

# Online Supplemental

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## List of Abbreviations in Online Supplemental Tables

Pop=Population

ER=Emergency room

RV=recreational vehicle

Misc.=miscellaneous

BCBS=Blue Cross Blue Shield

RIHC=resource intensive healthcare

## Appendix A. Data & Code Availability

Data used to in this study came from various governmental agencies. Outcome data came from the American Hospital Association Survey and is published from the Health Resources Services Administration. This data is public domain and can be accessed here (<https://data.hrsa.gov/data/download>).

Candidate predictor data was extracted from Data Planet©, which is a web-based tool supported by SAGE Publishing. Data Planet© and SAGE publishing are reputable resources for researchers and are used worldwide. Due to Data Planet© terms of use, data cannot be publicly shared. However, researchers may have access to Data Planet© through licenses from their affiliated institutions, which are often available from their institutional library.

A repository with code and materials used to support this study is available on GitHub here: <https://github.com/iben-mickrick/Predicting-RIHC>

## Appendix B. Model Specification for Feature Selection and Machine Learning Models

Random Forest Machine Learning Model & Feature Selection Information	
Number of drawn candidate variables in each split	10.20 (ER), 10.20 (IP), 10.20 (HosExp)
Sample size of observations in full data	2,475 (ER), 2,491 (IP & HosExp)
Sample size* of observations in training data	1983 (ER), 1955 (IP & HosExp)
Sample size* of observations in testing data	492 (ER), 496 (IP & HosExp)
Whether observations were drawn with replacement	TRUE
Node size	5
Number of trees	500
Splitting rule	Minimize SSE
R packaged utilized	Random Forest & s13
LASSO Feature Selection Information	
Alpha	1
Lambda	Lambda minimum
R package utilized	glmnet
Regularized Machine Learning Model Information	
Alpha	1 (Tuned)
Lambda	Lambda minimum
R packaged utilized	Glmnet, S13

ER= emergency room visits

IP= inpatient days

HosExp = hospital expenditures

\*Formal sample size calculations are challenging given the novelty of the proposed prediction models and lack of previous population-centric prediction models of resource intensive healthcare utilization among U.S. counties. Best effort attempts were made based on recommendations for prediction models with continuous endpoints and it was determined a sample size of approximately 400 would be sufficient given approximately 100 predictors. As such, the training and test set sample sizes are generally a sufficient size for this study.

Appendix C. Demographic main effects variables, expressed as 2017 county per capita or per capita %, eligible for feature selection for each outcome (N variables =149)

<b>Outcome (per capita)</b>	<b>Log ER Visits (N=2475)</b>	<b>Log Inpatient Days (N=2491)</b>	<b>Log Hospital Expenditures (N=2491)</b>
census demographics 2017 population Median Age years	41.18 (5.28)	41.18 (5.27)	41.18 (5.27)
census demographics 2017 household Head Median Age years	53.68 (3.42)	53.68 (3.41)	53.68 (3.41)
census demographics 2017 family Head Median Age years	51.66 (2.91)	51.66 (2.90)	51.66 (2.90)
census demographics 2017 family Median Size persons	3.11 (0.32)	3.11 (0.32)	3.11 (0.32)
census demographics 2017 household Income Median (\$)	59263.81 (14660.63)	59237.72 (14663.59)	59237.72 (14663.59)
census demographics 2017 household Median persons	2.91 (0.31)	2.91 (0.31)	2.91 (0.31)
census demographics 2017 Non family Head Median Age years	57.97 (5.17)	57.98 (5.15)	57.98 (5.15)
census demographics 2017 Non family Median Size persons	2.00 (0.04)	2.00 (0.04)	2.00 (0.04)
census demographics 2017 household Income Per Capita (\$)	1.74 (2.89)	1.73 (2.88)	1.73 (2.88)
census demographics 2017 Personal Income (\$)	30533.30 (6743.83)	30519.57 (6743.58)	30519.57 (6743.58)
census demographics 2017 population 5+ English Speaking	84.59 (11.07)	84.61 (11.06)	84.61 (11.06)
census demographics 2017 population 5+ Spanish Speaking	6.27 (9.39)	6.25 (9.37)	6.25 (9.37)
census demographics 2017 population 5+ Speaking Asian or Pacific Islander Language	0.89 (1.68)	0.89 (1.68)	0.89 (1.68)
census demographics 2017 population 5+ Speaking other Language	0.57 (2.56)	0.56 (2.55)	0.56 (2.55)
census demographics 2017 population Living in Group Quarters	3.37 (3.81)	3.38 (3.81)	3.38 (3.81)
census demographics 2017 population Living in Institutional Group Quarters	2.16 (3.26)	2.16 (3.26)	2.16 (3.26)
census demographics 2017 population Living in Non-Institutional Group Quarters	1.22 (2.24)	1.22 (2.23)	1.22 (2.23)
census demographics 2017 household Head Under 25 Years	4.49 (2.66)	4.48 (2.65)	4.48 (2.65)
census demographics 2017 household Head 25-34 Years	13.28 (3.12)	13.27 (3.12)	13.27 (3.12)
census demographics 2017 household Head 35 to 44 Years	15.19 (2.64)	15.20 (2.64)	15.20 (2.64)
census demographics 2017 household Head 45-54 Years	19.57 (2.43)	19.58 (2.43)	19.58 (2.43)

census demographics 2017 household Head 55-64 Years	20.42 (2.34)	20.42 (2.34)	20.42 (2.34)
census demographics 2017 household Head 65-74 Years	14.54 (2.92)	14.54 (2.92)	14.54 (2.92)
census demographics 2017 household Head 75-84 Years	8.77 (2.24)	8.77 (2.23)	8.77 (2.23)
census demographics 2017 household Head 85+ Years	3.74 (1.36)	3.74 (1.36)	3.74 (1.36)
census demographics 2017 household No Vehicles	6.89 (4.39)	6.90 (4.38)	6.90 (4.38)
census demographics 2017 households 1 Vehicle	31.47 (5.39)	31.47 (5.39)	31.47 (5.39)
census demographics 2017 households 2 Vehicles	37.23 (4.49)	37.22 (4.49)	37.22 (4.49)
census demographics 2017 households 3 Vehicles	16.44 (3.79)	16.44 (3.79)	16.44 (3.79)
census demographics 2017 households 4+ Vehicles	7.98 (3.24)	7.97 (3.24)	7.97 (3.24)
census demographics 2017 population Density Per Square Mile	0.25 (1.10)	0.26 (1.11)	0.26 (1.11)
census demographics 2017 population 3+ enrolled in public or private school	80.87 (6.52)	80.88 (6.51)	80.88 (6.51)
census demographics 2017 population 3+ enrolled in public school	70.46 (7.48)	70.45 (7.48)	70.45 (7.48)
census demographics 2017 population 3+ enrolled in private school	10.41 (5.71)	10.42 (5.71)	10.42 (5.71)
census demographics 2017 population 3+ enrolled in public preprimary school	3.68 (1.64)	3.68 (1.64)	3.68 (1.64)
census demographics 2017 population 3+ enrolled in private preprimary school	1.60 (1.09)	1.60 (1.09)	1.60 (1.09)
census demographics 2017 population 3+ enrolled in public kindergarten	4.05 (1.28)	4.05 (1.28)	4.05 (1.28)
census demographics 2017 population 3+ enrolled in private kindergarten	0.41 (0.38)	0.41 (0.38)	0.41 (0.38)
census demographics 2017 population 3+ enrolled in public grade 1-4	15.46 (3.06)	15.45 (3.06)	15.45 (3.06)
census demographics 2017 population 3+ enrolled in private grade 1-4	1.51 (1.12)	1.52 (1.12)	1.52 (1.12)
census demographics 2017 population 3+ enrolled in public grade 5-8	15.94 (3.38)	15.94 (3.38)	15.94 (3.38)
census demographics 2017 population 3+ enrolled in private grade 5-8	1.49 (1.09)	1.49 (1.09)	1.49 (1.09)
census demographics 2017 population 3+ enrolled in public grade 9-12	16.38 (3.62)	16.37 (3.61)	16.37 (3.61)
census demographics 2017 population 3+ enrolled in private grade 9-12	1.39 (1.03)	1.39 (1.03)	1.39 (1.03)
census demographics 2017 population 3+ enrolled in public college	13.02 (7.67)	13.02 (7.65)	13.02 (7.65)
census demographics 2017 population 3+ enrolled in private college	3.10 (3.39)	3.10 (3.39)	3.10 (3.39)
census demographics 2017 population 3+ enrolled in public graduate or professional school	1.94 (1.64)	1.94 (1.63)	1.94 (1.63)

census demographics 2017 population 3+ enrolled in private graduate or professional school	0.91 (1.00)	0.91 (0.99)	0.91 (0.99)
census demographics 2017 population 3+ not enrolled in school	236.50 (48.01)	236.51 (47.90)	236.51 (47.90)
census demographics 2017 population 25+ with less than high school diploma	14.47 (6.45)	14.50 (6.45)	14.50 (6.45)
census demographics 2017 population 25+ with high school diploma	33.35 (6.97)	33.36 (6.96)	33.36 (6.96)
census demographics 2017 population 25+ with some college	22.57 (4.05)	22.56 (4.05)	22.56 (4.05)
census demographics 2017 population in Poverty	16.77 (6.25)	16.79 (6.27)	16.79 (6.27)
census demographics 2017 population 25+ with associates degree	8.40 (2.51)	8.39 (2.51)	8.39 (2.51)
census demographics 2017 population 25+ with bachelor's degree	13.82 (5.49)	13.81 (5.49)	13.81 (5.49)
census demographics 2017 population 25+ with master's degree	5.36 (2.79)	5.36 (2.78)	5.36 (2.78)
census demographics 2017 population 25+ with professional degree	1.21 (0.84)	1.21 (0.83)	1.21 (0.83)
census demographics 2017 population 25+ with doctorate	0.82 (0.95)	0.82 (0.95)	0.82 (0.95)
census demographics 2017 households income less than 15,000	11.99 (4.31)	12.00 (4.31)	12.00 (4.31)
census demographics 2017 household Income 15,000-24,999	9.44 (2.46)	9.44 (2.46)	9.44 (2.46)
census demographics 2017 household income 25,000-34,999	9.77 (1.99)	9.78 (2.00)	9.78 (2.00)
census demographics 2017 household income 35,000-49,999	13.09 (1.94)	13.09 (1.94)	13.09 (1.94)
census demographics 2017 household income 50,000-74,999	17.33 (1.95)	17.32 (1.95)	17.32 (1.95)
census demographics 2017 household income 75,000-99,999	13.37 (1.79)	13.37 (1.79)	13.37 (1.79)
census demographics 2017 household income 100,000-124,999	9.34 (1.91)	9.34 (1.91)	9.34 (1.91)
census demographics 2017 household income 125,000-149,999	5.89 (1.85)	5.89 (1.85)	5.89 (1.85)
census demographics 2017 household income 150,000-199,999	4.86 (2.34)	4.86 (2.34)	4.86 (2.34)
census demographics 2017 household income 200,000+	4.92 (3.74)	4.91 (3.73)	4.91 (3.73)
census demographics 2017 households 1 person	28.18 (4.64)	28.17 (4.64)	28.17 (4.64)
census demographics 2017 households 2 people	34.86 (4.01)	34.85 (4.01)	34.85 (4.01)
census demographics 2017 households 3 people	15.03 (2.47)	15.05 (2.47)	15.05 (2.47)
census demographics 2017 households 4 people	11.93 (2.35)	11.93 (2.35)	11.93 (2.35)
census demographics 2017 households 5 people	5.99 (1.65)	5.99 (1.64)	5.99 (1.64)



