A novel Bayesian hierarchical mixed-effects weighted Poisson regression model to explain socio-demographic factors associated with fertility rate in Afghanistan

May 18, 2025

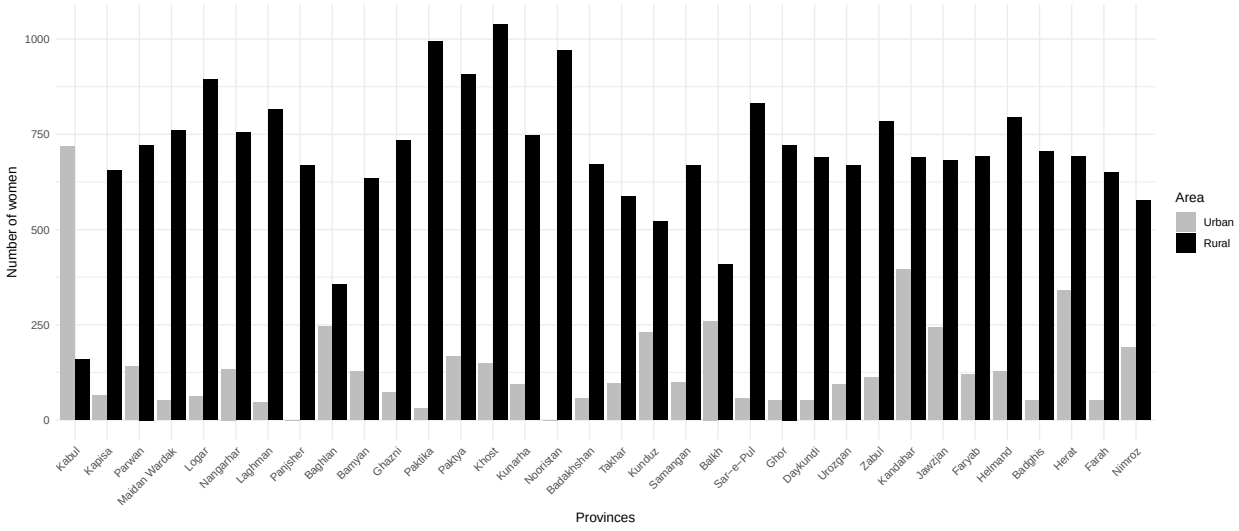


Figure 1: A bar plot was generated to display the distribution of ever-married women of reproductive age (15 to 49 years) in Afghanistan, categorized by province and area (urban vs. rural). The bars represent the count of women, with the urban population indicated in gray and the rural population in black. This visual comparison highlights the demographic composition across Afghanistan's 34 provinces, allowing for an assessment of urban-rural population differences in each region.

1 Auto-correlation functions and Trace-plots

Figure 2: Auto-correlation plots for $\boldsymbol{\theta}$, each subplot is one component of $\boldsymbol{\theta}$ representing the corresponding predictor.

