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Zakir Husain

Saswata Ghosh

and

Mousumi Dutta

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INSTITUTE OF DEVELOPMENT STUDIES KOLKATA

DD 27/D, Sector I, Salt Lake, Kolkata 700 064

Phone : +91 33 2321-3120/21 Fax : +91 33 2321-3119

E-mail : idsk@idskmail.com, Website: www.idsk.edu.in

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Zakir Husain*

Saswata Ghosh†

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Abstract:

Ante-natal Care (ANC) refers to a series of sequential check-ups of pregnant women to ensure the health of mother and child. This paper undertakes an analysis of the uptake of ANC services

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* (Corresponding author)
Economics Department, Presidency University, Kolkata 700073, India
Email: dzhusain@gmail.com ORCID: 0000-0002-0865-1399

† Institute for Development Studies Kolkata, Kolkata, India
Email: ghosh.saswata@gmail.com ORCID: 0000-0001-9337-683X

‡ Economics Department, Presidency University, Kolkata, India
Email: mousumi.econ@presiuniv.ac.in ORCID: 0000-0002-0819-2786

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using geo-spatial techniques in rural India, a fast-growing country with poor maternal and child health indicators. It is an important problem in countries with poor maternal health indicators where ensuring a continuum of care is an important challenge before policymakers. We have used data from the fourth round of District-level Household and Facility Survey, Annual Health Survey for 2012, and District Census Handbooks. Spatial lag and semi-parametric Geographically Weighted Regression models have been estimated. Results reveal the presence of statistically significant spatial clusters. They are formed through spatial diffusion processes. The study recommends location-specific policies to ensure a continuum of care, while globally ensuring adequate availability of medical staff.

Keywords: ante-natal care; maternal health; spatial analysis; geographically weighted regression model; India

1. Background

Despite attaining rapid economic growth in the past two decades, India has failed to attain the Millennium Development Goal of reducing maternal mortality rates by three quarters between 1990 and 2015. A key determinant of maternal health is the level, quality and continuity of ANC services. Such services refer to preventive healthcare services in the form of regular check-ups that allow doctors or midwives to treat and prevent potential health problems throughout the course of the pregnancy and to promote healthy lifestyles that benefit both mother and child. The India Fact Sheet of National Family Health Survey (Government of India, 2016) shows that while 55% of pregnant women had one ANC check-up, 45% went on to take at least four check-ups, and only 17% took the full ANC check-up. The fourth wave of the District-level Household and Facility Survey (DLHS4) reports that, in rural India, while 85% of pregnant women receive at least one ANC check-up, only 59% receive the minimum recommended three ANC check-ups. Given the sequential and time-bound nature of ANC services, it is important to ensure continuum of care in the availing of such services (Gayawan et al., 2014). This paper examines district-level variations in drop-out from availing ANC in rural India using geo-spatial techniques.[1]

Research on the utilisation levels of ANC services in India have identified education and awareness (Chandhiok et al., 2006), socio-religious identity, the autonomy of women, mass media exposure and birth order (Singh et al., 2012), deprivation level (Mohanty, 2012), age (Roy et al., 2013), place of residence (Chauhan & Kumar, 2016), and economic status (Paudel et al., 2014) as important demand-side correlates of low utilisation of ANC services (Awasthi et al., 2016). Supply-side factors (such as availability of medical and para-medical personnel and all-weather roads) are also important determinants in the uptake of maternal care (Ghosh et al., 2015).

In recent years, spatial techniques have been used to map spatial patterns in diseases (Berchuck et al., 2019; Cameletti et al., 2019; De Mello-Sampayo, 2016; Ejigu et al., 2020); they have also been used to identify regional variations in provisioning of maternal care services in countries like France (Charreire & Combier, 2009), Ethiopia (Asnake, 2016; O'Meara et al., 2013), Nigeria (Gayawan et al., 2014), and Indonesia (Charreire & Combier, 2009). Analysis of spatial variations in the utilisation of ANC services can provide government, policymakers and stakeholders with focused evidence to maximize the provision of ANC services to women in different localities, by designing

1. The focus on rural areas may be justified on four grounds: firstly, district-wise data for ANC services are available only for rural India; secondly, the geographical size of urban areas is small and discontinuous, so that identifying spatial variations between urban areas will not be easy; thirdly, there are substantial regional variations in the delivery of health services in rural areas; fourthly, educational levels and awareness is lower in rural areas.

public health interventions to meet the special needs of each region (Yeneneh et al., 2018). In India, however, the choice of the individual as the level of analysis in the majority of studies has resulted in a failure to examine regional variations in the uptake of ANC services using spatial methods.

This paper proposes to address two deficiencies of present studies on the utilisation of ANC services. Firstly, in contrast to existing studies on levels of utilisation of ANC services in India, the study focuses on dropouts or discontinuity in availing of the minimum recommended ANC services. It is defined as the difference in the percentages of women availing of the first ANC check-up and those availing of at least three ANC check-ups (the standard norm at the time of the survey). Secondly, the study proposes to use spatial econometric models to examine the relationship between uptake of ANC services and demand and supply-side variables. Specifically, it proposes to bring out local level relationships that are hidden in aggregative non-spatial and even standard spatial models using Geographically Weighted Regression (GWR) models.

The rest of the paper is structured as follows: Section 2 describes the variables used in the analysis and their sources. The next section presents the findings of our analysis. The final section discusses the implications of our findings and discusses possible policy strategies.

2. Materials and methods

2.1 Data

In spatial analysis choice of units is an important issue (O'Sullivan & Unwin, 2010). Districts—the smallest administrative unit for which maternal health indicators are available in India—are taken as the unit of analysis.[2] District-level data is obtained from

2. Districts are administrative divisions lying between states and Community Development Blocks, comprising both villages, towns and cities. They comprise both rural and urban areas. In 2011, there were

the District Census Handbooks (2011), District-Level Household Survey (fourth Round, 2012)[3] and Annual Health Survey (2012). Table 1 lists the variables used in the study, defines them and identifies their sources.

Table 1: Variables used, definitions and sources

Group \ Variables	Sources
Maternal health care services (Used to construct dependent variables)	
Percentage of pregnant women who received at least one ANC check-up (ANYANC) Percentage of pregnant women who had three or more ANC visits (ANC3)	Annual Health Survey and District-Level Household Survey fourth round (DLHS-4) District Fact Sheets (http://bit.ly/2qfx2yY and http://bit.ly/2qc899t)
Demographic variables (Predictor variables)	
Mean household size (HOUSEHOLD SIZE) Log of sex ratio at birth (CHILD SEX RATIO), defined as number of girls per 1000 sons Mean age at first marriage for women (MEAN AGE OF MARRIAGE)	Annual Health Survey and DLHS-4 District fact sheets (http://bit.ly/2qfx2yY and http://bit.ly/2qc899t)
Percentage of ever-married women with at least matriculate education (10 years of schooling) (MATRIC) Percentage of female workers in total working population (FEMALE WFPR) Percentage of socially disadvantaged groups (Scheduled Castes, Scheduled Tribes, and Muslims) in total population (PERCENT OF DISADVANTAGED GROUPS)	Census 2011 (http://bit.ly/2puRw9L, http://bit.ly/2qcitxU and http://bit.ly/2qfw4Ti)

641 districts; currently, they number 775. Their area varies widely from 9 square kilometers to 45,652 square kilometers.

3. We preferred the DLHS data to the more recent fifth wave of the Demographic Health Survey (2019-20) as the latter does not match with the rest of the data (relating to 2011-12).

Group \ Variables	Sources
Standard of living (Used to create predictor variable: Index for ASSET)	
Percentage of households with radio/transistor Percentage of households with television Percentage of households with mobile phones Percentage of households with bicycle	Census 2011 (http://bit.ly/2qfyQbc)
Infrastructure (Used to create predictor variable: Index for INFRASTRUCTURE)	
Percentage of households availing of banking services (BANK) Percentage of villages with all-weather roads (ROAD)	District Census Handbooks (http://bit.ly/2qCmKf9)
Health care infrastructure (Used to create predictor variables: Indices for HEALTH STAFF and GRASSROOT MEDICAL STAFF)	
Number of in-station doctors at Primary Health Centres per 100,000 persons Number of in-station para-medical staff at Primary Health Centres per 100,000 persons Number of in-station para-medical staff at Sub-Centres per 100,000 persons Percentage of villages with Accredited Social Health Activists or ASHAs Percentage of villages with Nutritional Centres-Anganwadi Centres	District Census Handbooks (http://bit.ly/2qCmKf9

Group \ Variables	Sources
Urban spill over (Predictor variable)	
Mean distance of villages from town weighted by female population (DISTANCE BETWEEN TOWN & VILLAGE)	Estimated from data on distance of village from nearest town, and population of female population in village provided in District Census Handbooks (http://bit.ly/2qCmKf9)

Note: The Indian health care system is a four tiered system. At the village level, sub-centres provide basic health facilities; at higher levels, health care is provided by the primary health centres and community health centres. At the district-level, district hospitals operate. At the top of the system is the multi-speciality hospitals located in the capital city of each state. ASHAs are female grass root health workers who motivate women to adopt maternal and child health care services. Anganwadis are centres providing care for mothers and young children in a rural India under the Integrated Child Development Scheme.

The study variable (ANCGAP) is defined as "Percentage of women who undergo at least one ANC check-up (ANYANC) but not all three (ANC3)". Mathematically, the measure is given by: ANCGAP = ANYANC – ANC3. Principal Component Analysis is carried out to reduce the dimension of the matrix of independent variables and reduce the chances of multicollinearity. Factor scores are normalised from 0 to 100 to create the following indices:

1. ASSET: Normalised factor scores of the asset index, capturing a household's economic status. It is calculated by combining the percentage of households with radio, television, mobile phones and cycles.
2. HEALTH STAFF: This index captures institutional health infrastructure in rural India. It is calculated using data for number of in-station doctors at Primary Health Centres per 100,000 persons, number of in-station para-medical staff at Primary Health Centres per 100,000 persons, and number of in-station para-medical staff at Sub-Centres per 100,000 persons.

3. GRASSROOT MEDICAL STAFF: This is an index of the availability of grassroots maternal and child health workers. It is created by combining the data for percentage of villages with Accredited Social Health Activists or ASHAs and percentage of villages with Nutritional Centres-Anganwadi Centres.

4. INFRASTRUCTURE: This is the normalised factor score representing public infrastructure in rural India. It combines percentage of households availing of banking services and percentage of villages with all-weather roads.

The rest of the predictor variables include: Mean household size (HOUSEHOLD SIZE), log of sex ratio at birth (CHILD SEX RATIO), Mean age at marriage for girls (MEAN AGE OF MARRIAGE), percentage of ever-married women with at least matriculate education (10 years of schooling) (MATRIC), percentage of female workers in total working population (FEMALE WFPR), percentage of backward section (Scheduled Castes, Scheduled Tribes, and Muslims) in total population (PERCENT OF DISADVANTAGED GROUPS), Mean distance of villages from town weighted by female population (DISTANCE BETWEEN TOWN & VILLAGE). Table 2 presents summary statistics for the predictor variables.

Table 2: Summary statistics for explanatory variables

Variable	Observations	Mean	S.D.	Min.	Max.	Global Moran's I
CHILD SEX RATIO	590	6.86	0.07	6.63	7.13	0.5165
HOUSEHOLD SIZE	590	4.75	0.64	2.80	6.30	0.7071
MEAN AGE OF MARRIAGE	590	20.70	1.61	16.45	28.50	0.6531
MATRIC	590	12.14	7.85	0.74	50.01	0.7397
FEMALE WFPR	590	38.42	15.25	8.28	79.23	0.7212
PERCENT OF DISADVANTAGED GROUP	590	44.19	22.56	7.86	99.26	0.6765
ASSET Index	590	48.89	21.59	0.00	100.00	0.5412
INFRASTRUCTURE index	590	54.28	20.13	0.00	100.00	0.6459
HEALTH STAFF index	590	10.12	8.66	0.00	80.83	0.4927
GRASSROOT MEDICAL STAFF index	590	79.19	13.71	30.12	100.00	0.4704
DISTANCE	590	21.10	13.10	0.00	168.08	0.47.02

Since the analysis is confined to rural areas and as such areas comprise only a minuscule portion of union territories, all union territories have been dropped when undertaking the analysis. Andaman and Nicobar Islands and Lakshadweep islands have also not been included in the analysis. Both archipelagos are tiny (8,250 km2 and 39 km2, respectively, comprising 0.25% and 0.001% of the Indian area); their population is also very small (3,81,000 and 64,000, respectively, comprising 0.03% and.01% of India's population). Neither the Annual Health Survey nor DLHS-4 was undertaken in Gujarat or Jammu and Kashmir. For Gujarat, unit-level data from the DLHS-3 (carried out during 2007–08) is used to estimate figures for maternal health for the districts. The quality of data on Jammu and Kashmir is unreliable for Census and earlier rounds of the DLHS (Guilmoto; Rajan, 2013); so, the study left out Jammu and Kashmir from the analysis.

2.2 Methodology

The analysis starts with an examination of variations in utilisation of ANC services and resultant discontinuity (ANCGAP) by major geographical regions using a choropleth map. It shows the spatial distribution of ANCGAP over districts. Global Moran's I is estimated to test whether the spatial distribution data has a pattern, or whether it is random. It is given by:

$$I = \frac{\sum_{i}^{N} \sum_{j} W_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum_{i} (x_i - \bar{x})^2} \qquad [1]$$

when N is the number of spatial units indexed by i and j; x is the variable of interest; W_{ij} is a matrix of row standardised spatial weights with zeroes on the diagonal, and W is the sum of all w_{ij}.

The formation of the spatial weight matrix is an important step in this exercise. As the geo-references in our data are given in the form of administrative boundaries and assume the form of irregular polygons, contiguity-based weights using the queen criterion are appropriate (O'Sullivan and Unwin 2010).[4] The common practice of row standardising Wij, to ensure that the sum of the weights for each row equals unity, is followed (Moscone et al., 2007).

The values of Moran's I are important because it gives an overall indication of whether there is clustering in the regions being studied. Moran's I, however, does not allow the identification of the presence (or absence) of significant spatial clusters for each location. Nor does it indicate the type of autocorrelation (Anselin, 1995). Therefore, Local Indicators of Spatial Association (LISA) are employed to test the null hypothesis of spatial randomness by comparing the values in a given location with values in neighbouring regions (Anselin, 1996). A modified Moran I statistic (Anselin, 1995) aimed at identifying LISA can be calculated as:

$$I_i = N\left(x_{ij} - \bar{x}\right)\frac{\sum_j (x_j - \bar{x})}{\sum_i (x_j - \bar{x})^2} \qquad [2]$$

so that $$I = \sum_i \frac{I_i}{N} \qquad [3].$$

There are N numbers of Local Moran's Ii, which are interpreted using two types of LISA maps. The LISA *significance* map shows the statistical significance level at which each region can be regarded as making a meaningful contribution to the global autocorrelation outcome. The LISA cluster map, on the other hand, examines the type of spatial autocorrelation, by distinguishing between four cases (Messner & Anselin, 2004). Two of these categories indicate positive autocorrelation ($0 < I_i < 1$), viz. when a location with an above-average value surrounded with neighbours with above-average values (high-high; HH), or when a location with below-average value surrounded with below-average values (low-low; LL). In contrast, negative spatial autocorrelation

4. The queen criterion is somewhat more encompassing and defines neighbours as spatial units sharing a common edge or a common vertex (Anselin & Rey, 2014).

