Presenting the results

What did you do and why? Before giving results, you must first give a reader enough information to appreciate them!

- State the *objectives* – Why do this simulation? What specific questions are you trying to answer?
- State the *rationale* for choice of factors studied, assumptions made
- Review all *methods* under study – be precise and detailed
- Describe *exactly* how you generated data for each choice of factors – enough detail should be given so that a reader could write his/her *own program* to reproduce your results!

Some basic principles:

- Present only a *subset* of results ("Results were qualitatively similar for all other scenarios we tried.")
  - i.e., don't overwhelm the reader with a dozen tables of numbers that all carry the same message
- Present only interesting, useful information ("Relative biases for all estimators were less than 2% under all scenarios and hence are not shown in the table.")

  ritem The *mode of presentation* should be *friendly...*

Tables

Tables are an obvious way to present results; *however*, some caveats

- Avoid zillions of numbers jam-packed into a table!
- Place things to be compared adjacent to one another so that comparison is easy
- Rounding...

Rounding: Three reasons (Wainer, 1993)

- Humans cannot understand more than two digits very easily

- More than two digits can almost never be statistically justified

- We almost never care about accuracy of more than two digits

Wainer, H. (1993) Visual Revelations, *Chance Magazine*

Examples

- "This year's school budget is \$27,329,681.32" *or* "This year's school budget is about 27 million dollars"

- "Mean life expectancy of Australian males is 67.14 years" *or* "Mean life expectancy of Australian males is 67 years"

Statistical justification:

We are statisticians! For example

- Reporting Monte Carlo power – how many digits?

- *Design the study* to achieve the desired accuracy and report only what we can *justify as accurate*

- The program yields 0.56273

- If we wish to report 0.56 (*two digits*) need the *standard error* of this *estimated proportion* to be ≤ 0.005 so we can tell the difference between 0.56 and 0.57 or 0.58 $(1.96 \times 0.005 \approx 0.01)$

- $d = 0.005 = 1/\sqrt{4S}$ gives $S = 10000$!

Always report the standard error of entries in the table so a reader can gauge the accuracy!

Bad table: Digits, "apples and oranges"

	Sample mean		Trimmed mean		Median	
	Normal	t_5	Normal	t_5	Normal	t_5
Mean	0.98515	0.98304	0.98690	0.98499	0.99173	0.98474
Bias	−0.01485	−0.01696	−0.01310	-0.01501	-0.00827	-0.01526
SD	0.33088	0.33067	0.34800	0.31198	0.39763	0.35016
MSE	0.10959	0.10952	0.12116	0.09746	0.15802	0.12273
Rel. Eff.	1.00000	1.00000	0.90456	1.12370	0.69356	0.89238

Good table: Digits, "apples with apples"

	Normal			t_5		
	Sample mean	Trim mean	Median	Sample mean	Trim mean	Median
Mean	0.99	0.99	0.99	0.98	0.98	0.98
Bias	−0.01	−0.01	−0.01	−0.02	−0.02	−0.02
SD	0.33	0.35	0.40	0.33	0.31	0.35
MSE	0.11	0.12	0.16	0.11	0.10	0.12
Rel. Eff.	1.00	0.90	0.69	1.00	1.12	0.89