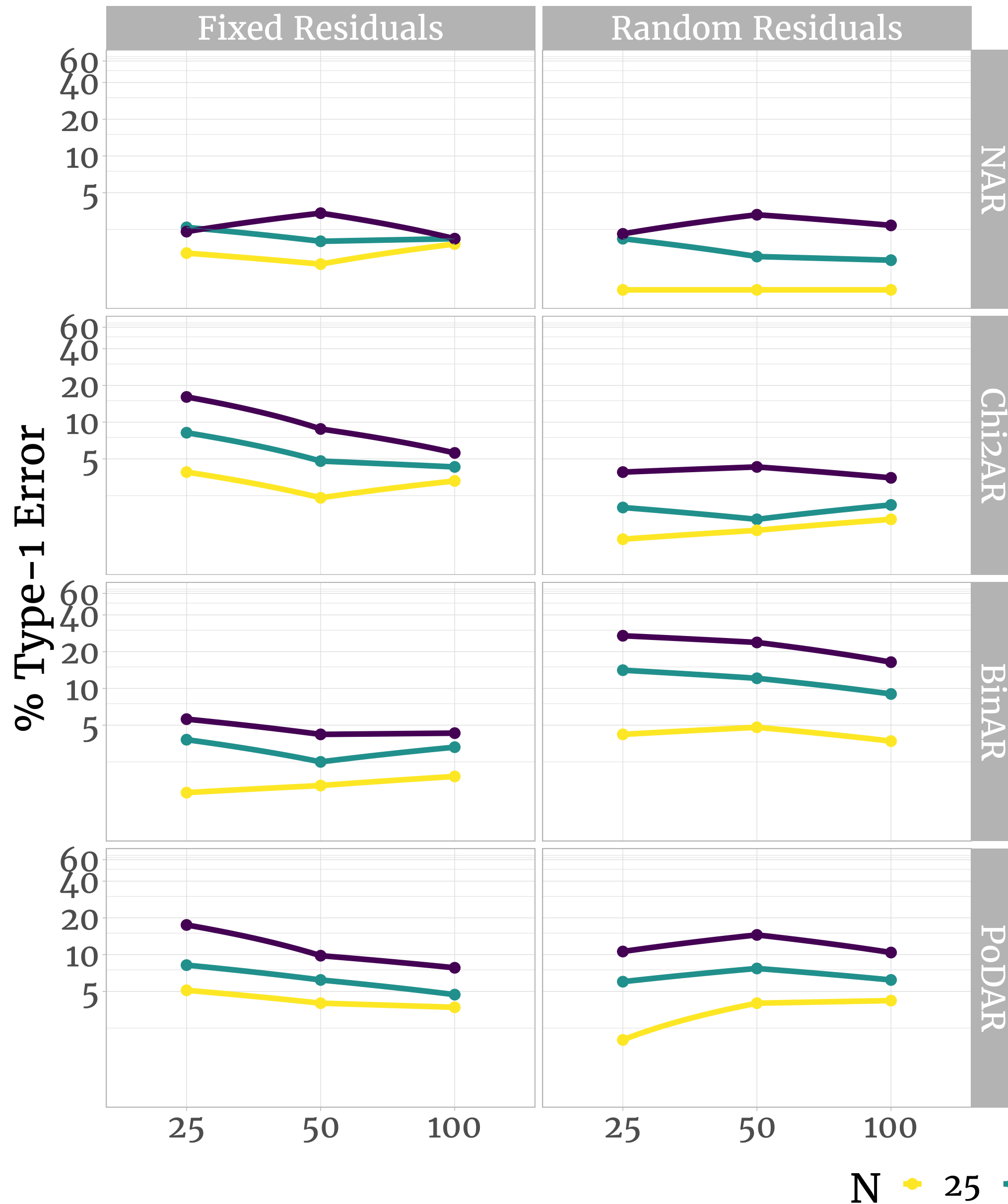Type-1 error in the covariance between φ and mean