($-1 < I_i < 0$) refers to a geographic distribution of values when a high value (above-average) is surrounded by low neighbours (high-low; HL) and vice versa (low-high; LH). The cluster map allows the identification of clusters contributing most strongly to the global outcome and identify the nature of the interaction.

A high value of Moran's I, however, need not necessarily be produced by spatial interactions for the phenomenon being studied; it may also be a result of spatial patterning of the covariates of the phenomenon being studied (Sarrias, 2017). To rule this out, and establish that spatial patterns are caused by interactions between the study variable across districts, an appropriate regression model that links ANCGAP to the explanatory variables is estimated. The Ordinary Least Square (OLS) model, however, ignores spatial interactions. Such interactions can be introduced by assuming that values of ANCGAP and/or error terms of the regression model are influenced by their value in neighbouring areal units. If the dependent variable is spatially dependent on the explanatory variables, the Classical OLS model yields biased estimates, while, in the case of spatial dependence in the error terms, OLS results are inefficient (Anselin, 1995, 2001; Anselin et al., 1996; Anselin & Rey, 2014). To take into account such spatial dependency either spatial lags should be incorporated in the dependent variable (spatial lag model), or moving averages of the error term should be taken (spatial error model), or both (spatial autoregressive moving average model). The general form of the model is:

$$Y = \rho WY + X\beta + \lambda W\eta + \varepsilon \qquad [4]$$

when

Y is the vector of district-wise gap,

W is the spatial weight matrix, formed by using the Queen's contiguity criterion,

X is the matrix of explanatory variables,

β is the vector of regression coefficients,

η is the spatial error term, and

ε is the classical error term.

When $\rho = \eta = 0$, this model is the traditional Classical Linear Regression Model. If $\rho \neq 0$ and $\eta = 0$, the model becomes the spatial lag model, while it becomes the spatial error model when $\rho = 0$ and $\eta \neq 0$. Diagnostic tests, based on the Lagrange Multiplier and their robust variants, indicate which model is appropriate (Anselin & Rey, 2014).

Although global parameters provide a useful overview of the overall situation, the isotropic conceptualisation of space is adequate in representing local conditions only when such conditions do not vary substantially over the study area. As spatial variations of the local observation increases, however, the reliability of the global observations as representative of local conditions decreases (Fotheringham et al., 2002). Given the heterogeneity between Indian districts, the use of a global spatial model may be questioned. In such cases, GWR models, with coefficients that vary geographically, may be used to reflect the district-level heterogeneity in our data (Fotheringham et al., 2017; Nakaya et al., 2009). It may be represented as:

$$\eta_i = \sum_k \beta_k (u_i, v_i) X_{kj} = X_i^t \beta(u_i) \qquad [5]$$

where x_{kj} and β_k is the kth explanatory variable and its coefficient, respectively. In this model, the coefficients vary with the geographical coordinates of the locality [$u_i = (u_i, v_i)$]. The GWR model will yield n-values of each coefficient. This feature of the model facilitates mapping and spatial analysis of the coefficients. It is also possible to undertake statistical tests of which coefficient is 'global' (Nakaya et al., 2009). This enables estimation of a semi-parametric variant of the GWR model, permitting some coefficients to be constant, while others vary globally. The semi-parametric GWR model takes the form (Nakaya et al., 2009):

$$\eta_i = \sum_k \beta_k (u_i, v_i) X_{kj} + \sum_l \gamma_l z_{li} \qquad [6]$$

In this model, there will be n-estimates of coefficients of the 'local' variables, while the remaining variables, having a global effect, with a single coefficient.

The exploratory spatial analysis is undertaken using Luc Anselin's GeoDa Version 1.2, while the econometric analysis was undertaken in R (using the package spdep, developed by Roger Bivand) and compared with estimates from the alpha version of Anselin's GeoDa Space; the GWR4 software (developed by Tomoki Nakaya, Martin Charlton, Chris Brunsdon, Paul Lewis, Jing Yao and A. S. Fotheringham) was used to estimate the GWR model.

3. Results

Figure 1 shows the percentage of pregnant women who received an ANC check-up (ANYANC) and who took all three ANC check-ups (ANC3). The percentage of women who receive at least one ANC check-up is quite high, with relatively little inter-district variation (85.3% at the all-India level, with a standard deviation of 15.6). It is lowest in the North-eastern region (72.1%), followed by the Western (75.2%) and Northern regions (78.1%).[5] The percentage of women who go on to receive the recommended three ANC check-ups is, however, much less (58.8%); inter-district variation is also high (standard deviation is 21.3). Values of ANC3 are low in regions, except in Southern and Eastern India. At the all-India level, the drop-out level (ANCGAP) is 26.6%. It is highest in the states of Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh and Rajasthan, the drop-out rate is substantial (35.4%), while southern states perform best (their drop-out rate is 15.8%).

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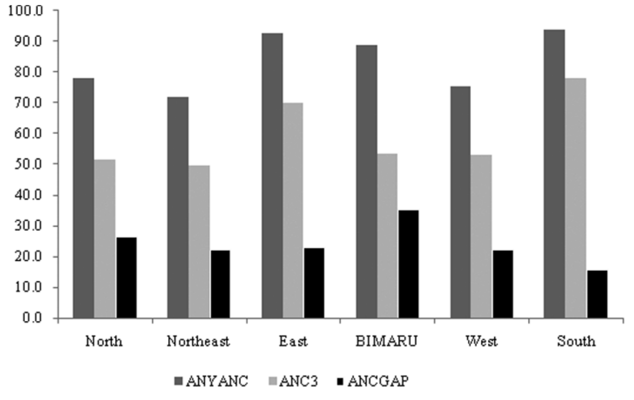
5. The states are grouped on the basis of cultural similarity and contiguity into six regions: South (Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, and Pondicherry), West (Gujarat, Maharashtra, Goa, Daman and Diu), North-east (Nagaland, Manipur, Arunachal Pradesh, Meghalaya, Mizoram, and Sikkim), East (West Bengal, Odisha, Assam, and Tripura), North (Punjab, Haryana, Delhi, Uttarakhand, and Himachal Pradesh) and BIMARU or Central region (Bihar, Jharkhand, Chattisgarh, Madhya Pradesh, Rajasthan, and Uttar Pradesh), based on a study by Karve (1993).

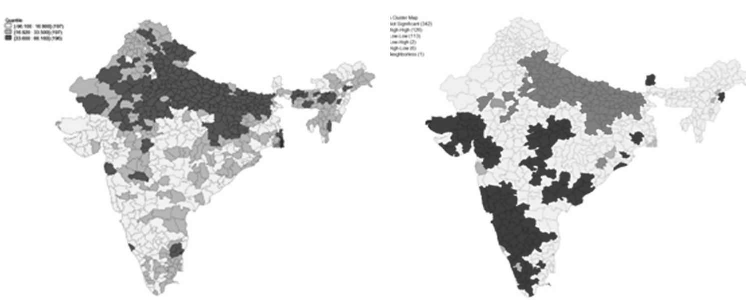
Figure 1: Variations in ANYANC, ANC3, and ANCGAP



3.1 Exploratory spatial analysis

The regional pattern for the dropouts (ANCGAP) is visible in the quantilechoropleth map (Figure 2a)—northern and central states like Bihar, Jharkhand, Chhattisgarh, Rajasthan, Uttar Pradesh, Uttarakhand, and western Madhya Pradesh have particularly high drop-out rates, and Gujarat and the zone from southern Maharashtra to Kerala, including Karnataka, have a low drop-out rate. This implies a clear dichotomy between Northern and Southern India, in line with the North-South divide observed in earlier studies (Dyson & Moore, 1983).

Figure 2: Univariate spatial analysis of ANCGAP



(a) Quantile map: ANCGAP

(b) LISA cluster map: ANCGAP

The possibility of spatial clusters is signified by the high value of Global Moran's I (0.65, Prob <0.001). This is not compatible with a notion of spatial randomness (Anselin et al., 2002).The LISA cluster map (Figure 2b) indicates statistically significant spatial clusters. The northern cluster (indicated by red) belongs to the High-High category; it implies that a high value of ANCGAP in one district is associated with high values in neighbouring districts also. These are the hotspot districts, where not only are drop-out rates high but appear to be spatially related. It is on this cluster that policymakers should focus on. In the remaining clusters indicated by blue low values of ANCGAPare associated with low values in contiguous districts.They are mainly located in the southern and western part of India. Possible reasons for the clusters are poor health infrastructure, lack of awareness and cultural resistance in the northern areas(Ghosh et al., 2020; Jat et al., 2011); southern India, on the other hand, has a higher proportion of educated women, better autonomy of women, societies are more progressive and health facilities are more developed (Mistry et al., 2009; Navaneetham & Dharmalingam, 2002).

3.2 Spatial regression results

To rule out clustering between the correlates of ANCGAP in adjacent districts, the following spatial econometric model is estimated:

$$ANCGAP = \rho WY + X\beta + \lambda W\eta + \varepsilon$$

where the X-matrix is formed of the study variables identified earlier (CHILD SEX RATIO, HOUSEHOLD SIZE, MEAN AGE OF MARRIAGE, MATRIC, FEMALE WFPR, PERCENT OF DISADVANTAGED GROUPS, ASSET Index, INFRASTRUCTURE Index,HEALTH STAFF Index, GRASSROOT MEDICAL STAFF Index, and DISTANCE BETWEEN TOWN & VILLAGE). Except for HOUSEHOLD SIZE and PERCENT OF DISADVANTAGED GROUPS, all variables are hypothesised to be negatively related to ANCGAP.

Table 3: Spatial diagnostics and selection of appropriate model

Spatial diagnostics	Model 1		Model 2	
	Value	P-value	Value	P-value
Moran's I (error)	16.22	0.00	16.24	0.00
Lagrange Multiplier-Lag (LM_{ρ})	292.48	0.00	315.70	0.00
Robust LM-Lag (LM_{ρ}*)	55.52	0.00	65.39	0.00
Lagrange Multiplier-Error (LM_{λ})	237.06	0.00	250.33	0.00
Robust LM-Error (LM_{λ}*)	0.09	0.76	0.02	0.90
Lagrange Multiplier-SARMA ($LM_{\rho\lambda}$)	292.58	0.00	315.72	0.00
Appropriate model	**Spatial Lag**		**Spatial Lag**	

The spatial diagnostics given in Table 3 indicate that the spatial lag model, reported in Table 4 (Model 1), is appropriate. The coefficient for spatial effect (ρ) is statistically significant at 1% level. This confirms the hypothesis that space is an important determinant of discontinuity in availing ANC services. Thus, discontinuities in a district are affected by the situation in contiguous districts. But, the coefficient of only household size (HOUSEHOLD SIZE), among the other covariates, is statistically significant. A possible reason is a correlation among the explanatory variables (see Appendix Table A1). A parsimonious model (MODEL 2), therefore, was estimated; it includes—apart from the spatial lag—the four variables, CHILD SEX RATIO, HOUSEHOLD SIZE, MEAN AGE OF MARRIAGE, and HEALTH STAFF Index. Spatial diagnostics (Table 3) indicate that the spatial lag model is again the appropriate model. Results (Table 4, Model 2) reveal that all the variables, including ρ (coefficient for spatial lag), are statistically significant.

Table 4: Results of spatial autoregressive model for ANCGAP

Variable	Spatial Model 1			Spatial Model 2		
	β	z	Prob.	β	z	Prob.
CONSTANT	92.43	1.87	0.06	84.21	1.83	0.07
ρ	0.64	231.88	0.00	0.65	253.31	0.00
CHILD SEX RATIO	-16.09	-2.29	0.02	-16.32	-2.50	0.01

Variable	Spatial Model 1			Spatial Model 2		
	β	z	Prob.	β	z	Prob.
MAGE	0.95	2.89	0.00	0.93	3.03	0.00
HOUSEHOLD SIZE	3.40	3.74	0.00	4.03	4.85	0.00
FEMALE WFPR	-0.02	-0.43	0.67	-	-	-
MATRIC	-0.12	-1.42	0.16	-	-	-
INDEX FOR HEALTH STAFF	-0.11	-1.50	0.13	-0.13	-2.23	0.03
GRASSROOT MEDICAL STAFF Index	-0.05	-1.25	0.21	-	-	-
INFRASTRUCTURE Index	-0.01	-0.42	0.68	-	-	-
ASSET Index	0.02	0.69	0.49	-	-	-
DISTANCE BETWEEN TOWN & VILLAGE	-0.06	-1.36	0.17	-	-	-
PERCENT OF DISADVANTAGED GROUPS	-0.01	-0.34	0.74	-	-	-
N	590	-	-	590	-	-
Degrees of freedom	577	-	-	584	-	-
F (Wald)	290.82	-	0.00	318.33	-	0.00
Log Likelihood ratio	-2277.21	-	-	-2280.34	-	-
R2	-	-	-	-	-	-
Pseudo-R2	0.59	-	-	0.59	-	-
Spatial Pseudo-R2	0.39	-	-	0.38	-	-
Akaike Information Criterion	4582.40	-	-	4574.70	-	-

In spatial models the marginal effect is given by

$$\frac{\delta y}{\delta x} = [I - \rho W]^{-1} X\beta = X\beta + \rho W X\beta + \rho^2 W^2 X\beta + \rho^3 W^3 X\beta + \ldots \quad [7]$$

Thus, the marginal effect is a function of the value of X not only at that location but also of at neighbouring locations, at neighbours of the neighbours, and so on, with a distance decaying effect (Matthews 2006: 164-165). The estimated marginal effects (Table 5) reveal that indirect effects are lower than direct effects. Thus, the marginal effect is highest for CHILD SEX RATIO, which has the highest direct effect.

Table 5: Marginal effects of spatial models

Variables	Spatial Model 1			Spatial Model 2		
	Direct	Indirect	Total	Direct	Indirect	Total
CHILD SEX RATIO	-18.03	-26.94	-44.97	-18.39	-28.77	-47.16
MEAN AGE OF MARRIAGE	1.07	1.59	2.66	1.04	1.63	2.68
HOUSEHOLD SIZE	3.81	5.70	9.51	4.54	7.11	11.65
FEMALE WFPR	-0.02	-0.03	-0.05	-	-	-
MATRIC	-0.13	-0.20	-0.34	-	-	-
HEALTH STAFF Index	-0.12	-0.18	-0.29	-0.14	-0.22	-0.37
GRASSROOT MEDICAL STAFF Index	-0.05	-0.08	-0.13	-	-	-
INFRASTRUCTURE Index	-0.01	-0.02	-0.04	-	-	-
ASSET Index	0.02	0.03	0.05	-	-	-
DISTANCE BETWEEN TOWN & VILLAGE	-0.06	-0.10	-0.16	-	-	-
PERCENT OF DISADVANTAGED GROUPS	-0.01	-0.01	-0.02	-	-	-

3.3 Results of GWR model

The spatial lag model presents a bird's eye view of the spatial processes and effects of explanatory variables in determining the level of ANCGAP. It identifies important determinants of the discontinuity in availing of ANC services. The GWR4 model, particularly its semi-parametric variant, informs policy makers about regional variations in the impact of the enabling the introduction of region specific policies. We have estimated Model 2 using the GWR method as Model 1 demonstrates multi-collinearity. The model is estimated using a bandwidth of 2.656, selected using the Golden Section Search criterion (Greig, 1980). The results of the geographical variability of local coefficients—

the DIFF statistic is 0.71, -37.40, -10.36 and -20.10 for HEALTH STAFF, CHILD SEX RATIO, MEAN AGE OF MARRIAGE and HOUSEHOLD SIZE, respectively—indicate that only the coefficient of HEALTH STAFF does not vary over space.[6] The coefficient of HEALTH STAFF (availability of doctors and para-medical staff in the primary and Community Health Centers) is -1.31 (with S.E. = 0.60 and t = -2.17). The results make intuitive sense as the availability of medical staff is important in all regions. The impact of CHILD SEX RATIO, which is a proxy for social attitudes, should vary across regions depending upon the nature of society and education levels; similarly, the negative impact of household size on uptake of ANC services may be moderated by level of economic development, transport connectivity, availability of medical facilities in the neighbourhood, and active role played by grass-root health workers, like Accredited Social Health Activists (ASHAs).