census demographics 2017 households 6 people	2.42 (1.02)	2.42 (1.02)	2.42 (1.02)
census demographics 2017 households 7+ people	1.58 (1.11)	1.59 (1.11)	1.59 (1.11)
census demographics 2017 family married with children less than 18	9.37 (1.47)	9.37 (1.47)	9.37 (1.47)
census demographics 2017 household average size persons	2.39 (0.50)	2.39 (0.50)	2.39 (0.50)
census demographics 2017 Male household head	62.11 (5.51)	62.08 (5.53)	62.08 (5.53)
census demographics 2017 Female household head	37.89 (5.51)	37.92 (5.53)	37.92 (5.53)
census demographics 2017 Male Head of family	45.42 (6.33)	45.41 (6.33)	45.41 (6.33)
census demographics 2017 Female head of family	20.56 (5.05)	20.59 (5.07)	20.59 (5.07)
census demographics 2017 family married	24.09 (3.40)	24.07 (3.41)	24.07 (3.41)
census demographics 2017 other male head of family No Wife Present	2.49 (0.52)	2.49 (0.51)	2.49 (0.51)
census demographics 2017 other female head of family No Husband	5.80 (1.94)	5.82 (1.95)	5.82 (1.95)
census demographics 2017 family married no children less than 18	14.72 (3.19)	14.70 (3.19)	14.70 (3.19)
census demographics 2017 other male head of family no wife present with children less than 18	1.52 (0.37)	1.52 (0.37)	1.52 (0.37)
census demographics 2017 other Male head of family no wife present no children less than 18	0.97 (0.25)	0.97 (0.25)	0.97 (0.25)
census demographics 2017 other Female head family no husband present with children less than 18	3.82 (1.33)	3.83 (1.33)	3.83 (1.33)
census demographics 2017 other Female head of family no husband present no children less than 18	1.98 (0.74)	1.99 (0.74)	1.99 (0.74)
census demographics 2017 Non family male household head	16.69 (3.18)	16.68 (3.18)	16.68 (3.18)
census demographics 2017 Non family female head of household	17.33 (3.14)	17.33 (3.14)	17.33 (3.14)
census demographics 2017 Non family male household head with people less than 18	0.31 (0.13)	0.31 (0.13)	0.31 (0.13)
census demographics 2017 Non family male household head without people less than 18	16.37 (3.23)	16.35 (3.23)	16.35 (3.23)
census demographics 2017 Non family female household head with people less than 18	0.08 (0.04)	0.08 (0.04)	0.08 (0.04)
census demographics 2017 Non family female household head without people less than 18	17.26 (3.16)	17.27 (3.16)	17.27 (3.16)
census demographics 2017 population urban persons	48.01 (29.65)	47.99 (29.70)	47.99 (29.70)
census demographics 2017 population rural persons	51.99 (29.65)	52.01 (29.70)	52.01 (29.70)
census demographics 2017 population male persons	49.95 (1.92)	49.95 (1.92)	49.95 (1.92)
census demographics 2017 population female persons	50.05 (1.92)	50.05 (1.92)	50.05 (1.92)

census demographics 2017 White population alone persons	88443.85 (214149.46 )	88022.72 (213530.48 )	88022.72 (213530.48 )
census demographics 2017 other race population alone persons	3.50 (4.77)	3.49 (4.76)	3.49 (4.76)
census demographics 2017 White households	84.35 (15.68)	84.25 (15.75)	84.25 (15.75)
census demographics 2017 Black households	8.40 (13.75)	8.52 (13.88)	8.52 (13.88)
census demographics 2017 Asian households	1.28 (2.79)	1.28 (2.79)	1.28 (2.79)
census demographics 2017 American Indian and Alaska Native Head of households	0.01 (0.08)	0.01 (0.08)	0.01 (0.08)
census demographics 2017 other Race Head of households	2.50 (3.78)	2.49 (3.77)	2.49 (3.77)
census demographics 2017 family with 1 person	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
census demographics 2017 Two or more Races Head of households	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
census demographics 2017 families 2 persons families	14.98 (3.10)	14.97 (3.10)	14.97 (3.10)
census demographics 2017 families 3 persons families	7.03 (1.04)	7.04 (1.04)	7.04 (1.04)
census demographics 2017 families 4 persons families	5.66 (0.78)	5.66 (0.78)	5.66 (0.78)
census demographics 2017 families 5 persons families	2.84 (0.49)	2.84 (0.49)	2.84 (0.49)
census demographics 2017 families 6 persons families	1.14 (0.32)	1.14 (0.32)	1.14 (0.32)
census demographics 2017 families 7+ persons families	0.73 (0.38)	0.73 (0.38)	0.73 (0.38)
census demographics 2017 Non family 1 person households	28.18 (4.64)	28.17 (4.64)	28.17 (4.64)
census demographics 2017 Non family 2 people households	4.75 (1.74)	4.74 (1.73)	4.74 (1.73)
census demographics 2017 Non family 3 people households	0.67 (0.57)	0.66 (0.57)	0.66 (0.57)
census demographics 2017 Non family 4 people households	0.28 (0.39)	0.28 (0.39)	0.28 (0.39)
census demographics 2017 Non family 5 people households	0.08 (0.10)	0.08 (0.10)	0.08 (0.10)
census demographics 2017 Non family 6 people households	0.03 (0.15)	0.03 (0.15)	0.03 (0.15)
census demographics 2017 Non family 7+ people households	0.02 (0.03)	0.02 (0.03)	0.02 (0.03)
census demographics 2017 families under 25 years families	1.05 (0.42)	1.05 (0.42)	1.05 (0.42)
census demographics 2017 families aged 25-34 years families	4.68 (0.94)	4.68 (0.94)	4.68 (0.94)
census demographics 2017 families aged 35-44 years families	5.89 (0.80)	5.89 (0.80)	5.89 (0.80)
census demographics 2017 families aged 45-54 years families	6.80 (0.89)	6.80 (0.89)	6.80 (0.89)
census demographics 2017 families aged 55-64 years families	6.62 (1.14)	6.62 (1.13)	6.62 (1.13)

census demographics 2017 White Non-Hispanic households	0.49 (0.82)	0.49 (0.82)	0.49 (0.82)
census demographics 2017 families aged 65-74 years families	4.49 (1.19)	4.49 (1.18)	4.49 (1.18)
census demographics 2017 families aged 75+ years families	2.84 (0.90)	2.84 (0.90)	2.84 (0.90)
census demographics 2017 Non families aged under 25 years households	2.33 (2.33)	2.33 (2.32)	2.33 (2.32)
census demographics 2017 Non families aged 25-34 years households	3.67 (1.86)	3.67 (1.85)	3.67 (1.85)
census demographics 2017 Nonfamilies aged 35-44 years households	3.06 (0.85)	3.06 (0.84)	3.06 (0.84)
census demographics 2017 Non families aged 45-54 years households	5.65 (1.09)	5.65 (1.09)	5.65 (1.09)
census demographics 2017 Non families aged 55-64 years households	7.01 (1.50)	7.01 (1.50)	7.01 (1.50)
census demographics 2017 Nonfamilies aged 65-74 years households	5.48 (1.36)	5.48 (1.36)	5.48 (1.36)
census demographics 2017 Non families aged 75+ years households	6.80 (2.14)	6.80 (2.14)	6.80 (2.14)
census demographics 2017 population native citizens	94.86 (5.81)	94.87 (5.81)	94.87 (5.81)
census demographics 2017 population foreign born or naturalized citizens	1.98 (2.56)	1.98 (2.56)	1.98 (2.56)
census demographics 2017 population foreign born non-citizens	3.16 (3.70)	3.15 (3.70)	3.15 (3.70)
census demographics 2017 White population alone persons	80.97 (16.75)	80.86 (16.82)	80.86 (16.82)
census demographics 2017 Black population alone persons	9.20 (14.34)	9.33 (14.49)	9.33 (14.49)
census demographics 2017 Asian population alone persons	1.64 (3.12)	1.64 (3.13)	1.64 (3.13)
census demographics 2017 population 15+ married and together	48.52 (7.08)	48.49 (7.09)	48.49 (7.09)
census demographics 2017 population 15+ married and separated	2.06 (1.06)	2.07 (1.06)	2.07 (1.06)
census demographics 2017 population 15+ married and absent	2.32 (1.18)	2.32 (1.18)	2.32 (1.18)
census demographics 2017 population 15+ widowed	7.25 (1.87)	7.26 (1.87)	7.26 (1.87)
census demographics 2017 population 15+ divorced	12.14 (2.49)	12.14 (2.48)	12.14 (2.48)
census demographics 2017 population 5+ speaking other IndoEuropean languages	1.72 (2.32)	1.72 (2.32)	1.72 (2.32)
census demographics 2017 population Veterans	10.25 (2.81)	10.25 (2.80)	10.25 (2.80)

Appendix C.1. Demographic second order variables, expressed as 2017 county per capita or per capita %, eligible for feature selection, for each outcome