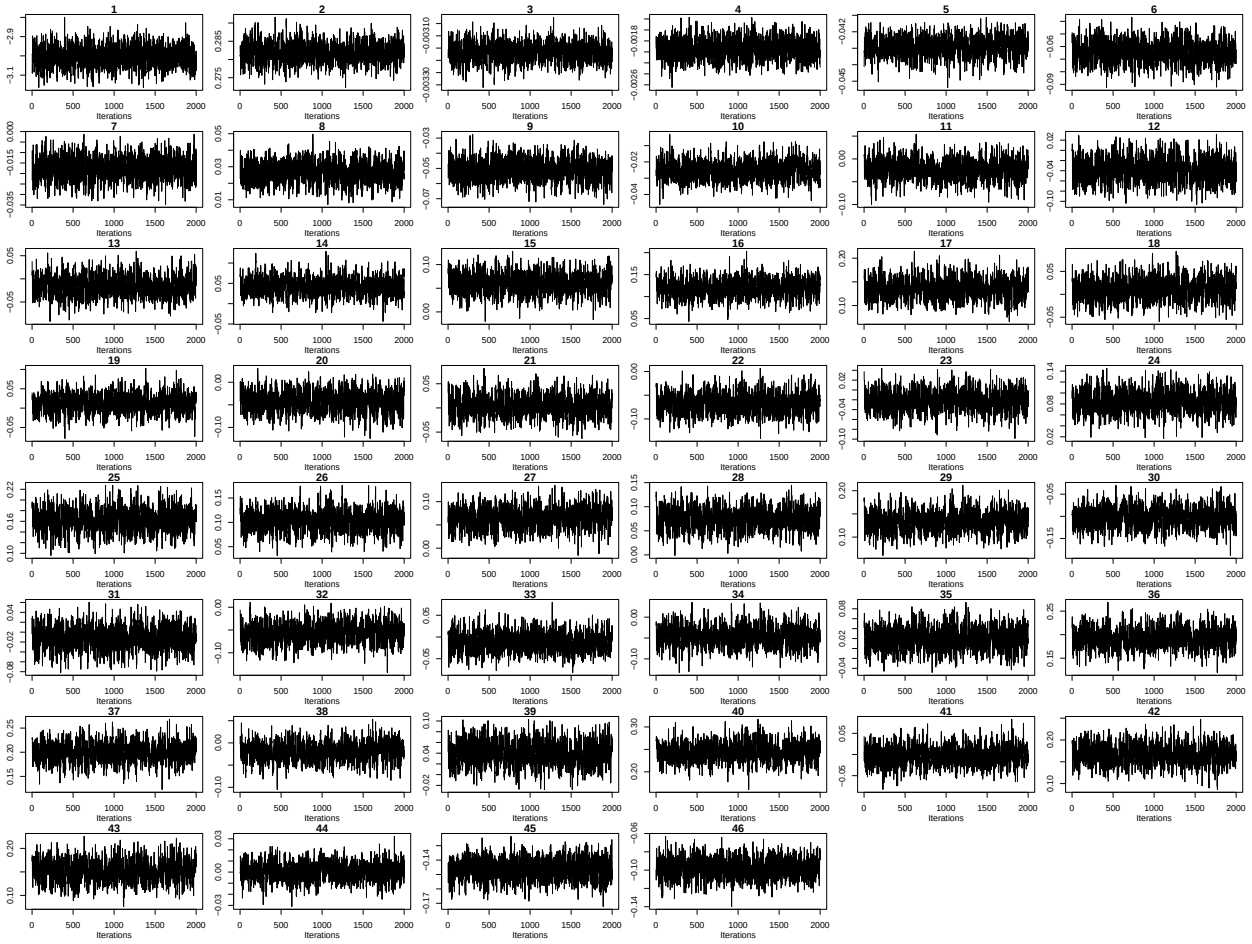
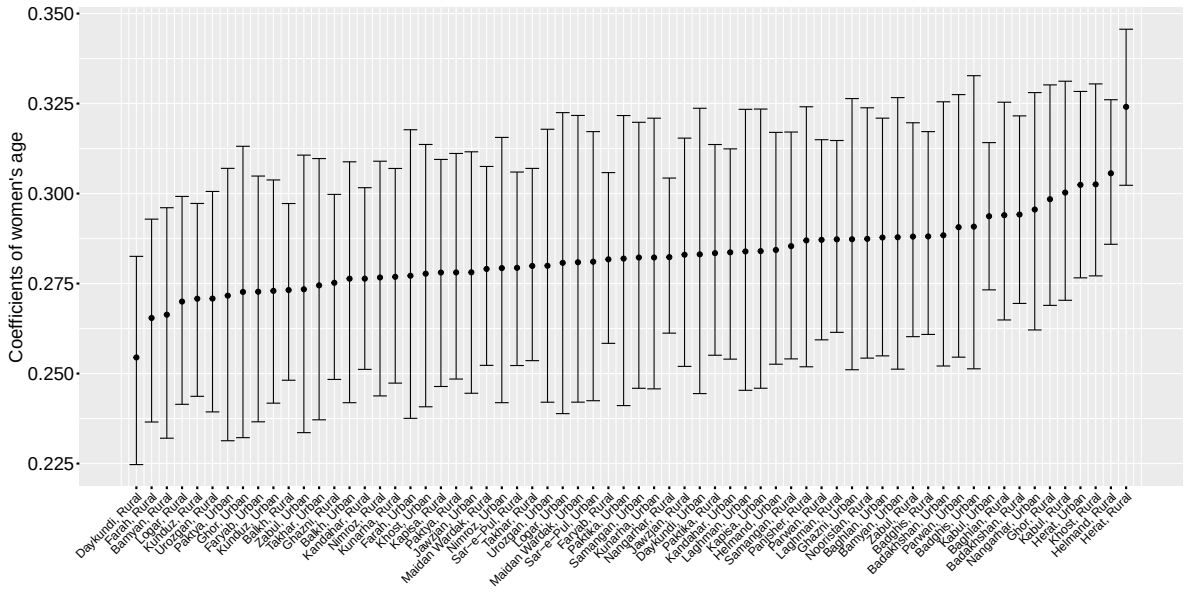
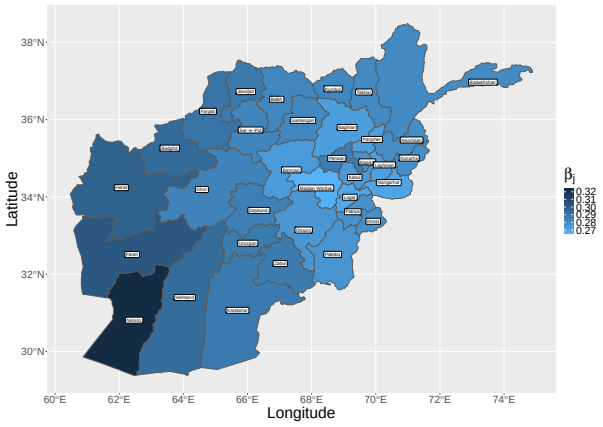


Figure 3: Trace-plots for $\boldsymbol{\theta}$, each subplot is one component of $\boldsymbol{\theta}$ representing the corresponding predictor.

