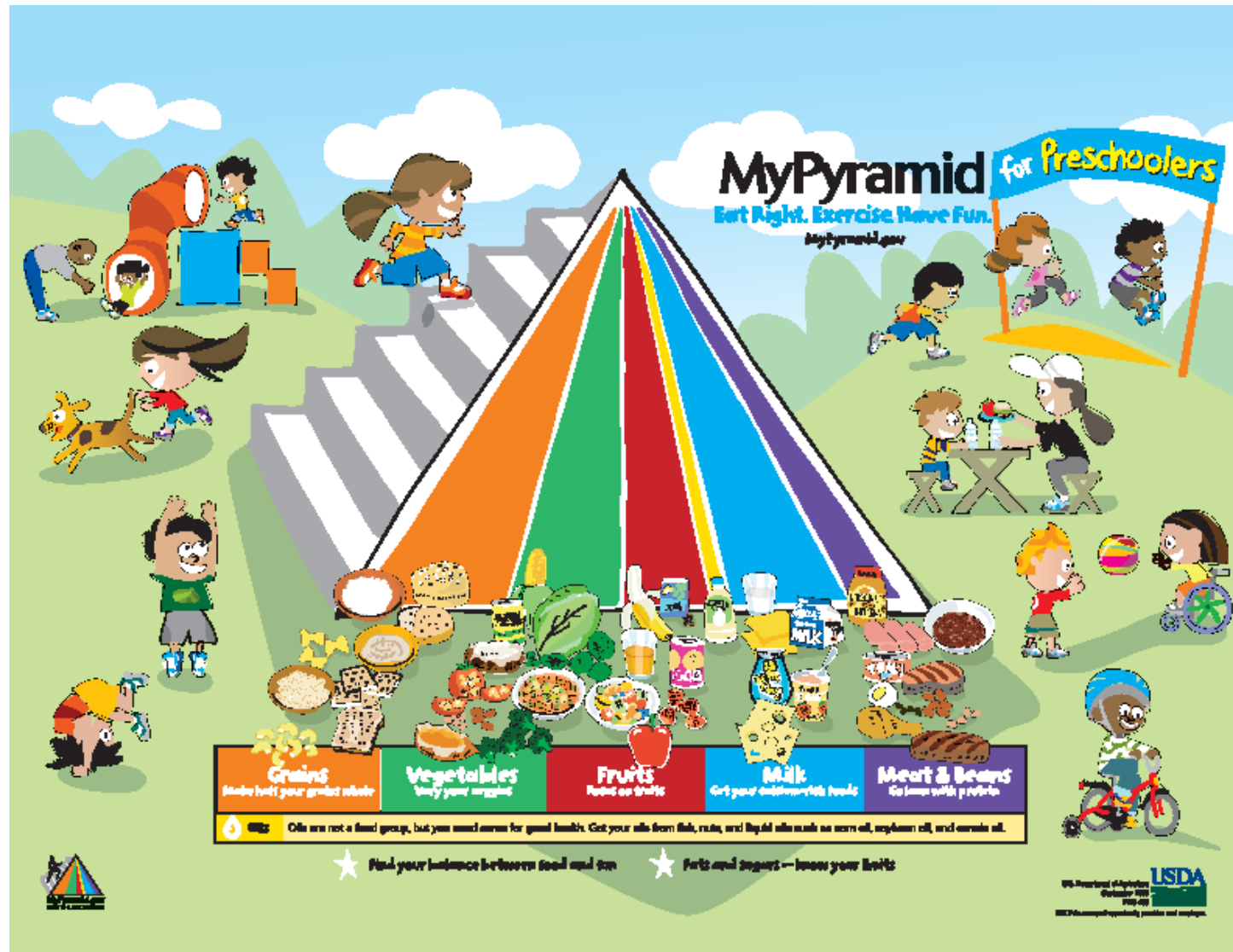
Complexity of evidence

highly complex



easy to digest

US Pre-schooler (2-5) diet advice



US Kids (6-11) diet advice



Grains

Make half your grains whole

Start smart with breakfast. Look for whole-grain cereals.

Just because bread is brown doesn't mean it's whole-grain. Search the ingredients list to make sure the first word is "whole" (like "whole wheat").

Vegetables

Vary your veggies

Color your plate with all kinds of great-tasting veggies.

What's green and orange and tastes good? Veggies! Go dark green with broccoli and spinach, or try orange ones like carrots and sweet potatoes.

Fruits

Focus on fruits

Fruits are nature's treats — sweet and delicious. Go easy on juice and make sure it's 100%.

Milk

Get your calcium-rich foods

Move to the milk group to get your calcium. Calcium builds strong bones.

Look at the carton or container to make sure your milk, yogurt, or cheese is lowfat or fat-free.

Meat & Beans

Go lean with protein

Eat lean or lowfat meat, chicken, turkey, and fish. Ask for it baked, broiled, or grilled — not fried. It's nutty, but true. Nuts, seeds, peas, and beans are all great sources of protein, too.

