Advancing the field of forensic pathology:
Lessons learned from death in custody investigations

MY PRESENTATION (*hyperlinks to research items included*) IS **ON**

Cognitive bias:
A MAJOR, but neglected, problem in the field of forensic pathology

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A few preliminary quick points to make:

1. Thank you for inviting me and giving the opportunity to present to you.
2. NAS (2009) Report "Strengthening Forensic Science" had a great impact.

   And hopefully your Report will also have such an impact, if not more.
3. NAS (2009): NOT giving more funds just to support doing things the way they were.
4. Much of what is learned from death in custody also applies to forensic pathology in general, and hopefully your Report will have a broader impact across forensic pathology. Of course, there are some unique issues to death in custody investigations.

Cognitive bias: A MAJOR, but neglected, problem in the field of forensic pathology

So what is this 'MAJOR' problem? (and Recommendations to deal with it):

- Forensic pathology (forensic pathologists, medical examiners, coroners, medico-legal examiners, etc.) require context to do their job! (just like some other forensic domains, e.g., CSI, digital forensic)
- Rather, **THE** question is: What is the proper way to use context in forensic pathology decisions?
    1. What context?
    2. How to use this context?
    3. What impact does this context have (transparency)?
- Before I answer these questions, let me address why this relatively simple issue (dealt with in many forensic domains) has turned to be a "MAJOR problem" in forensic pathology

See: https://www.science.org/doi/full/10.1126/science.aat8443

Cognitive bias: A MAJOR, but neglected, problem in the field of forensic pathology

Why this relatively simple issue has turned to be a "MAJOR problem"

- The forensic pathology community has refused to take on this issue (which not only have other forensic domains now taken on –impact of NAS 2009– but the medical healthcare domain has acknowledged the problem of bias), a couple illustrative examples:
  - Response to the **first** empirical article (two studies) about bias in forensic pathology.

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PAPER

General

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Cognitive bias in forensic pathology decisions

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- First article on bias and NAME's response was to try to have it retracted (e.g., complained that the statistical analysis is incorrect –Journal decided to send it to a additional new statistical reviewer, who confirmed that the statistics were all correct).
- Filed multiple complaints:
  - NAME filed official complaint to my university, not only complaining (again) that the statistical analysis is incorrect, but claiming I was intentionally deceptive in conducting this research (a hearing at the university dismissed all charges)
  - Also complaints were filed against *all* of my forensic pathologist collaborators (all complaints were dismissed).
- And, there is much more about how the forensic pathology community responded…
-
-
- Even the Editor of the journal felt he had to write his own Letter-to-the-Editor stating that: "It was not disappointing to me that this article received such scrutiny; however, the "emotional" nature of some of the letters was." (https://doi.org/10.1111/1556-4029.14844)

→ Emotional, vitriol, pushback
→ Went after the authors personally
➔ Not open culture, that enables improvement

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journal homepage: www.elsevier.com/locate/scijus

Short Communication

Fourth study on bias in medico-legal decisions:

The role of alternative hypotheses in reducing bias in forensic medical experts' decision making

Can be freely accessed at:
https://www.sciencedirect.com/science/article/pii/S1355030623000837?via%3Dihub

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Acknowledgments

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Cognitive bias: A MAJOR, but neglected, problem in the field of forensic pathology

Why this relatively simple issue has turned to be a "MAJOR problem"

- The forensic pathology community has refused to take on this issue

  (which not only have other forensic domains now taken on –impact of NAS 2009– but the medical healthcare domain has acknowledged the problem of bias), a couple illustrative examples:
  - Response to the first empirical article (two studies) about bias in forensic pathology
  - Indeed, see our fourth study on bias in medico-legal decisions

→ **Not about the personal perspective, but the impact on the field of forensic pathology**, the lack of open culture has additional consequences, e.g.:

1. Lack of understanding of cognitive bias
2. No decision on what is relevant and legitimate context to use? E.g., Who brought the child to the hospital? From what neighborhood was the child from? Past criminal record? → A 'hierarchy of context'
3. Lack of transparency
4. Incorrect use of bias mitigating approaches, e.g., LSU-E in the George Floyd case.