The summary results of the semi-parametric GWR model are given in the top panel of Table 6. Both R2 and adjusted-R2 falls slightly (to 0.59 and 0.55, respectively); simultaneously, AIC rises marginally to 4569.70. The mean and median values of each of the coefficients varying across space are of the same sign; however, their value decreases in contrast to the global estimates (Table 6).

Table 6: Summary results of GWR model

Variable	Mean	STD	Lower Quartile	Median	Upper Quartile	Inter-Quartile Range	Robust
Intercept	26.36	8.57	23.73	28.76	32.38	8.66	6.42
CHILD SEX RATIO	-1.90	3.86	-4.35	-1.85	0.22	4.57	3.39
MEAN AGE OF MARRIAGE	1.32	3.39	-0.92	0.56	3.54	4.46	3.31
HOUSEHOLD SIZE	5.54	4.46	2.57	5.45	9.75	7.17	5.32

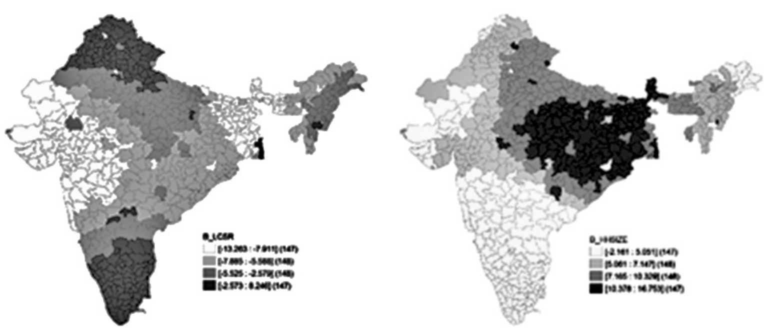
6. If the DIFF statistic is between 0 and 1, the hypothesis of no local variations is weakly rejected; in case it is between 1 and 2, the hypothesis is strongly rejected (Nakaya, 2015).

Variable	Mean	STD	Lower Quartile	Median	Upper Quartile	Inter-Quartile Range	Robust
HEALTH STAFF	-0.40	2.49	-2.05	-0.97	0.45	2.50	1.85
Intercept	26.10	8.50	24.05	28.16	32.26	8.21	6.09
CHILD SEX RATIO	-1.87	3.82	-4.16	-1.82	0.10	4.25	3.15
MEAN AGE OF MARRIAGE	1.43	3.64	-0.72	0.49	3.53	4.25	3.15
HOUSEHOLD SIZE	5.59	4.40	2.62	5.36	9.72	7.10	5.26

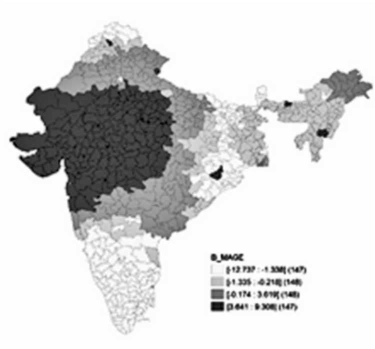
Note: Robust STD is given by (Inter-quartile range / 1.349)

The results of the 591 GWR regression models are reported in Supplementary Tables. Figure 3 maps variations in the coefficients of the semi-parametric form of the GWR model and local R2. Clear spatial patterns are visible. For instance, the values of coefficients for CHILD SEX RATIO is highest (in absolute terms) in the central part of India, ranging from Gujarat to the North-eastern states. On the other hand, coefficients of MEAN AGE OF MARRIAGE and HOUSEHOLD SIZE are high in Western and Central-Eastern regions of India, respectively. It may also be seen that the mean values of the GWR coefficients are higher than the coefficients of the spatial lag model.

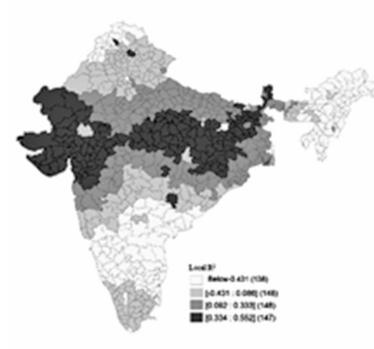
Figure 3: Quantile maps of geographically weighted regression coefficients and local R^2



(a) Coefficient of CHILD SEX RATIO (b) Coefficient of HOUSEHOLD SIZE



(c) Coefficient of MEAN AGE OF MARRIAGE



(d) Local R2

4. Discussion

This study advocates a shift from the current focus on ensuring high levels of availing ANC services to ensuring continuity in the utilisation of such services. Such continuity is observed to be determined by both spatial contiguity effects (viz. conditions in neighbouring areas) and the influence of covariates. The impact of a strong health infrastructure is constant determinant of dropout rates across space. In contrast, the impact of child sex ratio, household size and mean age at first marriage varies across regions. Specifically, discontinuities in the utilisation of ANC services are more likely in areas characterised by low sex ratio at birth, high age at marriage, large families, and where doctors are not available.

It is well-documented that the unavailability of doctors affects the uptake of full ANC and results in an increase in the gap between uptake of any ANC and full ANC (Ghosh et al., 2015). Although hardly any study has incorporated sex ratio at birth as an explanatory variable in modelling the gap between uptake of any ANC and full ANC, this study demonstrates that son preference possibly enhances the utilisation of ANC. Although earlier studies have observed an inverted–U shape relationship between age at marriage and utilisation of ANC (Gupta et al., 2010), we found that the gap between utilisation of any ANC and full ANC increases significantly with age at marriage. Pregnancy at a higher age could be associated with obstetric complications (Lampinen et al., 2009) and such women may not likely to receive full ANC plausibly because of social stigma associated with pregnancy complications in rural areas. Women who belong to large families could be overburdened with household chores and would lack time to complete the prescribed number of ANC check-ups (Roy et al., 2017). In the Central-Eastern parts of the country, for instance, farm-based households require a higher number of household members. In these households, women's engagement in the household chores is high, while individual autonomy in decision-making is low, which could restrict the uptake of three ANC and thus enhances the gap between one ANC and three ANC.

Such effects, however, do not vary uniformly across regions. This is logically consistent and implies that improving the supply-side to remove deficiencies in health infrastructure should be taken up as a national priority (Saprii et al., 2015). In contrast the influence of the variables determining demand for ANC services (MEAN AGE OF MARRIAGE, CHILDSEX RATIO and HOUSEHOLD SIZE) varies across regions. While MEAN AGE OF MARRIAGE exerts a stronger influence in Western India, for instance, HOUSEHOLD SIZE is a more important factor underlying drop-out in Eastern India. Policymakers may reconsider the rationality of the current maternal health policy focussing on under-performing states and shift to targeting clusters of districts. While the launching of Aspirational District Programme[7] by the Government of India in 2018 seems to be a significant step in this direction, the strategy could further be refined as indicated in the present findings. Components of the big push would include vigorous implementation

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7. Under the scheme, districts with poor performance in five dimensions (Health and Nutrition, Education, Agriculture and Water Resources, Financial Inclusion and Skill Development and Infrastructure) are targeted to ensure convergence with other districts.

of the faltering Mother and Child Tracking System[8] (Gera et al., 2015; Nagarajan et al., 2016) by revamping the current Health Management Information System[9] and measures to increase demand for maternal healthcare services. The latter may consist of generation of demand for rights and better services, leverage of intermediaries to legitimise the demands of poor and marginalised women, sensitisation of leaders and health providers to women's needs (Papp et al., 2013), promotion of women's self-help groups to enhance female autonomy, and improvement of social networks (Dutta et al., 2021). The higher marginal effects of the GWR model, compared to the spatial lag model, indicate that such a strategy should yield high dividends—as, given spatial dependence between districts, such a big push should diffuse over the hotspot cluster, and enable attainment of the Sustainable Development Goals related to maternal health. Such a shift will enable policymakers to address the unique needs of localities and incorporate spatial interdependencies in their policies.

The spatial lag model suggests the possible diffusion of health seeking behaviour of pregnant women over space (Matthews, 2006). The diffusion process remains a black box whose mechanics must be analysed for effective policy-making. It is possible that factors like scepticism about health service quality and socio-cultural notions may be relevant in this context (Vellakkal et al., 2017). Unless these forces are identified, they will act as obstacles to government measures to ensure continuity in the utilisation of ANC services. This is a possible research extension that is best

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8. The Mother and Child Tracking System is a web-based system of storing information on health care services provided to mothers and children. Each individual is assigned an unique number which enables them to be tracked and their health monitored at any health center in India.

9. The Health Management Information System is an online system in which every public health care unit provides information on services provided through a national portal. Private units are covered, but do not generally report.

addressed by micro-level studies in the relevant clusters.

5. Conclusion

In recent years, the issue of continuum of care (World Health Organization, 2005) has emerged as an important factor affecting the quality of delivery of maternal health care services. Despite its importance, national-level studies on the regional variations in continuum of care are absent. This study, based on discontinuity in the uptake of ANC is, therefore, a preliminary step to address this lacuna. This study underlines the importance of increasing medical and para-medical staff at the grass-root level to ensure continuity in the utilisation of ante natal services. Apart from such supply side initiatives, locality-specific measures are also necessary to create the demand for ante natal services. Without a holistic policy addressing both the demand and supply side attaining the Sustainable Development Goals with respect to improving maternal and child health will remain difficult.

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Supplementary: Results of GWR model

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
532	20.56903	1.188806	-3.00464	1.169346	4.05343	1.250181	2.379064	1.392313	0.3	0.033565	0
146	33.74509	1.196194	-0.23892	1.114541	6.776899	1.049813	4.079481	1.23289	0.4	0.054914	0.000586
474	25.28961	1.903049	-9.60624	1.516595	5.166749	1.955082	10.35433	1.667667	0.59	0.076684	0.007093
522	21.80025	1.559573	-6.40377	1.309209	2.555549	1.603169	5.42978	1.490399	0.39	0.031543	0.000245
283	26.81335	1.606288	-2.1538	1.598409	3.926709	1.538487	0.511679	1.170034	0.24	0.074851	0.000393
119	29.15537	1.353022	-4.68741	1.194634	4.48651	1.258661	6.261576	1.072704	0.45	0.030588	0.000313
501	22.06008	1.263379	-4.633	1.13408	5.422255	1.228078	4.564973	1.340978	0.38	0.016372	0.000096
598	4.931206	3.146339	6.010436	1.691554	-2.08575	1.743478	-4.92335	1.658668	0.22	0.109216	0.00066
143	35.06328	1.195486	0.061179	1.097927	7.160819	1.010871	4.029535	1.303237	0.4	0.014178	0.000709
465	24.67862	1.590239	-8.4962	1.305083	5.589632	1.65795	8.91824	1.451696	0.53	0.105103	0.003965
175	33.07592	1.091193	-0.74828	1.101827	10.76606	0.920486	2.676918	1.402297	0.53	0.024419	0.00018
64	35.96595	1.368649	0.570815	1.195497	5.053684	1.16829	2.121659	1.408971	0.34	0.033124	0.000361
104	32.24399	1.253475	-0.84083	1.164597	5.491656	1.13691	3.566085	1.162563	0.35	0.024786	0.000255
70	32.64084	1.570372	1.081056	1.398291	3.347914	1.361163	0.484212	1.460526	0.27	0.018776	0.000279
178	35.23459	1.121	-0.88886	1.19092	9.163492	0.96137	1.540595	1.428451	0.43	0.159602	0.00114
503	22.25159	1.214225	-4.17643	1.124176	6.218494	1.162348	4.406443	1.309952	0.39	0.035786	0.000759
480	23.36086	2.188347	-10.0341	1.737619	4.8896	2.362907	10.1282	1.976779	0.53	0.069769	0.000034
49	31.22781	1.823727	1.810471	1.695984	1.537143	1.634107	-1.27856	1.777565	0.11	0.030678	0.000701
482	24.98382	1.788055	-9.37108	1.443581	5.34718	1.899386	9.994701	1.613478	0.56	0.082164	0.003612
553	11.8392	2.148157	1.297473	1.40978	-1.54675	1.336094	-1.35092	1.349787	0.18	0.128762	0.00001
260	23.55616	3.010187	0.209839	2.684286	0.400448	2.382786	-1.92795	2.42577	0.28	0.412451	0.00011
384	26.47118	1.868506	-8.85813	1.474917	4.61471	1.794939	9.952613	1.515353	0.61	0.217311	0.000493
461	30.4641	1.01096	-0.96777	1.063549	12.52132	0.886087	2.452198	1.320818	0.6	0.042863	0.000768
209	33.57525	0.982418	-2.96924	1.194839	10.10438	0.949984	-0.51531	1.234036	0.45	0.015633	0.000031
616	4.68068	3.047362	7.211437	1.652055	-2.30017	1.646332	-3.74752	1.540976	0.25	0.030827	0.000382
459	28.14896	1.100084	-3.57133	1.054161	9.449788	1.006206	5.929401	1.074742	0.52	0.022724	0.000498
162	33.44353	1.150718	-0.48137	1.068394	8.712396	0.96689	4.585057	1.276374	0.47	0.022904	0.000286

