Missing The Point

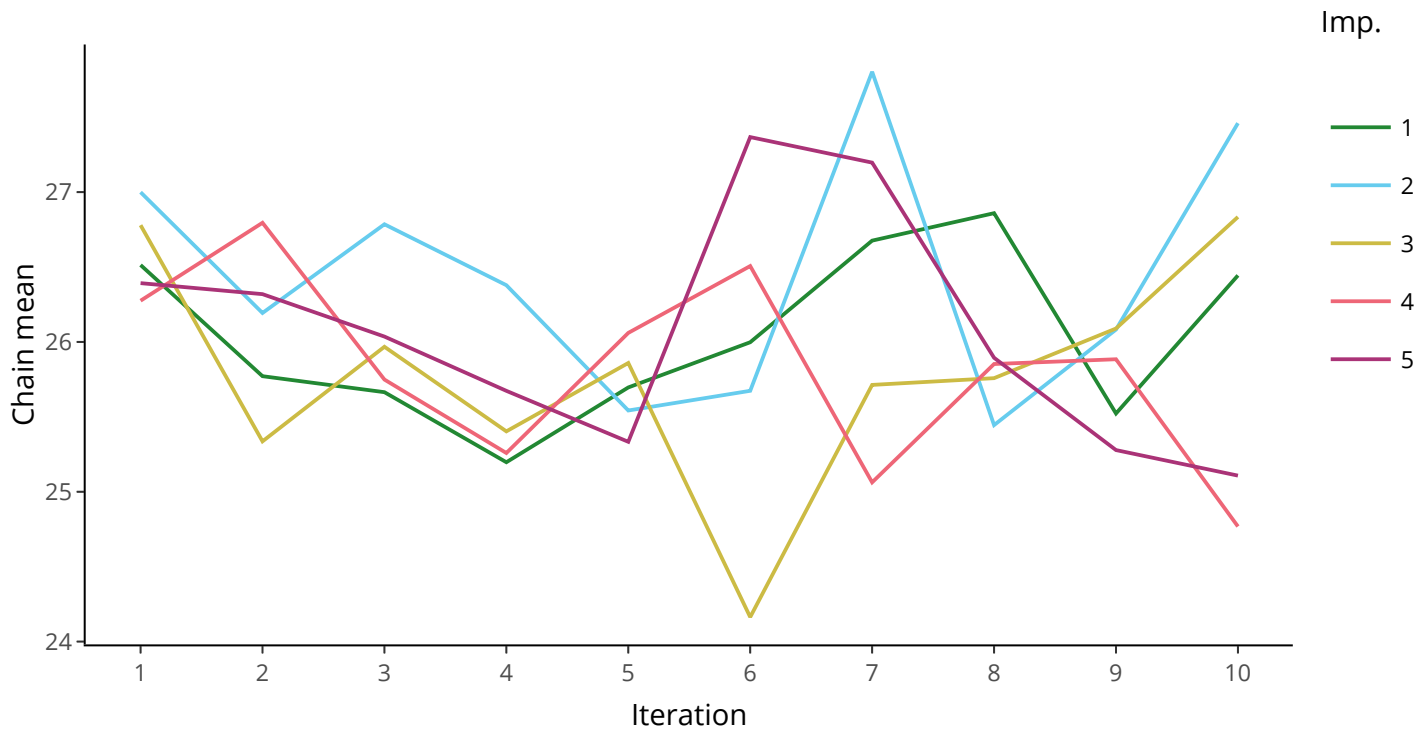
Non-Convergence In Iterative Imputation Algorithms

