

CAIDE Dementia Risk Estimation Under Data Gaps: Evidence From Latin America

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Background

- FINGERS LATAM, a multidomain prevention trial, aims to identify populations at risk of dementia and advance prevention strategies.
- The CAIDE score (Cardiovascular Risk Factors, Aging, and Incidence of Dementia) is a validated tool that estimates dementia risk up to 20 years before symptom onset.
- In LMICs, scalability is constrained by missing key variables, including lipid profiles, resulting in incomplete CAIDE assessments.
- The reliability of imputing missing CAIDE data in Latin America remains unclear, including in Antioquia, Colombia, where the world's largest known PSEN1 E280A kindred is located.



Objective

To compare three CAIDE estimation strategies under incomplete-data conditions in the FINGERS LATAM Colombian cohort and determine whether imputed scores preserve the distribution of complete-case estimates.



Methods

We analyzed 187 participants from the Neuroscience Group of Antioquia. Total cholesterol had the highest proportion of missing data (50%), followed by BMI (12%) and systolic blood pressure (11%). Three imputation approaches were compared:

1

Listwise deletion

Complete-case analysis (n = 93)

2

Simple imputation

Single-value replacement (n = 187)

3

Population-based imputation

Stratified by age & sex from Colombian lipid profiles (LiPAC)

Distributional similarity was assessed with descriptive statistics, skewness, and violin plots.



Results

	Listwise deletion	Simple imputation	Population-based
N	93	187	187
Mean	7.7	7.5	7.4
Median	8	8	8
SD	1.53	1.49	1.49
Range	6–12	6–12	6–12
Skewness	0.63	0.73	0.89

Central tendency and dispersion were near-identical across methods — negligible differences between strategies.

Figure 1.

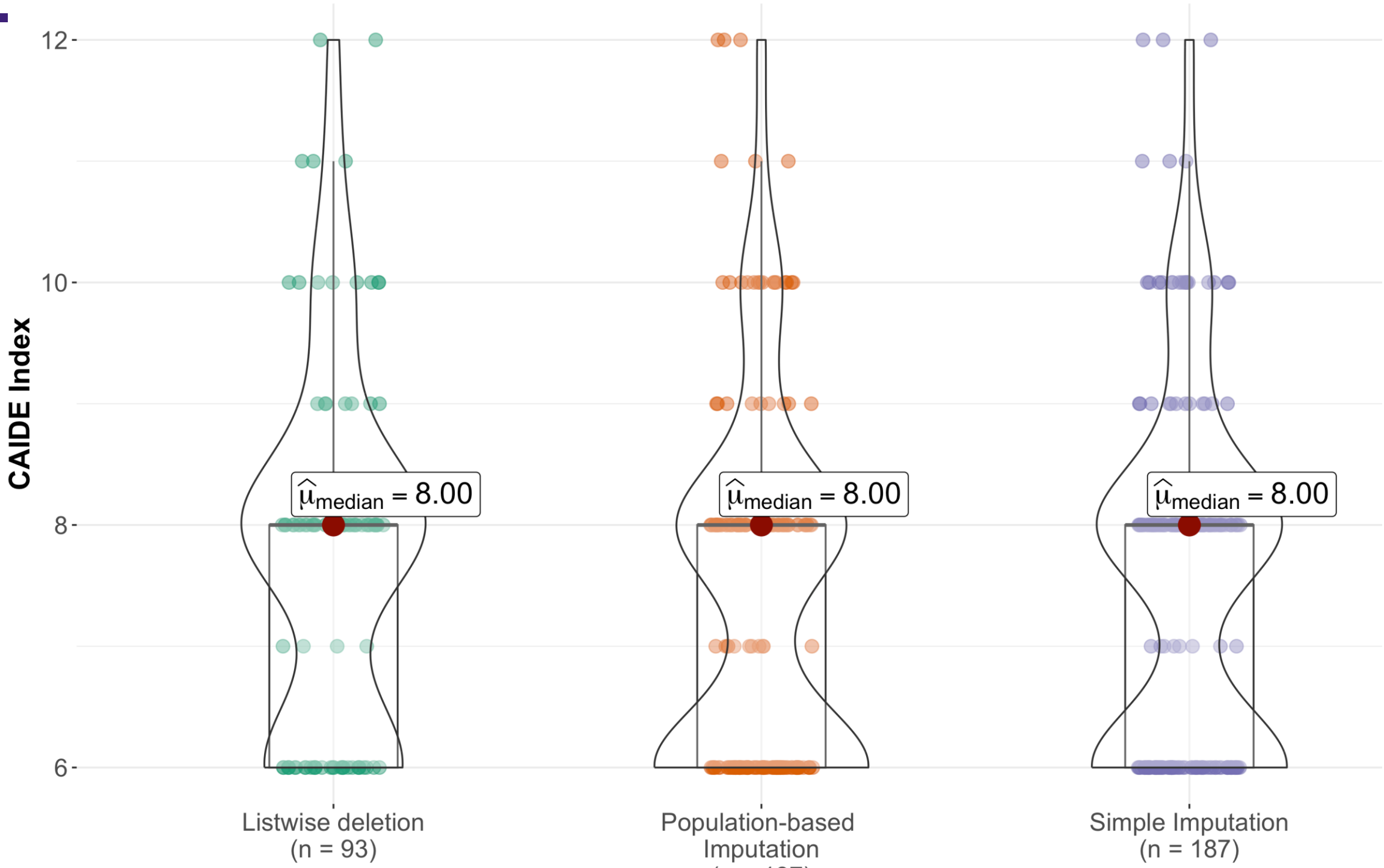


Figure 1. Violin plots of CAIDE scores by estimation method. Medians = 8 in all methods, with overlapping distributions and mild positive skewness (0.63–0.89), indicating negligible differences.



Conclusions

- Simple and population-based imputation may offer balanced alternatives for CAIDE estimation in data-scarce LMIC settings.
- CAIDE score distributions were preserved across imputation strategies despite substantial missing data.
- CAIDE shows promise as a scalable tool for identifying individuals at increased risk of dementia; future studies should validate these findings using longitudinal outcomes and larger regional datasets.

TAKE-HOME MESSAGE

Consistent CAIDE score distributions across imputation strategies suggest that simplified approaches not requiring cholesterol measurements may support scalable, low-cost dementia risk screening in LMIC settings.

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