For an 1,800-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov

Eat 6 oz. every day;
at least half should be whole

Eat 2 1/2 cups every day

Eat 1 1/2 cups every day

Get 3 cups every day;
for kids ages 2 to 8, it's 2 cups

Eat 5 oz. every day

Oils Oils are not a food group, but you need some for good health. Get your oils from fish, nuts, and liquid oils such as corn oil, soybean oil, and canola oil.

Find your balance between food and fun

- Move more. Aim for at least 60 minutes everyday, or most days.
- Walk, dance, bike, rollerblade — it all counts. How great is that!

Fats and sugars — know your limits

- Get your fat facts and sugar smarts from the Nutrition Facts label.
- Limit solid fats as well as foods that contain them.
- Choose food and beverages low in added sugars and other caloric sweeteners.



US Adult diet advice?



More adult dietary advice

Best Antioxidants for Skin

The first signs of aging usually occur in the late 20s and early 30s. There are various antioxidants for skin that can help. The effects of antioxidants are evident on the skin. Consult a skin doctor before you incorporate a supplement. [Diet](#) is always the safest option you have for skin. Read more on [antioxidants](#).

Vitamins

Sun skin creams and lotions are rich in vitamin E and this is so, because the vitamin E in these cosmetics prevents the damage of cell membranes. It is

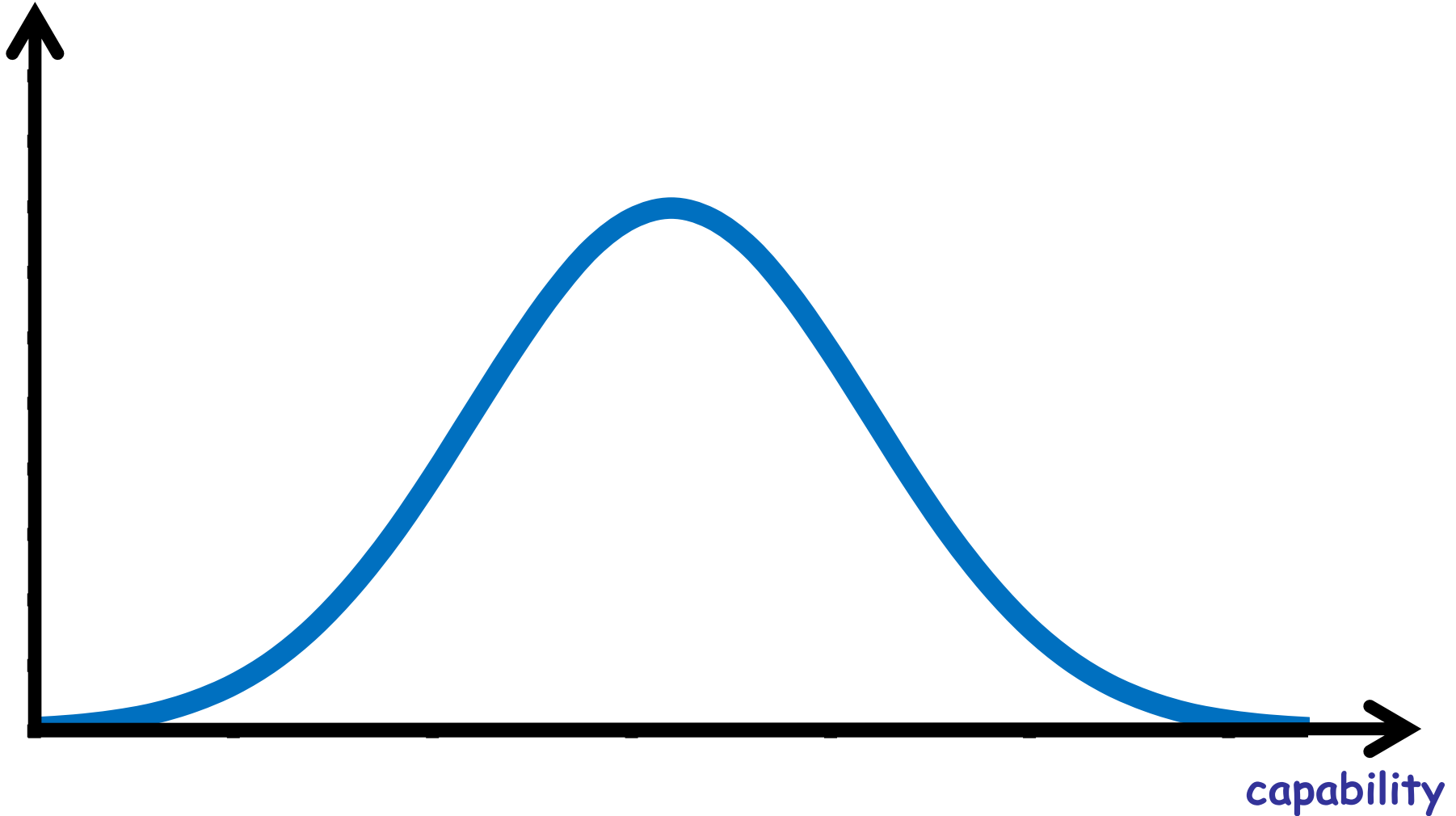
Cochrane Review Meta-Analysis:

"antioxidant supplements--vitamins A, C, and E; beta-carotene; and selenium--do not prevent heart disease or cancer, do not forestall death, and ***may even increase mortality risk slightly.***"

***"Nice skin,
shame she's dead!"***

A naïve view of the 'profession'

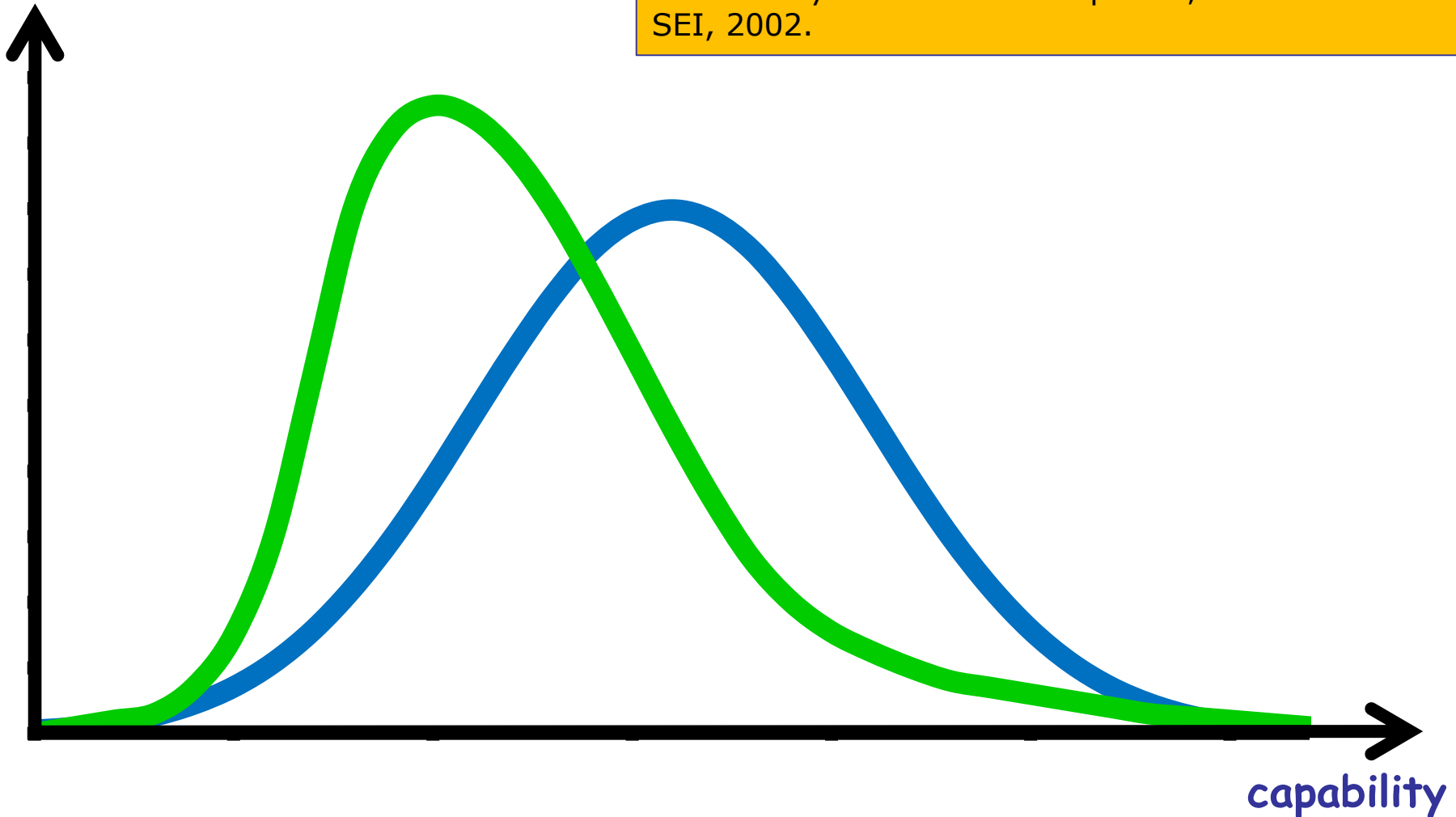
number of testers



Actual IT 'Professionals'