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
235	32.43822	0.966537	-2.66889	1.16484	10.95811	0.917259	-0.45565	1.20555	0.51	0.03915	0.000217
515	22.02771	1.449216	-5.96767	1.230048	3.103141	1.501663	5.353805	1.45438	0.39	0.030626	0.000266
191	34.95212	1.066403	-1.55833	1.215176	9.388448	0.96201	0.396997	1.389787	0.42	0.027881	0.000119
556	16.09246	1.856395	-2.66465	1.457639	-0.85229	1.436663	-0.52349	1.390541	0.21	0.069016	0.000309
63	36.01913	1.382441	0.576155	1.204758	4.964315	1.178241	1.985489	1.42196	0.34	0.061704	0.00103
139	33.4297	1.356222	0.372628	1.215679	4.926762	1.191074	2.290845	1.287643	0.33	0.028061	0.001553
180	36.68317	1.208064	-0.1439	1.169555	7.461798	0.996648	2.721174	1.398758	0.37	0.030395	0.001238
324	29.11216	1.246781	-4.23779	1.422278	5.968151	1.339866	0.525524	1.039282	0.42	0.022868	0.000033
457	26.29023	1.003216	-1.69915	1.144901	11.54574	0.918053	3.529072	1.24044	0.55	0.05011	0.001354
393	28.09049	1.006127	-2.31486	1.422407	11.32568	1.027832	-1.9488	1.489948	0.58	0.03253	0
377	28.09861	1.077484	-2.83607	1.401204	11.44047	1.112365	-0.59747	1.296452	0.55	0.053424	0.000119
193	33.80427	0.992165	-2.70065	1.199274	10.00923	0.950259	-0.43401	1.261972	0.45	0.022138	0.000583
182	36.94131	1.19282	-0.48827	1.21588	7.606147	1.0046	1.741367	1.431702	0.35	0.0439	0.002913
469	26.04218	1.931513	-9.23714	1.520164	4.813181	1.887559	10.26122	1.601595	0.62	0.125766	0.008235
170	32.00396	1.108653	-0.79222	1.049536	10.82487	0.925093	4.207751	1.331976	0.54	0.051213	0.002061
583	7.966711	2.583358	3.906813	1.556751	-2.12498	1.403841	-2.35238	1.418311	0.2	0.032357	0.000261
572	8.52989	2.525854	3.641084	1.541742	-2.04438	1.377639	-2.11192	1.394886	0.2	0.168576	0.000683
225	33.06441	0.97084	-4.16502	1.189575	10.16844	0.970963	-0.60264	1.149484	0.46	0.026675	0.002847
339	29.96988	0.987451	-4.47901	1.22391	11.19505	1.057313	0.316355	1.089015	0.53	0.051617	0.002782
125	25.70742	1.541219	-8.41082	1.292838	5.502952	1.523951	9.004179	1.339851	0.55	0.051062	0.004437
176	35.14878	1.168765	-0.34544	1.129103	8.731833	0.959455	3.267847	1.38975	0.44	0.045545	0.007411
370	28.97585	0.986872	-2.01752	1.324584	11.87205	0.957523	-1.4812	1.377399	0.6	0.03422	0.000547
128	28.99868	1.15956	-4.06877	1.099002	7.24349	1.075156	6.371332	1.042112	0.48	0.038502	0.000305
335	29.94113	0.983966	-4.71967	1.224748	10.88075	1.087896	0.61452	1.067294	0.52	0.076683	0.000139
150	35.68849	1.25967	0.38933	1.131736	6.008424	1.078417	3.24331	1.33367	0.36	0.014651	0.000347
115	26.39936	2.240931	-8.46379	1.727749	4.988097	2.079048	10.29557	1.705603	0.63	0.168692	0.000248
54	31.82461	1.628622	1.226763	1.46975	2.789808	1.427443	-0.11513	1.51862	0.22	0.025815	0.001029
303	29.13142	1.251039	-4.27055	1.425	5.996103	1.341154	0.494643	1.043464	0.43	0.042083	0.00067
441	24.48922	1.541136	-8.19836	1.271967	5.698199	1.591596	8.546511	1.416017	0.51	0.016808	0.000494

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
414	23.31706	1.144932	-2.32965	1.345891	7.383718	1.204835	0.341721	1.508536	0.44	0.031659	0
185	35.67355	1.129265	-0.92689	1.208043	8.805442	0.973173	1.325018	1.431926	0.4	0.035454	0.000032
46	31.47232	1.760258	1.644836	1.618519	1.920537	1.559042	-0.91327	1.689831	0.15	0.024261	0.000016
391	28.29213	1.040313	-2.2854	1.474562	11.29864	1.068721	-2.11905	1.508198	0.58	0.021654	0.000473
222	32.57295	0.996063	-5.89665	1.199012	10.13447	1.027985	-0.18769	1.07851	0.48	0.020099	0.00157
555	15.43595	2.145904	-2.72811	1.602902	-1.06877	1.487047	-0.72378	1.516324	0.18	0.069248	0.000964
565	13.75323	1.982984	-0.48488	1.390425	-1.28857	1.363033	-1.16882	1.359919	0.17	0.064303	0.000213
447	24.37535	1.115464	-3.92712	1.090866	9.559465	1.027788	5.399082	1.165222	0.49	0.047697	0.006368
378	27.9379	1.086919	-2.6572	1.438775	11.37906	1.119067	-0.86581	1.352151	0.55	0.060697	0.000307
224	32.11973	0.991618	-6.31037	1.204526	10.21552	1.050182	0.282225	1.056113	0.5	0.012851	0.001624
506	24.69607	1.04848	-2.2032	1.137084	10.06388	0.966499	4.009223	1.249978	0.49	0.052636	0.002687
105	33.10146	1.21445	-0.48013	1.135892	6.254396	1.085553	3.898407	1.196336	0.38	0.174986	0.009697
488	24.40259	1.779421	-9.20616	1.446147	5.238912	1.970073	9.709605	1.648422	0.53	0.036862	0.000408
481	24.12473	1.948483	-9.71827	1.572439	5.146003	2.145377	10.10968	1.788333	0.53	0.044187	0.00128
122	28.72433	1.250106	-5.08141	1.146929	5.855662	1.167759	6.993733	1.051248	0.48	0.015399	0.000155
420	33.0339	1.151067	-0.65403	1.080288	8.068638	0.996618	4.651008	1.224414	0.45	0.022666	0.001221
81	32.36019	1.369189	0.051515	1.235818	4.591259	1.218054	2.066164	1.255975	0.3	0.020227	0.000992
231	33.58908	0.981247	-3.16466	1.197018	10.04112	0.955657	-0.56846	1.222937	0.45	0.022706	0.00007
444	25.80221	1.116254	-4.6654	1.069139	9.62081	1.034892	6.171097	1.088556	0.52	0.053112	0.001361
523	20.35499	1.424013	-4.9819	1.288822	1.418544	1.469334	3.159026	1.404808	0.34	0.079622	0.009256
558	18.01649	1.282202	-2.85726	1.252001	0.43357	1.432407	0.566531	1.324514	0.23	0.063678	0.000451
417	29.23714	0.968609	-1.44572	1.168999	12.53843	0.888894	0.542213	1.272467	0.61	0.014073	0.00005
557	16.76695	1.763513	-3.09767	1.439108	-0.63101	1.448356	-0.14742	1.376979	0.23	0.166605	0.001186
134	35.61963	1.362972	0.577013	1.192698	5.092833	1.167106	2.249388	1.389279	0.34	0.025016	0.001034
101	28.71715	1.472037	-2.98475	1.300418	3.721916	1.366326	3.433254	1.200738	0.33	0.026174	0.000684
406	24.08761	1.105254	-2.31418	1.348207	8.241013	1.153813	0.285514	1.490808	0.46	0.030373	0.000698
30	32.50768	1.706968	1.437943	1.53446	2.465101	1.474295	-0.26838	1.627332	0.23	0.094688	0.000091
334	30.93881	0.968446	-5.49152	1.201155	10.66013	1.058102	0.579552	1.050184	0.52	0.038807	0.000164
275	29.87964	0.989075	-4.48562	1.227191	11.1424	1.067953	0.387079	1.085918	0.53	0.10974	0.000944

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
355	30.78788	0.97343	-3.61062	1.200114	11.46266	0.95406	-0.44976	1.143266	0.54	0.014469	0.000278
319	30.11069	1.165053	-5.25179	1.397418	7.016743	1.295498	0.665205	1.0419	0.46	0.024617	0.000024
149	35.39084	1.248029	0.334236	1.126727	6.148949	1.071339	3.41203	1.317763	0.37	0.031917	0.000288
142	33.85963	1.309474	0.285242	1.181407	5.368266	1.149752	2.794974	1.276111	0.34	0.013631	0.000618
500	22.28718	1.359097	-5.55249	1.159391	4.601562	1.355747	5.343554	1.393574	0.39	0.024625	0.000002
121	28.82958	1.247669	-4.97099	1.145739	5.837184	1.164934	6.921415	1.049024	0.48	0.03871	0.001466
467	23.07911	1.342852	-6.10279	1.145176	6.03548	1.310935	6.225976	1.327618	0.44	0.04128	0.000715
232	33.70363	0.991973	-2.55663	1.194311	10.12582	0.943965	-0.36717	1.267249	0.46	0.041149	0.00011
316	26.72791	1.573778	-1.80962	1.543396	3.587232	1.503545	-0.01459	1.159065	0.3	0.046529	0.000112
23	32.10075	1.888931	1.834692	1.739385	1.2861	1.649068	-1.12273	1.885614	0.16	0.092096	0.000434
57	35.47491	1.482138	0.636918	1.279415	4.38942	1.253568	1.329453	1.482787	0.34	0.044914	0.001776
65	33.75541	1.152326	-0.4255	1.073353	9.172692	0.949725	4.302208	1.324578	0.48	0.024632	0.000016
284	26.70594	1.652881	-2.04033	1.618944	3.805699	1.561232	0.439808	1.198652	0.24	0.033223	0.000667
578	6.640203	2.713561	4.653413	1.581664	-2.25936	1.489917	-3.05881	1.486532	0.2	0.045537	0.001824
196	34.88044	1.284126	0.392379	1.152002	5.716677	1.112815	3.077155	1.3097	0.36	0.040611	0.000748
280	26.56555	1.646421	-1.66786	1.586791	3.441988	1.547874	-0.01926	1.209882	0.27	0.111428	0.000166
55	32.79553	1.631683	1.230083	1.452573	3.00604	1.405584	0.197306	1.535658	0.26	0.043394	0.000192
509	21.4902	1.15425	-2.43049	1.167182	5.613137	1.168382	2.417702	1.399546	0.35	0.03142	0.000228
253	24.2109	2.507742	0.02503	2.173967	0.972849	1.972179	-1.63415	1.95051	0.29	0.112357	0.000219
347	31.93254	0.961977	-2.91505	1.166672	11.17021	0.917325	-0.54024	1.177598	0.52	0.025856	0.000072
425	30.13836	1.081592	-1.42535	1.0312	11.35488	0.934248	4.744247	1.243315	0.56	0.028772	0.001122
455	25.20635	1.067797	-3.08118	1.089509	10.65333	0.979668	5.134369	1.161881	0.52	0.031788	0.002741
582	9.208776	2.461543	3.115874	1.523257	-1.94974	1.361175	-1.93663	1.384012	0.19	0.021364	0.000247
570	10.82812	2.433676	1.015046	1.554823	-1.73395	1.414447	-1.77669	1.463198	0.13	0.03304	0.00019
320	23.23578	1.424848	-6.69217	1.181306	5.391228	1.43887	6.799031	1.391702	0.44	0.072293	0.00096
566	11.94461	2.243606	0.630802	1.470805	-1.5836	1.362538	-1.5309	1.394243	0.15	0.048299	0.000507
171	32.0506	1.100976	-0.76293	1.054777	11.02957	0.91956	3.91378	1.353202	0.55	0.038283	0.001276
126	27.24392	1.438316	-7.27482	1.241496	5.130684	1.361396	8.429153	1.185458	0.54	0.082228	0.007966
554	8.170145	2.542303	4.721191	1.544294	-1.98489	1.401002	-1.83265	1.385625	0.23	0.027932	0.000296

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
274	0	8.087928	0	29.05606	0	49.97129	17.1801	14.14727	1	1	NaN
102	30.91232	1.372552	-0.90494	1.238975	4.222635	1.2428	2.292978	1.203309	0.29	0.020778	0.000321
632	4.388197	3.276084	8.141345	1.735158	-2.09735	1.755359	-3.75211	1.607578	0.27	0.040442	0.000031
617	4.964915	3.035357	7.225325	1.667388	-2.2666	1.624096	-3.37902	1.524841	0.26	0.026291	0.001226
551	11.22596	2.139343	2.328461	1.3853	-1.54625	1.341989	-1.12096	1.339566	0.21	0.057571	0.000011
381	27.66857	1.093298	-2.35936	1.536435	11.05744	1.145572	-1.79501	1.524028	0.56	0.167646	0.0003
416	22.89037	1.177932	-2.38544	1.365409	6.849155	1.253922	0.142666	1.531645	0.42	0.027746	0.000009
331	31.7199	1.000495	-6.74364	1.258342	9.357784	1.135398	1.012708	1.035314	0.51	0.074857	0.001711
575	10.94367	2.492985	0.643199	1.600152	-1.7161	1.459685	-1.76841	1.51667	0.11	0.101626	0.001771
428	28.25104	1.043835	-1.93949	1.041395	12.06459	0.93309	4.822977	1.196524	0.58	0.040355	0.000021
215	33.57051	1.019013	-5.12445	1.2178	9.593046	1.031317	-0.80256	1.146187	0.44	0.040297	0.000154
327	32.40334	1.130594	-7.57056	1.338358	9.495947	1.204174	0.174585	1.114113	0.53	0.04189	0.00274
325	27.25231	1.494772	-2.54736	1.501286	4.183224	1.439597	-0.0309	1.118873	0.37	0.033532	0.001078
422	31.02878	1.113762	-1.5926	1.054656	9.366054	0.976751	5.110257	1.172174	0.5	0.041309	0.000284
567	12.77411	2.219889	-0.27726	1.489898	-1.48402	1.391985	-1.43702	1.429034	0.13	0.053701	0.000028
373	29.08513	1.013364	-2.18758	1.365257	11.71778	0.990184	-1.61875	1.378014	0.59	0.101069	0.002082
60	34.08725	1.519149	0.842515	1.324491	3.998939	1.296751	1.140098	1.451993	0.32	0.061947	0.002197
350	31.42375	0.964281	-5.09281	1.183357	10.86432	1.001545	0.029368	1.072897	0.51	0.019009	0.000001
190	35.23138	1.062614	-1.85134	1.232247	9.094072	0.976762	0.025816	1.377482	0.4	0.033737	0.001202
437	25.46756	1.087127	-3.78833	1.071134	10.45417	1.002007	5.628969	1.122152	0.52	0.02223	0.000001
291	27.93534	1.303572	-3.38615	1.463719	5.204334	1.385404	1.129772	1.031884	0.31	0.039627	0.000095
412	26.13859	1.008177	-1.95246	1.273894	10.62583	0.984013	0.941164	1.370154	0.54	0.028981	0.00034
354	30.52596	0.976676	-4.27481	1.205028	11.3457	0.998218	-0.0903	1.107692	0.53	0.021402	0.001427
438	24.48037	1.427092	-7.67575	1.213225	6.209139	1.418519	7.946279	1.308056	0.51	0.068572	0.001435
630	6.544663	2.724769	5.291562	1.585416	-2.27926	1.464185	-2.78325	1.443593	0.22	0.028368	0.000017
562	14.75726	2.0815	-1.92285	1.514988	-1.19483	1.432977	-1.03567	1.449258	0.16	0.036745	0.000008
106	32.44387	1.161075	-1.03378	1.102446	7.258256	1.037113	4.635292	1.166331	0.42	0.022301	0.000127
308	25.08736	1.994003	-0.65189	1.773817	2.036277	1.677699	-0.92337	1.496976	0.31	0.062005	0.000055

