Supplementary Materials for

**Kim, H., Song, E.-J., & Windsor, L. (2022). Evidence-based home visiting provisions and child maltreatment report rates: County-level analysis of US national data from 2016 to 2018. Child Maltreatment, 107755952211075.** [**https://doi.org/10.1177/10775595221107533**](https://doi.org/10.1177/10775595221107533)

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Guidance on How to Use the Enclosed Supplementary Materials for Replication

**Table S1.** Evidence-Based Home Visiting Models Meeting the DHHS Criteria and Operating in the United States, 2016-2018.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model | Findings on reductions in child maltreatment | Ages served (month) | The number of local agencies | | |  | The number of families served | | |  | Measured in the current study | | |
| 2016 | 2017 | 2018 |  | 2016 | 2017 | 2018 |  | 2016 | 2017 | 2018 |
| Attachment and Biobehavioral Catch-Up | Not measured | 0 to 47 | 25 | 34 | 50 |  | NA | 1,093 | 1,350 |  | Yes | Yes | Yes |
| Child First | Not measured | 0 to 60 | 23 | 23 | 23 |  | 1,400 | 1,777 | 1,859 |  | Yes | Yes | Yes |
| Early Head Start Home-Based Option | No effect: 1 | 0 to 35 | 799 | 821 | 816 |  | 70,350 | 56,001 | 56,632 |  | Yes | Yes | Yes |
| Family Check-Up | Not measured | 24 to 60 | 13 | 4 | NA |  | NA | NA | NA |  | Yes | Yes | No |
| Family Connects | Not measured | 0 to 11 | 4 | 10 | 15 |  | NA | NA | NA |  | No | Yes | Yes |
| Family Spirit | Not measured | 0 to 35 | 30 | 56 | 54 |  | 1,358 | 1,981 | 1,739 |  | Yes | Yes | Yes |
| Health Access Nurturing Development Services | Favorable: 1 | 0 to 23 | 61 | 61 | 66 |  | 11,090 | 10,034 | 9,071 |  | Yes | Yes | Yes |
| Healthy Families America | Favorable: 20  No effect: 188  Unfavorable: 1 | 0 to 60 | 577 | 565 | 574 |  | 65,635 | 69,249 | 69,795 |  | Yes | Yes | Yes |
| Home Instruction for Parents of Preschool Youngsters | Not measured | 24 to 60 | 130 | 126 | 115 |  | 14,487 | 14,523 | 13,537 |  | Yes | Yes | Yes |
| Maternal Early Childhood Sustained Home-Visiting Program | Not measured | 0 to 23 | 9 | 9 | 9 |  | 27 | 64 | 150 |  | Yes | Yes | Yes |
| Maternal Infant Health Program | No effect: 13  Unfavorable: 5 | 0 to 23 | NA | NA | NA |  | NA | NA | 15,968 |  | No | No | No |
| Minding the Baby Home Visiting | Not measured | 0 to 23 | 2 | 4 | 4 |  | 43 | 60 | 48 |  | Yes | Yes | Yes |
| Nurse-Family Partnership | Favorable: 7  No effect: 19 | 0 to 23 | 266 | 266 | 312 |  | 49,692 | 51,253 | 49,583 |  | Yes | Yes | Yes |
| Parents as Teachers | No effect: 4 | 0 to 60 | 1,217 | 1,242 | 987 |  | 121,919 | 120,310 | 92,728 |  | Yes | Yes | Yes |
| Play and Learning Strategies | Not measured | 0 to 23 | 4 | 4 | NA |  | 1,503 | NA | NA |  | Yes | Yes | No |
| SafeCare Augmented | Favorable: 1  No effect: 8 | 0 to 60 | 153 | 117 | 112 |  | 6,822 | 6,887 | 8,024 |  | Yes | Yes | Yes |

*Note*. DHHS = Department of Health and Human Services. Unfavorable = unfavorable or ambiguous. NA = not available.

*Sources*: HomVEE (n.d.) and NHVRC (2019)

