

TOP TEN LIST

TEN BEST WAYS TO MISUSE CONFIDENCE INTERVALS

With apologies to David Letterman, and thanks for editorial assistance to Elizabeth Kirby and for their insights to the following Internet contributors:

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R.S. Kirby, March 2002

**"If the confidence interval is
very tight, the case for causation
is strengthened...."**

Submitted without attribution as a quotation from a
manuscript under review by

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Top Ten List: Ten Best Ways to Misuse Confidence Intervals

Number 10

Say It With Total Confidence

Being a statistician means never having to say you're wrong. Don't be afraid to use those 100% CIs so that you can state with authority:

"I'm 100% sure that the true population parameter lies between zero and infinity!"




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Number 9

Out of Sight, Out of Mind

Whether you calculated the CIs or not, it isn't necessary or desirable to include them in your publication.

A general statement in the text to the effect that "all statistical values were significant" should be sufficient for all but lay audiences.



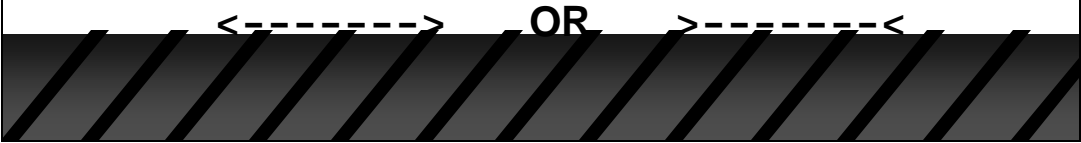
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Number 8

A Picture is Worth a Thousand Words

Assess statistical significance through visual comparison of confidence intervals.

For example: which of the following confidence intervals is larger?



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Number 7

Smoke and Mirrors

On a graph, overly wide confidence bands can be “adjusted” by plotting the data on an arithmetic scale and the CIs on a logarithmic scale.

Your friends will be amazed at how tight those CIs become.




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Number 6

How Big is Your N?

Remember that any results would have been statistically significant if only your sample size was large enough. This should not ruin otherwise good science.

To compensate for small sample sizes, adjust your CIs so that the null value is always excluded. Don't be afraid to use 15% CIs if necessary, if that will help support your hypothesis.



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Number 5

To Really Foul Things Up . . .

Never include your point estimate within the confidence limits.

When questioned, blame it on the computer program.




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Number 4

Will 99 and a Half Do?

95% CIs are trite and commonplace. Be creative – Try reporting results such as the $-2 \log(67.45\%)$ CIs and see what exciting results you get.

No one will understand it, but they don't understand the 95 or 99% CIs either.




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Number 3

Sound Bytes Are Best

Selectively quote the results concerning one confidence limit. For example, when the estimate of the confidence interval is 0 to 70, perhaps for the association between watching late night reruns and sleep disorders:

“This risk factor decreases the risk of the outcome up to 70%.”




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Number 2

Why Infer When You Can Guess?

To demonstrate statistical significance for a comparison of rates or proportions, visually examine the two confidence intervals.

Try comparing the lower confidence bound of the smaller value with the upper confidence bound of the larger value. If that still doesn't work, try fitting ever narrowing confidence bands (e.g. the 15% CIs as in Number 6 above) until the confidence limits no longer overlap.



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Number 1

Is That All, Folks?

The best way to misuse confidence intervals is to confuse statistical significance with true, substantive significance.

An observed statistical difference begs the question "So what?" which is too seldom asked.



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“If you pay strict attention to these suggested methods for using confidence intervals, you too can misuse confidence intervals with confidence.”

-- R. S. Kirby

March 25, 2002