Cognitive bias: A MAJOR, but neglected, problem in the field of forensic pathology

Without an open culture, there is a lack of training and understanding what cognitive bias is all about…

E. g.: Fallacies about bias

- Unintentional and implicit bias
- Only 'bad' examiners
- Can control bias by mere willpower
- Experts are not immune
- And other bias fallacies:

Table 1. Six Fallacies about Cognitive Bias Commonly Held by Experts

Can be freely accessed at:
https://pubs.acs.org/doi/10.1021/acs.analchem.0c00704

Fallacy	Incorrect belief
1. Ethical Issues	It only happens to corrupt and unscrupulous individuals, an issue of morals and personal integrity, a question of personal character.
2. Bad Apples	It is a question of competency and happens to experts who do not know how to do their job properly.
3. Expert Immunity	Experts are impartial and are not affected because bias does not impact competent experts doing their job with integrity.
4. Technological Protection	Using technology, instrumentation, automation, or artificial intelligence guarantees protection from human biases.
5. Blind Spot	Other experts are affected by bias, but not me. I am not biased; it is the other experts who are biased.
6. Illusion of Control	I am aware that bias impacts me, and therefore, I can control and counter its affect. I can overcome bias by mere willpower.

Cognitive bias: A MAJOR, but neglected, problem in the field of forensic pathology

Without an open culture, there is a lack of training and understanding what cognitive bias is all about…

E. g.:

- Do not appreciate the different sources of bias
- And how they can impact forensic pathology
- And, what can (should) be done about it