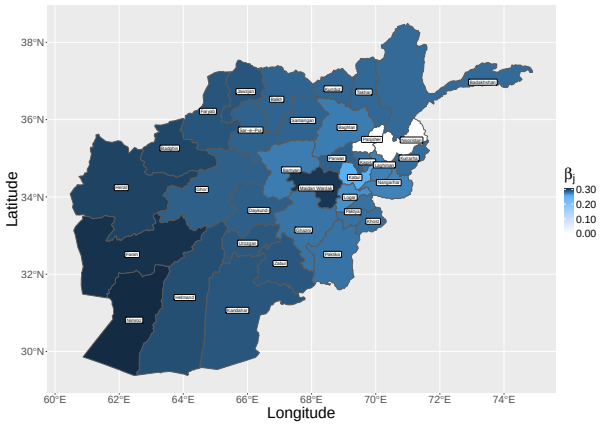
2 95% CI and geographic plots



(a) 95% credible intervals for the regression coefficients of women's age in each stratum

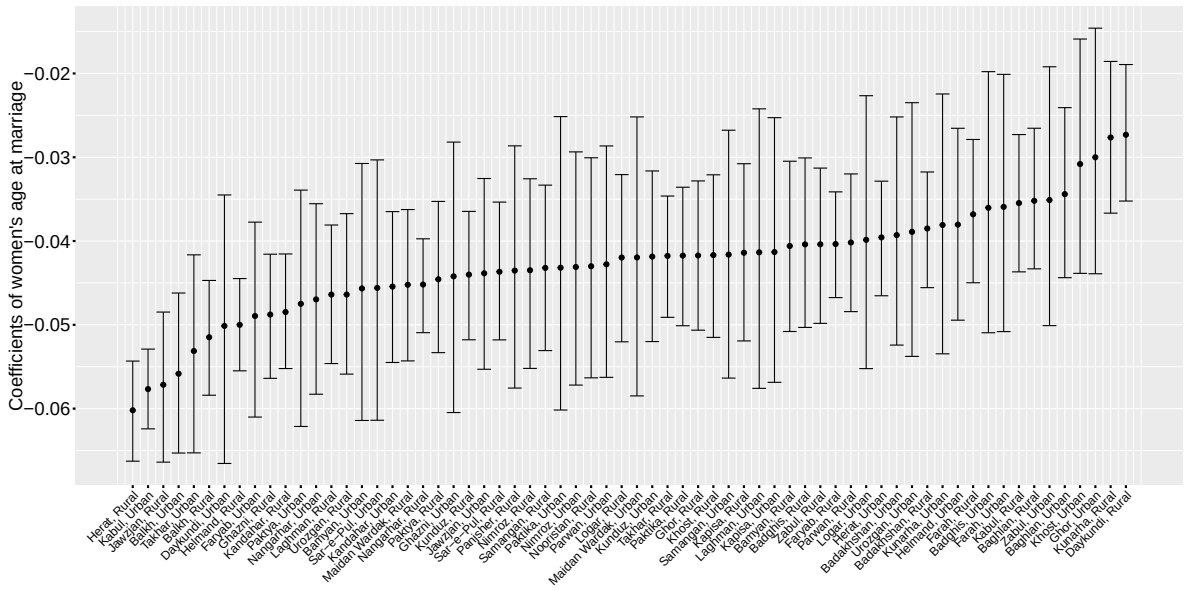


(b) Regression coefficients of women's age in the rural areas

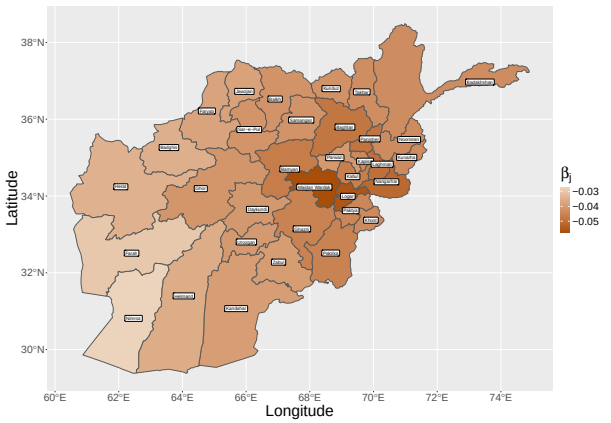


(c) Regression coefficients of women's age in urban areas

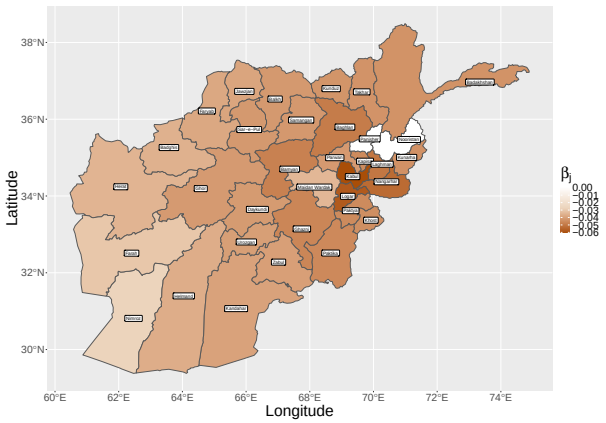
Figure 4: 95% Credible interval for the regression coefficients of women's age in each stratum and their geographic plots.