<b>Log ER Visits (2,475)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
census demographics 2017 non Families Median Age years * census demographics 2017 other Families female head no husband present	335.14 (113.21)
census demographics 2017 population non Institutional living in group quarters* census demographics 2017 other Families female head no husband present	7.36 (14.87)
census demographics 2017 household head 85+ years* census demographics 2017 other Families female head no husband present	21.01 (8.42)
census demographics 2017 households with no vehicles* census demographics 2017 other Families female head no husband present	44.12 (44.52)
census demographics 2017 population 3+ enrolled in public graduate or professional schools* census demographics 2017 other Families female head no husband present	11.55 (11.52)
census demographics 2017 population 25+ with masters degree* census demographics 2017 other Families female head no husband present	31.00 (18.94)
census demographics 2017 population 25+ with professional degree* census demographics 2017 other Families female head no husband present	7.04 (5.88)
census demographics 2017 household income 100,000-124,999* census demographics 2017 other Families female head no husband present	52.56 (15.45)
census demographics 2017 other Families female head no husband present with children less than 18* census demographics 2017 other Families female head no husband present	24.67 (18.59)
census demographics 2017 population Urban* census demographics 2017 other Families female head no husband present	292.01 (220.86)
census demographics 2017 Asian Head household* census demographics 2017 other Families female head no husband present	7.47 (15.21)
census demographics 2017 Families 3 persons families * census demographics 2017 other Families female head no husband present	41.62 (17.48)
census demographics 2017 families under 25 years families* census demographics 2017 other Families female head no husband present	6.37 (3.92)
census demographics 2017 White Non-Hispanic households* census demographics 2017 other Families female head no husband present	2.29 (2.99)
census demographics 2017 Asian population alone* census demographics 2017 other Families female head no husband present	9.48 (17.14)
<b>Log IP Days (2,491)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
census demographics 2017 population living in group quarters* census demographics 2017 household Income Per Capita	5.70 (15.16)
census demographics 2017 population institutional living in group quarters* census demographics 2017 household Income Per Capita	4.01 (11.03)
census demographics 2017 population living in non-institutional group quarters* census demographics 2017 household Income Per Capita	1.68 (9.60)
census demographics 2017 households without vehicle* census demographics 2017 household Income Per Capita	9.94 (16.93)

census demographics 2017 households with 1 vehicle* census demographics 2017 household Income Per Capita	50.50 (79.81)
census demographics 2017 population 3+ in public grades 5-8* census demographics 2017 household Income Per Capita	30.73 (58.39)
census demographics 2017 population 3+ enrolled in public undergraduate schools* census demographics 2017 household Income Per Capita	16.78 (24.31)
census demographics 2017 population 3+ enrolled in public graduate schools* census demographics 2017 household Income Per Capita	2.80 (6.15)
census demographics 2017 population 25+ with professional degree* census demographics 2017 household Income Per Capita	1.55 (2.78)
census demographics 2017 households 1 person * census demographics 2017 household Income Per Capita	52.96 (95.18)
census demographics 2017 Female head of households* census demographics 2017 household Income Per Capita	59.42 (88.52)
census demographics 2017 Male head of Families* census demographics 2017 household Income Per Capita	83.22 (148.43)
census demographics 2017 Female head of non- Families* census demographics 2017 household Income Per Capita	30.16 (51.83)
census demographics 2017 Female head non- Families with no people less than 18* census demographics 2017 household Income Per Capita	30.21 (52.48)
census demographics 2017 Non families aged under 25 years households* census demographics 2017 household Income Per Capita	3.46 (6.15)
<b>Log Hospital Expenditures (2,491)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
census demographics 2017 population Non Institutional living in group quarters* census demographics 2017 Non Families head less than 25 years	5.92 (21.47)
census demographics 2017 household income per capita * census demographics 2017 Non Families head less than 25 years	3.46 (6.15)
census demographics 2017 household head 85+years* census demographics 2017 Non Families head less than 25 years	8.44 (7.59)
census demographics 2017 households with 5 people* census demographics 2017 Non Families head less than 25 years	13.29 (11.98)
census demographics 2017 Asian households* census demographics 2017 Non Families head less than 25 years	3.92 (11.30)
census demographics 2017 population density per square mile* census demographics 2017 Non Families head less than 25 years	0.83 (8.44)
census demographics 2017 population 25+years with professional degree* census demographics 2017 Non Families head less than 25 years	3.35 (6.05)
census demographics 2017 Non family 4 people households* census demographics 2017 Non Families head less than 25 years	1.39 (6.55)
census demographics 2017 households with 1 person* census demographics 2017 Non Families head less than 25 years	67.37 (71.41)
census demographics 2017 Non family 1 person households* census demographics 2017 Non Families head less than 25 years	67.37 (71.41)
census demographics 2017 White Non-Hispanic households* census demographics 2017 Non Families head less than 25 years	0.98 (1.75)

census demographics 2017 Asian population alone* census demographics 2017 Non Families head less than 25 years	4.85 (12.61)
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An \* is placed between 2 features to indicate interaction

Appendix D. Adult & child disease main effect variables, expressed as 2017 county per capita or per capita %, eligible for feature selection, for each outcome (N variables =146)

<b>Outcomes (Per Capita)</b>	<b>ER Visits (N=2475)</b>	<b>Inpatient Days (N=2491)</b>	<b>Hospital Expenditures (N=2491)</b>
<i>Variable Name</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>
health adults 2017 Aerobic exercise only inactive count of households persons	30.49 (1.22)	30.49 (1.23)	30.49 (1.23)
health adults 2017 Aerobic exercise only insufficiently active count of households persons	19.71 (0.25)	19.71 (0.25)	19.71 (0.25)
health adults 2017 Aerobic exercise only sufficiently active count of households persons	48.21 (1.28)	48.20 (1.28)	48.20 (1.28)
health adults 2017 Aerobic and strength exercise requirements neither met count of households persons	46.79 (1.13)	46.80 (1.13)	46.80 (1.13)
health adults 2017 Aerobic and strength exercise met muscle only count of households persons	3.45 (0.07)	3.45 (0.07)	3.45 (0.07)
health adults 2017 Aerobic and strength exercise met aerobic only count of households persons	27.60 (0.78)	27.60 (0.79)	27.60 (0.79)
health adults 2017 Aerobic and strength met both count of households persons	20.51 (0.82)	20.51 (0.82)	20.51 (0.82)
health adults 2017 Serious psychological distress count of households persons	3.50 (0.29)	3.50 (0.29)	3.50 (0.29)
health adults 2017 Hospital or ER count of households persons	0.89 (0.11)	0.89 (0.12)	0.89 (0.12)
health adults 2017 Hospital outpatient department count of households persons	1.00 (0.11)	1.00 (0.11)	1.00 (0.11)
health adults 2017 Has unmet dental needs due to cost count of households persons	10.98 (0.84)	10.99 (0.84)	10.99 (0.84)
health adults 2017 Does not have unmet dental need due to cost count of households persons	88.01 (1.07)	88.01 (1.07)	88.01 (1.07)
health adults 2017 All types heart disease count of households persons	12.43 (0.97)	12.43 (0.96)	12.43 (0.96)
health adults 2017 Chronic bronchitis count of households persons	3.91 (0.14)	3.91 (0.14)	3.91 (0.14)
health adults 2017 Dental visit 6 months or less count of households persons	46.45 (2.07)	46.44 (2.08)	46.44 (2.08)
health adults 2017 Dental visit 6 month to less than 1 year count of households persons	15.94 (0.33)	15.95 (0.33)	15.95 (0.33)
health adults 2017 Dental visit within 1 year and less than 2 years count of households persons	12.16 (0.32)	12.16 (0.32)	12.16 (0.32)
health adults 2017 Dental visits between 2 years and less than 5 years count of households persons	10.97 (0.51)	10.97 (0.51)	10.97 (0.51)
health adults 2017 Dental visit within 5 years count of households persons	12.08 (0.99)	12.08 (0.99)	12.08 (0.99)

health adults 2017 HIV ever tested count of households persons	35.72 (1.79)	35.73 (1.80)	35.73 (1.80)
health adults 2017 HIV never tested count of households persons	58.95 (1.95)	58.94 (1.95)	58.94 (1.95)
health adults 2017 Any cancer count of households persons	9.49 (1.05)	9.49 (1.05)	9.49 (1.05)
health adults 2017 breast cancer count of households persons	1.72 (0.14)	1.72 (0.14)	1.72 (0.14)
health adults 2017 Cervical cancer count of households persons	0.44 (0.02)	0.44 (0.02)	0.44 (0.02)
health adults 2017 Prostate Cancer count of households persons	1.17 (0.14)	1.17 (0.14)	1.17 (0.14)
health adults 2017 Diabetes count of households persons	10.09 (0.81)	10.09 (0.80)	10.09 (0.80)
health adults 2017 Ulcers count of households persons	6.29 (0.26)	6.29 (0.26)	6.29 (0.26)
health adults 2017 kidney disease count of households persons	2.11 (0.19)	2.11 (0.19)	2.11 (0.19)
health adults 2017 Liver disease count of households persons	1.66 (0.07)	1.66 (0.07)	1.66 (0.07)
health adults 2017 Arthritis diagnosis count of households persons	24.12 (1.72)	24.12 (1.72)	24.12 (1.72)
health adults 2017 Coronary heart disease count of households persons	6.60 (0.67)	6.60 (0.67)	6.60 (0.67)
health adults 2017 Chronic joint symptoms count of households persons	30.93 (1.31)	30.92 (1.30)	30.92 (1.30)
health adults 2017 Migraines or severe headaches count of households persons	14.93 (0.25)	14.93 (0.25)	14.93 (0.25)
health adults 2017 Pain in neck count of households persons	16.30 (0.25)	16.30 (0.25)	16.30 (0.25)
health adults 2017 Pain in lo wither back count of households persons	30.28 (0.58)	30.28 (0.58)	30.28 (0.58)
health adults 2017 Pain in face or ja with count of households persons	4.20 (0.06)	4.19 (0.06)	4.19 (0.06)
health adults 2017 Hearing trouble count of households persons	16.18 (1.15)	16.18 (1.15)	16.18 (1.15)
health adults 2017 Vision trouble count of households persons	9.64 (0.35)	9.64 (0.35)	9.64 (0.35)
health adults 2017 Absence of all natural teeth count of households persons	7.68 (0.69)	7.68 (0.69)	7.68 (0.69)
health adults 2017 sadness all or most of the time count of households persons	2.89 (0.23)	2.89 (0.23)	2.89 (0.23)
health adults 2017 Sadness some of the time count of households persons	8.30 (0.39)	8.30 (0.39)	8.30 (0.39)
health adults 2017 Hypertension count of households persons	28.41 (1.98)	28.41 (1.97)	28.41 (1.97)
health adults 2017 Hopelessness all or most of the time count of households persons	2.05 (0.16)	2.05 (0.16)	2.05 (0.16)
health adults 2017 Hopelessness some of the time count of households persons	4.90 (0.28)	4.90 (0.28)	4.90 (0.28)