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
383	27.86544	1.080538	-2.3466	1.517054	11.15089	1.123149	-1.81879	1.510164	0.56	0.038456	0.001386
301	31.12134	1.083119	-6.27268	1.352586	8.120234	1.23534	0.861125	1.042315	0.49	0.029151	0.001994
498	23.52862	1.562228	-7.55078	1.271857	4.670803	1.680212	7.759995	1.502637	0.46	0.025557	0.000052
257	23.52378	3.075303	0.236363	2.76113	0.346896	2.435097	-1.97858	2.479002	0.28	0.240252	0.000054
310	25.20697	1.957445	-0.709	1.749517	2.134815	1.656941	-0.87645	1.461705	0.31	0.040012	0.000931
612	4.347818	3.097473	7.038103	1.649174	-2.25034	1.711349	-4.5367	1.594859	0.25	0.029885	0.000127
453	29.2125	0.979669	-1.17914	1.106032	12.77164	0.879822	2.034085	1.268049	0.61	0.041132	0.001354
485	25.01055	1.585424	-8.58781	1.30839	5.603459	1.624624	9.044589	1.423328	0.54	0.148661	0.01349
362	31.09092	0.968045	-5.49834	1.196431	10.70784	1.045518	0.467137	1.053223	0.52	0.015533	0.000007
124	25.92897	1.675093	-8.87711	1.367918	5.135466	1.666149	9.621113	1.438864	0.58	0.031942	0.000227
409	27.09475	0.981659	-1.65953	1.212396	11.69329	0.920491	1.609012	1.296584	0.57	0.035935	0.000755
265	26.44205	1.63568	-1.53667	1.564956	3.274824	1.521791	-0.23423	1.199975	0.3	0.027345	0.000004
244	32.25149	1.140137	-7.51863	1.359616	9.41861	1.225307	0.184096	1.119168	0.53	0.068768	0.00033
294	30.08612	1.114933	-5.20655	1.364618	7.024773	1.270791	0.985727	1.013239	0.45	0.05665	0.003414
545	19.31838	1.460617	-1.82351	1.31276	2.845164	1.512432	0.334848	1.534657	0.3	0.044787	0.000146
247	25.959	1.74309	-1.48764	1.615422	2.988304	1.547953	-0.46773	1.282621	0.34	0.109066	0.001328
298	28.68395	1.254024	-3.79293	1.422939	5.552742	1.350738	0.681785	1.022501	0.39	0.386869	0.025918
466	23.33689	1.328858	-6.24852	1.142939	6.453123	1.289049	6.439903	1.297422	0.45	0.039235	0.000527
251	24.50459	2.227268	-0.29719	1.942755	1.46382	1.816539	-1.23582	1.721365	0.3	0.115631	0.000988
595	5.482951	2.978914	5.35023	1.655865	-2.17093	1.654565	-4.31178	1.613013	0.21	0.072939	0.002334
610	5.755813	2.812586	5.542339	1.594693	-2.32642	1.542739	-3.46585	1.508529	0.22	0.033902	0
201	34.28851	1.208296	-0.00824	1.114848	6.660446	1.050516	3.924812	1.261296	0.39	0.030012	0.000235
161	33.59055	1.156536	-0.42393	1.075483	8.247719	0.981886	4.558971	1.262528	0.45	0.012437	0.000073
177	35.54063	1.142565	-0.72114	1.187799	8.853699	0.967545	1.857987	1.430228	0.41	0.037651	0.000074
88	33.51076	1.31955	0.227948	1.19228	5.220196	1.163344	2.665017	1.266412	0.34	0.019026	0.000203
45	31.01799	1.678675	1.197156	1.528223	2.380398	1.496868	-0.58153	1.583197	0.16	0.02219	0.000105
159	34.96697	1.192355	0.033103	1.096168	7.23468	1.008294	4.075396	1.300234	0.41	0.044933	0.001237
78	31.51374	1.493418	0.448292	1.339634	3.59152	1.322465	0.806212	1.356215	0.25	0.049993	0.000054
40	31.72801	1.623527	1.187603	1.465569	2.804051	1.425468	-0.11153	1.511719	0.21	0.046289	0.00392

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
172	32.86008	1.123938	-0.63108	1.067186	10.34922	0.929214	3.971212	1.356556	0.52	0.026284	0.000252
147	33.89471	1.192656	-0.19575	1.109384	6.899795	1.041204	4.120111	1.242053	0.4	0.044872	0.001177
43	31.01765	1.703998	1.308532	1.556477	2.232488	1.521821	-0.73141	1.617074	0.15	0.039049	0.000037
561	14.56098	2.043291	-1.61142	1.477191	-1.21534	1.411621	-1.09272	1.419176	0.16	0.04575	0.000043
389	27.99751	1.039122	-2.38077	1.503023	11.09897	1.089782	-2.36824	1.559943	0.57	0.054298	0.000541
473	25.42597	1.882379	-9.53405	1.500633	5.137613	1.921883	10.30768	1.641177	0.59	0.063135	0.000164
99	29.93211	1.584599	-0.07357	1.425837	2.948149	1.442793	0.351204	1.452925	0.19	0.127281	0.00032
388	26.82777	1.13794	-2.52591	1.680363	10.27027	1.267888	-2.63446	1.719266	0.53	0.050671	0.000478
508	23.52887	1.082501	-2.03204	1.191492	8.263191	1.048008	2.606689	1.365976	0.44	0.027633	0.000112
346	32.09401	0.977887	-1.87781	1.140874	11.43173	0.899704	-0.11924	1.249694	0.54	0.022863	0.000972
61	34.61424	1.490524	0.746582	1.293626	4.250705	1.269275	1.356805	1.447886	0.33	0.091949	0.002615
141	27.40878	2.350993	-4.04885	2.233208	6.939333	2.455784	7.421913	1.706531	0.46	0.342137	0.086273
236	41.83644	5.961653	-0.93398	2.871486	3.40002	3.138272	-6.60217	4.568395	0.9	0.999998	0.081517
140	33.59035	1.333683	0.315876	1.199551	5.125279	1.172233	2.528446	1.279018	0.33	0.046448	0.000202
195	33.83448	1.019323	-1.80471	1.184884	10.23915	0.934638	0.166176	1.332895	0.47	0.019819	0.000019
349	31.26291	0.963704	-4.72628	1.183621	11.02715	0.988397	-0.08656	1.086145	0.52	0.052054	0.005213
302	30.06783	1.158892	-5.19286	1.392318	6.959868	1.292812	0.716148	1.035382	0.46	0.03432	0.00014
351	31.49473	0.971357	-5.84578	1.196137	10.51599	1.045014	0.44614	1.049851	0.51	0.013544	0.000441
313	26.14465	1.697769	-1.34736	1.590963	3.007754	1.536211	-0.4159	1.2419	0.31	0.021271	0.000024
183	36.95466	1.196997	-0.42826	1.210866	7.559425	1.004358	1.868356	1.428399	0.35	0.048876	0.000063
507	23.52862	1.562228	-7.55078	1.271857	4.670803	1.680212	7.759995	1.502637	0.46	0.117381	0.007756
217	34.85198	1.028435	-3.00343	1.237814	9.098156	0.998822	-0.71364	1.292902	0.39	0.044251	0.004918
188	35.63608	1.086381	-1.62547	1.238666	8.799762	0.984993	0.206902	1.401738	0.38	0.022217	0.00002
579	17.68671	1.423308	-3.11148	1.314447	-0.07467	1.436575	0.358216	1.31516	0.24	0.096241	0.000146
366	30.77416	0.974869	-2.34282	1.192769	11.79472	0.910025	-0.76237	1.20956	0.57	0.024768	0.000395
458	28.12337	1.108906	-3.80891	1.061328	9.05577	1.018382	6.074469	1.064403	0.51	0.021899	0.000551
548	16.71023	1.54587	-0.64368	1.15154	0.341759	1.482685	0.77098	1.412238	0.22	0.063495	0.000043
35	31.63184	1.887292	1.963033	1.762443	1.186376	1.675967	-1.34269	1.871451	0.12	0.061301	0.000157
86	33.32284	1.337161	0.25205	1.205323	5.044877	1.179326	2.467825	1.269817	0.33	0.049709	0.002507

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
421	32.4033	1.142176	-0.99194	1.080321	8.121542	1.002088	4.800027	1.191054	0.45	0.106395	0.001994
318	27.41103	1.42651	-2.59098	1.500537	4.382255	1.444905	0.515844	1.076232	0.3	0.149026	0.000271
28	32.34145	1.74651	1.55056	1.580244	2.178812	1.513191	-0.50577	1.679035	0.21	0.267468	0.001927
168	32.64297	1.126893	-0.67352	1.057241	10.2099	0.933843	4.306472	1.327572	0.52	0.043761	0.000002
100	30.48223	1.535359	0.074402	1.377639	3.186655	1.378257	0.544803	1.3918	0.21	0.023639	0.000454
341	28.88862	1.013691	-4.06846	1.264818	10.47954	1.161238	0.853237	1.073014	0.5	0.072577	0.00266
448	24.50406	1.134136	-4.5156	1.086253	9.36657	1.049194	5.781211	1.144333	0.49	0.02147	0.002131
155	35.52533	1.194597	0.024465	1.103863	7.475291	0.991114	3.882497	1.333158	0.41	0.027877	0.001482
68	34.08725	1.519149	0.842515	1.324491	3.998939	1.296751	1.140098	1.451993	0.32	0.03606	0.000131
574	9.92662	2.466123	1.920717	1.546187	-1.85682	1.395893	-1.94806	1.436655	0.15	0.029969	0.000714
144	33.96743	1.215859	-0.07738	1.124955	6.45755	1.066794	3.837475	1.244842	0.38	0.049404	0.002013
564	12.86554	2.232946	-0.43539	1.502725	-1.47566	1.402908	-1.42596	1.443891	0.13	0.057004	0.000041
360	31.05539	0.968615	-3.40035	1.189981	11.42647	0.938389	-0.52936	1.150791	0.54	0.025137	0.00202
512	20.72413	1.251543	-4.01488	1.182974	3.300477	1.313157	3.088111	1.387827	0.32	0.076282	0.000812
80	31.64407	1.462382	0.316785	1.311824	3.816268	1.296431	1.093788	1.324772	0.26	0.025649	0.000698
449	24.77748	1.135163	-4.73706	1.082749	9.391682	1.052244	5.982923	1.126744	0.5	0.022431	0.002646
38	31.83892	1.764594	1.667218	1.61608	1.945913	1.548577	-0.79195	1.697745	0.18	0.070413	0.000757
338	29.115	1.003754	-4.26931	1.254958	10.37168	1.15603	0.926814	1.062132	0.5	0.058958	0.000443
596	4.116733	3.35737	7.220433	1.722571	-1.97152	1.862344	-5.58104	1.694001	0.24	0.240241	0.671274
278	26.24439	1.765706	-1.32035	1.642736	3.029629	1.601524	-0.32002	1.304958	0.26	0.090865	0.001644
277	26.25396	1.768279	-1.33427	1.644743	3.04375	1.60394	-0.30505	1.306499	0.26	0.056787	0.002993
439	24.4634	1.374174	-7.36991	1.187406	6.531775	1.345672	7.650975	1.263639	0.5	0.02747	0.001713
451	27.96499	1.026637	-1.78239	1.055601	12.33957	0.92093	4.571535	1.206839	0.59	0.08715	0.009768
380	27.23141	1.124773	-2.40095	1.556073	10.91167	1.191772	-1.49191	1.511368	0.54	0.047629	0.000335
299	30.27289	1.09939	-5.39629	1.356391	7.234297	1.259943	1.01678	1.014115	0.45	0.128051	0.00099
110	30.61753	1.241467	-2.72247	1.15064	5.315661	1.150199	4.996425	1.065456	0.39	0.056694	0.000265
114	26.86513	2.493014	-6.93563	1.994702	6.062533	2.302417	10.02889	1.810016	0.6	0.09726	0.002115
382	27.64135	1.101642	-2.46254	1.500863	11.18079	1.144771	-1.28338	1.444188	0.55	0.07219	0.001267
37	31.58847	1.763531	1.665393	1.620479	1.91322	1.557516	-0.88632	1.694533	0.16	0.06626	0.001672

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
165	33.02483	1.142778	-0.6185	1.062947	9.002253	0.962831	4.665722	1.267409	0.48	0.022801	0.000521
499	23.35805	1.444991	-6.89363	1.192816	5.363021	1.470988	7.03109	1.402693	0.45	0.02215	0.000194
514	21.77441	1.408302	-5.59974	1.214874	3.042135	1.454206	4.892683	1.437243	0.38	0.049295	0.000143
116	26.99138	1.831334	-8.19692	1.447773	4.313911	1.719273	9.398774	1.426792	0.6	0.109111	0.002011
328	32.16802	1.071911	-7.29415	1.313134	9.294901	1.177877	0.614552	1.073765	0.52	0.027798	0
477	22.77283	2.51269	-10.2134	1.953339	4.834998	2.549864	10.24821	2.148449	0.56	0.070213	0.000422
363	30.95226	0.968172	-5.21378	1.194556	10.88689	1.033218	0.333792	1.062474	0.52	0.01383	0.000011
238	31.78269	0.962962	-5.0018	1.179453	10.74879	0.988544	-0.14032	1.080859	0.5	0.043121	0.000041
405	29.41577	0.968907	-1.52824	1.184293	12.45442	0.893572	0.069956	1.276698	0.61	0.030671	0.003338
402	30.3084	0.980699	-2.10961	1.219702	11.95047	0.914705	-0.94203	1.242765	0.58	0.026244	0.001812
194	33.86269	1.068116	-1.07885	1.157096	10.32335	0.930816	1.342169	1.399839	0.49	0.046504	0.00094
464	24.88487	1.556785	-8.4326	1.289769	5.685759	1.591067	8.842605	1.404108	0.53	0.061214	0.000044
83	32.57749	1.353274	0.051371	1.223503	4.754603	1.203409	2.246779	1.251067	0.31	0.022537	0.000018
129	27.8521	1.123462	-4.26685	1.07216	8.602323	1.038296	6.320151	1.05446	0.5	0.013503	0.000017
166	31.47157	1.120084	-1.36139	1.05795	9.199069	0.976603	5.018246	1.187573	0.49	0.051075	0.000027
371	29.34252	0.996107	-2.06342	1.320006	11.86481	0.958348	-1.5062	1.348287	0.59	0.02803	0.000005
103	31.10096	1.353774	-0.9198	1.226249	4.383145	1.22697	2.4893	1.190851	0.3	0.050867	0.00017
113	27.79791	1.630863	-6.58291	1.338687	3.96396	1.515287	7.676341	1.232976	0.53	0.064682	0.00052
312	25.7369	1.810749	-0.99427	1.656792	2.582824	1.586315	-0.64816	1.332314	0.3	0.02314	0.000215
479	22.5775	2.431224	-10.1495	1.900816	4.626378	2.572716	9.980925	2.154262	0.52	0.122259	0.003886
137	34.72385	1.316639	0.466102	1.172665	5.413331	1.141547	2.760385	1.319355	0.35	0.05661	0.000526
468	22.72136	2.69257	-10.0805	2.087667	5.113637	2.627186	10.4438	2.187994	0.6	0.092317	0.00019
233	32.66962	0.989666	-1.8145	1.149129	11.09064	0.908509	0.057866	1.280609	0.52	0.046238	0.000082
73	34.55699	1.422508	0.678878	1.243169	4.64684	1.2221	1.845131	1.385198	0.34	0.016574	0.000537
395	26.9023	1.047639	-2.6539	1.51737	10.39142	1.133826	-2.19403	1.596657	0.54	0.095836	0.000301
321	28.15206	1.348786	-3.28752	1.451304	5.005632	1.386714	0.320199	1.05543	0.38	0.025229	0.000328
604	6.730653	2.751175	5.909483	1.611499	-2.13981	1.478415	-2.33344	1.433424	0.24	0.032612	0.00004
390	28.12377	1.034396	-2.34334	1.486644	11.18832	1.075759	-2.29827	1.540399	0.57	0.032862	0
24	32.181	1.848567	1.758284	1.692684	1.53714	1.608688	-0.95743	1.8254	0.18	0.040888	0.000839