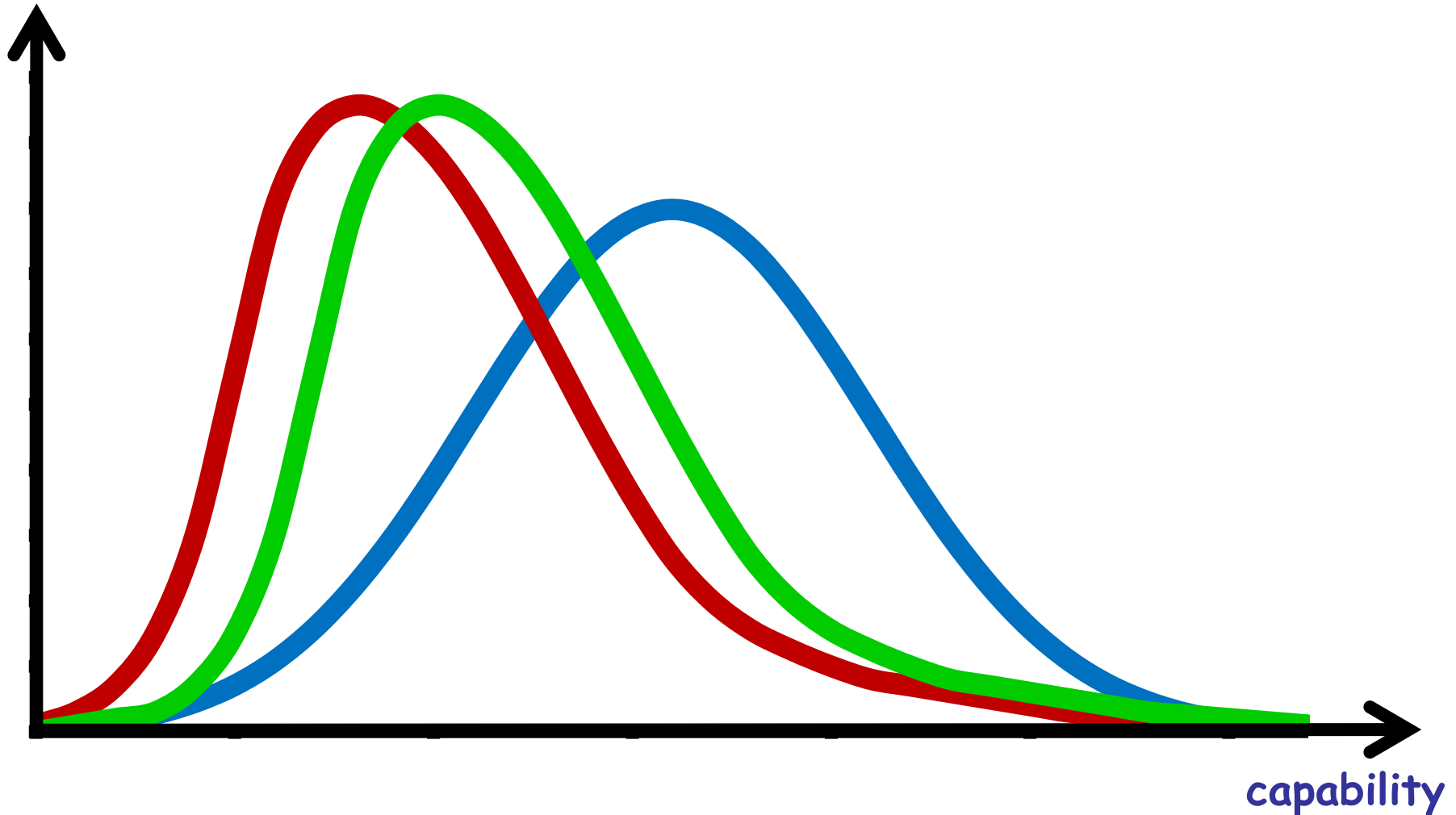
number of IT 'professionals'

"Process Maturity Profile of the Software Community 2001 Year End Update",
SEI, 2002.