(a) 95% credible intervals for the regression coefficients of women's age at marriage in each stratum

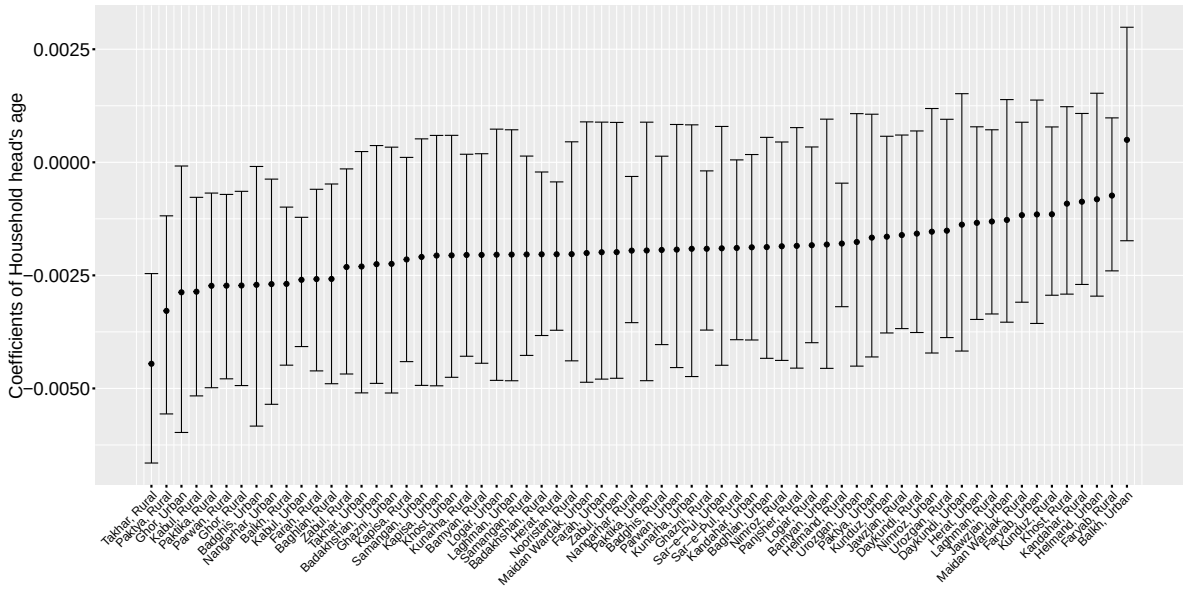


(b) This map shows the regression coefficients of women's age at marriage in rural areas

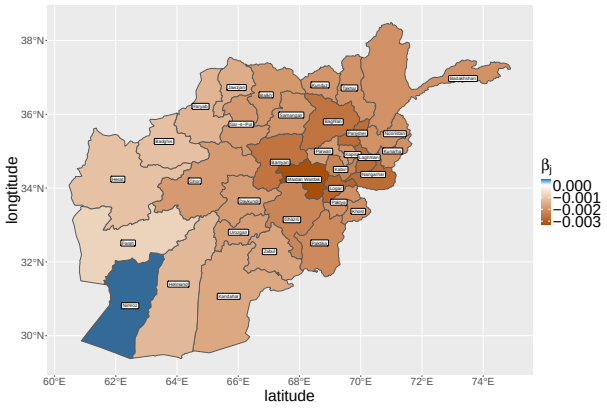


(c) This map shows the regression coefficients of women's age at marriage in urban areas

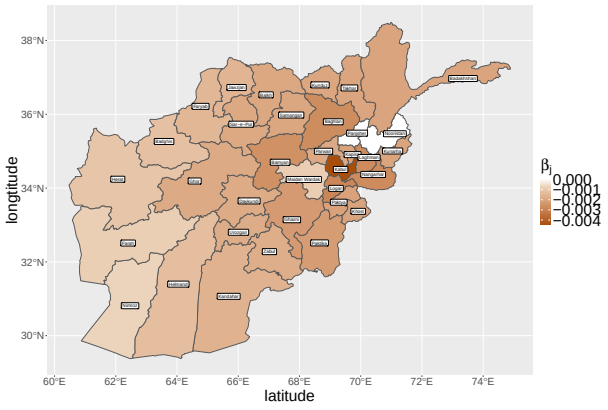
Figure 5: 95% Credible interval for the regression coefficients of women's age at marriage in each stratum and geographic plots



(a) 95% credible intervals for the regression coefficients of Household head's age in each stratum