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
413	25.60959	1.027403	-2.04979	1.291712	10.05131	1.019525	0.816982	1.40034	0.52	0.038455	0.000173
160	34.84684	1.182499	-0.05704	1.090298	7.622847	0.991222	4.178682	1.304878	0.42	0.052687	0.00002
629	4.964915	3.035357	7.225325	1.667388	-2.2666	1.624096	-3.37902	1.524841	0.26	0.156338	0.003608
589	8.331468	2.668963	2.678577	1.623576	-2.01365	1.498381	-2.62487	1.535836	0.15	0.050715	0.000183
163	33.73673	1.153624	-0.41443	1.0711	8.974843	0.955178	4.410882	1.309643	0.47	0.016356	0.000166
164	34.03931	1.156763	-0.37741	1.080622	9.070956	0.950509	4.169347	1.336409	0.47	0.028254	0.000091
202	33.72441	1.031446	-1.51239	1.172352	10.39468	0.929108	0.523206	1.355835	0.48	0.065341	0.002773
36	31.63353	1.766173	1.675181	1.622642	1.903012	1.558224	-0.88094	1.698364	0.16	0.043196	0.000687
314	26.19093	1.685428	-1.39854	1.584093	3.060629	1.530076	-0.39072	1.23241	0.32	0.055815	0.001211
317	27.54374	1.400921	-2.71381	1.488418	4.50224	1.431374	0.541972	1.06474	0.31	0.040674	0.000033
534	19.08367	1.258086	-2.37043	1.18153	2.306031	1.377774	1.077728	1.434701	0.24	0.076761	0.001436
74	33.23277	1.456042	0.733558	1.289024	4.215265	1.265121	1.407726	1.360744	0.31	0.014895	0.000017
613	4.083057	3.873208	7.958917	1.842206	-1.40185	2.132854	-6.79835	1.818168	0.25	0.055227	0.000008
588	9.845142	2.569359	1.482084	1.613803	-1.84612	1.468724	-2.06317	1.519717	0.13	0.04575	0.007781
212	32.14806	1.003291	-6.67843	1.221187	10.01359	1.076249	0.481086	1.053156	0.51	0.018091	0.000107
450	29.23514	1.024979	-1.23744	1.047661	12.56044	0.900819	3.928462	1.272151	0.6	0.038779	0.000546
174	32.75396	1.095007	-0.71517	1.084663	10.89626	0.918411	3.088911	1.392627	0.54	0.012588	0.000504
379	27.25771	1.124281	-2.43981	1.53524	10.98109	1.186601	-1.28428	1.47316	0.54	0.073844	0.000315
375	28.74152	1.042437	-2.42645	1.398977	11.61103	1.033362	-1.34377	1.369016	0.58	0.119369	0.006088
223	32.47101	0.986726	-5.71892	1.193473	10.23113	1.01829	-0.18343	1.077743	0.49	0.019341	0
541	18.02337	1.428631	-1.61323	1.16528	1.336554	1.462764	0.688006	1.447616	0.23	0.080236	0.000457
483	24.91621	1.889966	-9.64975	1.515521	5.271895	1.997387	10.29038	1.694025	0.57	0.078572	0.002805
153	36.26085	1.212644	0.109366	1.124923	7.089724	1.003999	3.471204	1.355722	0.38	0.026262	0.000368
386	27.57985	1.095265	-2.35453	1.557451	10.95458	1.158426	-1.97816	1.55916	0.56	0.117348	0.001491
365	30.48971	0.982432	-3.1373	1.21861	11.64305	0.946036	-0.62362	1.17718	0.55	0.016536	0.000056
34	33.97601	1.665461	0.967883	1.448873	3.184744	1.400402	0.334649	1.612136	0.3	0.076597	0.00124
269	25.56996	1.906269	-0.7498	1.723742	2.290156	1.636017	-0.8566	1.419626	0.28	0.197945	0.004245
210	32.74552	1.056327	-6.92415	1.239871	9.798159	1.09237	-0.03316	1.085298	0.5	0.01841	0.000193
329	31.50169	1.07585	-6.67592	1.344821	8.552853	1.219565	0.803618	1.05428	0.51	0.140902	0.000434

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
576	9.098839	2.57791	2.228361	1.59358	-1.94662	1.452279	-2.25949	1.495205	0.15	0.06553	0.001724
348	31.5663	0.959772	-4.05688	1.17752	11.06771	0.95339	-0.38833	1.117679	0.51	0.055159	0.007566
270	26.05634	1.753875	-1.15162	1.628306	2.832621	1.575295	-0.49708	1.292893	0.29	0.088779	0.01739
300	30.37415	1.14329	-5.51763	1.388243	7.29724	1.28187	0.713174	1.042106	0.47	0.058307	0.000034
581	8.427339	2.524035	3.998364	1.539644	-2.0363	1.37508	-2.02046	1.38369	0.21	0.043798	0.001196
282	26.87749	1.549909	-2.00153	1.545277	3.795476	1.502345	0.190675	1.144021	0.28	0.027696	0.00022
530	16.97365	2.037488	-3.88629	1.599596	-0.55015	1.52666	0.329832	1.508549	0.25	0.06803	0.001311
600	8.331468	2.668963	2.678577	1.623576	-2.01365	1.498381	-2.62487	1.535836	0.15	0.061562	0.001404
560	14.15571	1.987119	-0.98125	1.416285	-1.24754	1.379105	-1.14432	1.375937	0.17	0.152312	0.001016
398	23.94495	1.189473	-2.77333	1.540222	7.681905	1.332597	-1.38972	1.637993	0.45	0.047489	0.000105
404	29.60274	0.969625	-1.46771	1.16737	12.49933	0.889291	0.199842	1.269995	0.61	0.048844	0.005767
400	30.96905	0.971825	-2.09452	1.171137	11.84285	0.899841	-0.6372	1.216235	0.57	0.041386	0.002309
127	28.61056	1.23746	-5.09139	1.140728	6.067493	1.156241	6.999891	1.049964	0.49	0.082433	0.000418
597	4.835926	3.193838	6.145925	1.70261	-2.0512	1.768274	-5.07524	1.671573	0.22	0.109839	0.004953
591	7.556504	2.72171	3.34616	1.624299	-2.08958	1.520477	-2.98082	1.546378	0.17	0.077692	0.003421
547	16.20506	1.674081	0.133638	1.189125	0.23355	1.5413	1.102064	1.44567	0.24	0.115789	0.002791
631	7.574219	2.615671	4.520949	1.564174	-2.16178	1.408069	-2.3507	1.408675	0.22	0.028597	0.000095
26	32.88395	1.74516	1.389848	1.55661	2.370145	1.491612	-0.28839	1.686918	0.25	0.04029	0
552	14.40905	1.708325	-0.14958	1.244471	-0.96574	1.368345	-0.5849	1.322041	0.19	0.038465	0.000047
72	32.63316	1.549205	1.011999	1.378819	3.481021	1.344915	0.611539	1.436976	0.27	0.018763	0.000004
256	26.0013	1.733147	-1.51546	1.609887	3.02477	1.543032	-0.45237	1.274363	0.34	0.062756	0.000007
189	35.11197	1.167769	-0.35202	1.128417	8.765683	0.958705	3.271208	1.389923	0.44	0.024176	0.001595
25	32.96304	1.842551	1.430298	1.640675	1.886126	1.562555	-0.61962	1.830762	0.23	0.234419	0.00305
307	25.28247	1.924128	-0.83982	1.724941	2.265517	1.641382	-0.79365	1.434997	0.32	0.038816	0.000081
227	32.39555	0.981395	-5.60594	1.190263	10.29814	1.012475	-0.17972	1.077548	0.49	0.026898	0.000257
167	28.56743	1.079441	-2.62774	1.036917	10.69186	0.969856	5.408505	1.130874	0.54	0.031951	0.002119
359	31.57337	0.965727	-2.57201	1.165333	11.4467	0.908084	-0.56587	1.190538	0.54	0.019334	0.000215
524	19.42072	1.309379	-4.0171	1.272789	1.047438	1.430179	1.885452	1.356611	0.29	0.037229	0.000002
287	26.8084	1.595372	-2.55271	1.623981	4.3087	1.529708	1.087012	1.149043	0.22	0.069189	0.00189

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
356	30.99536	0.971699	-2.47944	1.183749	11.69145	0.910025	-0.69612	1.197495	0.56	0.015623	0.000054
259	23.59106	2.974299	0.200126	2.64033	0.435022	2.351061	-1.90645	2.393457	0.29	0.121749	0.000819
268	25.35027	1.945163	-0.6614	1.747362	2.145174	1.648922	-0.9163	1.448188	0.29	0.20943	0.001606
258	24.29574	2.35965	-0.1356	2.048114	1.203859	1.894542	-1.41037	1.839342	0.3	0.047946	0.000023
255	25.90097	1.754931	-1.39925	1.621122	2.911179	1.553913	-0.49415	1.290376	0.34	0.068178	0.000056
157	34.7658	1.16923	-0.27794	1.101342	8.687013	0.9576	3.8374	1.357476	0.45	0.047688	0
41	31.82092	1.653109	1.319423	1.49546	2.633945	1.448801	-0.25579	1.549295	0.21	0.029886	0.00001
286	26.93814	1.547596	-2.62475	1.597006	4.389338	1.507045	1.067713	1.127665	0.23	0.031952	0.000135
213	33.31861	1.042969	-5.88152	1.224531	9.634864	1.057992	-0.67942	1.122316	0.46	0.018481	0.000225
207	32.40373	0.98366	-5.68395	1.191714	10.27647	1.016036	-0.15974	1.07611	0.49	0.021658	0.000005
623	3.887455	3.308903	7.668691	1.697524	-2.05605	1.834358	-5.24807	1.659185	0.25	0.029212	0.000548
187	36.60034	1.123252	-1.64527	1.266988	7.962818	1.022247	-0.07055	1.419603	0.33	0.054732	0.00302
411	29.03087	0.98068	-1.94145	1.2977	11.98119	0.942086	-1.2379	1.35462	0.6	0.023685	0.000002
538	16.26347	1.484155	-1.71489	1.246167	-0.48234	1.408213	-0.26209	1.311795	0.2	0.03855	0.000022
84	32.18982	1.330982	-0.3069	1.211418	4.813215	1.19439	2.523422	1.216599	0.31	0.029985	0.001328
471	25.55838	1.910312	-9.51551	1.516136	5.055456	1.926558	10.35091	1.644494	0.6	0.061282	0.001742
169	31.48507	1.109133	-1.01862	1.040608	10.60905	0.936944	4.651165	1.276212	0.54	0.024047	0.0007
148	34.58039	1.188053	-0.03766	1.095632	7.236569	1.013596	4.160452	1.281902	0.41	0.030052	0.000013
592	6.803546	2.746267	4.148336	1.607486	-2.18662	1.527006	-3.25133	1.535568	0.19	0.142942	0.003632
332	31.77315	0.992248	-6.67906	1.238024	9.701502	1.109584	0.900241	1.038447	0.51	0.080346	0.004199
399	21.70484	1.27482	-2.40005	1.393867	5.448964	1.373493	-0.10877	1.568145	0.38	0.088312	0.000459
281	26.8719	1.5804	-2.5101	1.610477	4.266137	1.523731	0.96706	1.144519	0.23	0.048175	0.000708
27	32.53757	1.739276	1.488985	1.565377	2.282569	1.49982	-0.39588	1.67216	0.23	0.108504	0.003998
454	27.90271	0.994723	-1.41438	1.095286	12.58204	0.894984	3.629285	1.232471	0.59	0.035762	0.000554
433	26.62751	1.344196	-7.08233	1.195724	5.994544	1.278664	8.064761	1.151896	0.53	0.018613	0.000198
573	8.30218	2.594589	3.086127	1.575699	-2.06248	1.440483	-2.45687	1.471391	0.17	0.075792	0.004671
47	31.47873	1.531144	0.654354	1.374817	3.34539	1.353214	0.487326	1.39887	0.23	0.016693	0.000013
304	25.4013	1.957156	-0.63622	1.758746	2.122593	1.656475	-0.96004	1.461647	0.29	0.067114	0.000004
145	33.31521	1.222566	-0.32878	1.138527	6.190491	1.088648	3.778347	1.21021	0.37	0.030958	0.001647

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
192	34.19108	1.029504	-1.81475	1.197224	9.955332	0.944276	0.153351	1.345866	0.45	0.031195	0.000463
376	28.40142	1.062414	-2.94912	1.371716	11.53415	1.088502	-0.53909	1.268848	0.55	0.054957	0.000113
535	18.56032	1.237757	-2.67662	1.208999	1.326427	1.412727	0.904215	1.378022	0.22	0.034165	0.000024
138	33.74978	1.395496	0.586057	1.236542	4.711796	1.213879	1.983326	1.329491	0.33	0.08838	0.002849
87	33.16061	1.252645	-0.26095	1.158128	5.762005	1.118612	3.420674	1.212182	0.36	0.059622	0.007894
199	33.24145	1.051697	-1.07406	1.135512	10.81703	0.918336	1.398151	1.385104	0.51	0.014066	0.000203
42	31.49126	1.661593	1.288772	1.508122	2.526603	1.465622	-0.39677	1.55907	0.19	0.020336	0.000001
262	25.72115	1.826848	-0.93412	1.66865	2.527364	1.596331	-0.68653	1.347508	0.3	0.138347	0.009795
261	25.2529	1.988316	-0.57277	1.7789	2.019796	1.669253	-1.00268	1.486159	0.29	0.067598	0.000324
135	34.9193	1.307772	0.462077	1.164994	5.500949	1.131788	2.840761	1.323256	0.35	0.030964	0.000395
419	32.59445	1.149484	-0.90463	1.087396	7.823947	1.011665	4.712227	1.191082	0.44	0.02312	0.001107
44	30.98772	1.668941	1.138894	1.517465	2.436413	1.488473	-0.52417	1.570475	0.16	0.028361	0.000013
226	32.46295	0.993955	-5.9678	1.198389	10.18001	1.029872	-0.10055	1.073003	0.49	0.012131	0.000686
333	30.97394	0.968864	-5.91957	1.222599	9.901871	1.109838	1.046615	1.029939	0.51	0.099261	0.000014
133	33.69743	1.426705	0.677767	1.259305	4.495893	1.236879	1.722826	1.352193	0.32	0.15125	0.002055
216	33.78228	1.010338	-4.62806	1.217973	9.537166	1.018106	-0.84968	1.170037	0.43	0.017911	0.000038
577	8.164156	2.594726	3.28546	1.570539	-2.08606	1.434596	-2.4711	1.461982	0.18	0.037244	0.000017
397	23.94495	1.189473	-2.77333	1.540222	7.681905	1.332597	-1.38972	1.637993	0.45	0.065608	0.000448
336	30.01295	0.976448	-5.03923	1.228918	10.18224	1.127258	1.02541	1.040004	0.5	0.075734	0.000032
305	27.2191	1.478251	-2.37478	1.492618	4.089656	1.441771	0.048303	1.102786	0.35	0.025188	0.000477
112	28.44713	1.476093	-4.76277	1.268179	3.899431	1.373496	5.644821	1.137987	0.43	0.026112	0.000011
505	24.29633	1.066854	-2.49023	1.127339	9.644398	0.9841	4.226068	1.243339	0.48	0.022306	0.000058
66	35.82081	1.356428	0.565844	1.187736	5.13793	1.160202	2.266805	1.393609	0.34	0.062222	0.00307
229	32.74886	0.964841	-4.24184	1.182889	10.36321	0.96574	-0.5372	1.134086	0.47	0.019261	0.000912
323	28.71566	1.289016	-3.85062	1.434833	5.570056	1.359401	0.431292	1.045399	0.41	0.027646	0.000381
539	17.38227	1.363726	-1.72213	1.162483	0.519918	1.444909	0.436268	1.37697	0.2	0.105044	0.000074
609	5.201377	2.901119	6.304851	1.611183	-2.34881	1.581408	-3.63133	1.516376	0.24	0.029923	0.000089
511	20.19015	1.234572	-3.71958	1.200649	2.688687	1.33983	2.477812	1.387116	0.29	0.064166	0.000419
497	24.11446	1.605515	-8.20774	1.30633	5.223406	1.732568	8.60169	1.509848	0.49	0.043867	0.00059