**Table S2.** Random Effects Within-Between Models of Child Maltreatment Report Rates, U.S. Counties, 2016-2018

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Any EHV models | Unadjusted model | Adjusted model | Within-effect × urbanicity interaction model | Between-effect × urbanicity interaction model |
| *Coefficient (95% CI)* |  |  |  |  |
| Any EHV |  |  |  |  |
| Within-effect | **-2.13 (-3.87, -0.58)** | **-2.21 (-3.67, -0.78)** | **-3.34 (-6.65, -0.23)** | **-2.21 (-3.78, -0.56)** |
| Within-effect × small urban | - | - | 3.16 (-0.41, 6.97) | - |
| Within-effect × rural | - | - | -1.71 (-5.90, 3.17) | - |
| Between-effect | -0.31 (-4.97, 4.26) | 1.90 (-1.82, 5.36) | 1.90 (-2.18, 5.66) | 2.88 ( -3.36, 8.54) |
| Between-effect × small urban | - | - | - | -4.81 (-12.30, 3.50) |
| Between-effect × rural | - | - | - | 2.75 ( -5.37, 11.48) |
| *Model Fit* |  |  |  |  |
| Bayesian Information Criterion | 13042.3 | 12763.6 | 12771.7 | 12775.5 |
| MIECHV-funded EHV models | Unadjusted model | Adjusted model | Within-effect × urbanicity interaction model | Between-effect × urbanicity interaction model |
| *Coefficient (95% CI)* |  |  |  |  |
| MIECHV-funded EHV provisions |  |  |  |  |
| Within-effect | 0.24 (-2.04, 2.43) | 0.69 (-1.66, 3.28) | 0.05 ( -4.72, 4.99) | 0.69 (-1.72, 2.85) |
| Within-effect × small urban | - | - | 1.48 ( -1.23, 4.54) | - |
| Within-effect × rural | - | - | -2.54 ( -4.12, 7.07) | - |
| Between-effect | **4.15 ( 0.69, 7.17)** | 1.54 (-1.18, 4.34) | 1.54 (-11.19, 5.92) | 2.55 (-1.97, 6.96) |
| Between-effect × small urban | - | - | - | -2.62 (-7.90, 2.73) |
| Between-effect × rural | - | - | - | 5.07 (-3.51, 12.87) |
| *Model Fit* |  |  |  |  |
| Bayesian Information Criterion | 13043.2 | 12770.3 | 12784.1 | 12781.3 |

*Note*. CI = confidence interval. EHV = evidence-based home visiting provision. MIECHV = Maternal, Infant, and Early Childhood Home Visiting. BIC = Bayesian Information Criterion. Sample size = 1,776 county-year observations nested in 592 counties and 48 states and DC. Significant coefficients (p < .05) are in boldface. Unadjusted models controlled for year fixed effects, urbanicity, and state and county random intercepts. Adjusted models additionally controlled for within-effects and between-effects of median household income, % single-parent households among households with related children, % Black children among children, % Latino children among children, % foreign-born among residents, % children among residents, % children with disabilities among children, and % moved in one year among residents. A lower Bayesian Information Criterion value indicates a better fit.

**Table S3.** Random Effects Within-Between Models (Adjusted Models) of Child Maltreatment Report Rates per 1,000 Children, U.S. Counties, 2016-2018

|  |  |  |
| --- | --- | --- |
|  | Coefficient (95% confidence interval) | |
| *Fixed effects* | Any EHV model | MIECHV-funded EHV model |
| Intercept | **50.66 (44.97, 56.83)** | **50.47 (43.85, 57.43)** |
| Any EHV |  |  |
| Within-effect | **-2.21 (-3.67, -0.78)** | **-** |
| Between-effect | 1.90 (-1.82, 5.36) | **-** |
| MIECHV-funded EHV |  |  |
| Within-effect | **-** | 0.69 (-1.66, 3.28) |
| Between-effect | **-** | 1.54 (-1.18, 4.34) |
| Median household income |  |  |
| Within-effect | **-0.36 (-0.69, -0.02)** | **-0.34 (-0.68, -0.01)** |
| Between-effect | **-0.30 (-0.48, -0.13)** | **-0.30 (-0.47, -0.11)** |
| % single-parent households with related children |  |  |
| Within-effect | 0.30 (-0.02, 0.65) | **0.32 (0.00, 0.64)** |
| Between-effect | **1.03 (0.65, 1.37)** | **1.02 (0.65, 1.40)** |
| % Black children among resident children |  |  |
| Within-effect | **0.84 (0.20, 1.46)** | **0.82 (0.21, 1.45)** |
| Between-effect | **-0.53 (-0.70, -0.36)** | **-0.53 (-0.67, -0.35)** |
| % Latino children among resident children |  |  |
| Within-effect | **-2.79 (-4.13, -1.48)** | **-2.80 (-4.09, -1.49)** |
| Between-effect | **-0.19 (-0.33, -0.04)** | **-0.20 (-0.35, -0.02)** |
| % foreign-born among residents |  |  |
| Within-effect | -0.95 (-2.22, 0.44) | -0.94 (-2.35, 0.46) |
| Between-effect | **-0.31 (-0.58, -0.05)** | **-0.32 (-0.61, -0.02)** |
| % children among residents |  |  |
| Within-effect | -0.10 (-2.32, 1.96) | -0.07 (-2.43, 2.33) |
| Between-effect | -0.26 (-0.79, 0.24) | -0.27 (-0.84, 0.19) |
| % children with disabilities among resident children |  |  |
| Within-effect | 0.47 (-0.38, 1.32) | 0.49 (-0.35, 1.28) |
| Between-effect | **1.78 (1.10, 2.44)** | **1.74 (1.11, 2.45)** |
| % moved in one year among residents |  |  |
| Within-effect | 0.08 (-0.41, 0.65) | 0.09 (-0.39, 0.6) |
| Between-effect | **0.42 (0.05, 0.75)** | **0.43 (0.04, 0.77)** |
| Urbanicity (reference = large urban) |  |  |
| Small urban | 2.56 (0.05, 5.35) | 2.71 (-0.21, 5.53) |
| Rural | **9.60 (5.28, 13.96)** | **9.71 (5.25, 14.26)** |
| Year (reference = 2016) |  |  |
| 2017 | **2.67 (1.73, 3.43)** | **2.57 (1.75, 3.45)** |
| 2018 | **5.16 (3.69, 6.53)** | **5.05 (3.64, 6.45)** |
| *Random effects* | Variance | |
| Level 1 residual | 23.64 | 23.78 |
| Level 2 intercept | 153.04 | 152.94 |
| Level 3 intercept | 424.91 | 424.32 |

