Statistical Publication Rules

NAS Panel on Marine Recreational Information Program (MRIP)
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Background on my Expertise

▶ Fishing? Only twice, in Canada and Finland

▶ NSO Data Quality Standards

  ▶ Led revision of NCES Statistical Standards

  ▶ Reviewed documentation standards for EIA

  ▶ Evaluated publication standards for NIOSH

  ▶ Quality Reviews for Dutch, Danish, British, and South African NSOs

Comparison of Publication Rules

► National Electronic Injury Surveillance System (NEISS) sponsored by both CDC and CPSC

  ► Different rules for publication of estimates

  ► Requested help to avoid conflict

► Led to publication:

► Marker, D.A. (2021). Suppression Criteria for Inaccurate Estimates. *Statistical Journal of the International Association of Official Statistics (IAOS)* vol. 37, no. 4, pp. 1337-1346. **DOI:** 10.3233/SJI-210794
https://content.iospress.com/articles/statistical-journal-of-the-iaos/sji210794

Suppression Rules (2021 SJIAOS)

▶ Mostly a table of NSO rules

  ▶ 7 countries on 4 continents

  ▶ 10 US statistical offices

▶ Generally 3 types of rules

  ▶ CV (or RSE)

  ▶ Minimum sample size

  ▶ Response rates

Response Rates

- ► Drastic reductions last 20 years - cut-offs obsolete

- ► Generally a requirement for nonresponse bias analyses when below a certain rate

- ► Compare frame information on respondents and nonrespondents

- ► If biases too bad, consider suppression regardless of precision

Minimum Sample Size

- Generally focus on denominator*

- Often minimum of 30, based on CLT

- For proportions near 0 or 1, need more cases

- Effective sample size (accounting for design)

- *Rules about the numerator are typically to protect confidentiality, not accuracy

Coefficient of Variation (CV) - RSE

- Apparently MRIP uses PSE?
- Generally don't publish if CV≥50%
  - To avoid a 95% CI crossing 0
- Warn if 50%>CV≥30%
- Best to use symmetric rules
  - Same decision for p=0.10 and 0.90
- Consider using non-symmetric CI - Wilson

Marine Recreational Information Program (MRIP)

- MRIP uses typical rules of 30% and 50%
- Good use of color
- Does it use symmetric rules?
- Oddly, seems to suppress CI, but not point estimate?

Estimate Status	Year	Common Name	PSE Harvest	Does Total Harvest (A+B1) Meet MRIP Standard	Is Total Harvest (A+B1) Significantly Different From 0	Total Harvest (A+B1)	Total Harvest (A+B1) Lower 95% Confidence Limit	Total Harvest (A+B1) Upper 95% Confidence Limit	PSE Released	Does Released Alive (B2) Meet MRIP Standard	Is Released Alive (B2) Significantly Different From 0	Released (B2)	Released Alive (B2) Lower 95% Confidence Limit
PRELIMINARY	2025	BLACKFIN TUNA	27.1	YES	YES	107,592	50,443	164,741	85	NO	NO	23,650	0

- As part of the government's guidelines for statistical programs, the Office of Management and Budget requires federal agencies to establish their own criteria for statistical precision. Standard 4.1.5 in OMB Standards and Guidelines for Statistical Surveys directs federal agencies as follows: *'Prior to producing estimates, establish criteria for determining when the error... associated with a direct survey estimate, model-based estimate, or projection is too large to publicly release the estimate/projection.'*
- Upper and lower confidence limits are calculated using a standard 95% confidence interval. The lower 95% confidence interval is truncated at 0 to match graph output.
- PSE, or proportional standard error, is automatically included in all outputs.
- Estimates with a percent standard error exceeding 50 are not statistically different from zero using a standard 95% confidence interval.
   - A PSE highlighted in yellow indicates an estimate with a PSE value 30 to 50 and should be treated with caution.
   - A PSE highlighted in red indicates a highly imprecise estimate with a PSE value greater than 50.

Can Bad Data be Better than No Data?

- No "theoretically" best set of rules for all
- Depends upon application, trade-off
- How will people act without your fuzzy estimates?
- 1990s Clinton health insurance effort
  - What % of companies offered health insurance?
    - By state
  - Many states CV>50%, lots of imputation
  - Decided better to share estimates, with caveats