health adults 2017 worthlessness all or most of the time count of households persons	1.76 (0.16)	1.76 (0.16)	1.76 (0.16)
health adults 2017 worthlessness some of the time count of households persons	3.75 (0.22)	3.76 (0.22)	3.76 (0.22)
health adults 2017 Everything effort all or most of the time count of households persons	6.51 (0.39)	6.51 (0.39)	6.51 (0.39)
health adults 2017 Everything effort some of the time count of households persons	9.92 (0.22)	9.92 (0.22)	9.92 (0.22)
health adults 2017 Nervousness all or most of the time count of households persons	5.01 (0.20)	5.01 (0.20)	5.01 (0.20)
health adults 2017 Nervousness some of the time count of households persons	12.73 (0.14)	12.73 (0.14)	12.73 (0.14)
health adults 2017 Restlessness all of most of the time count of households persons	6.43 (0.27)	6.43 (0.28)	6.43 (0.28)
health adults 2017 Restlessness some of the time count of households persons	12.64 (0.20)	12.64 (0.20)	12.64 (0.20)
health adults 2017 Stroke count of households persons	2.83 (0.25)	2.83 (0.25)	2.83 (0.25)
health adults 2017 Cannot so any physical activity count of households persons	16.99 (1.12)	16.99 (1.12)	16.99 (1.12)
health adults 2017 Cannot walk quarter mile count of households persons	7.76 (0.61)	7.76 (0.61)	7.76 (0.61)
health adults 2017 Cannot Climb 10steps without rest count of households persons	5.66 (0.47)	5.66 (0.47)	5.66 (0.47)
health adults 2017 Cannot stand 2hrs count of households persons	10.60 (0.78)	10.60 (0.78)	10.60 (0.78)
health adults 2017 Cannot sit 2hrs count of households persons	3.54 (0.25)	3.54 (0.25)	3.54 (0.25)
health adults 2017 Cannot stoop,bend or kneel count of households persons	9.91 (0.71)	9.91 (0.71)	9.91 (0.71)
health adults 2017 Cannot reach overhead count of households persons	2.65 (0.20)	2.65 (0.20)	2.65 (0.20)
health adults 2017 Cannot do thing with hand or small objects count of households persons	2.01 (0.16)	2.02 (0.16)	2.02 (0.16)
health adults 2017 Cannot carry 10lbs count of households persons	4.66 (0.36)	4.66 (0.36)	4.66 (0.36)
health adults 2017 Cannot push or pull large objects count of households persons	6.74 (0.48)	6.74 (0.48)	6.74 (0.48)
health adults 2017 Emphysema count of households persons	1.57 (0.15)	1.57 (0.15)	1.57 (0.15)
health adults 2017 Health Status excellent or very good count of households persons	59.71 (1.72)	59.71 (1.72)	59.71 (1.72)
health adults 2017 Health status good count of households persons	27.09 (0.67)	27.10 (0.67)	27.10 (0.67)
health adults 2017 Health status fair or poor count of households persons	13.19 (0.89)	13.20 (0.90)	13.20 (0.90)
health adults 2017 Ever had asthma count of households persons	12.70 (0.24)	12.70 (0.24)	12.70 (0.24)
health adults 2017 All current smokers count of households persons	15.38 (0.69)	15.39 (0.69)	15.39 (0.69)

health adults 2017 Every day smokers count of households persons	11.74 (0.62)	11.74 (0.62)	11.74 (0.62)
health adults 2017 Some day smokers count of households persons	3.64 (0.09)	3.64 (0.09)	3.64 (0.09)
health adults 2017 Former smokers count of households persons	22.62 (1.09)	22.62 (1.09)	22.62 (1.09)
health adults 2017 Non smokers count of households persons	62.15 (1.05)	62.15 (1.04)	62.15 (1.04)
health adults 2017 Alcohol lifetime abstainer count of households persons	19.87 (0.86)	19.87 (0.87)	19.87 (0.87)
health adults 2017 Alcohol former user infrequent count of households persons	8.72 (0.40)	8.72 (0.40)	8.72 (0.40)
health adults 2017 Alcohol former regular user count of households persons	5.74 (0.28)	5.74 (0.28)	5.74 (0.28)
health adults 2017 Still have asthma count of households persons	7.67 (0.16)	7.67 (0.16)	7.67 (0.16)
health adults 2017 Alcohol current infrequent user count of households persons	13.08 (0.12)	13.08 (0.12)	13.08 (0.12)
health adults 2017 Alcohol current regular user count of households persons	51.11 (1.35)	51.10 (1.36)	51.10 (1.36)
health adults 2017 Underweight BMI count of households persons	1.80 (0.04)	1.80 (0.04)	1.80 (0.04)
health adults 2017 Hay fever count of households persons	8.34 (0.20)	8.34 (0.20)	8.34 (0.20)
health adults 2017 Healthy BMI count of households persons	32.92 (0.81)	32.92 (0.81)	32.92 (0.81)
health adults 2017 Overweight BMI count of households persons	32.73 (0.29)	32.73 (0.29)	32.73 (0.29)
health adults 2017 Obese BMI count of households persons	29.18 (1.19)	29.19 (1.19)	29.19 (1.19)
health adults 2017 All without usual healthcare count of households persons	13.42 (0.54)	13.42 (0.54)	13.42 (0.54)
health adults 2017 All with usual healthcare count of households persons	85.79 (0.62)	85.79 (0.62)	85.79 (0.62)
health adults 2017 Regular healthcare with doctor or HMO count of households persons	62.65 (1.06)	62.65 (1.06)	62.65 (1.06)
health adults 2017 Regular healthcare at clinic or healthcare center count of households persons	19.68 (0.60)	19.68 (0.61)	19.68 (0.61)
health adults 2017 Regular healthcare some other place count of households persons	0.91 (0.02)	0.91 (0.02)	0.91 (0.02)
health adults 2017 No doctor visit within 12 months count of households persons	17.34 (0.51)	17.34 (0.51)	17.34 (0.51)
health adults 2017 Sinusitis count of households persons	12.29 (0.27)	12.29 (0.27)	12.29 (0.27)
health adults 2017 1 doctor visit within 12 months count of households persons	16.97 (0.35)	16.97 (0.35)	16.97 (0.35)
health adults 2017 2-3 doctor visits within 12 months count of households persons	26.23 (0.46)	26.23 (0.46)	26.23 (0.46)
health adults 2017 4-9 doctors visits within 12 months count of households persons	23.79 (0.59)	23.79 (0.59)	23.79 (0.59)

health adults 2017 10+ doctors visits within 12 months count of households persons	13.98 (0.36)	13.98 (0.36)	13.98 (0.36)
health adults 2017 Doctor visit within last 6 months count of households persons	68.91 (0.95)	68.91 (0.95)	68.91 (0.95)
health adults 2017 Doctor visits between 6 months less than 1 year count of households persons	13.64 (0.36)	13.64 (0.36)	13.64 (0.36)
health adults 2017 Doctor visit more than 1 year less than 2 years count of households persons	7.51 (0.31)	7.51 (0.31)	7.51 (0.31)
health adults 2017 Doctor visit more than 2 years less than 5 years count of households persons	4.49 (0.13)	4.49 (0.13)	4.49 (0.13)
health adults 2017 Doctor visit more than 5 years count of households persons	2.75 (0.08)	2.75 (0.08)	2.75 (0.08)
health adults 2017 Never had a doctor's visit count of households persons	1.02 (0.05)	1.02 (0.05)	1.02 (0.05)
health children 2017 No missing school days among school aged population count of households persons	26.60 (1.55)	26.62 (1.57)	26.62 (1.57)
health children 2017 1-2 missed school days among school aged population count of households persons	29.18 (0.26)	29.18 (0.26)	29.18 (0.26)
health children 2017 3-5 missed school days among school aged population count of households persons	24.25 (0.06)	24.25 (0.06)	24.25 (0.06)
health children 2017 6-10 missed school days among school aged population count of households persons	9.64 (0.11)	9.64 (0.12)	9.64 (0.12)
health children 2017 11+ school days missed among school aged population count of households persons	4.10 (0.07)	4.10 (0.07)	4.10 (0.07)
health children 2017 Not enrolled in school among school aged population count of households persons	0.52 (0.03)	0.52 (0.03)	0.52 (0.03)
health children 2017 no ER visit within past 12 months count of households persons	82.58 (0.49)	82.57 (0.49)	82.57 (0.49)
health children 2017 with 1 ER visits past 12 months count of households persons	11.52 (0.25)	11.53 (0.25)	11.53 (0.25)
health children 2017 2+ ER visits in past 12 months count of households persons	5.38 (0.28)	5.38 (0.28)	5.38 (0.28)
health children 2017 in special education count of households persons	7.86 (0.08)	7.86 (0.08)	7.86 (0.08)
health children 2017 ever told had asthma count of households persons	12.97 (0.28)	12.97 (0.28)	12.97 (0.28)
health children 2017 still have asthma count of households persons	8.36 (0.37)	8.36 (0.38)	8.36 (0.38)
health children 2017 with hay fever count of households persons	8.39 (0.12)	8.39 (0.12)	8.39 (0.12)
health children 2017 with respiratory allergies count of households persons	10.12 (0.12)	10.12 (0.12)	10.12 (0.12)
health children 2017 with food allergies count of households persons	5.76 (0.08)	5.76 (0.08)	5.76 (0.08)
health children 2017 with skin allergies count of households persons	11.91 (0.40)	11.91 (0.40)	11.91 (0.40)
health children 2017 population 3-17 with learning disabilities count of households persons	7.27 (0.14)	7.27 (0.14)	7.27 (0.14)
health children 2017 population 3-17 with ADHD count of households persons	9.52 (0.17)	9.52 (0.17)	9.52 (0.17)