Can be freely accessed at:
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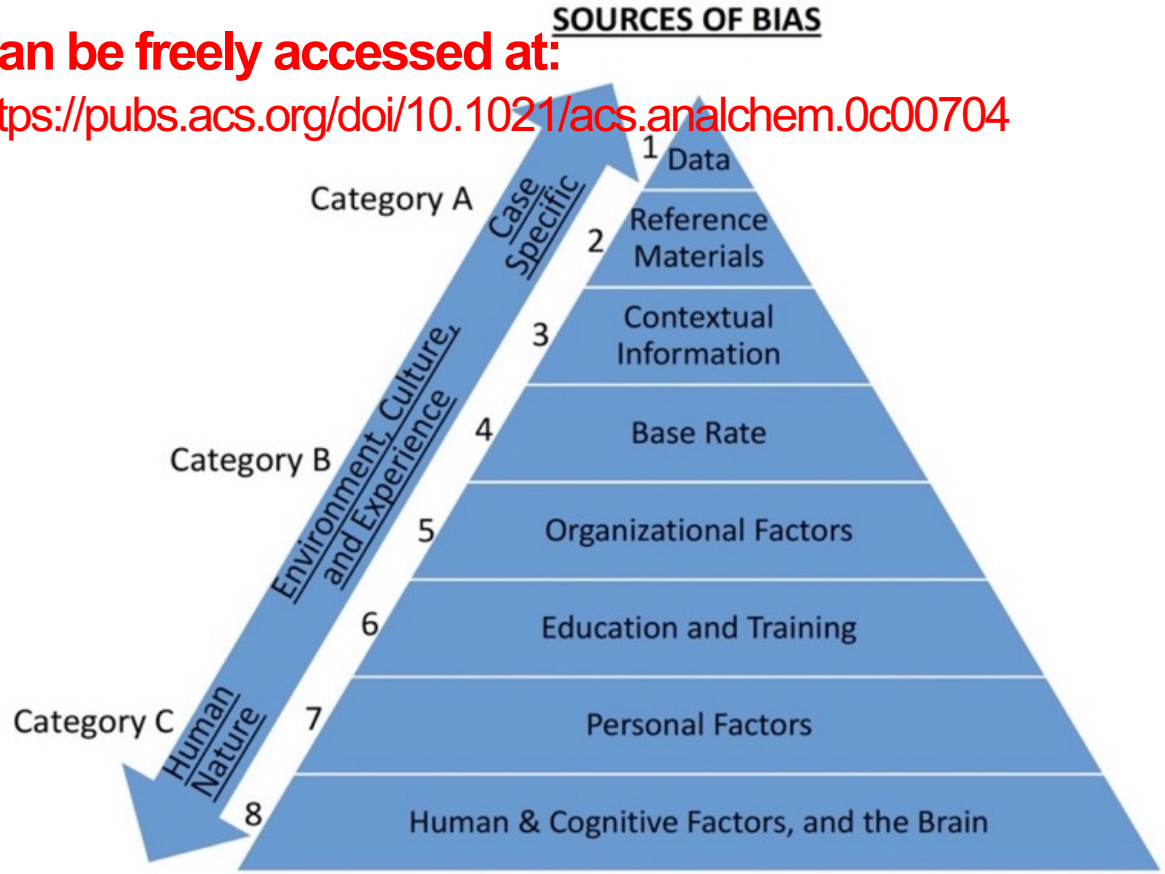
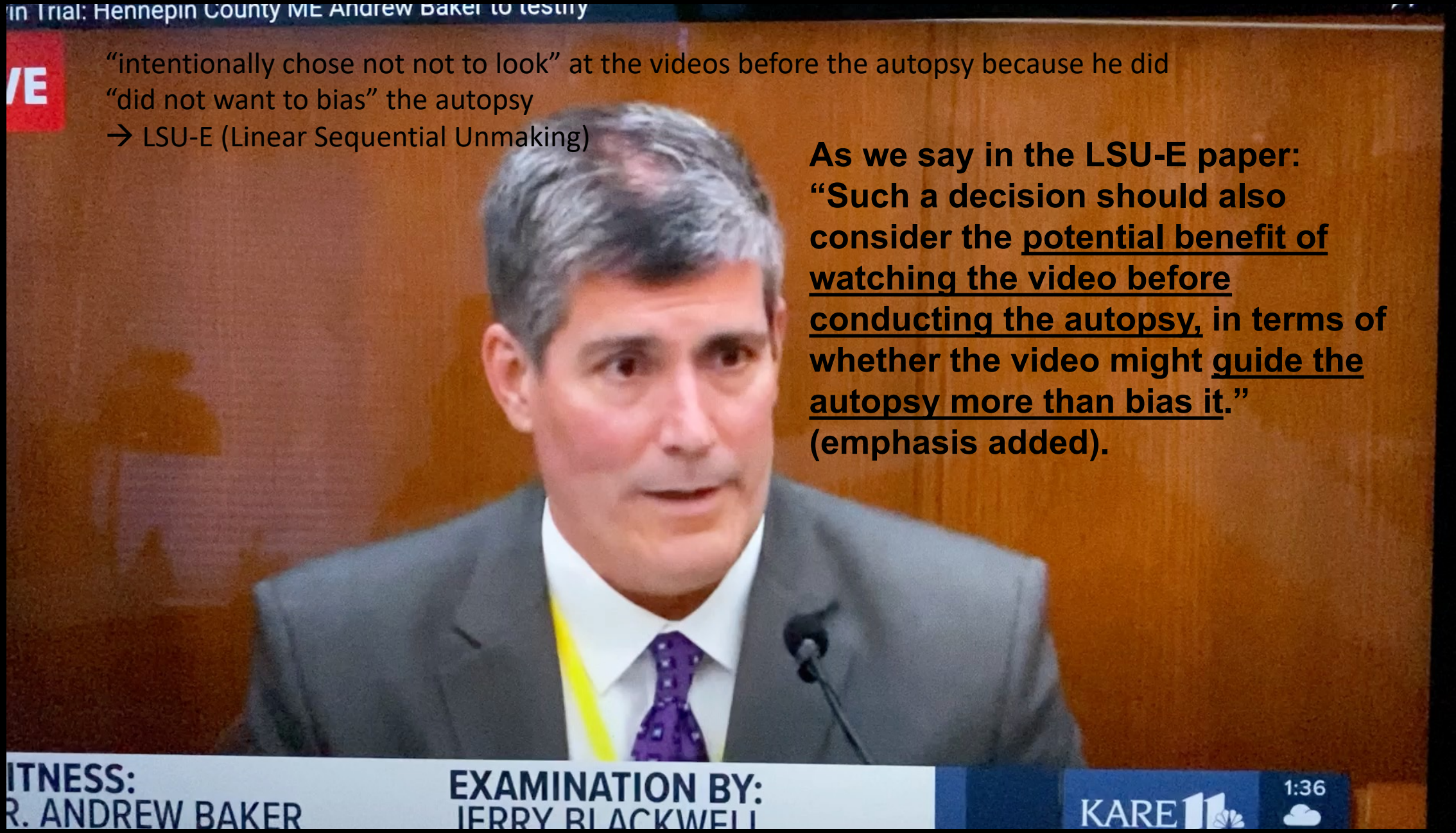