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
415	24.60766	1.069907	-2.17125	1.310791	8.940777	1.088314	0.714028	1.445695	0.48	0.026973	0.000018
487	24.43648	1.725044	-8.97346	1.402417	5.270547	1.898005	9.48281	1.600375	0.52	0.031121	0.001397
452	26.629	1.034733	-2.36901	1.074102	11.79586	0.943052	4.919659	1.16749	0.56	0.028761	0.001948
516	23.32387	1.692664	-8.14867	1.384813	4.234156	1.877438	8.155219	1.596945	0.46	0.025525	0.000025
490	24.19064	1.714379	-8.8024	1.396465	5.107309	1.907204	9.245347	1.604355	0.51	0.069957	0.005213
237	32.08293	0.957774	-4.06153	1.174468	10.80509	0.951489	-0.45341	1.123934	0.5	0.053436	0.000178
385	27.6989	1.08197	-2.35432	1.553717	10.96313	1.145523	-2.16643	1.573987	0.56	0.075164	0.000057
432	26.90198	1.433305	-7.46122	1.240302	5.33548	1.364442	8.488346	1.197949	0.54	0.04726	0.000578
550	11.8326	2.012588	2.761933	1.308738	-1.20914	1.41827	-0.28849	1.366746	0.24	0.078325	0.00331
533	19.06146	1.219497	-2.869	1.206994	1.862109	1.384945	1.265628	1.389656	0.24	0.054671	0.001211
241	32.42545	1.197896	-7.70045	1.37447	9.624991	1.251108	-0.29134	1.16243	0.54	0.093223	0.002873
337	25.32189	13.19985	12.20131	3.290961	14.5297	7.675168	-7.87773	4.277218	0.74	0.999984	0.009893
315	26.815	1.549125	-1.90093	1.529575	3.673568	1.488551	0.002754	1.142438	0.31	0.043052	0.000234
292	27.70476	1.367277	-2.94302	1.481907	4.72885	1.416928	0.722377	1.051245	0.31	0.043158	0.000001
394	26.97929	1.00366	-2.2496	1.360813	10.89979	1.015464	-0.71362	1.440728	0.55	0.148216	0.006841
525	19.32793	1.358266	-4.1531	1.294113	0.822788	1.443949	1.852598	1.356269	0.29	0.030523	0.000515
353	31.32344	0.971006	-5.9681	1.20581	10.34642	1.069194	0.696099	1.041965	0.51	0.018128	0.000154
593	5.880421	2.828336	5.111205	1.608959	-2.26649	1.568535	-3.68723	1.546547	0.21	0.293719	0.064167
358	31.34205	0.968462	-2.33812	1.165198	11.62199	0.903065	-0.583	1.201447	0.55	0.019953	0.000236
118	27.56372	1.64076	-7.38114	1.337985	4.183511	1.531591	8.569841	1.272254	0.56	0.037555	0.000434
89	33.46659	1.320651	0.218931	1.193528	5.202396	1.164926	2.650149	1.265138	0.33	0.047809	0.008709
484	25.0927	1.719225	-9.13851	1.394501	5.393422	1.804387	9.736114	1.544884	0.56	0.054393	0.000015
69	32.67901	1.593233	1.147396	1.418989	3.213033	1.378203	0.364096	1.487399	0.27	0.065372	0.004256
75	32.77185	1.444977	0.616923	1.287321	4.186438	1.264749	1.395218	1.33645	0.29	0.027953	0.000107
426	30.60719	1.071155	-1.0562	1.035962	11.78737	0.914539	4.186235	1.307552	0.58	0.030763	0.00001
248	30.246	1.218383	-5.61688	1.445135	7.400743	1.326079	0.31551	1.095429	0.49	0.078266	0.000187
513	20.56099	1.293826	-4.38685	1.215562	2.383904	1.381062	3.101739	1.394705	0.32	0.042589	0.000579
203	33.94209	1.015044	-4.5041	1.222502	9.440079	1.020803	-0.89894	1.183375	0.42	0.028662	0.000436
344	29.04826	1.018575	-3.91235	1.268827	11.18916	1.106839	0.351366	1.115953	0.53	0.082306	0.000504

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
368	29.70445	1.007669	-2.80681	1.282987	11.7761	0.973228	-0.83368	1.237182	0.57	0.057923	0.000079
470	25.43402	1.992694	-9.62025	1.571282	5.034195	1.998289	10.48824	1.702004	0.61	0.095874	0.000623
599	4.642116	3.278811	6.438099	1.720339	-1.99121	1.813514	-5.34186	1.691991	0.23	0.236277	0.041539
48	32.41882	1.554528	1.016232	1.387494	3.395656	1.353318	0.514073	1.438674	0.26	0.029391	0.001369
230	33.15502	0.973193	-4.16326	1.19197	10.10584	0.973566	-0.62179	1.153418	0.46	0.019295	0.000685
615	4.97131	2.957371	6.710508	1.626377	-2.33969	1.60406	-3.66036	1.52192	0.24	0.063614	0.000253
271	26.301	1.675199	-1.39473	1.584943	3.118136	1.539651	-0.3219	1.229605	0.29	0.094569	0.00024
266	25.94979	1.790371	-1.05118	1.6498	2.705188	1.591142	-0.58179	1.32347	0.28	0.16389	0.000031
151	36.01476	1.268531	0.423067	1.136304	5.905758	1.082556	3.084354	1.349725	0.36	0.062413	0.000123
62	36.95177	1.345923	0.52377	1.185406	5.179367	1.142116	2.015855	1.430505	0.33	0.122655	0.001166
478	21.70389	2.72539	-10.1489	2.106324	4.385302	2.830357	9.772042	2.352533	0.5	0.050387	0
549	13.95171	1.75555	0.30549	1.245924	-1.03849	1.363038	-0.58739	1.324117	0.2	0.068117	0.000651
131	26.94462	1.453993	-7.53661	1.250381	5.215982	1.383975	8.572142	1.209491	0.55	0.01747	0.000513
173	33.21127	1.093143	-0.74929	1.106885	10.6736	0.922316	2.613179	1.404659	0.52	0.032607	0.000048
621	4.116098	3.173407	7.510042	1.665043	-2.20895	1.74605	-4.58364	1.60451	0.25	0.038326	0.000002
521	20.83662	1.810287	-6.64761	1.477319	1.893509	1.717912	4.90066	1.564484	0.38	0.071208	0.005043
204	34.66046	1.047233	-4.11624	1.245959	8.948442	1.044373	-1.12538	1.241471	0.39	0.030384	0.000002
345	28.41286	1.042065	-3.58952	1.298916	10.92261	1.158561	0.488269	1.122314	0.51	0.053316	0.004295
357	29.32279	1.020518	-3.3629	1.287582	11.6529	1.029126	-0.37427	1.193406	0.55	0.046018	0.00113
387	26.90104	1.14002	-2.41483	1.65103	10.45613	1.251108	-2.26322	1.663734	0.53	0.026886	0.00006
211	32.30192	1.013863	-6.76191	1.224686	9.970797	1.077842	0.375881	1.059052	0.51	0.042409	0.004444
340	29.72909	0.98299	-4.80477	1.235677	10.18672	1.138278	1.030141	1.0438	0.5	0.087677	0.018506
158	34.38733	1.147125	-0.48162	1.115798	9.442002	0.944953	3.271667	1.394593	0.47	0.027954	0.001406
559	15.88927	1.564619	-1.57718	1.270345	-0.66504	1.398055	-0.44053	1.314421	0.2	0.138062	0.000019
403	29.29636	0.979212	-1.88315	1.275412	12.06374	0.930926	-1.15046	1.330012	0.6	0.053537	0.000754
520	21.0774	2.020875	-7.63667	1.636289	2.514241	1.968005	6.128278	1.704512	0.4	0.101066	0.000363
410	27.4016	0.977265	-1.6703	1.219534	11.8327	0.918235	1.258669	1.300575	0.58	0.022902	0.000001
446	25.8877	1.107408	-4.45562	1.065393	9.849833	1.025034	6.070224	1.090109	0.52	0.029517	0.001466
442	26.88852	1.160549	-5.29953	1.095054	8.051315	1.083818	6.798766	1.061881	0.51	0.047734	0.001429

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
476	23.25402	2.360389	-10.1839	1.848454	4.919087	2.43058	10.33325	2.055338	0.56	0.050268	0.002662
408	26.7957	0.986869	-1.66769	1.208597	11.51804	0.924989	1.866163	1.296085	0.56	0.067107	0.000018
123	27.40122	1.602962	-7.63144	1.319964	4.412835	1.506983	8.802556	1.271289	0.57	0.060227	0.000929
584	7.408767	2.632601	4.633277	1.567859	-2.18339	1.415873	-2.41736	1.413979	0.22	0.024149	0.000013
626	3.637536	3.510068	8.299254	1.741427	-1.82562	1.944556	-5.68993	1.707751	0.26	0.104668	0.000707
361	30.78701	0.974336	-3.36376	1.201386	11.51964	0.944272	-0.53821	1.156821	0.54	0.0263	0.002111
136	35.53344	1.287974	0.455787	1.147932	5.698732	1.107058	2.976543	1.339758	0.36	0.031403	0.003112
364	30.67041	0.977655	-3.17709	1.207965	11.59342	0.940963	-0.60328	1.16973	0.55	0.016165	0.00006
537	4.755367	3.016904	6.36643	1.638659	-2.26144	1.673364	-4.42941	1.590901	0.23	0.104665	0.002977
434	25.58134	1.389362	-7.63662	1.213181	6.168622	1.345755	8.194174	1.223145	0.53	0.044444	0.000692
528	18.46497	2.123593	-5.43487	1.681436	0.384238	1.669889	2.353674	1.615264	0.32	0.105492	0.00024
396	26.27049	1.09339	-2.82387	1.591847	9.775439	1.222693	-2.44404	1.66886	0.51	0.068801	0.001882
430	31.2669	1.047762	-0.86137	1.057919	11.99574	0.898729	2.97548	1.359013	0.58	0.048664	0.000808
85	32.56307	1.32732	-0.12257	1.207054	4.937714	1.185562	2.543565	1.22996	0.32	0.038909	0.000012
297	29.75575	1.149165	-4.86669	1.381548	6.651521	1.29194	0.890817	1.014942	0.43	0.079807	0.000492
82	32.59415	1.372939	0.179291	1.236499	4.62309	1.216799	2.036929	1.267865	0.31	0.017766	0.000544
234	33.00488	0.973851	-2.68818	1.175847	10.58744	0.928546	-0.4233	1.226692	0.48	0.031523	0
58	34.73053	1.495255	0.734462	1.295896	4.240705	1.27105	1.323746	1.457982	0.33	0.052179	0.001733
51	32.43251	1.625793	1.252	1.455966	2.9447	1.40996	0.100957	1.521838	0.25	0.036467	0.000946
472	25.78797	1.773504	-9.19977	1.427019	5.085224	1.782439	9.986265	1.529323	0.59	0.058898	0.000077
427	27.41765	1.062186	-2.83109	1.042725	11.30057	0.965484	5.37283	1.132365	0.55	0.025742	0.001257
132	33.42162	1.468696	0.78551	1.295776	4.173346	1.271185	1.356724	1.378513	0.31	0.061541	0.000194
214	32.65959	1.001728	-5.94693	1.202145	10.07284	1.032117	-0.22566	1.081537	0.48	0.019288	0.000523
352	32.09616	0.991031	-6.31774	1.20482	10.21712	1.051248	0.304916	1.055261	0.5	0.012621	0.000485
52	32.74926	1.629593	1.232182	1.451824	3.005808	1.405106	0.192112	1.532145	0.26	0.031809	0.001539
288	26.77886	1.608712	-2.52734	1.630917	4.28017	1.536139	1.078052	1.155378	0.21	0.08145	0.000455
608	5.537542	2.848725	6.030558	1.603017	-2.34678	1.546112	-3.38547	1.495132	0.23	0.025705	0.000251
221	33.407	0.9801	-4.10767	1.198898	9.93863	0.979933	-0.67635	1.167298	0.45	0.028913	0.002521
372	29.12311	1.000841	-2.09628	1.347981	11.78113	0.974443	-1.65474	1.380127	0.59	0.024673	0.000293

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
531	17.10028	1.975957	-3.86836	1.565344	-0.51005	1.514157	0.362238	1.481725	0.26	0.026485	0.000397
53	31.79913	1.593234	1.074569	1.433761	3.010532	1.397917	0.095346	1.475283	0.22	0.024854	0.00071
186	35.68596	1.098209	-1.41582	1.233141	8.791143	0.981845	0.470327	1.414156	0.39	0.13846	0.004119
198	32.7816	1.09407	-0.71925	1.086495	10.89335	0.918384	3.034299	1.393992	0.54	0.028722	0.000014
369	29.67914	1.008981	-2.9939	1.279242	11.74754	0.98303	-0.70526	1.220842	0.56	0.025343	0.000026
219	33.93887	1.012572	-4.44594	1.2215	9.456402	1.017731	-0.88667	1.184673	0.42	0.017566	0.000776
527	18.93738	1.863443	-5.20323	1.516383	0.458364	1.579412	2.315627	1.503494	0.33	0.04976	0.001255
429	30.79393	1.060793	-0.94355	1.042162	11.96822	0.905859	3.76577	1.333056	0.58	0.031134	0.000287
445	25.51399	1.145037	-5.23509	1.082916	9.002643	1.066817	6.438292	1.093374	0.51	0.027205	0.000113
272	26.56197	1.660281	-1.68613	1.597191	3.458016	1.557455	0.019975	1.218496	0.26	0.046182	0.000779
456	26.15536	1.027365	-2.19349	1.098733	11.59129	0.93674	4.615938	1.187608	0.55	0.039109	0.000861
285	27.09115	1.508786	-2.55148	1.564315	4.32399	1.490136	0.820128	1.11329	0.25	0.098046	0.004187
460	29.62691	0.991784	-1.07633	1.079747	12.76674	0.881049	2.393509	1.285146	0.61	0.042185	0.000604
39	32.16724	1.710685	1.501149	1.548957	2.348621	1.488644	-0.42034	1.627416	0.21	0.120087	0.001584
152	35.47341	1.208467	0.162813	1.10541	6.888508	1.020572	3.827237	1.317442	0.39	0.028935	0.000038
436	25.4709	1.22372	-6.33706	1.125282	7.661263	1.156043	7.133439	1.119839	0.51	0.069686	0.004282
228	32.71654	0.9654	-4.35978	1.183029	10.35862	0.969075	-0.52153	1.128054	0.47	0.03531	0.000628
205	33.92811	1.004347	-4.21755	1.218016	9.519462	1.006439	-0.84063	1.190898	0.42	0.018779	0.002079
418	29.73387	1.157322	-3.4401	1.09993	7.095738	1.06915	6.015915	1.048602	0.46	0.061449	0.007717
33	33.03642	1.666414	1.243207	1.477939	2.871624	1.426027	0.108001	1.584578	0.27	0.064641	0.000012
568	11.59744	2.368548	0.438474	1.53858	-1.63697	1.410883	-1.62989	1.46013	0.12	0.039055	0.00029
423	30.47964	1.120125	-2.27626	1.071249	8.441635	1.009808	5.420579	1.106865	0.48	0.015852	0.000572
181	37.38562	1.215286	-0.31805	1.216431	7.146396	1.018197	1.825235	1.426685	0.33	0.093774	0.002204
311	25.54229	1.868949	-0.84701	1.69384	2.386268	1.612604	-0.76005	1.381435	0.3	0.083233	0.003738
184	36.88982	1.146826	-1.2971	1.263363	7.764436	1.021867	0.287135	1.435323	0.33	0.051111	0.004514
462	31.86825	1.013752	-1.09929	1.096883	11.81626	0.895092	1.310595	1.336243	0.57	0.026702	0.002355
111	30.73895	1.299918	-1.9251	1.186658	4.686668	1.195058	3.709801	1.11509	0.34	0.066598	0.00133
367	30.25922	0.98711	-2.48652	1.235924	11.82624	0.93106	-0.90514	1.226758	0.57	0.024292	0.000391
529	17.18787	2.248834	-4.53753	1.750152	-0.34481	1.622937	0.961806	1.637617	0.27	0.129464	0.00035