health children 2017 year with prescribed medication for at least 3 months count of households persons	13.21 (0.20)	13.21 (0.20)	13.21 (0.20)
health children 2017 Health status respondent assessed as excellent count of households persons	57.94 (1.09)	57.94 (1.09)	57.94 (1.09)
health children 2017 Health status respondent assessed as very good count of households persons	25.25 (0.17)	25.25 (0.17)	25.25 (0.17)
health children 2017 Health status respondent assessed as good count of households persons	13.45 (0.90)	13.46 (0.90)	13.46 (0.90)
health children 2017 Health status respondent assessed as fair or poor count of households persons	1.74 (0.14)	1.74 (0.14)	1.74 (0.14)
health children 2017 All without usual healthcare count of households persons	3.98 (0.17)	3.98 (0.17)	3.98 (0.17)
health children 2017 All with usual healthcare count of households persons	95.91 (0.16)	95.91 (0.16)	95.91 (0.16)
health children 2017 All persons with usual healthcare at clinic count of households persons	24.13 (1.71)	24.13 (1.71)	24.13 (1.71)
health children 2017 All persons with usual healthcare at doctor office count of households persons	70.04 (2.12)	70.03 (2.12)	70.03 (2.12)
health children 2017 All persons with usual healthcare at ER count of households persons	0.43 (0.07)	0.43 (0.07)	0.43 (0.07)
health children 2017 All persons with usual healthcare at hospital outpatient count of households persons	0.72 (0.08)	0.72 (0.08)	0.72 (0.08)
health children 2017 All persons with usual healthcare at other facility count of households persons	0.28 (0.07)	0.28 (0.07)	0.28 (0.07)
health children 2017 Doctor visit within 6months or less count of households persons	76.33 (0.19)	76.33 (0.19)	76.33 (0.19)
health children 2017 Doctor visit more than 6 months less than 1 year count of households persons	15.77 (0.10)	15.77 (0.10)	15.77 (0.10)
health children 2017 Doctor visit more than 1 year less than 2 years count of households persons	4.35 (0.07)	4.35 (0.07)	4.35 (0.07)
health children 2017 Doctor visit more than 2 years less than 5 years count of households persons	0.95 (0.03)	0.95 (0.03)	0.95 (0.03)
health children 2017 Doctor visit more than 5 years count of households persons	1.69 (0.09)	1.69 (0.09)	1.69 (0.09)
health children 2017 Uninsured for healthcare count of households persons	4.46 (0.18)	4.46 (0.18)	4.46 (0.18)
health children 2017 Unmet medical need count of households persons	1.40 (0.09)	1.40 (0.09)	1.40 (0.09)
health children 2017 Delayed care due to cost count of households persons	2.37 (0.09)	2.37 (0.09)	2.37 (0.09)
health children 2017 Children 2-17 years with unmet dental need count of households persons	4.14 (0.17)	4.14 (0.17)	4.14 (0.17)
health children 2017 Children 2-17years no unmet dental need count of households persons	94.95 (0.13)	94.95 (0.13)	94.95 (0.13)
health children 2017 Children 2 17years with dental visit within last 6months count of households persons	66.84 (0.37)	66.84 (0.37)	66.84 (0.37)
health children 2017 Children 2-17years with dental visit more than 6 months less than 1 year count of households persons	16.61 (0.32)	16.61 (0.32)	16.61 (0.32)
health children 2017 Children 2-17years dental visit more than 1 year less than 2 years count of households persons	5.36 (0.15)	5.36 (0.15)	5.36 (0.15)

health children 2017 Children 2-17years dental visit more than 2 years less than 5 years count of households persons	1.96 (0.06)	1.96 (0.06)	1.96 (0.06)
health children 2017 Children 2-17years dental visit more than 5 years count of households persons	1994.18 (6000.49)	1984.88 (5982.39)	1984.88 (5982.39)

Children aged less than 18 years unless otherwise indicated  
Adults aged 18+ years

Appendix D.1. Adult & Child Disease second order variables, expressed as 2017 county per capita or per capita %, eligible for feature selection, for each outcome

<b>Log ER Visits (2,475)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
health adults 2017 Aerobic exercise only insufficiently active count of households persons*health children 2017 dental visits more than 5 years count of households persons	39640.24 (120857.87)
health adults 2017 Alcohol lifetime abstainer count of households persons *health children 2017 dental visits more than 5 years count of households persons	40522.99 (126770.19)
health adults 2017 Alcohol current infrequent user count of households persons*health children 2017 dental visits more than 5 years count of households persons	26035.16 (78333.81)
health children 2017 Hay fever count of households persons *health children 2017 dental visits more than 5 years count of households persons	16688.88 (50100.51)
health adults 2017 Overweight BMI count of households persons*health children 2017 dental visits more than 5 years count of households persons	65203.07 (196564.58)
health children 2017 11+ missed school days among school aged population* health children 2017 dental visits more than 5 years	8049.99 (24162.24)
health children 2017 No ER visit last 12 months count of households persons *health children 2017 dental visits more than 5 years count of households persons	164920.75 (496660.77)
health children 2017 2+ ER visits in past 12 months count of households persons *health children 2017 dental visits more than 5 years count of households persons	10461.64 (31353.39)
health children 2017 prescribed medication for at least 3 months count of households persons*health children 2017 dental visits more than 5 years count of households persons	26172.15 (78427.54)
health children 2017 Health status respondent assessed fair or poor count of households persons*health children 2017 dental visits more than 5 years count of households persons	3324.72 (9960.50)
health children 2017 All persons with usual healthcare at ER count of households persons *health children 2017 dental visits more than 5 years count of households persons	847.93 (2532.67)
health children 2017 Doctor visit more than 2 years less than 5 years count of households persons*health children 2017 dental visits more than 5 years count of households persons	1845.43 (5532.06)
health children 2017 Doctor visit more than 1 year less than 2 years count of households persons*health children 2017 dental visits more than 5 years count of households persons	8535.48 (25591.10)
health children 2017 Uninsured for healthcare count of households persons *health children 2017 dental visits more than 5 years count of households persons	8552.85 (25534.90)
health children 2017 Delayed care due to cost *health children 2017 dental visits more than 5 years	4570.19 (13641.73)
<b>Log IP Days (2,491)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
health adults 2017 Aerobic exercise only insufficiently active count of households persons*health children 2017 dental visits more than 5 years count of households persons	39454.95 (120492.82)
health adults 2017 Aerobic and strength exercise met aerobic only count of households persons *health children 2017 dental visits more than 5 years count of households persons	55714.84 (171375.76)
health adults 2017 Alcohol current infrequent user count of households persons *health children 2017 dental visits more than 5 years count of households persons	25914.05 (78097.46)
health adults 2017 Underweight BMI count of households persons*health children 2017 dental visits more than 5 years count of households persons	3681.33 (11500.98)

health adults 2017 Overweight BMI count of households persons*health children 2017 dental visits more than 5 years count of households persons	64898.58 (195971.61)
health adults 2017 Regular healthcare some other place count of households persons *health children 2017 dental visits more than 5 years count of households persons	1809.41 (5457.93)
health adults 2017 Never had doctor visit count of households persons*health children 2017 dental visits more than 5 years count of households persons	1968.61 (5956.28)
health children 2017 3-5 missed school days aged 5 17 count of households persons*health children 2017 dental visits more than 5 years count of households persons	48100.81 (144876.78)
health children 2017 6-10 missed school days aged 5 17 count of households persons*health children 2017 dental visits more than 5 years count of households persons	19040.24 (57250.43)
health children 2017 2+ ER visits past 12 months count of households persons*health children 2017 dental visits more than 5 years count of households persons	10413.82 (31258.63)
health children 2017 still have asthma count of households persons*health children 2017 dental visits more than 5 years count of households persons	16708.54 (50211.73)
health children 2017 with skin allergies count of households persons*health children 2017 dental visits more than 5 years count of households persons	23892.52 (72017.84)
health children 2017 Doctor visit more than 1 year less than 2 years count of households persons *health children 2017 dental visits more than 5 years count of households persons	8495.84 (25513.91)
health children 2017 Doctor visit more than 5 years count of households persons *health children 2017 dental visits more than 5 years count of households persons	3319.40 (10100.16)
health children 2017 no unmet dental needs count of households persons*health children 2017 dental visits more than 5 years count of households persons	188593.41 (568466.65)
<b>Log Hospital Expenditures (2,491)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
health adults 2017 HIV ever tested count of households persons*health children 2017 dental visits more than 5 years count of households persons	73352.55 (226145.99)
health adults 2017 Cervical cancer count of households persons*health children 2017 dental visits more than 5 years count of households persons	857.87 (2556.77)
health adults 2017 Kidney disease count of households persons*health children 2017 dental visits more than 5 years count of households persons	3825.31 (11125.88)
health adults 2017 Ever had asthma count of households persons*health children 2017 dental visits more than 5 years count of households persons	25293.54 (76561.12)
health adults 2017 Still have asthma count of households persons *health children 2017 dental visits more than 5 years count of households persons	15208.90 (45922.96)
health adults 2017 Underweight BMI count of households persons*health children 2017 dental visits more than 5 years count of households persons	3681.33 (11500.98)
health adults 2017 Obese BMI count of households persons*health children 2017 dental visits more than 5 years count of households persons	57875.55 (173837.77)
health adults 2017 Regular healthcare some other place count of households persons*health children 2017 dental visits more than 5 years count of households persons	1809.41 (5457.93)
health children 2017 3-5 missed school days aged 5 17 count of households persons*health children 2017 dental visits more than 5 years count of households persons	48100.81 (144876.78)
health children 2017 with respiratory allergies count of households persons*health children 2017 dental visits more than 5 years count of households persons	20011.37 (60100.75)
health children 2017 Children 3-17 with ADHD count of households persons*health children 2017 dental visits more than 5 years count of households persons	18807.38 (56400.12)
health children 2017 Doctor visit more than 6 months less than 1 year count of households persons*health children 2017 dental visits more than 5 years count of households persons	31303.56 (94306.19)

health children 2017 Doctor visit more than 5 years count of households persons*health children 2017 dental visits more than 5 years count of households persons	3319.40 (10100.16)
health children 2017 Delayed care due to cost count of households persons *health children 2017 dental visits more than 5 years count of households persons	4549.12 (13600.57)
health children 2017 Children 2-17years dental visit less than 6 months count of households persons*health children 2017 dental visits more than 5 years count of households persons	133059.37 (401132.97)

Children aged less than 18 years unless otherwise indicated

Adults aged 18+ years

An \* is placed between 2 features to indicate interaction



Appendix E. Community characteristics main effect variables, expressed as 2017 county per capita or per capita percent, eligible for feature selection, for each outcome (N variables =151)

<b>Outcome (Per Capita)</b>	<b>ER Visits (N=2475)</b>	<b>Inpatient Days (N=2491)</b>	<b>Hospital Expenditures (N=2491)</b>
<i>Variable Name</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>
census employment 2017 Employee uses own car, truck or van to commute to work empl 16 persons	46.01 (7.04)	46.02 (7.04)	46.02 (7.04)
census employment 2017 Own car, truck or van to commute to work alone empl 16 persons	40.37 (6.67)	40.37 (6.67)	40.37 (6.67)
census employment 2017 Own car, truck or van_ to commute to work in carpool empl 16 persons	5.65 (1.62)	5.64 (1.62)	5.64 (1.62)
census employment 2017 Public transportation to commute to work empl 16 persons	0.64 (1.96)	0.64 (1.96)	0.64 (1.96)
census employment 2017 Bus or trolley bus to commute to work empl 16 persons	0.46 (0.95)	0.46 (0.95)	0.46 (0.95)
census employment 2017 Streetcar or trolley car to commute to work empl 16 persons	0.01 (0.05)	0.01 (0.05)	0.01 (0.05)
census employment 2017 Subway or elevated train to commute to work empl 16 persons	0.10 (1.18)	0.10 (1.17)	0.10 (1.17)
census employment 2017 Railroad to commute to work empl 16 persons	0.05 (0.34)	0.05 (0.34)	0.05 (0.34)
census employment 2017 Ferry to commute to work empl 16 persons	0.01 (0.09)	0.01 (0.09)	0.01 (0.09)
census employment 2017 Taxi to commute to work empl 16 persons	0.04 (0.13)	0.04 (0.13)	0.04 (0.13)
census employment 2017 Own motorcycle to commute to work empl 16 persons	0.12 (0.12)	0.12 (0.12)	0.12 (0.12)
census employment 2017 Own bicycle to commute to work empl 16 persons	0.23 (0.42)	0.23 (0.42)	0.23 (0.42)
census employment 2017 Walked to work as commute empl 16 persons	1.76 (1.55)	1.75 (1.54)	1.75 (1.54)
census employment 2017 Other transportation to commute to work empl 16 persons	0.52 (0.54)	0.52 (0.53)	0.52 (0.53)
census employment 2017 Employee works at home empl 16 persons	2.54 (1.66)	2.53 (1.65)	2.53 (1.65)
census employment 2017 Employee travel time less than 15 min empl 16 persons	19.57 (7.85)	19.54 (7.85)	19.54 (7.85)
census employment 2017 Employee travel time between 15-.29 min empl 16 persons	15.15 (4.85)	15.15 (4.85)	15.15 (4.85)
census employment 2017 Employee travel time between 30-59 min empl 16 persons	10.97 (4.68)	10.99 (4.69)	10.99 (4.69)
census employment 2017 Employee travel time between 60-89 min empl 16 persons	2.34 (1.61)	2.34 (1.61)	2.34 (1.61)
census employment 2017 Employee travel time 90 min empl 16 persons	1.29 (0.81)	1.29 (0.81)	1.29 (0.81)