Figure 1. Eight sources of bias


in Trial: Hennepin County ME Andrew Baker to testify
VE
"intentionally chose not not to look" at the videos before the autopsy because he did "did not want to bias" the autopsy
→ LSU-E (Linear Sequential Unmaking)
As we say in the LSU-E paper: "Such a decision should also consider the potential benefit of watching the video before conducting the autopsy, in terms of whether the video might guide the autopsy more than bias it." (emphasis added).
ITNESS:
R. ANDREW BAKER
EXAMINATION BY:
JERRY BLACKWELL
KARE 11
1:36

Forensic Science International: Synergy 3 (2021) 100161

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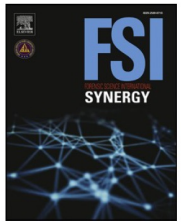


Linear Sequential Unmasking–*Expanded* (LSU-*E*): A general approach for improving decision making as well as minimizing noise and bias

Itiel E. Dror, Jeff Kukucka

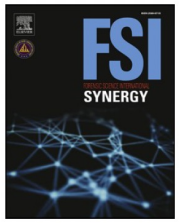
Can be freely accessed at:
https://www.sciencedirect.com/science/article/pii/S2589871X21000310?via%3Dihub

Forensic Science International: Synergy 4 (2022) 100216

Contents lists available at ScienceDirect

Forensic Science International: Synergy

journal homepage: www.sciencedirect.com/journal/forensic-science-international-synergy



Can be freely accessed at:
https://www.sciencedirect.com/science/article/pii/S2589871X22000018?via%3Dihub

A practical tool for information management in forensic decisions: Using Linear Sequential Unmasking-Expanded (LSU-E) in casework

Adele Quigley-McBride [a,*], Itiel E. Dror [b], Tiffany Roy [c], Brandon L. Garrett [a], Jeff Kukucka [d]

Cognitive bias: A MAJOR, but neglected, problem in the field of forensic pathology

So what is this 'MAJOR' problem? (and Recommendations to deal with it):

- Forensic pathology (forensic pathologists, medical examiners, coroners, medico-legal examiners, etc.) require context to do their job! (just like some other forensic domains, e.g., CSI, digital forensic)
- THE question is what is the proper way to use context in forensic pathology decisions?
  1. What context?
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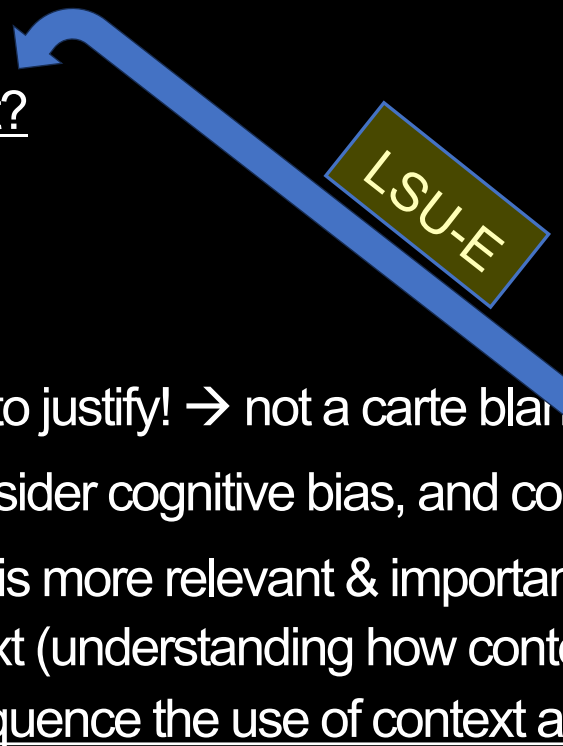
  3. Transparency



NOT "based on my training and experience" without any explanation and elaboration

→ 1. They need to decide, and to justify! → not a carte blanche, "multi-source, multi-context" decision-maker

→ 2. They need to properly consider cognitive bias, and consider different countermeasures

For example, what context is more relevant & important, what context is more objective, less biasing

→ A hierarchy of context (understanding how context should influence their decisions)

➔ Prioritize and sequence the use of context accordingly

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- THE question is what is the proper way to use context in forensic pathology decisions?
  1. What context?
  2. How to use this context?
  3. Transparency

  } → Apply to forensic pathology in general, death in custody or not. What about specific issues to death in custody?

