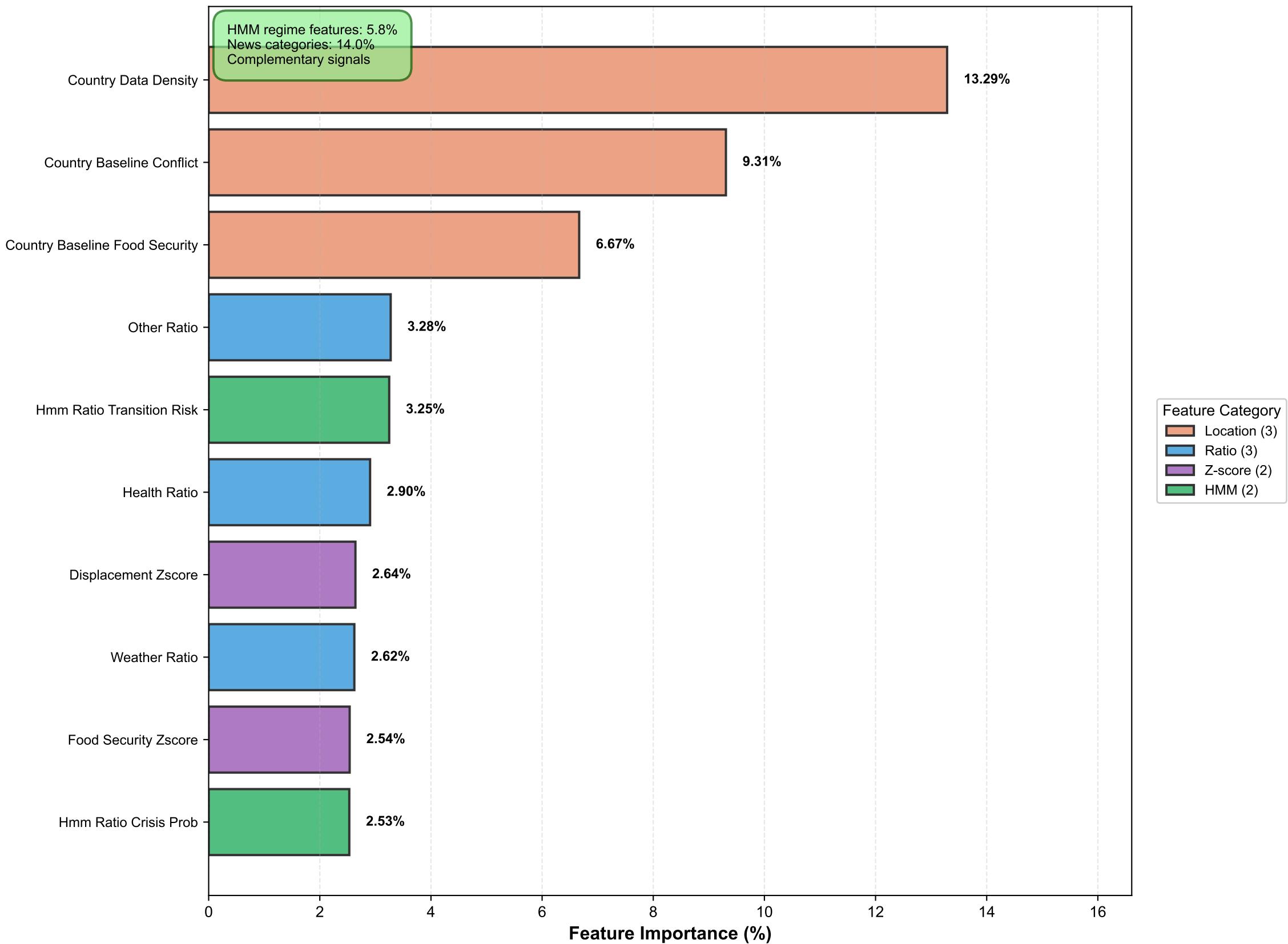


XGBoost Advanced: Top 10 Features by Importance



Feature importance from XGBoost Advanced model (35 features total) trained on WITH_AR_FILTER subset (6,553 observations, 534 districts where AR baseline got it wrong). Beyond geographic priors, news features provide complementary crisis signals: HMM ratio transition risk (#5, 3.2%) captures regime shifts from stable to crisis-prone narratives; news category composition (other, health, weather ratios: 8.8%) identifies media emphasis patterns; Z-score anomalies (displacement, food security: 5.2%) detect temporal deviations signaling rapid-onset shocks. HMM crisis probability (#10, 2.5%) confirms regime detection adds orthogonal signal to compositional features. These news features target cases where geographic persistence fails—precisely where early warning matters most. 5-fold stratified spatial cross-validation, $h=8$ months.