



Verifiable models or “alternative facts”: is there really any choice?



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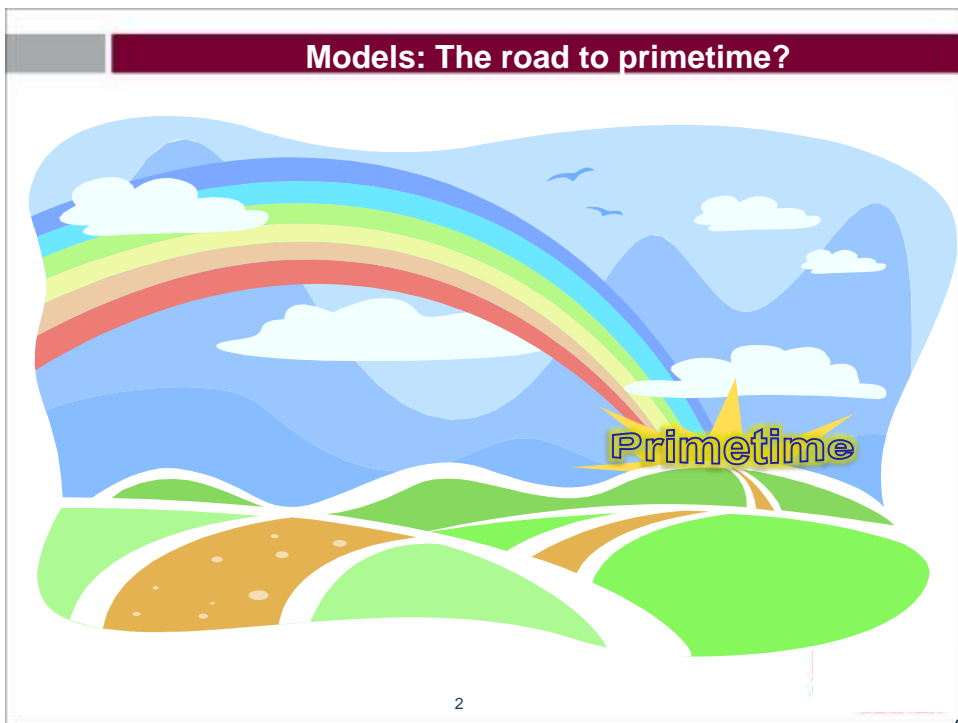
Alternative facts

From Wikipedia, the free encyclopedia

“Alternative facts” is a phrase used by U.S. Counselor to the President Kellyanne Conway. *[This information is current as of 09/20/17. It refers to the statement made by Kellyanne Conway.]*

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Potholes, pitfalls and precipices

Lack of realism

Weak inputs

Faulty technique



Inadequate uncertainty handling

Insufficient validation

Poor reporting

3



Open Source Initiative

1. Free Redistribution
2. Must include the Source Code
3. Must allow Derived Works
4. Integrity of the Source Code Can be Protected to a Limited Extent
5. No Discrimination Against Persons or Groups
6. No Discrimination Against Fields of Endeavor
7. Distribution of License
8. License Must Not Be Specific to a Product
9. License Must Not Restrict Other Software
10. License Must Be Technology-Neutral

Funding: dual licensing, software as a service, not charging for the software but for services, freemium, donation-based funding, crowdfunding, and crowdsourcing.

4

Model Transparency and Validation: A Report of the ISPOR-SMDM Modeling Good Research Practices Task Force-7



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- Trust and confidence are critical to the success of models
- Transparency of model: People can see how it is built
 - However, can be huge, highly technical
 - Usually requires special knowledge
- Validation of model: People can see how well it reproduces reality
- Technical documentation in sufficient detail to enable a reader with the necessary expertise to
 - evaluate the model
 - potentially reproduce it
- Made available either
 - openly or
 - under agreements that protect intellectual property

Pharmacoeconomic Modeling: Stuck on the road to nowhere



“...based on >8 years of being a NICE appraisal committee member... submitted models are highly biased”

HTAi & ISPOR EU 2017

Why are other models not pressured to be open source?

Trust, but verify!

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7

Linus' Law

"given enough eyeballs,
all bugs are shallow"

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8

Proposal

- All models intended for supporting health-care decisions be made available to **anyone** who wishes to review them
 - All code, equations, data sources
 - Analyses
 - Base case
 - Uncertainty
 - Scenarios
 - Detailed technical report
 - Verification reports
 - Validation exercises
- Not mandatory allowance for
 - Redistribution
 - Derived works
- Can restrict use
- Not required to submit with papers.



Accreditation

As required by the DoD for all simulation models: “official certification that a model...and its associated data are acceptable for use for a specific application.”

V V & A