census employment 2017 Employment Potential pop 16 persons	98.34 (0.28)	98.34 (0.28)	98.34 (0.28)
census employment 2017 Employed civilian males pop 16 persons	27.51 (4.61)	27.50 (4.61)	27.50 (4.61)
census employment 2017 Employed civilian females pop 16 persons	24.35 (3.79)	24.35 (3.79)	24.35 (3.79)
census employment 2017 Employed armed forces male pop 16 persons	0.30 (1.48)	0.30 (1.47)	0.30 (1.47)
census employment 2017 Employed armed forces female pop 16 persons	0.05 (0.20)	0.05 (0.20)	0.05 (0.20)
census employment 2017 Unemployed males pop 16 persons	1.38 (0.38)	1.38 (0.38)	1.38 (0.38)
census employment 2017 Unemployed females pop 16 persons	1.23 (0.35)	1.23 (0.35)	1.23 (0.35)
census employment 2017 Not in the labor force males pop 16 persons	19.58 (5.16)	19.58 (5.16)	19.58 (5.16)
census employment 2017 Not in the labor force female pop 16 persons	23.94 (3.83)	23.95 (3.83)	23.95 (3.83)
census employment 2017 Employed civilian total pop 16 persons	51.86 (7.75)	51.85 (7.75)	51.85 (7.75)
census employment 2017 Employed in agriculture forestry fishing and hunting pop 16 persons	2.43 (3.06)	2.42 (3.05)	2.42 (3.05)
census employment 2017 Employed in mining quarrying and oil and gas extraction pop 16 persons	0.84 (1.95)	0.84 (1.94)	0.84 (1.94)
census employment 2017 Employed in construction pop 16 persons	3.62 (1.23)	3.62 (1.23)	3.62 (1.23)
census employment 2017 Employed in manufacturing pop 16 persons	6.21 (3.64)	6.21 (3.64)	6.21 (3.64)
census employment 2017 Employed in wholesale trade pop 16 persons	1.31 (0.65)	1.31 (0.65)	1.31 (0.65)
census employment 2017 Employed in retail trade pop 16 persons	5.97 (1.40)	5.97 (1.41)	5.97 (1.41)
census employment 2017 Employed in transportation and warehousing pop 16 persons	2.14 (0.91)	2.14 (0.91)	2.14 (0.91)
census employment 2017 Employed in utilities pop 16 persons	0.65 (0.54)	0.65 (0.54)	0.65 (0.54)
census employment 2017 Employed in information pop 16 persons	0.82 (0.49)	0.82 (0.49)	0.82 (0.49)
census employment 2017 Employed in finance and insurance pop 16 persons	1.85 (1.03)	1.85 (1.03)	1.85 (1.03)
census employment 2017 Employed in real estate and rental and leasing pop 16 persons	0.69 (0.46)	0.69 (0.46)	0.69 (0.46)
census employment 2017 Employed in professional scientific and technical services pop 16 persons	1.97 (1.59)	1.97 (1.58)	1.97 (1.58)
census employment 2017 Employed in management of companies and enterprises pop 16 persons	0.03 (0.06)	0.03 (0.06)	0.03 (0.06)
census employment 2017 Employed in administrative and support and waste mgt services pop 16 persons	1.63 (0.72)	1.64 (0.72)	1.64 (0.72)
census employment 2017 Employed in educational services pop 16 persons	4.90 (1.90)	4.90 (1.90)	4.90 (1.90)
census employment 2017 Employed in healthcare and social assistance pop 16 persons	7.15 (1.86)	7.15 (1.86)	7.15 (1.86)
census employment 2017 Employed in arts entertainment and recreation pop 16 persons	0.92 (0.80)	0.92 (0.80)	0.92 (0.80)

census employment 2017 Employed in accommodation and food services pop 16 persons	3.37 (1.44)	3.37 (1.44)	3.37 (1.44)
census employment 2017 Employed in other services pop 16 persons	2.50 (0.71)	2.50 (0.71)	2.50 (0.71)
census employment 2017 Employed in public administration pop 16 persons	2.83 (1.49)	2.84 (1.49)	2.84 (1.49)
census employment 2017 Occupation management, business and financial operations pop 16 persons	6.78 (2.84)	6.77 (2.83)	6.77 (2.83)
census employment 2017 Occupation professional and related pop 16 persons	9.68 (3.02)	9.68 (3.02)	9.68 (3.02)
census employment 2017 Occupation sales and office pop 16 persons	11.50 (2.45)	11.50 (2.45)	11.50 (2.45)
census employment 2017 Occupation service pop 16 persons	9.54 (1.91)	9.54 (1.91)	9.54 (1.91)
census employment 2017 Occupation farming, fishing and forestry pop 16 persons	1.00 (1.24)	1.00 (1.24)	1.00 (1.24)
census employment 2017 Occupation construction, extraction and maintenance pop 16 persons	5.41 (1.85)	5.41 (1.85)	5.41 (1.85)
census employment 2017 Occupation production, transportation and material moving pop 16 persons	7.95 (2.97)	7.96 (2.97)	7.96 (2.97)
census employment 2017 employed white collar job pop 16 persons	27.96 (6.78)	27.95 (6.78)	27.95 (6.78)
census employment 2017 Employed blue collar job pop 16 persons	13.36 (3.70)	13.36 (3.70)	13.36 (3.70)
census employment 2017 Employed in private for profit wage and salary workers pop 16 persons	32.51 (6.60)	32.50 (6.60)	32.50 (6.60)
census employment 2017 Employed private for profit wage and salary workers self pop 16 persons	1.88 (0.94)	1.88 (0.94)	1.88 (0.94)
census employment 2017 Employed private not for profit wage and salary workers pop 16 persons	4.12 (1.81)	4.11 (1.81)	4.11 (1.81)
census employment 2017 Employed local government workers pop 16 persons	4.44 (1.67)	4.44 (1.67)	4.44 (1.67)
census employment 2017 Employed state government workers pop 16 persons	3.18 (1.87)	3.19 (1.87)	3.19 (1.87)
census employment 2017 Employed federal government workers pop 16 persons	1.42 (1.43)	1.42 (1.42)	1.42 (1.42)
census employment 2017 Employed self-employed workers in own not incorporated business pop 16 persons	4.17 (2.20)	4.16 (2.20)	4.16 (2.20)
census employment 2017 Employed unpaid family workers pop 16 persons	0.14 (0.21)	0.14 (0.21)	0.14 (0.21)
census housing units 2017 House median year built count year	1975.47 (10.94)	1975.48 (10.92)	1975.48 (10.92)
census housing units 2017 House median year moved In count year	2002.42 (1.04)	2002.42 (1.04)	2002.42 (1.04)
census housing units 2017 House median rent count	534.03 (200.92)	533.80 (200.72)	533.80 (200.72)
census housing units 2017 House median value owner households count	136327.77 (80977.73)	136245.36 (80842.33)	136245.36 (80842.33)
census housing units 2017 House heating fuel utility gas count housing units	32.06 (20.52)	32.03 (20.51)	32.03 (20.51)

census housing units 2017 House heating fuel bottled tank or LP gas count housing units	0.17 (0.41)	0.17 (0.41)	0.17 (0.41)
census housing units 2017 House heating fuel electricity count housing units	32.29 (19.80)	32.37 (19.80)	32.37 (19.80)
census housing units 2017 House heating fuel fuel oil, kerosene etc. count housing units	4.03 (8.90)	4.02 (8.87)	4.02 (8.87)
census housing units 2017 House heating fuel coal or coke count housing units	0.17 (0.71)	0.17 (0.71)	0.17 (0.71)
census housing units 2017 House heating fuel wood count housing units	4.19 (4.87)	4.18 (4.85)	4.18 (4.85)
census housing units 2017 House heating fuel solar energy count housing units	0.04 (0.12)	0.03 (0.12)	0.03 (0.12)
census housing units 2017 House heating fuel other fuel count housing units	0.64 (0.76)	0.64 (0.75)	0.64 (0.75)
census housing units 2017 House heating fuel no fuel used count housing units	0.38 (2.35)	0.38 (2.34)	0.38 (2.34)
census housing units 2017 Houses occupied count housing units	83.96 (9.47)	83.98 (9.45)	83.98 (9.45)
census housing units 2017 Houses vacant count housing units	16.04 (9.47)	16.02 (9.45)	16.02 (9.45)
census housing units 2017 House vacant units for rent count housing units	2.81 (1.18)	2.81 (1.19)	2.81 (1.19)
census housing units 2017 House vacant units rented not occupied count housing units	0.17 (0.16)	0.17 (0.16)	0.17 (0.16)
census housing units 2017 House vacant units for sale count housing units	1.44 (0.52)	1.44 (0.52)	1.44 (0.52)
census housing units 2017 House vacant units sold not occupied count housing units	0.46 (0.33)	0.46 (0.33)	0.46 (0.33)
census housing units 2017 House vacant units seasonal recreational or occasional use count housing units	6.25 (8.89)	6.22 (8.86)	6.22 (8.86)
census housing units 2017 House vacant units for migrant workers count housing units	0.05 (0.14)	0.05 (0.15)	0.05 (0.15)
census housing units 2017 House vacant units vacant other count housing units	4.87 (3.08)	4.87 (3.08)	4.87 (3.08)
census housing units 2017 House structure with 1 unit detached count housing units	59.12 (10.06)	59.14 (10.05)	59.14 (10.05)
census housing units 2017 House structure with 1 Unit attached count housing units	2.42 (3.32)	2.41 (3.31)	2.41 (3.31)
census housing units 2017 House structure with 2 units count housing units	2.44 (2.03)	2.44 (2.02)	2.44 (2.02)
census housing units 2017 House structure with 3-4 units count housing units	2.72 (1.79)	2.72 (1.79)	2.72 (1.79)
census housing units 2017 House structure with 5-9 units count housing units	2.58 (1.83)	2.59 (1.83)	2.59 (1.83)
census housing units 2017 House structure with 10-19 units count housing units	1.90 (1.99)	1.90 (1.99)	1.90 (1.99)
census housing units 2017 housing structure with 20-49 units count housing units	1.39 (1.54)	1.39 (1.54)	1.39 (1.54)
census housing units 2017 House structure with 50 units count housing units	1.23 (2.36)	1.23 (2.35)	1.23 (2.35)