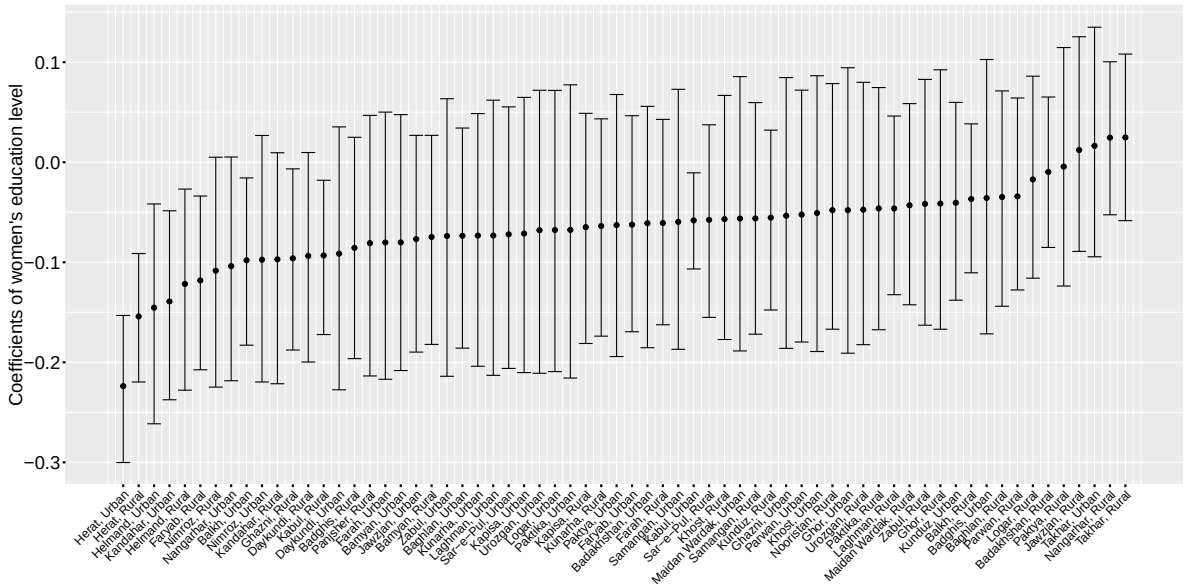


(b) This map shows the regression coefficients of Household head's age in rural areas

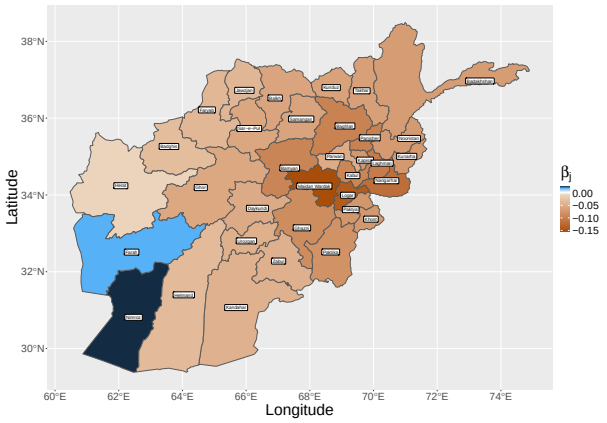


(c) This map shows the regression coefficients of Household head's age in urban areas

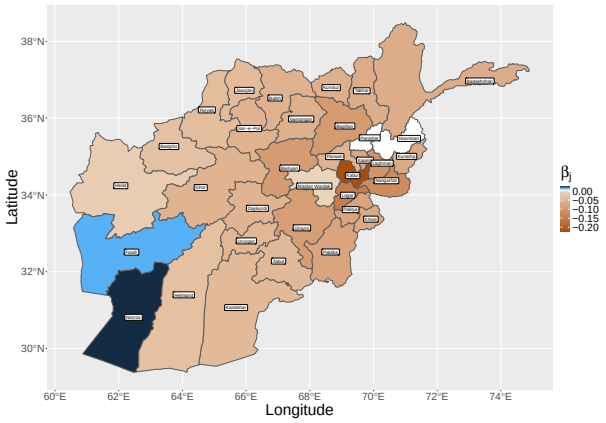
Figure 6: 95% Credible interval for the regression coefficients of Household head's age in each stratum and geographic plots



(a) 95% credible intervals for the regression coefficients of women's education in each stratum