→ 1. They need to decide, and to justify! → not a carte blanche

→ 2. They need to properly consider cognitive bias, and consider different countermeasures

→ 3. They must have transparency (complex, given the implicit bias)

Cognitive bias: A MAJOR, but neglected, problem in the field of forensic pathology

Death in custody investigations:

- Some issues get exacerbated.
  - E.g., police presence during autopsies.
- Some new issues arise.
  - Treating death in custody differently.

    Question: should they be treated differently? → They **ARE**, the question is 'should' they? (& if so, how?)
  - Same case, same evidence, all identical, *except*...: one death was in police custody and the other not.
  - And, if there is a systematic difference, **what does that mean?**
    - e.g., 'homicide' when death is not in police custody, but 'undetermined' when in custody
      - 1. Pro-police bias?

      OR…:
      - 2. No, not bias, just an artifact of doing more testing in death in custody cases…

MUCH more to say and to discuss, but due to time constraints, let's move to & end with Recommendations:

Cognitive bias: A MAJOR, but neglected, problem in the field of forensic pathology

RECOMMENDATIONS (which follow from me presentation):

1. Examine, consider, and determine the dangers of bias specifically in forensic pathology decision making (not limited to only death in custody). Including:
   a. Determining what contexts are needed
   b. Organizing the different contexts in a 'Hierarchy of Contexts' (by relevance/importance, subjectivity, & biasability)
   c. How to properly use context (e.g., LSU-E, based on the 'Hierarchy of Contexts')
2. Establish standards specifically relating to and addressing bias. Including:
   a. Avoiding --as much as possible-- context that is not needed (see 1a, above)
   b. Mandatory reporting on what contextual information was provided (e.g., the police theory)
   c. Use of bias mitigating techniques
3. Oversight and accountability (no use having Standards if there is no oversight)
4. Encourage and fund collaborative research specifically on bias, and ways to minimize it.
5. Specific mandatory proper training on bias in forensic pathology
6. Establish a cross-discipline , independent, & scientific, professional body responsible for 1-5 (above) –E.g., Federal Commission, NIH

References:

1. **About cognitive bias impacting experts —sources and fallacies:**
   - Dror, I. E. (2020). "***Cognitive and human factors in expert decision making: Six fallacies and the eight sources of bias***". Analytical Chemistry, 92 (12), 7998–8004. DOI: 10.1021/acs.analchem.0c00704
   - Can be freely accessed at: https://pubs.acs.org/doi/10.1021/acs.analchem.0c00704

2. **A short summary published in *Science* magazine on bias in forensic decisions:**
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   - Can be freely accessed at: https://www.science.org/doi/full/10.1126/science.aat8443

3. **The *first* ever article (includes two studies) on bias in forensic pathology:**
   - Dror, I. E., Melinek, J., Arden, J. L. Kukucka, J., Hawkins, S., Carter, J. & Atherton, D. S. (2021). "***Cognitive Bias in Forensic Pathology Decisions***". Journal of Forensic Sciences, 66 (5), 1751-1757. DOI: 10.1111/1556-4029.14697
   - Can be freely accessed at: http://dx.doi.org/10.1111/1556-4029.14697

4. ***Second* published article on bias in forensic pathology:**
   - Dror, I. E, Wolf, D. A., Phillips, G., et al. (2022). "***Contextual information in medicolegal death investigation decision-making***". Forensic Science International: Synergy, 5, 100285. DOI: 10.1016/j.fsisyn.2022.100285
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5. ***Third* published article on bias in forensic pathology:**
   - Lidén, M., Thiblin, I., & Dror, I. E. (2023). "***The role of alternative hypotheses in reducing bias in forensic medical experts' decision making***". Science and Justice, 63 (5), 581-587. DOI: 10.1016/j.scijus.2023.07.005
   - Can be freely accessed at: https://www.sciencedirect.com/science/article/pii/S1355030623000837?via%3Dihub

6. **Linear Sequential Unmasking (LSU-E), a way to minimize bias:**
   - Dror, I. E. & Kukucka, J. (2021). "***Linear Sequential Unmasking–Expanded (LSU-E): A general approach for improving decision making as well as minimizing noise and bias***". Forensic Science International: Synergy, 3, 100161. DOI: 10.1016/j.fsisyn.2021.100161
   - Can be freely accessed at: https://www.sciencedirect.com/science/article/pii/S2589871X21000310?via%3Dihub

Good luck with your work

and

Thank you very much!

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