census housing units 2017 House structure mobile home count housing units	10.04 (7.27)	10.06 (7.28)	10.06 (7.28)
census housing units 2017 House structure boat,RV, Van or other count housing units	0.09 (0.21)	0.09 (0.21)	0.09 (0.21)
census housing units 2017 House rent less than 250 count housing units	2.93 (2.17)	2.93 (2.17)	2.93 (2.17)
census housing units 2017 House rent 250-499 count housing units	7.88 (4.15)	7.87 (4.15)	7.87 (4.15)
census housing units 2017 House rent 500-749 count housing units	6.79 (4.37)	6.79 (4.37)	6.79 (4.37)
census housing units 2017 House rent 750-999 count housing units	2.62 (3.00)	2.62 (3.00)	2.62 (3.00)
census housing units 2017 House rent 1000-1249 count housing units	1.22 (1.95)	1.22 (1.94)	1.22 (1.94)
census housing units 2017 House rent 1250-1499 count housing units	0.65 (1.33)	0.64 (1.32)	0.64 (1.32)
census housing units 2017 House rent 1500-1999 count housing units	0.49 (1.24)	0.48 (1.24)	0.48 (1.24)
census housing units 2017 House rent 2000+ count housing units	0.32 (0.95)	0.32 (0.95)	0.32 (0.95)
census housing units 2017 House no cash rent count housing units	3.09 (1.78)	3.09 (1.78)	3.09 (1.78)
census housing units 2017 House owner households valued less than 10,000 count housing units	1.50 (1.10)	1.50 (1.10)	1.50 (1.10)
census housing units 2017 House owner households valued 10,000-14,999 count housing units	1.10 (0.84)	1.11 (0.84)	1.11 (0.84)
census housing units 2017 House owner households valued 15,000-19,999 count housing units	0.97 (0.78)	0.97 (0.78)	0.97 (0.78)
census housing units 2017 House owner household valued 20,000-24,999 count housing units	1.11 (0.95)	1.11 (0.95)	1.11 (0.95)
census housing units 2017 House owner households valued 25,000-29,999 count housing units	0.99 (0.89)	0.99 (0.89)	0.99 (0.89)
census housing units 2017 House owner households valued 30,000-34,999 count housing units	1.22 (1.06)	1.22 (1.06)	1.22 (1.06)
census housing units 2017 House owner households valued 35,000-39,999 count housing units	0.86 (0.77)	0.86 (0.77)	0.86 (0.77)
census housing units 2017 House owner households valued 40,000-49,999 count housing units	2.21 (1.71)	2.21 (1.71)	2.21 (1.71)
census housing units 2017 House owner households valued 50,000-59,999 count housing units	2.53 (1.73)	2.54 (1.74)	2.54 (1.74)
census housing units 2017 House owner households valued 60,000-69,999 count housing units	2.74 (1.79)	2.74 (1.78)	2.74 (1.78)
census housing units 2017 House owner households valued 70,000-79,999 count housing units	2.98 (1.73)	2.98 (1.73)	2.98 (1.73)
census housing units 2017 House owner households valued 80,000-89,999 count housing units	3.25 (1.71)	3.25 (1.71)	3.25 (1.71)
census housing units 2017 House owner households valued 90,000-99,999 count housing units	2.54 (1.35)	2.54 (1.35)	2.54 (1.35)
census housing units 2017 House owner households valued 100,000-124,999 count housing units	5.83 (2.38)	5.83 (2.37)	5.83 (2.37)

census housing units 2017 House owner households valued 125,000-149,999 count housing units	4.29 (2.08)	4.29 (2.08)	4.29 (2.08)
census housing units 2017 House owner households valued 150,000-174,999 count housing units	5.26 (2.21)	5.26 (2.21)	5.26 (2.21)
census housing units 2017 House owner households valued 175,000-199,999 count housing units	3.10 (1.72)	3.10 (1.72)	3.10 (1.72)
census housing units 2017 House owner households valued 200,000-249,999 count housing units	4.75 (2.64)	4.76 (2.65)	4.76 (2.65)
census housing units 2017 House owner households valued 250,000-299,999 count housing units	3.47 (2.46)	3.48 (2.47)	3.48 (2.47)
census housing units 2017 House owner households valued 300,000-399,999 count housing units	3.37 (3.18)	3.37 (3.18)	3.37 (3.18)
census housing units 2017 House owner households valued 400,000-499,999 count housing units	1.45 (1.86)	1.45 (1.86)	1.45 (1.86)
census housing units 2017 House owner households valued 500,000-749,999 count housing units	1.44 (2.20)	1.43 (2.20)	1.43 (2.20)
census housing units 2017 House owner households valued 750,000-999,999 count housing units	0.48 (0.93)	0.48 (0.93)	0.48 (0.93)
census housing units 2017 House owner households valued 1,000,000+ count housing units	0.56 (0.99)	0.56 (0.99)	0.56 (0.99)
census housing units 2017 House built 2010 or later count housing units	8.90 (3.87)	8.90 (3.87)	8.90 (3.87)
census housing units 2017 House built 2000-2009 count housing units	11.46 (6.15)	11.46 (6.14)	11.46 (6.14)
census housing units 2017 House built 1990-1999 count housing units	13.37 (5.36)	13.38 (5.36)	13.38 (5.36)
census housing units 2017 House built 1980-1989 count housing units	12.36 (4.60)	12.37 (4.60)	12.37 (4.60)
census housing units 2017 House built 1970-1979 count housing units	15.49 (3.82)	15.50 (3.82)	15.50 (3.82)
census housing units 2017 House built 1960-1969 count housing units	9.69 (3.22)	9.70 (3.22)	9.70 (3.22)
census housing units 2017 house built 1950-1959 count housing units	9.10 (4.00)	9.10 (4.00)	9.10 (4.00)
census housing units 2017 House built 1940-1949 count housing units	4.99 (2.45)	4.98 (2.45)	4.98 (2.45)
census housing units 2017 House built 1939 or earlier count housing units	14.66 (10.91)	14.61 (10.90)	14.61 (10.90)
census housing units 2017 House year moved in 2010 or later count housing units	35.78 (7.36)	35.78 (7.35)	35.78 (7.35)
census housing units 2017 House year moved in 2000 to 2009 count housing units	21.89 (3.80)	21.89 (3.80)	21.89 (3.80)
census housing units 2017 House year moved in 1990 to 1999 count housing units	11.95 (2.07)	11.96 (2.08)	11.96 (2.08)
census housing units 2017 House year moved in 1980 to 1989 count housing units	6.43 (1.63)	6.44 (1.63)	6.44 (1.63)
census housing units 2017 House year moved in 1970-1979 count housing units	4.95 (1.75)	4.96 (1.75)	4.96 (1.75)
census housing units 2017 House year moved in 1969 or earlier count housing units	2.94 (1.37)	2.95 (1.37)	2.95 (1.37)

census housing units 2017 Housing units owner occupied count housing units	57.99 (8.38)	58.02 (8.39)	58.02 (8.39)
census housing units 2017 Housing units renter occupied count housing units	25.97 (7.97)	25.97 (7.98)	25.97 (7.98)
census housing units 2017 Housing owner households with any mortgage count housing units	33.20 (8.81)	33.21 (8.81)	33.21 (8.81)
census housing units 2017 Housing owner households with no mortgage count housing units	24.79 (7.02)	24.80 (7.02)	24.80 (7.02)

Employee and occupation information among population 16 years+

Appendix E.1. Community characteristic second order variables, expressed as 2017 county per capita or per capita %, eligible for feature selection, for each outcome

<b>Log ER Visits (2,475)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
census employment 2017 Car, truck, van to commute to work alone*census housing units 2017 Housing units renter occupied count housing units	1049.43 (359.74)
census employment 2017 Employee work at home*census housing units 2017 Housing units renter occupied count housing units	63.88 (42.41)
census employment 2017 Employee travel time between 15-29 min*census housing units 2017 Housing units renter occupied count housing units	407.56 (219.10)
census employment 2017 Employee travel time between 30-59 min*census housing units 2017 Housing units renter occupied count housing units	282.87 (159.14)
census employment 2017 Employed agriculture forestry fishing and hunting*census housing units 2017 Housing units renter occupied count housing units	58.06 (71.71)
census employment 2017 Employed wholesale trade*census housing units 2017 Housing units renter occupied count housing units	34.17 (19.85)
census employment 2017 Employed healthcare and social assistance*census housing units 2017 Housing units renter occupied count housing units	187.18 (79.67)
census employment 2017 Occupation management business and financial operations*census housing units 2017 Housing units renter occupied count housing units	176.38 (94.37)
census employment 2017 Occupation farming, fishing and forestry*census housing units 2017 Housing units renter occupied count housing units	24.90 (34.21)
census employment 2017 Employed self-employed workers in own not incorporated business*census housing units 2017 Housing units renter occupied count housing units	103.24 (49.59)
census housing units 2017 House median rent *census housing units 2017 Housing units renter occupied count housing units	14428.93 (9102.99)
census housing units 2017 House vacant units for migrant workers*census housing units 2017 Housing units renter occupied count housing units	1.24 (3.45)
census housing units 2017 Housing structure boat, RV, van or other*census housing units 2017 Housing units renter occupied count housing units	2.34 (5.02)
census housing units 2017 House rent less than 250 *census housing units 2017 Housing units renter occupied count housing units	79.14 (79.63)
census housing units 2017 House owner households valued 250,000-299,999*census housing units 2017 Housing units renter occupied count housing units	91.28 (71.93)
<b>Log IP Days (2,491)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
census employment 2017 Employed wholesale trade*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	9.68 (5.97)
census employment 2017 Occupation construction, extraction and maintenance*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	38.39 (15.43)
census employment 2017 Employee travel time between 30-59 min.*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	79.11 (41.02)
census employment 2017 Employee travel time between 60-89 min.*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	16.39 (12.07)