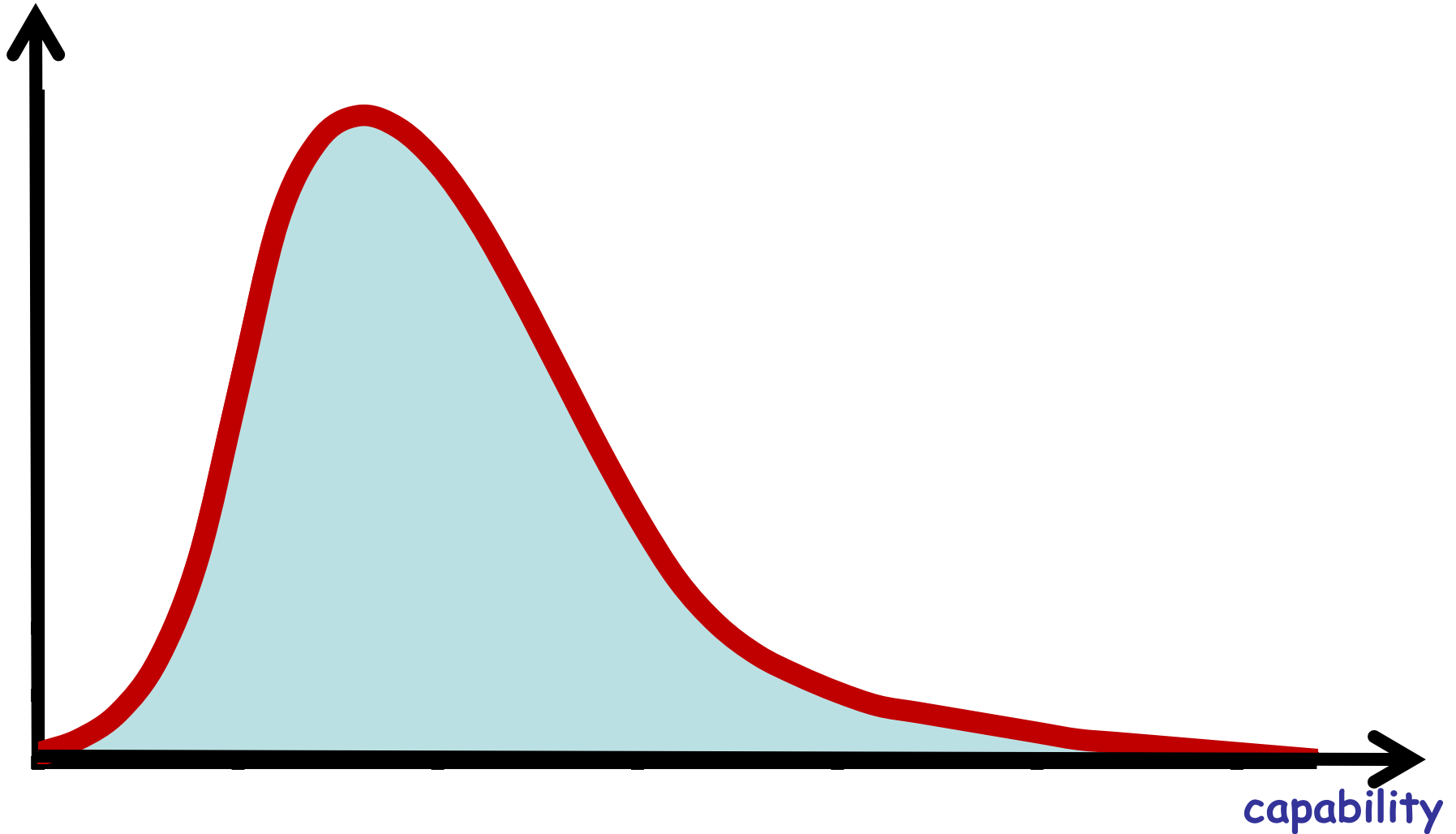
Are testers more capable?

number of testers/developers



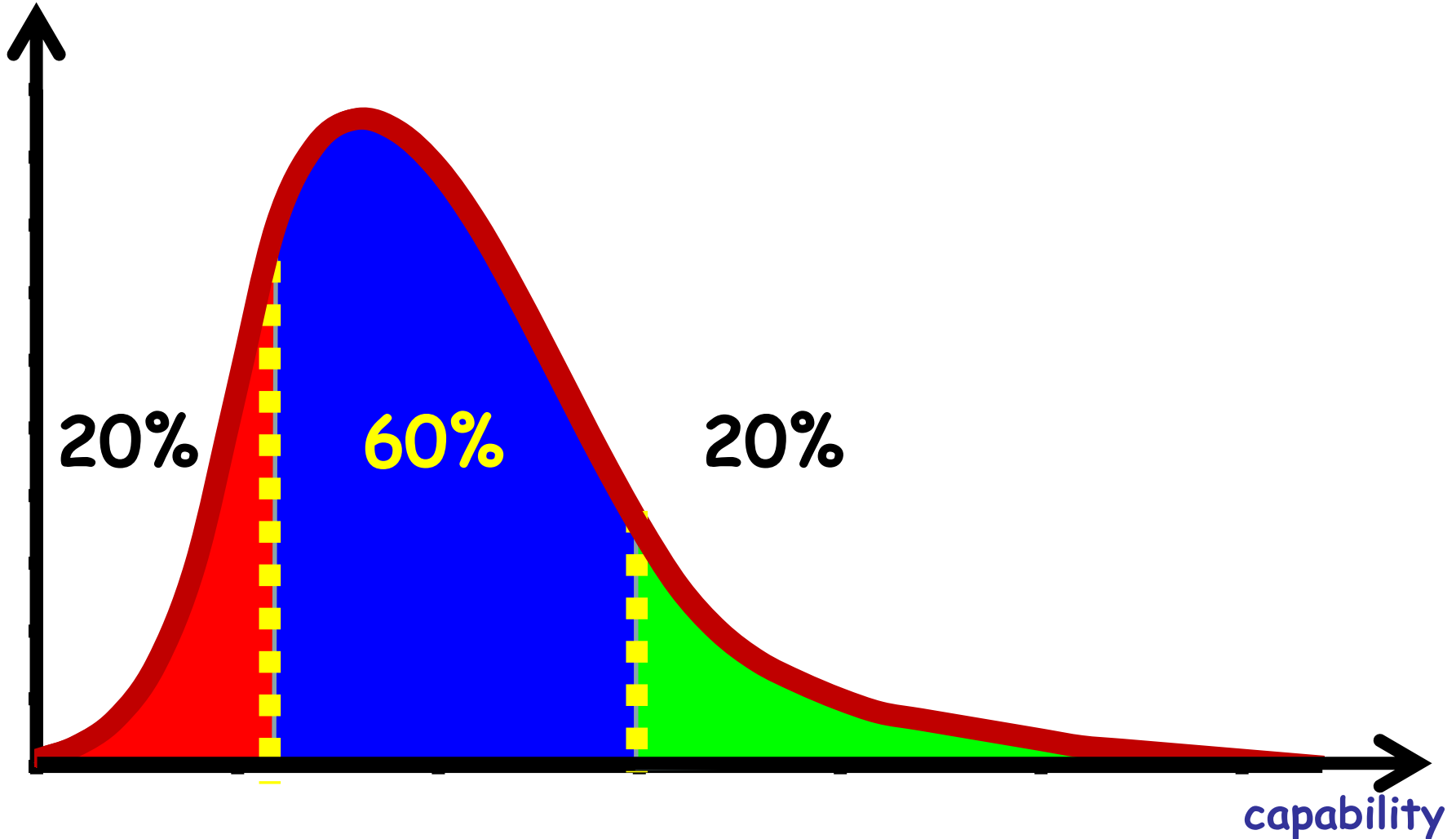
The profile for testers?