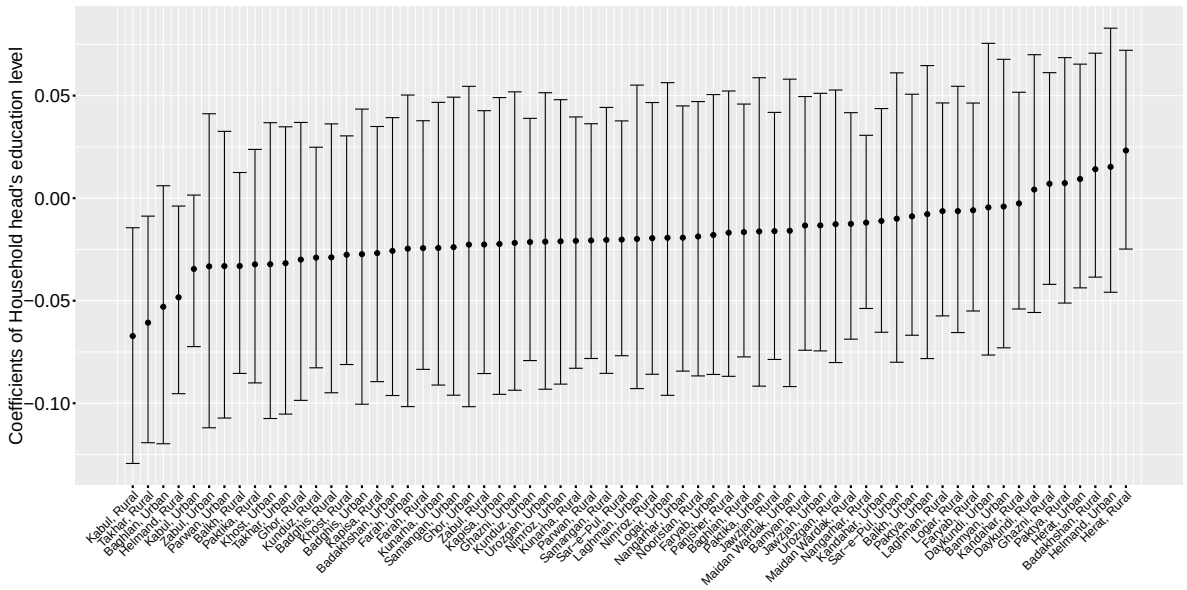


(b) Regression coefficients of women's education in the rural areas

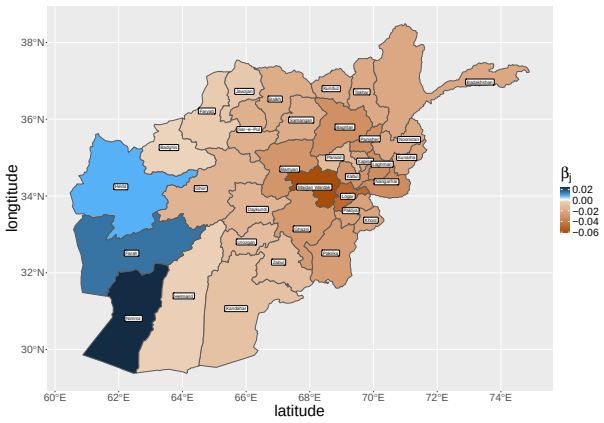


(c) Regression coefficients of women's education in urban areas

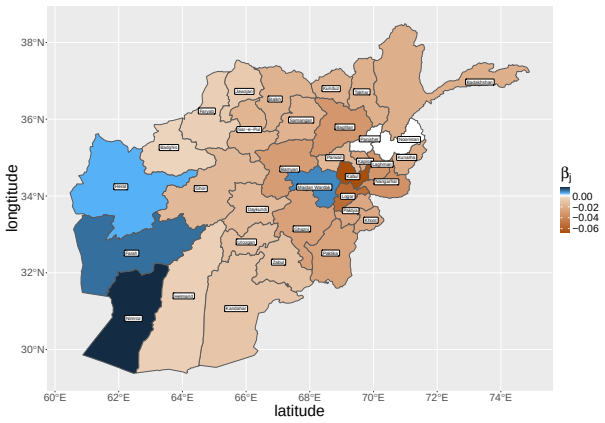
Figure 7: 95% Credible interval for the regression coefficients of women's education in each stratum and their geographic plots.



(a) 95% credible intervals for the regression coefficients of Household head's education in each stratum