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
463	31.81226	1.007945	-1.14764	1.099102	11.8479	0.8938	1.144397	1.326234	0.57	0.026497	0.002327
32	31.60698	1.056991	-0.83166	1.063169	11.78136	0.90236	2.955937	1.369521	0.57	0.099656	0.002135
117	26.47118	1.868506	-8.85813	1.474917	4.61471	1.794939	9.952613	1.515353	0.61	0.047036	0.000093
79	30.81018	1.527103	0.257304	1.370976	3.265179	1.363545	0.543928	1.385604	0.22	0.024951	0.001723
206	34.28986	1.096342	-5.2034	1.256552	8.974541	1.09626	-1.35888	1.211041	0.41	0.062476	0.000509
154	36.60034	1.123252	-1.64527	1.266988	7.962818	1.022247	-0.07055	1.419603	0.33	0.038154	0.001065
622	3.794951	3.357808	7.874728	1.707445	-2.00725	1.860422	-5.33507	1.669312	0.26	0.043001	0.000001
218	33.43438	1.001238	-1.97746	1.175763	10.49586	0.926771	-0.00991	1.300478	0.48	0.030778	0.000263
31	33.07931	1.597386	1.11551	1.413337	3.294226	1.372474	0.469342	1.501421	0.28	0.066047	0.000092
526	18.37709	1.541549	-3.98945	1.371344	0.087539	1.465223	1.068637	1.35992	0.28	0.065566	0.000648
392	28.28077	1.008924	-2.28307	1.425697	11.3902	1.027506	-2.0392	1.487926	0.58	0.036514	0.000448
200	32.45681	0.997962	-1.51963	1.133076	11.32986	0.902914	0.396891	1.302272	0.54	0.020006	0.00001
76	33.29843	1.416949	0.598756	1.258588	4.484008	1.236152	1.728949	1.329361	0.31	0.019502	0.000201
306	25.99271	1.730777	-1.36606	1.606868	2.940133	1.543726	-0.46984	1.267547	0.33	0.033534	0.000788
243	32.12692	1.125433	-7.39782	1.359746	9.29024	1.224181	0.323752	1.106935	0.53	0.0331	0.003379
343	28.8362	1.015673	-4.03139	1.267	10.46375	1.16446	0.856914	1.073904	0.5	0.033918	0.000705
295	30.29675	1.100275	-5.41829	1.357289	7.252062	1.26006	1.0032	1.015356	0.45	0.093818	0.00582
290	28.16372	1.252277	-3.66041	1.436146	5.541178	1.358618	1.276491	1.019773	0.33	0.029811	0.000353
542	24.90278	1.232567	-2.98591	1.722268	8.462244	1.421746	-2.62682	1.782828	0.46	0.259323	0.000166
179	34.93326	1.126381	-0.75239	1.169366	9.358866	0.953565	1.995385	1.4258	0.44	0.012406	0.000433
374	29.8758	0.986199	-2.02915	1.257508	11.98091	0.927926	-1.16488	1.282751	0.59	0.022875	0.000148
208	30.72334	1.107022	-5.86124	1.367794	7.671303	1.257375	0.828668	1.037502	0.48	0.030155	0.001373
492	24.24989	2.118404	-10.0135	1.678666	5.128473	2.208242	10.48961	1.872856	0.58	0.127781	0.008156
475	24.16641	1.739499	-8.91693	1.417651	5.086227	1.943644	9.348535	1.626451	0.51	0.099613	0.015734
401	32.00139	0.967993	-2.34781	1.155471	11.31148	0.905546	-0.42552	1.211728	0.53	0.028404	0.003007
273	26.59787	1.610185	-1.67481	1.5604	3.446347	1.521173	-0.08594	1.184222	0.29	0.024739	0.000038
50	31.44537	1.815803	1.809044	1.683632	1.587221	1.614893	-1.16477	1.766398	0.13	0.024023	0.000294
245	28.04509	1.411032	-3.41916	1.485205	5.032009	1.404903	0.084059	1.100774	0.41	0.064307	0.000004
59	34.37128	1.513796	0.796918	1.315512	4.081973	1.288748	1.198429	1.459139	0.33	0.034474	0.000301

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
517	22.24707	1.823494	-7.9345	1.48743	3.302077	1.92515	7.175517	1.644614	0.43	0.099133	0.006506
620	4.100688	3.209016	7.806896	1.679565	-2.1918	1.750005	-4.35798	1.600781	0.26	0.04249	0.000095
489	23.7557	1.700137	-8.47629	1.388584	4.700267	1.903147	8.734651	1.604149	0.48	0.070117	0.000012
611	6.607802	2.716519	4.686774	1.581927	-2.26266	1.491304	-3.0713	1.486937	0.21	0.299442	0.048118
624	4.264854	3.119472	7.24899	1.653172	-2.24668	1.718207	-4.48922	1.592639	0.25	0.041292	0.000058
602	8.086842	2.559597	5.059835	1.54959	-1.92617	1.430296	-1.7173	1.398102	0.24	0.028145	0.000016
601	4.423869	3.702292	7.206551	1.816745	-1.58076	2.031685	-6.38933	1.79396	0.24	0.083244	0.006163
619	4.02314	3.267678	8.05125	1.697474	-2.13945	1.776786	-4.36635	1.615283	0.26	0.04197	0.000442
627	3.720123	3.776669	8.443507	1.80837	-1.4903	2.091953	-6.50332	1.781517	0.26	0.074377	0.001225
276	26.26678	1.756814	-1.3441	1.638251	3.059963	1.597611	-0.29647	1.297406	0.26	0.045313	0.00074
594	5.786313	2.902289	5.048597	1.63811	-2.19996	1.613454	-4.00116	1.588345	0.2	0.038272	0.000808
424	29.2458	1.082847	-2.18161	1.034763	10.76849	0.960577	5.221963	1.159976	0.54	0.037726	0.000542
309	24.85519	2.104236	-0.40881	1.857266	1.720925	1.732882	-1.13378	1.592922	0.3	0.039289	0.000266
254	24.21289	2.58539	0.089937	2.239916	0.877686	2.013604	-1.75466	2.004687	0.28	0.266515	0.000966
614	4.361073	3.091706	7.218767	1.648193	-2.27362	1.696235	-4.29553	1.577415	0.25	0.026693	0.000179
628	3.944001	3.706778	7.893868	1.802388	-1.59274	2.048636	-6.44559	1.777358	0.25	0.077712	0.000158
633	5.767046	2.816494	5.41929	1.597386	-2.31217	1.551838	-3.55437	1.521006	0.22	0.071234	0.00001
606	6.170722	2.807265	6.079308	1.617235	-2.2535	1.497029	-2.71547	1.449538	0.24	0.025649	0.003295
120	30.11858	1.233816	-3.45652	1.142792	5.511536	1.146556	5.726632	1.046694	0.43	0.028998	0.000119
267	25.63393	1.858718	-0.85164	1.68972	2.421888	1.611113	-0.75371	1.375025	0.29	0.094189	0.003209
571	9.38713	2.46043	2.790344	1.526661	-1.93238	1.366659	-1.96028	1.394887	0.18	0.03543	0.001809
130	30.99957	1.295647	-1.6492	1.186282	4.773063	1.188175	3.548563	1.125945	0.34	0.07059	0.002165
326	27.71783	1.421818	-2.94125	1.475621	4.613031	1.412218	0.121032	1.085983	0.38	0.021942	0.000018
67	35.05573	1.466059	0.681252	1.269889	4.439336	1.247029	1.504631	1.446627	0.34	0.017376	0.000418
569	11.86186	2.451631	-0.15132	1.606793	-1.61186	1.47781	-1.57316	1.542235	0.1	0.189043	0.001732
435	25.23493	1.343169	-7.34621	1.185607	6.588211	1.296298	7.8334	1.203411	0.52	0.017461	0.000053
279	25.92308	1.78441	-1.05072	1.644841	2.699075	1.584222	-0.58517	1.316065	0.29	0.025911	0.000194
431	29.26309	1.014073	-1.16117	1.055707	12.67713	0.893392	3.591117	1.27807	0.6	0.037029	0.000001
29	22.76519	2.219993	-9.85821	1.766075	4.510791	2.45396	9.634591	2.020056	0.49	0.280817	0.000466

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
156	34.53099	1.165724	-0.29676	1.092864	8.775033	0.955714	3.9872	1.347918	0.46	0.025797	0.000223
252	24.40271	2.242623	-0.35592	1.949053	1.461937	1.842168	-1.19164	1.755948	0.31	0.063114	0.001277
249	24.65487	2.125153	-0.57294	1.860369	1.760484	1.772318	-1.01952	1.646612	0.32	0.167735	0.000956
330	32.01143	1.010033	-6.92603	1.250136	9.628542	1.117192	0.806731	1.046487	0.51	0.0551	0.00103
563	11.87926	2.375701	0.0941	1.554624	-1.60329	1.43033	-1.5808	1.484689	0.11	0.037597	0.0004
56	34.29564	1.542044	0.830004	1.339621	3.911803	1.30946	1.019955	1.484402	0.32	0.036766	0.000241
486	24.84847	1.717133	-9.08646	1.393358	5.406536	1.833623	9.652247	1.562901	0.54	0.056539	0.000061
220	32.79899	0.963573	-3.90341	1.181786	10.40666	0.95585	-0.56005	1.150978	0.47	0.025238	0.001247
491	23.5746	1.760863	-8.68563	1.439899	4.569921	1.983195	8.821286	1.65089	0.48	0.047772	0.002254
197	33.59446	1.029097	-1.48978	1.167107	10.50112	0.925944	0.553866	1.353297	0.49	0.027659	0.001236
605	6.895381	2.712399	5.598688	1.596997	-2.16516	1.45381	-2.34576	1.42142	0.24	0.038722	0.001007
443	26.18966	1.102906	-4.34661	1.061553	9.893856	1.019779	6.063261	1.084907	0.52	0.013458	0.001471
607	5.196449	2.974888	6.943067	1.652012	-2.28755	1.590625	-3.25083	1.505222	0.25	0.097765	0.006736
625	3.940781	3.291755	7.550104	1.694996	-2.06913	1.825856	-5.24047	1.657654	0.25	0.089292	0.003166
544	22.7015	1.38454	-2.72748	1.672681	6.344134	1.5639	-1.73098	1.745382	0.4	0.119142	0.000626
543	24.373	1.245646	-2.95308	1.686772	7.974595	1.431973	-2.31091	1.75265	0.45	0.125198	0.000816
540	18.23906	1.338644	-1.99122	1.167195	1.413392	1.433691	0.695921	1.428177	0.22	0.129448	0.000012
504	22.4967	1.141545	-3.13315	1.129589	7.070995	1.088603	3.828304	1.304634	0.4	0.027899	0.000212
502	21.58427	1.259404	-4.35667	1.148196	4.677263	1.251708	4.017837	1.364324	0.36	0.039853	0.000277
590	8.753859	2.726326	2.125612	1.670789	-1.93494	1.537775	-2.56717	1.579699	0.13	0.068413	0.000038
242	32.1138	1.158212	-7.47098	1.383059	9.376924	1.249233	0.112443	1.130988	0.54	0.051731	0.003737
293	30.08612	1.114933	-5.20655	1.364618	7.024773	1.270791	0.985727	1.013239	0.45	0.077244	0.000141
546	18.4227	1.613206	-1.12466	1.329711	2.067453	1.629534	0.637975	1.540525	0.29	0.065546	0.000179
246	26.64968	1.625895	-2.29133	1.569654	3.757376	1.492903	-0.26733	1.210181	0.38	0.064655	0.000954
296	28.68395	1.254024	-3.79293	1.422939	5.552742	1.350738	0.681785	1.022501	0.39	0.046278	0.003412
440	23.70809	1.440761	-7.20614	1.19825	5.798917	1.456871	7.395417	1.372503	0.47	0.040698	0.000056
250	24.8956	2.044324	-0.65347	1.804845	1.944217	1.714837	-0.94206	1.556414	0.32	0.143643	0.003218
289	28.31035	1.236355	-3.75092	1.427074	5.621119	1.349987	1.24045	1.015093	0.34	0.10896	0.007247
264	25.8484	1.790941	-1.0292	1.646738	2.655041	1.581707	-0.61043	1.318266	0.3	0.125286	0.002717

Area_key	est_Intercept	se_Intercept	est_LCSR	se_LCSR	est_HHSIZE	se_HHSIZE	est_MAGE	se_MAGE	localR2	influence	CooksD
580	8.008618	2.580436	3.851729	1.556335	-2.11981	1.403582	-2.34771	1.419148	0.2	0.196684	0.000403
510	21.95283	1.172949	-3.41134	1.134347	6.103611	1.139698	3.672248	1.327766	0.37	0.033605	0.000006
263	25.90896	1.796368	-1.0251	1.652783	2.66942	1.591465	-0.60521	1.32731	0.29	0.111631	0.003235
407	28.27121	0.974537	-1.34325	1.140795	12.56815	0.886101	2.176747	1.255901	0.6	0.031032	0.000742
71	33.24777	1.542702	0.979436	1.360751	3.671799	1.328156	0.829366	1.44561	0.3	0.01422	0.000698
77	32.44243	1.451622	0.565198	1.296717	4.06764	1.275068	1.277479	1.333377	0.28	0.017305	0.000122
109	31.32297	1.204007	-2.00276	1.134588	5.947013	1.107762	4.757977	1.090339	0.39	0.020253	0
107	31.84929	1.163955	-1.5076	1.108981	6.954625	1.054772	4.808653	1.126593	0.42	0.038138	0.000412
108	30.01236	1.167075	-3.28155	1.106969	6.796181	1.07879	5.898227	1.049728	0.45	0.03544	0.002795
240	33.2761	0.972369	-3.45665	1.190191	10.19017	0.954552	-0.59197	1.192466	0.46	0.014339	0.000689
239	32.89452	0.966428	-4.10191	1.185048	10.29808	0.964388	-0.57077	1.145456	0.47	0.013033	0.000614
618	4.004374	3.287859	8.129681	1.704076	-2.12007	1.785861	-4.36333	1.620615	0.27	0.065976	0.000241
493	24.30788	1.686536	-8.72398	1.372032	5.217125	1.855012	9.196773	1.573845	0.51	0.084388	0.007263

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