number of testers



Testers are not all the same...

number of testers



Complexity of evidence

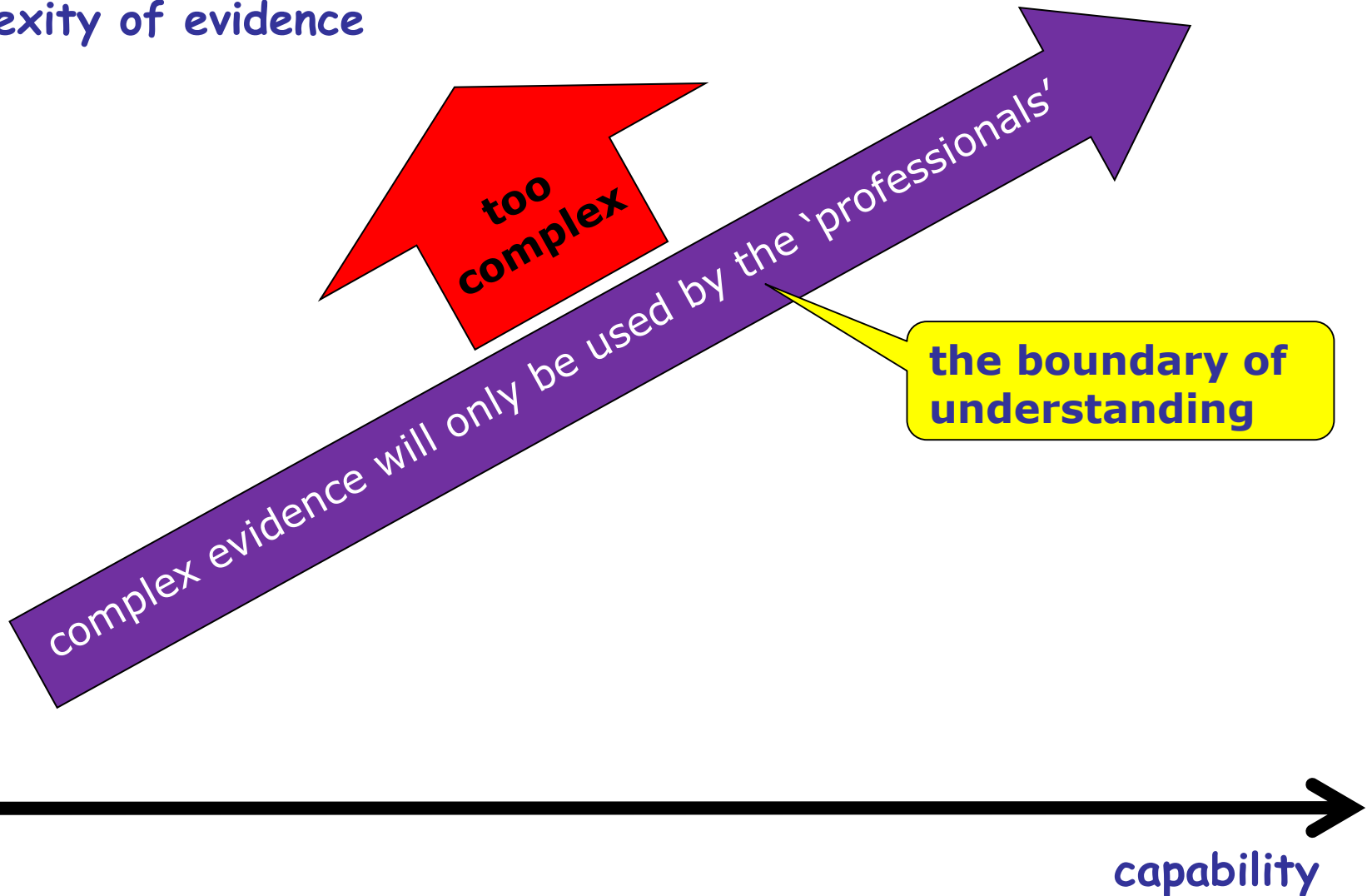
highly complex



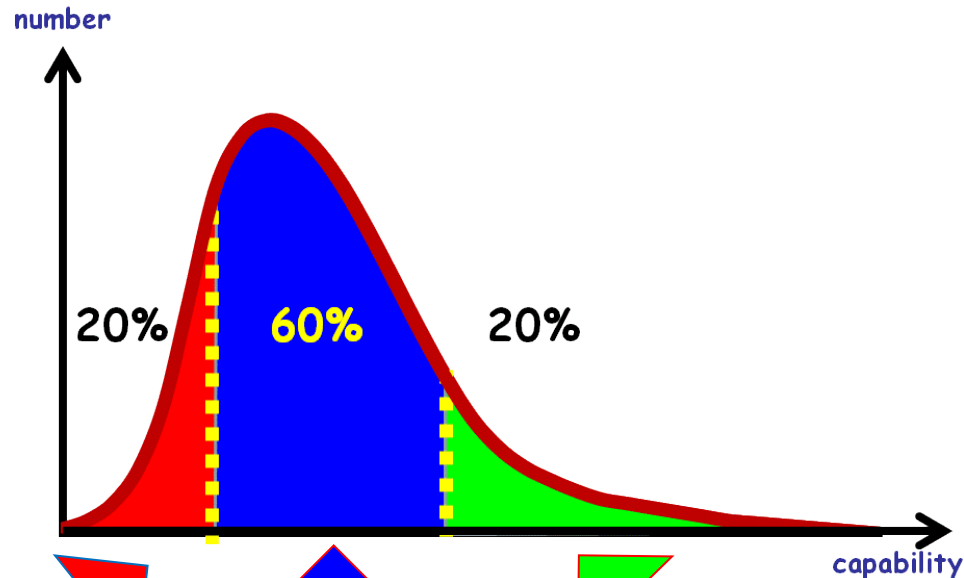
easy to digest

Usability of evidence

complexity of evidence



Presenting the evidence to testers