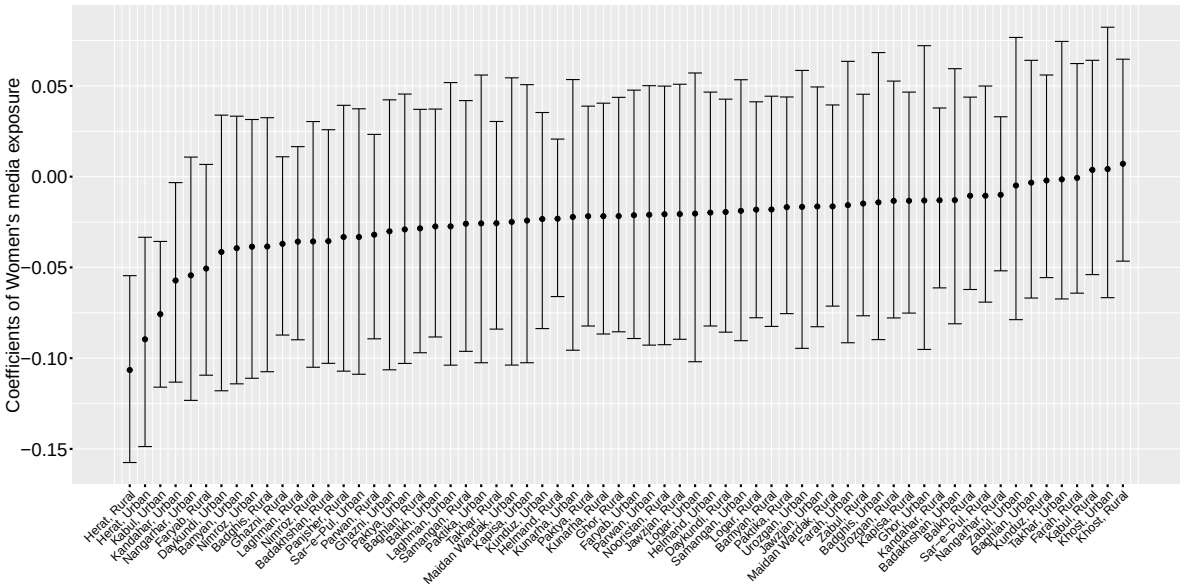


(b) Regression coefficients of Household head's education in the rural areas

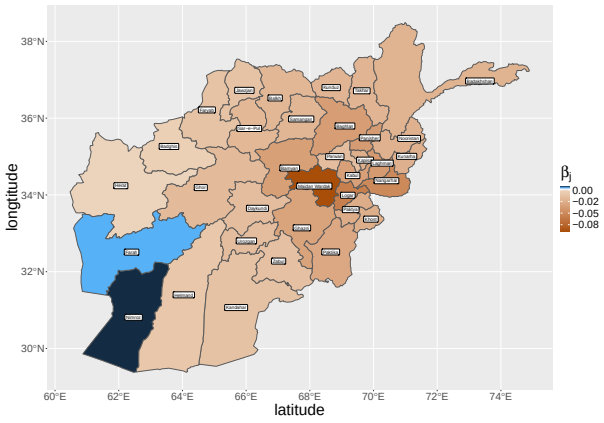


(c) Regression coefficients of Household head's education in urban areas

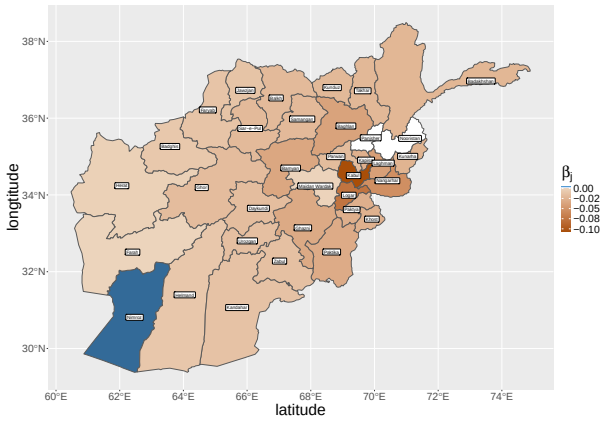
Figure 8: 95% Credible interval for the regression coefficients of Household head's education in each stratum and their geographic plots.



(a) 95% credible intervals for the regression coefficients of media access in each stratum

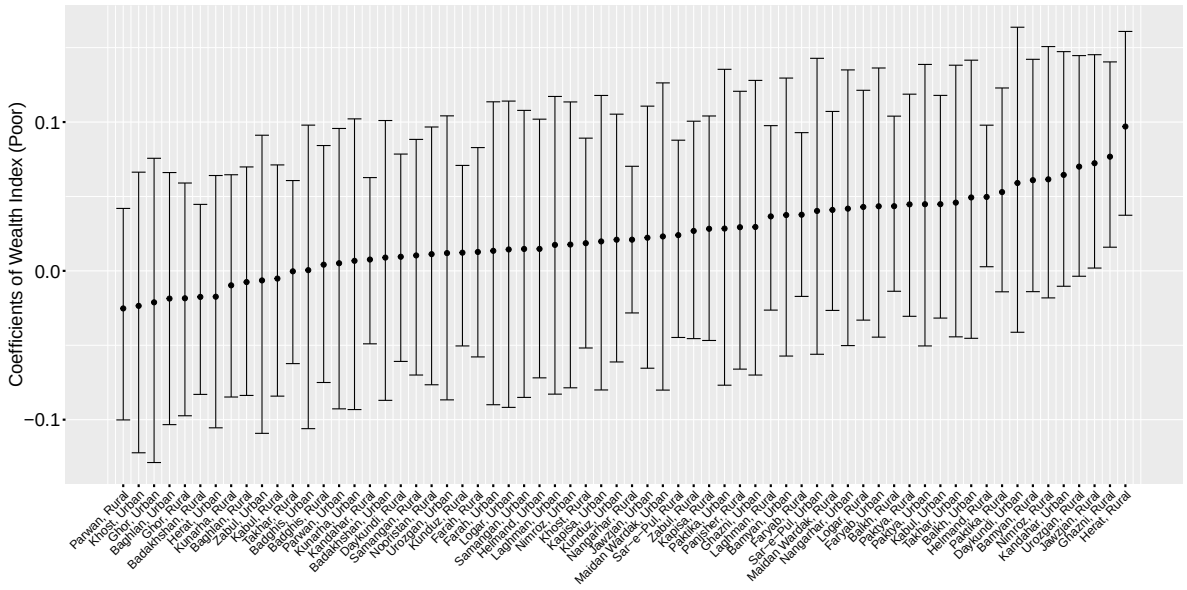


(b) Regression coefficients of media access in the rural areas

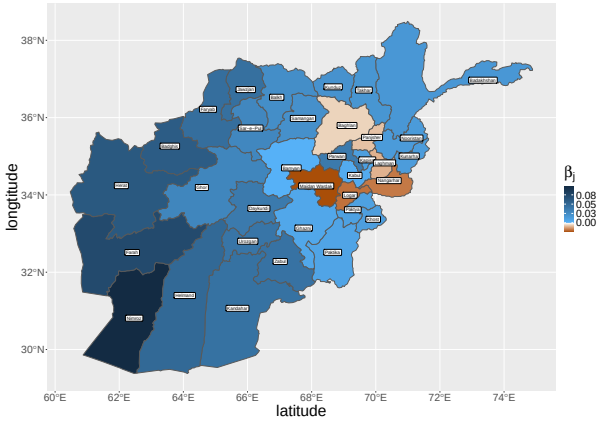


(c) Regression coefficients of media access in urban areas

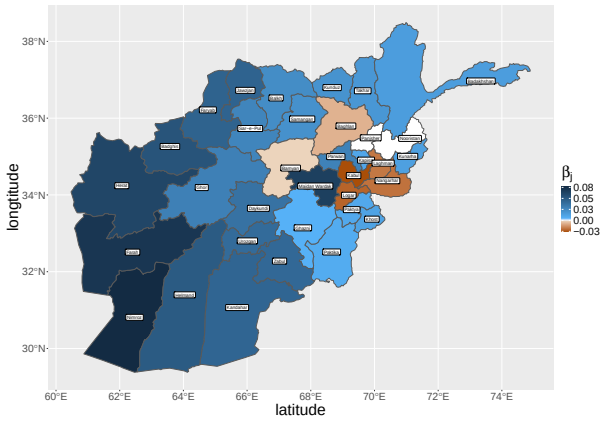
Figure 9: 95% Credible interval for the regression coefficients of media access in each stratum and their geographic plots.