*Note*. EHV = evidence-based home visiting provision. MIECHV = Maternal, Infant, and Early Childhood Home Visiting. Sample size = 1,776 county-year observations nested in 592 counties and 48 states and DC. Significant coefficients (p < .05) are in boldface.

**Statistical Model Equations**

The basic all-EHV model is:

The basic MIECHV-funded EHV model is:

Here, is the child maltreatment report rate for the *t*th county-year in the *i*th county in the *j*th state. is the all-EHV provision for the *t*th county-year in the *i*th county in the *j*th state. is the mean all-EHV provision from 2016-2018 for the *i*th county in the *j*th state. is the vector of urbanicity categories. is the vector of control variables. is the intercept. is the within-effect of all-EHV provision. is the between-effect of all-EHV provision. , , and are the vectors of coefficients for urbanicity categories, within-effects of controls, and between-effects of controls, respectively. is the vector of year-fixed effects. is the state-level random intercept. is the county-level random intercept. is the observation-level error. *MEHV* is the MIECHV-funded EHV provision.

**Guidance on How to Use the Enclosed Supplementary Materials for Replication**

This study used data linking multiple national datasets at the county level for counties in 50 States and DC from 2009 to 2018. The data had been constructed by a larger project funded by the Centers for Disease Control and Prevention (CDC), K01CE003229.

The purpose of this document is to provide guidance on how to use the enclosed supplementary materials (the SAS programs and the R script) to replicate this study’s data and analysis results.

The child maltreatment report data are available to eligible researchers with no cost. All other data are open to the public with no cost. Table S1 lists the datasets, their sources (locations), and the SAS programs for importing, managing, and merging the datasets.

**Table S1.** SAS Programs, Raw Datasets, and Sources to Construct the Present Study’s Data.

|  |  |  |
| --- | --- | --- |
| SAS Program | Dataset | Source |
| 01 CAN\_Input.sas | Child maltreatment report data | <https://www.ndacan.acf.hhs.gov/> |
| 02 Census\_Input.sas | Census ACS data | <https://www.socialexplorer.com/explore-tables> |
| 03 BIRTH\_Input.sas | Birth outcome data | <https://wonder.cdc.gov/> |
| 04 Opioid\_Input.sas | Opioid prescription rate data | <https://www.cdc.gov/drugoverdose/rxrate-maps/> |
| 05 NCHS\_RUC\_Input.sas | NCHS rural-urban codes | <https://www.cdc.gov/nchs/data_access/urban_rural.htm> |
| 06 USDA\_RUC\_Input.sas | USDA rural-urban codes | <https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx> |
| 07 Spatial\_Input.sas | Census gazetteer files | <https://www.census.gov/geographies/reference-files/time-series/geo/gazetteer-files.html> |
| 08 CHR\_Input.sas | County Health Rankings data | <https://www.countyhealthrankings.org/> |
| 09 Food\_Input.sas | Food insecurity data | <https://map.feedingamerica.org/> |
| 10 MHV\_Input.sas | MIECHV data | <https://mchb.hrsa.gov/programs-impact/programs/home-visiting/state-fact-sheets> |
| 11 NHV\_Input.sas | NHVRC data | <https://nhvrc.org/yearbook/2020-yearbook/> |
| 12 Grand\_Merge.sas | This program merges all datasets and constructs analysis data. | |

After obtaining the raw datasets, running all enclosed SAS programs from “01 CAN\_Input.sas” to “12 Grand\_Merge.sas” will produce the analysis data (“CDCK01County.sas7bdat”). The “Dataset Contents.htm” reports the summary information about the contents of the analysis data, including the variables’ names and descriptions.

After constructing the analysis data, one can use the enclosed R script (“Analysis\_County\_HomeVisit\_CMR.R”) to replicate this study’s analysis results.

All the SAS programs, “Dataset Contents.htm”, and the R script are in the “Supplement.zip” file.

Please contact the corresponding author (Hyunil Kim, [hyunil@illinois.edu](mailto:hyunil@illinois.edu)) for additional information.