**Need to be
provided with
simple rules
or guidelines**

**May need to be
trained to find
and appraise
evidence**

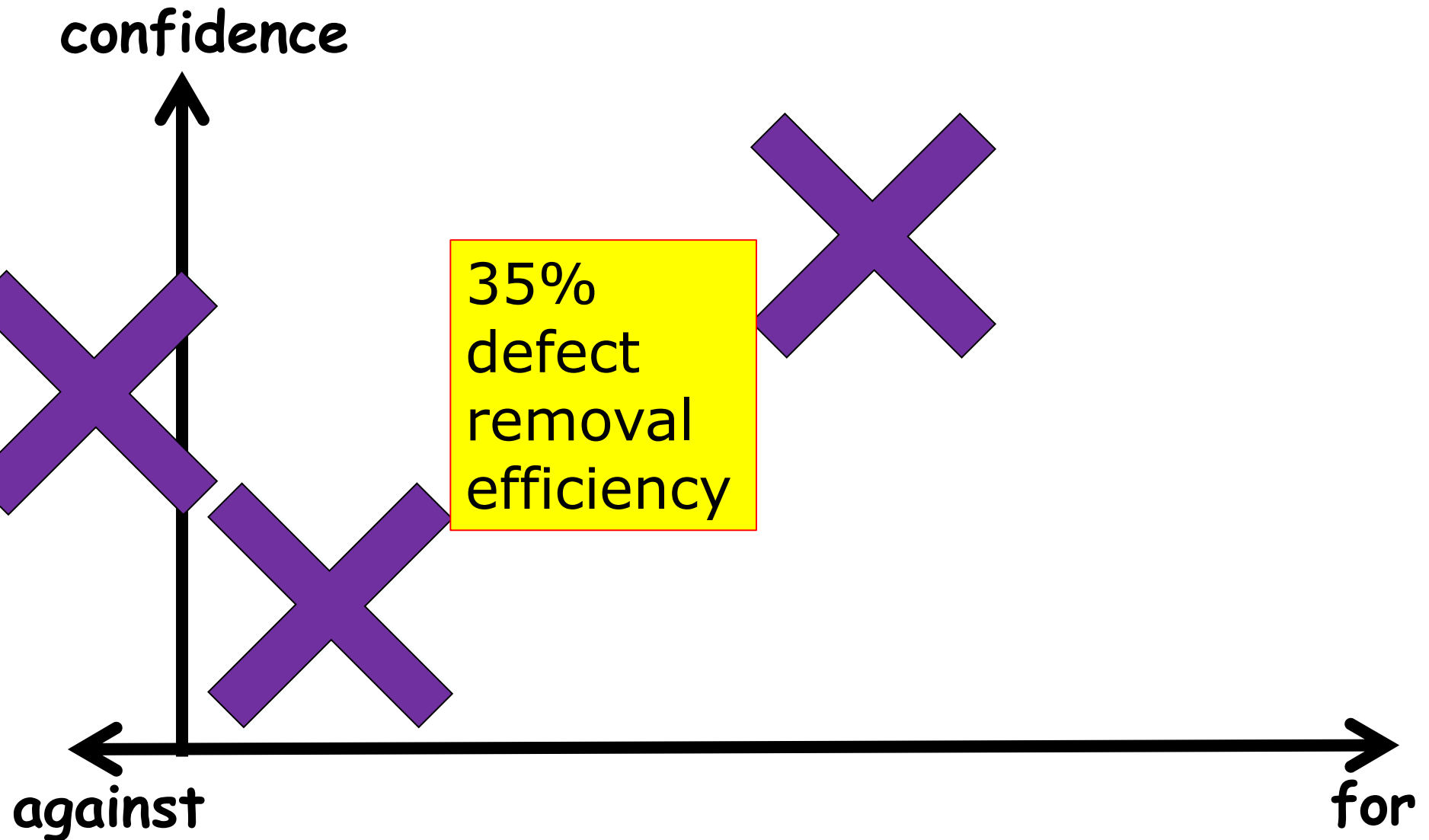
**Should already be
competently finding and
appraising evidence
PLUS
Should consider
contributing to the
guidelines on current
best evidence**