(a) 95% credible intervals for the regression coefficients of wealth index (poor) in each stratum

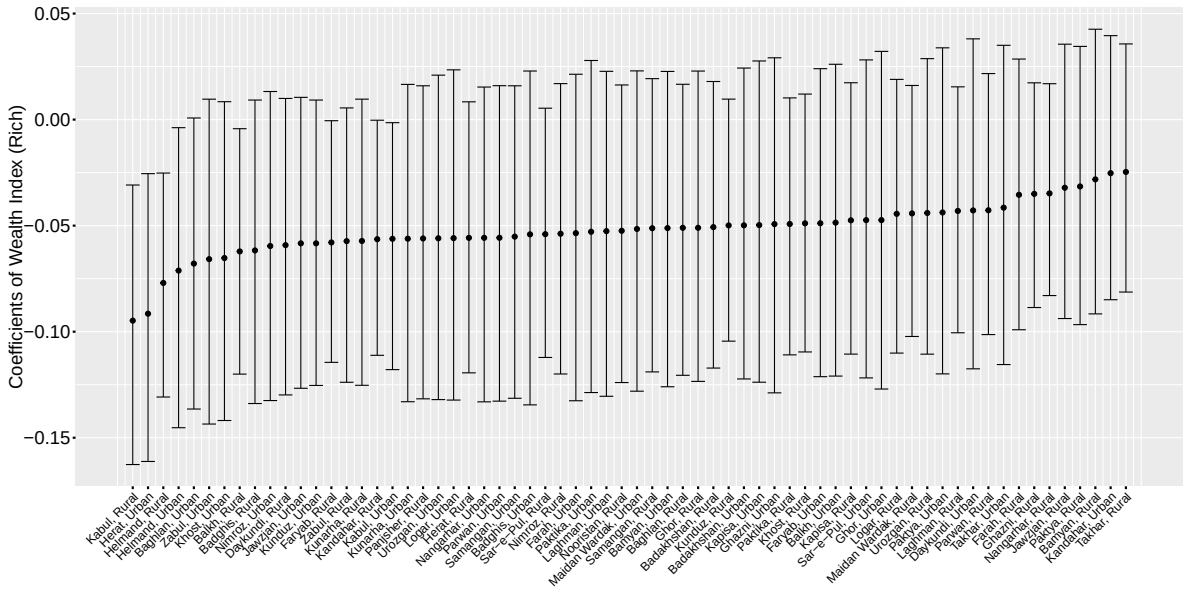


(b) Regression coefficients of wealth index (poor) in the rural areas

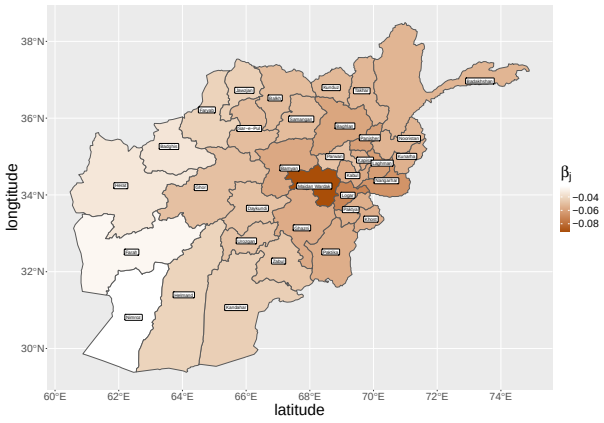


(c) Regression coefficients of wealth index (poor) in urban areas

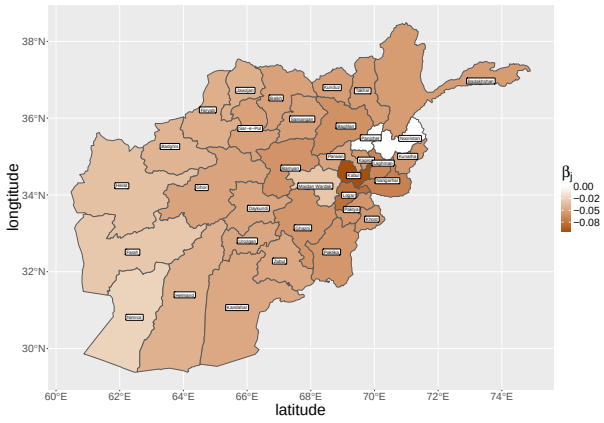
Figure 10: 95% Credible interval for the regression coefficients of wealth index (poor) in each stratum and their geographic plots.



(a) 95% credible intervals for the regression coefficients of wealth index (rich) in each stratum



(b) Regression coefficients of wealth index (rich) in the rural areas



(c) Regression coefficients of wealth index (rich) in urban areas

Figure 11: 95% Credible interval for the regression coefficients of wealth index (rich) in each stratum and their geographic plots.