

V1 2022 Schield IASE Slides 1

## Statistical Literacy: Seven Simple Questions for Policy Makers

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**Milo Schield, University of New Mexico**  
*Fellow: American Statistical Association*  
*Elected Member: International Statistical Institute*  
*US Rep: International Statistical Literacy Project*  
*Past-President: National Numeracy Network*

**IASE Webinar December 7, 2022**

Paper: [www.statlit.org/pdf/2022-Schild-SJIAOS.pdf](http://www.statlit.org/pdf/2022-Schild-SJIAOS.pdf)  
 Slides: [www.StatLit.org/pdf/2022-Schild-IASE-Slides.pdf](http://www.StatLit.org/pdf/2022-Schild-IASE-Slides.pdf)

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## Data Literacy & Statistical Literacy

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Although distinct, these two areas overlap.

The overlap occurs when delivering the results to decision-makers, policymakers and journalists.

They are not trained to read, interpret and evaluate the results of data analytics or statistical tests.

*They need help!*

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## Policymakers & Decision makers Need Help

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These people are not experts.  
 They usually ask good questions.  
 But after a data or statistical presentation, they often say: *Thank you. We'll look into that.*

That usually means:

- \* they didn't know what questions to ask
- \* the data proposal is DOA: Dead On Arrival.

I want to help policy makers ask good questions.  
*Here are 7 questions to ask about observational data.*

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## Statistical Literacy: Seven Questions for Policy Makers

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1. How big, how many, how much?
2. Compared to what?
3. Why not a rate?
4. Per what? What was *taken into account*?
5. How were things counted or measured?
6. What was *taken into account* (controlled for)?
7. What should have been *taken into account*?

*What does "take into account" mean with numbers?*

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## Question #4: Per what? The Diabolical Denominator

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Which state has the higher Covid death rate?  
 Michigan (Mich.) or Rhode Island (R.I.)? It depends...

Mich. 20,098 ???	<b>Total Covid Deaths</b>	R.I. 18,022 ???
	per million CASES	
1,399	per million INFECTIONS	665
1,662	per million TESTS	665
	per Million POPULATION	2,521

www.worldometers.info/coronavirus/country/us/ as of 5/11/2021  
 Total tests given exceeded the population for both states

Might like *deaths per infection*. Not generally available.

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## Question #7: What should have been taken into account

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*Death is twice as likely for Covid vaccinated cases (.41%) as for unvaccinated cases (0.17%).* UK National Health Service.

Q. What could confuse (confound) this crude comparison?

Covid Death Rates Per Case			Death Rates by Age	
	Crude Rate	# Cases	<50	50+
Unvaccinated	<b>0.17%</b>	151,052	0.03%	5.96%
Vaccinated	<b>0.41%</b>	117,114	0.02%	1.68%

41/17 = 2.4 UK NHS 2021

Selection: a simple way to *take into account* a related factor.  
 You don't need math to see a reversal: Simpson's paradox

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**Schild Articles on  
Taking into account (Controlling for)**

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*Statistical Literacy: Critical Thinking about Statistics.*  
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*Information Literacy, Statistical Literacy and Data Literacy*  
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Schild's articles by topic:  
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**Question #4:  
Per What (Diabolical Denom.)**

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Why are men disproportionately represented in prison?  
 Is gender discrimination the cause of this gender disparity?

Male	Percentage who are ....	Black	Ref
93%	Prison	33%	1
88%	[Arrests: Murder]	51%	2
79%	[Arrests: Violent]	36%	2
72%	Arrests: All	27%	2
70%	Criminal Victimizations	21%	3
49%	US Population 2019	13%	4

1: <https://bjs.ojp.gov/content/pub/pdf/p19.pdf> Table 3  
 2: <https://ucr.fbi.gov/crime-in-the-us/2019/crime-in-the-us-2019> Table 43A  
 3: <https://bjs.ojp.gov/content/pub/pdf/cv19.pdf> Table 13  
 4: <https://www.census.gov/en.html> Table NC-EST2019-ASR6H

Is racial discrimination the cause of this racial disparity?

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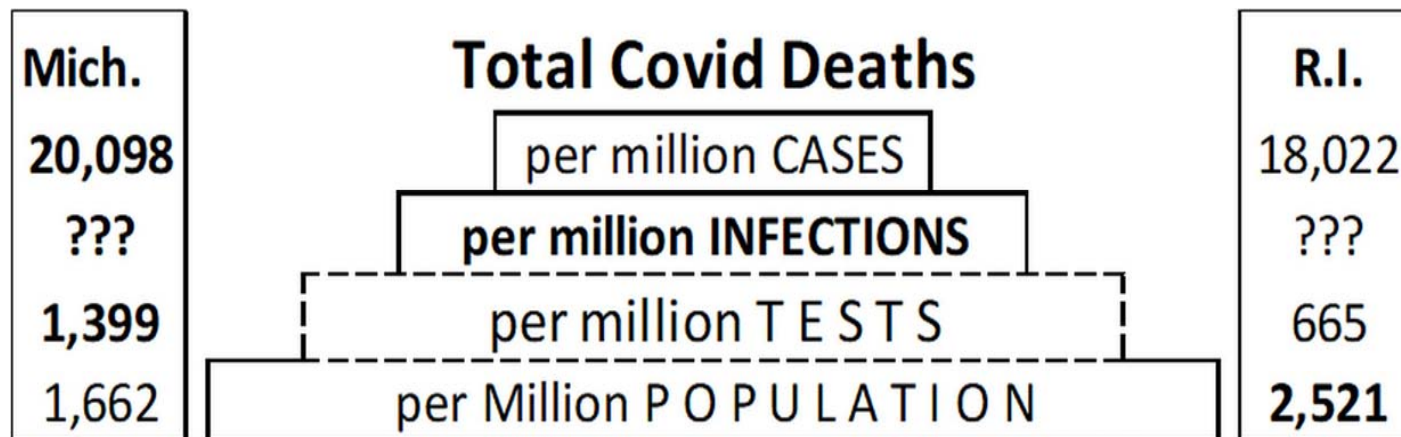
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