*So, is there any evidence
already out there.....?*

Useful Questions/Evidence?

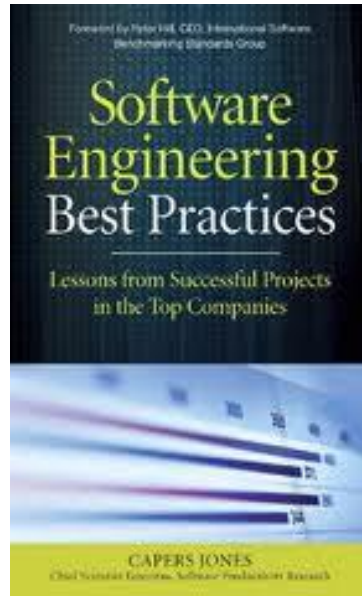
- Are formal reviews an efficient way of finding defects or are there better alternatives?
- Do testing tools save you money, cost you money or are they simply a distraction?
- Does using standards reduce the probability of project failure?
- Is a certified tester more effective than those without industry certification?
- Will exploratory testing detect more bugs than scripted approaches?

For each Question...



Formal reviews?

confidence



85% max.
defect
removal
efficiency

Capers Jones

Software Engineering Best Practices – Lessons from Successful Projects in the Top Companies, McGraw Hill, 2010.

Based on data from more than 13,000 projects, from 600 corporations and more than 30 government organizations.



against



for

Agile vs Waterfall?

confidence



Capers Jones



against



for

System Testing?

confidence



40% max.
defect
removal
efficiency

Capers Jones



against



for

Automated Static Analysis?

confidence



87% max.
defect
removal
efficiency

Capers Jones



against



for

Testing tools?

- EuroSTAR 2007 survey
 - approx. 600 respondents
- 42% achieved significant benefit
- 33% had reasonable benefit
- 16% had some benefit
- 10% had no benefit from the tools

Synergistic Approach?

- Formal Reviews
- System Testing
- Static Analysis

confidence



99% max.
defect
removal
efficiency

Capers Jones



against



for

Standards?

confidence



8.33%
average
defect
removal

Capers Jones



against



for

Certified testers?

confidence



8.5%
average
defect
removal

Capers Jones



against



for

Certified testers?

- EuroSTAR 2007 survey
 - approx. 600 respondents
- 35% said that they knew more about testing
- 26% got a better job or contract
- 17% were better recognised for their testing skills
- 1% reported higher pay
- 23% said it had no effect

Exploratory testing?

- Will exploratory testing detect more bugs than scripted approaches?
 - Yes, if there's no time to script and run tests
- Not a useful question
 - the two approaches should ideally be used as complementary approaches

Evidence-based testing

what do you need to know?



finding the evidence



appraising the evidence



applying the results

Conclusions

- We should base our decisions on all the available evidence
 - not restrict ourselves to one or two favourite sources (such as ourselves)
- More research is needed
 - and the results need to be made accessible to all
- Testers are not a homogeneous group
 - different capabilities have different needs
- It doesn't help the discipline if those with different views spend too much of their time arguing amongst themselves

An (academic) EBT Bibliography

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Conclusion

- Intro to Evidence-Based Testing
- How could we store the 'evidence'?
- Would you contribute?

들어 주셔서 감사합니다