Hanne I. Oberman, Stef van Buuren, & Gerko Vink

ARTEMISS workshop ICML 2020

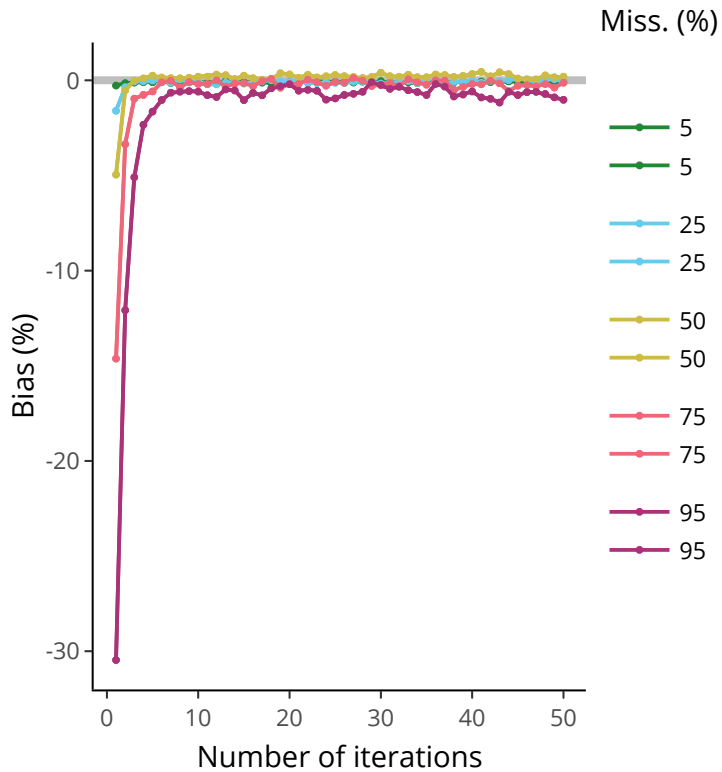
Algorithmic Convergence

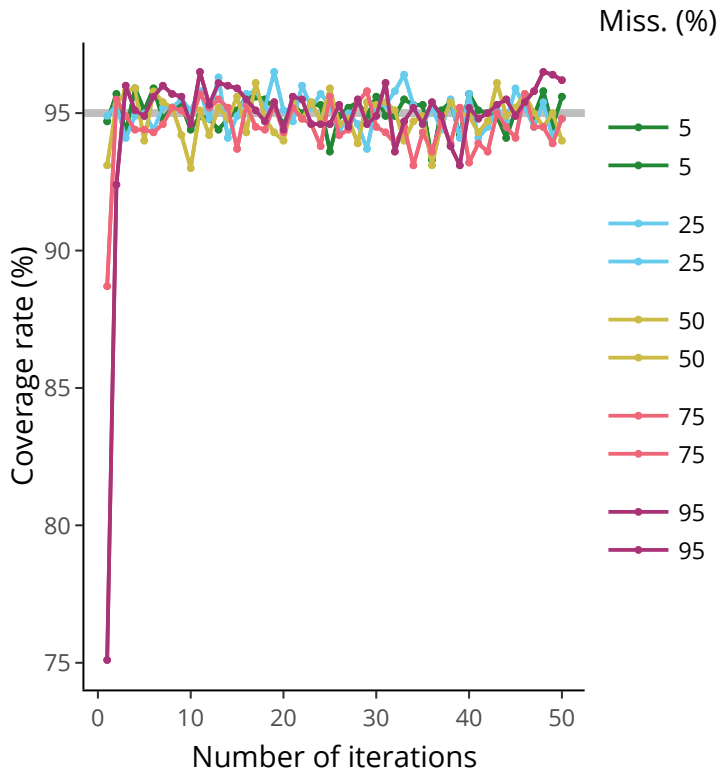
With iterative imputation, the validity of inferences relies on algorithmic convergence. Signs of non-convergence (i.e., non-mixing, trending) are typically identified through visual inspection.



Simulation Study

When imputing an incomplete multivariate normal set ($n_{\text{obs}} = 1000$, $n_{\text{sim}} = 1000$), we obtain valid regression estimates after 5 to 10 iterations.





