Replace *conventional certitude* with strategic communication of uncertainty

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*Term coined by Manski 2011*
Legitimacy of the US Census at risk

New DAS is not a “sea change,” but is interpreted as such in light of pervasive conventional certitude

U.S. Population: 332,574,351
332,574,350?
332,574,400?
332,574,000?
332,570,000?
Conventional certitude pervades reporting

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>332,574,351 in US</td>
<td>Census Bureau</td>
</tr>
<tr>
<td>$3995 bil baseline budget</td>
<td>Congressional Budget Office</td>
</tr>
<tr>
<td>888k on temporary layoff</td>
<td>Bureau of Labor Statistics</td>
</tr>
<tr>
<td>79,571,321 new cases</td>
<td>Centers for Disease and Control</td>
</tr>
<tr>
<td>975,513 total deaths</td>
<td></td>
</tr>
<tr>
<td>$22,997.5 bil GDP</td>
<td>Bureau of Economic Analysis</td>
</tr>
</tbody>
</table>
Communicating uncertainty improves trust, decisions

Reducing data to point estimates cannot yield diversification or information acquisition → Express uncertainty with all point estimates.
Implement strategic uncertainty communication

Quantify and visualize uncertainty to imply importance
Use frequency framing to make probability concrete
Suppress “as-if optimization” at all levels of the info hierarchy
Quantify and/or acknowledge transitory uncertainty
Provide prior forecast error by default
Label forecasts as hypothetical outcomes from statistical experiments
Label partial uncertainty expressions as incomplete
Quantify and visualize uncertainty

Graphs get attention, makes comparisons salient, and convey importance.

Frame probability as frequency to ease reasoning

Gigerenzer and Hoffrage, 1995.

Ottley et al. 2015.

Use continuous frequency formats over error bars
Curate sets of scenarios to convey distribution

“This is something we see a lot”

“This is something we sometimes see”

“This is something we see rarely (but with large implications for decisions)”
Tailor to information needs but anticipate heuristics

Not all users are alike in their information needs/aptitude → Provide info at different levels of granularity with different emphasis.

But: Expect users to tend to suppress uncertainty information at all levels.

Who will win the presidency?

<table>
<thead>
<tr>
<th>Chance of winning</th>
<th>Hillary Clinton</th>
<th>Donald Trump</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>71.4%</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

2016

2020

FiveThirtyEight top-level forecasts
Explicitly acknowledge transitory uncertainty

Project uncertainty to past data (e.g., BEA), propagate past uncertainty to future forecasts.

Standardize a data quality or completeness scoring system

Provide past error & calibration info by default

Accompany all new forecasts with prior prediction error in the same units/outcome spaces as the predictions.

Label partial expressions (i.e., of risk) incomplete

E.g., SEIR models that drove COVID-19 policy ignore behavioral, economic outcomes → **Label forecasts as hypothetical experiment results**

Report and/or acknowledge all expected forms of error (e.g., non-response and other non-sampling error), not just one type.
What if government data looked imprecise?

Providing obviously imperfect measurements by default avoids the veneer of certitude, normalizing error, and will enable analysts to account for noise in inference.
What is at stake: Trust in science

For trust in data-driven estimates and science, government communication must convey sources of uncertainty. The legitimacy of government institutions is at stake.

See also:
Manski. The lure of incredible certitude.
Manski. Communicating uncertainty in policy analysis
boyd and Sarathy. Differential perspectives: Epistemic disconnects surrounding the US Census Bureau’s use of differential privacy

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