Supplementary Materials for

Addressing census data problems in race imputation via fully Bayesian Improved Surname Geocoding and name supplements

Kosuke Imai et al.

Corresponding author: Kosuke Imai, imai@harvard.edu

Sci. Adv. 8, eadc9824 (2022)
DOI: 10.1126/sciadv.adc9824

This PDF file includes:

Fig. S1
Tables S1 and S2
Table S1: Area under the receiver operating characteristic curve (AUROC) for BISG predictions of individual race, using Census blocks to set racial prior distributions. Overall AUROC values (second row) are lower for all non-white racial groups than are AUROC values for individuals living in blocks for which the racial prior for those groups is nonzero (first row).

| Census Tally    | White | Black | Hispanic | Asian | Other |
|-----------------|-------|-------|----------|-------|-------|
| Non-zero counts | 89.2% | 92.4% | 94.9%    | 91.4% | 58.9% |
| Overall         | 89.8% | 91.7% | 91.9%    | 82.2% | 59.0% |

Table S2: Area under the receiver operating characteristic curve (AUROC) for BISG predictions of individual race, using Census blocks to set racial prior distributions. Predictive performance among individuals whose last names cannot be matched to the WRU name dictionary (first row) is significantly worse than among individuals for whom a match is found (second row). The discrepancy is more than ten percentage points for White, Hispanic, and Asian voters.

| Name Matched? | White | Black | Hispanic | Asian | Other |
|---------------|-------|-------|----------|-------|-------|
| No            | 79.4% | 85.5% | 78.1%    | 71.3% | 55.9% |
| Yes           | 90.3% | 91.8% | 92.2%    | 82.3% | 59.1% |
| Overall       | 89.8% | 91.7% | 91.9%    | 82.2% | 59.0% |
Figure S1: Area under the receiver operating characteristic curve (AUROC) for race predictions obtained using the standard BISG (blue) and fBISG (red) methods, by state. The results are based on progressively more name information, starting with the L2-augmented surname dictionary (left-most panel). Higher values indicate better predictive accuracy. Overall, the same patterns we observed when considering all states combined are evident when we disaggregate accuracy by state: additional name information improves accuracy, especially when using fBISG.