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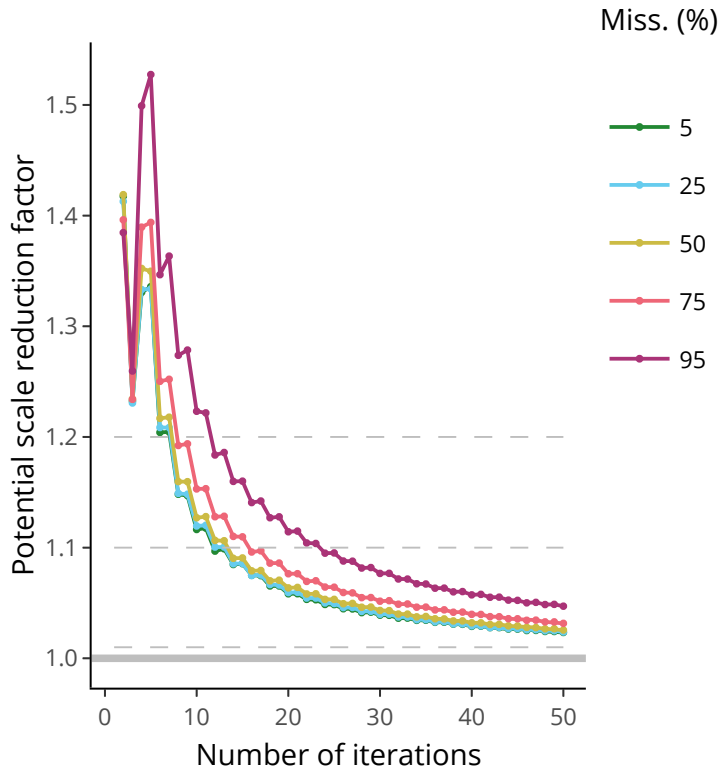
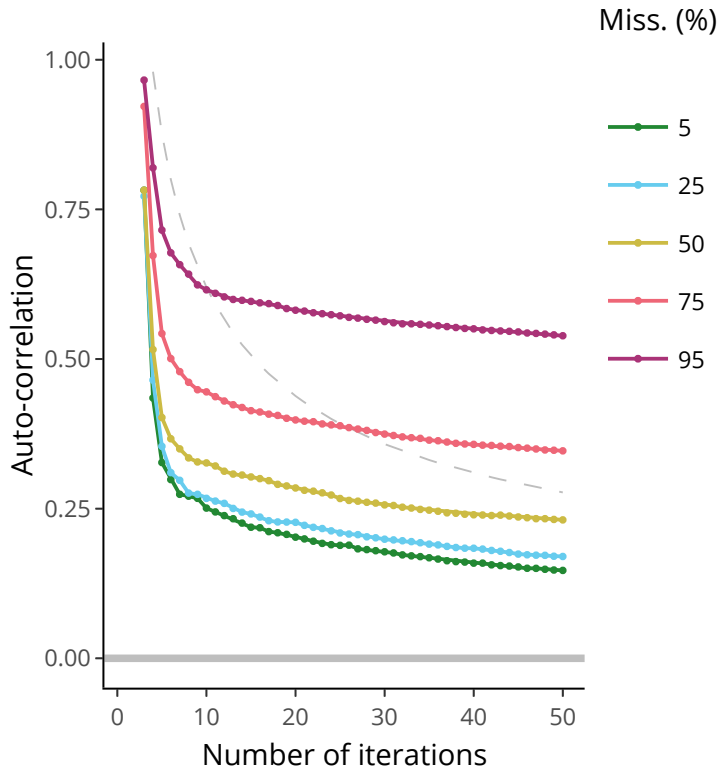
Simulation Study (2)

Whereas non-convergence diagnostics (potential scale reduction factor, auto-correlation) identify signs of non-convergence up-to 30 to 50 iterations.





Take-away

We conclude that—in the cases considered—it never hurts to iterate longer, but such calculations hardly bring added value.

Read more on github.com/hanneoberman/MissingThePoint. Or follow my updates through Twitter @hioberman.

Upcoming...

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