

Managing Incomplete PSA Observations in Prostate Cancer Data: Key Strategies and Best Practices for Handling Loss to Follow-Up and Missing Data

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Abstract : Multiple imputation with delta adjustment is a versatile and transparent technique for addressing univariate missing data in the presence of various missing mechanisms. This approach allows for the exploration of sensitivity to the missing-at-random (MAR) assumption. In this review, we outline the delta-adjustment procedure and illustrate its application for assessing the sensitivity to deviations from the MAR assumption. By examining diverse missingness scenarios and conducting sensitivity analyses, we gain valuable insights into the implications of missing data on our analyses, enhancing the reliability of our study's conclusions. In our study, we focused on assessing logPSA, a continuous biomarker in incomplete prostate cancer data, to examine the robustness of conclusions against plausible departures from the MAR assumption. We introduced several approaches for conducting sensitivity analyses, illustrating their application within the pattern mixture model (PMM) under the delta adjustment framework. This proposed approach effectively handles missing data, particularly loss to follow-up.

Keywords : loss to follow-up, incomplete response, multiple imputation, sensitivity analysis, prostate cancer

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