census employment 2017 Employed agriculture, forestry, fishing and hunting*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	17.60 (24.17)
census employment 2017 Employed in private for profit wage and salary workers *census employment 2017 Employed healthcare and social assistance workers pop 16 persons	235.74 (85.18)
census housing units 2017 House heating fuel bottled tank or LP gas*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	1.28 (3.06)
census housing units 2017 Housing structure with 1 unit detached*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	427.03 (144.41)
census housing units 2017 Housing structure with 2 units*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	18.18 (17.94)
census housing units 2017 Housing structure with 5-9 units*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	19.06 (15.39)
census housing units 2017 Housing structure with 50 units*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	9.59 (19.62)
census housing units 2017 House year moved in 1990-1999*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	85.78 (27.54)
census housing units 2017 House year moved in 1969 or earlier*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	21.62 (12.55)
census housing units 2017 Housing units owner occupied*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	417.44 (132.46)
census housing units 2017 Housing units renter occupied*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	187.13 (79.72)
census housing units 2017 House owner households valued 35,000-39,999*census employment 2017 Employed healthcare and social assistance workers pop 16 persons	6.08 (5.98)
<b>Log Hospital Expenditures (2,491)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
census employment 2017 Employee walked to work*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	17.23 (15.39)
census employment 2017 Employed in agriculture, forestry, fishing and hunting*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	22.66 (27.12)
census employment 2017 Employed in healthcare and social assistance*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	79.11 (41.02)
census employment 2017 Employed white collar*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	317.19 (193.80)
census employment 2017 Employed in private not for profit wage and salary workers*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	45.54 (29.95)
census housing units 2017 Housing structure with 10-19 units*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	22.33 (31.43)
census housing units 2017 Housing structure with 20-49 units*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	16.06 (25.51)
census housing units 2017 Housing structure with 50 units*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	16.27 (52.20)
census housing units 2017 Housing unit renter occupied*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	282.95 (158.74)
census housing units 2017 census employment 2017 Employed in private for profit wage and salary workers*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	369.86 (204.11)

census housing units 2017 House heating fuel bottled tank or LP gas*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	1.58 (3.22)
census housing units 2017 House built 1990-1999*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	152.91 (102.63)
census housing units 2017 House year moved in 2000-2009*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	247.05 (133.01)
census housing units 2017 House year moved in 1990-1999*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	133.32 (65.46)
census housing units 2017 Housing unit owner occupied*census employment 2017 Employee travel time between 30-59 min. work empl 16 persons	652.41 (332.57)

Employee and occupation information among population 16 years+

An \* is placed between 2 features to indicate interaction

Appendix F. Consumer expenditure main effect variables, expressed as 2017 county per capita, eligible for feature selection, for each outcome (N variables =571)

<b>Outcome (Per Capita)</b>	<b>ER Visits (N=2475)</b>	<b>Inpatient Days (N=2491)</b>	<b>Hospital Expenditures (N=2491)</b>
<i>Variable per capita (\$)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>
expenditures food 2017 Total annual expenditures	22727.77 (2912.64)	22714.19 (2922.62)	22714.19 (2922.62)
expenditures food 2017 food	2872.59 (341.98)	2870.75 (343.52)	2870.75 (343.52)
expenditures food 2017 Food at home	1638.26 (179.51)	1637.32 (180.25)	1637.32 (180.25)
expenditures food 2017 Cereals and bakery products	212.15 (22.23)	212.04 (22.31)	212.04 (22.31)
expenditures food 2017 Cereals and cereal products	71.29 (6.46)	71.26 (6.48)	71.26 (6.48)
expenditures food 2017 Flour	3.69 (0.39)	3.69 (0.39)	3.69 (0.39)
expenditures food 2017 Prepared flour mixes	5.22 (0.43)	5.22 (0.43)	5.22 (0.43)
expenditures food 2017 Ready to eat and cooked cereals	36.56 (3.36)	36.55 (3.37)	36.55 (3.37)
expenditures food 2017 Rice	10.24 (1.09)	10.24 (1.09)	10.24 (1.09)
expenditures food 2017 Pasta cornmeal and other cereal products	15.25 (1.65)	15.24 (1.66)	15.24 (1.66)
expenditures food 2017 Bakery products	141.12 (15.93)	141.03 (16.00)	141.03 (16.00)
expenditures food 2017 Bread	41.58 (4.53)	41.56 (4.55)	41.56 (4.55)
expenditures food 2017 Cookies and crackers	34.83 (4.22)	34.81 (4.24)	34.81 (4.24)
expenditures food 2017 Frozen and refrigerated bakery products	11.21 (1.15)	11.21 (1.15)	11.21 (1.15)
expenditures food 2017 Other bakery products	53.49 (6.07)	53.46 (6.10)	53.46 (6.10)
expenditures food 2017 Biscuits and rolls	20.56 (2.38)	20.55 (2.39)	20.55 (2.39)
expenditures food 2017 Cakes and cupcakes	14.79 (1.56)	14.78 (1.57)	14.78 (1.57)
expenditures food 2017 Bread and cracker products	2.38 (0.31)	2.38 (0.31)	2.38 (0.31)
expenditures food 2017 Sweetrolls coffee cakes doughnuts	9.17 (1.00)	9.17 (1.00)	9.17 (1.00)
expenditures food 2017 Pies tarts turnovers	6.50 (0.87)	6.49 (0.87)	6.49 (0.87)
expenditures food 2017 Meats poultry fish and eggs	363.25 (34.81)	363.11 (34.90)	363.11 (34.90)

expenditures food 2017 Beef	99.82 (11.37)	99.76 (11.42)	99.76 (11.42)
expenditures food 2017 Ground beef	43.36 (4.26)	43.34 (4.28)	43.34 (4.28)
expenditures food 2017 Roast	14.83 (1.79)	14.83 (1.79)	14.83 (1.79)
expenditures food 2017 Steak	33.70 (4.50)	33.67 (4.52)	33.67 (4.52)
expenditures food 2017 Other beef	8.49 (1.10)	8.48 (1.10)	8.48 (1.10)
expenditures food 2017 Pork	66.33 (6.04)	66.32 (6.05)	66.32 (6.05)
expenditures food 2017 Bacon	15.42 (1.50)	15.41 (1.51)	15.41 (1.51)
expenditures food 2017 Pork chops	9.93 (0.84)	9.93 (0.84)	9.93 (0.84)
expenditures food 2017 Ham	12.60 (1.21)	12.60 (1.21)	12.60 (1.21)
expenditures food 2017 Sausage	13.93 (1.33)	13.93 (1.33)	13.93 (1.33)
expenditures food 2017 Other pork	14.37 (1.40)	14.36 (1.40)	14.36 (1.40)
expenditures food 2017 Other meats	51.23 (5.24)	51.20 (5.25)	51.20 (5.25)
expenditures food 2017 Frankfurters	9.32 (0.80)	9.32 (0.80)	9.32 (0.80)
expenditures food 2017 Lunch meats cold cuts	35.86 (4.19)	35.84 (4.21)	35.84 (4.21)
expenditures food 2017 expenditures food 2017 Lamb organ meats and others	5.90 (0.54)	5.90 (0.54)	5.90 (0.54)
expenditures food 2017 poultry	69.47 (5.96)	69.45 (5.97)	69.45 (5.97)
expenditures food 2017 Fresh and frozen chickens	56.07 (4.81)	56.05 (4.82)	56.05 (4.82)
expenditures food 2017 Other poultry	13.27 (1.21)	13.27 (1.21)	13.27 (1.21)
expenditures food 2017 Fish and seafood	50.61 (4.88)	50.60 (4.88)	50.60 (4.88)
expenditures food 2017 Canned fish and seafood	7.72 (0.70)	7.72 (0.70)	7.72 (0.70)
expenditures food 2017 Fresh fish and shellfish	25.22 (2.60)	25.21 (2.60)	25.21 (2.60)
expenditures food 2017 Frozen fish and shellfish	17.62 (1.73)	17.62 (1.73)	17.62 (1.73)
expenditures food 2017 Eggs	25.50 (2.33)	25.49 (2.33)	25.49 (2.33)
expenditures food 2017 Dairy products	170.09 (20.93)	169.96 (21.04)	169.96 (21.04)
expenditures food 2017 Fresh milk and cream	57.71 (6.44)	57.68 (6.47)	57.68 (6.47)
expenditures food 2017 Fresh milk all types	48.51 (5.19)	48.48 (5.22)	48.48 (5.22)

expenditures food 2017 Cream	9.28 (1.27)	9.28 (1.28)	9.28 (1.28)
expenditures food 2017 Other dairy products	112.53 (14.54)	112.44 (14.61)	112.44 (14.61)
expenditures food 2017 Butter	10.54 (1.26)	10.53 (1.26)	10.53 (1.26)
expenditures food 2017 Cheese	55.86 (7.68)	55.82 (7.72)	55.82 (7.72)
expenditures food 2017 Ice cream and related products	21.92 (2.70)	21.90 (2.72)	21.90 (2.72)
expenditures food 2017 Miscellaneous dairy products	24.16 (2.97)	24.15 (2.99)	24.15 (2.99)
expenditures food 2017 Fruits and vegetables	314.92 (35.56)	314.73 (35.72)	314.73 (35.72)
expenditures food 2017 Fresh fruits	116.71 (14.08)	116.63 (14.15)	116.63 (14.15)
expenditures food 2017 Apples	17.09 (2.14)	17.07 (2.15)	17.07 (2.15)
expenditures food 2017 Bananas	17.49 (1.90)	17.48 (1.91)	17.48 (1.91)
expenditures food 2017 Oranges	12.24 (1.19)	12.24 (1.19)	12.24 (1.19)
expenditures food 2017 Citrus fruits excluding oranges	18.05 (2.25)	18.04 (2.26)	18.04 (2.26)
expenditures food 2017 Other fresh fruits	51.75 (6.69)	51.71 (6.73)	51.71 (6.73)
expenditures food 2017 Fresh vegetables	101.33 (12.13)	101.26 (12.19)	101.26 (12.19)
expenditures food 2017 Potatoes	15.65 (1.43)	15.64 (1.43)	15.64 (1.43)
expenditures food 2017 Lettuce	13.51 (1.64)	13.50 (1.65)	13.50 (1.65)
expenditures food 2017 Tomatoes	17.53 (2.19)	17.52 (2.20)	17.52 (2.20)
expenditures food 2017 Other fresh vegetables	54.55 (7.06)	54.51 (7.10)	54.51 (7.10)
expenditures food 2017 Processed fruits	43.62 (4.26)	43.61 (4.27)	43.61 (4.27)
expenditures food 2017 Frozen fruits and fruit juices	5.16 (0.69)	5.16 (0.70)	5.16 (0.70)
expenditures food 2017 Canned fruits	8.09 (0.90)	8.09 (0.91)	8.09 (0.91)
expenditures food 2017 Dried fruit	3.27 (0.47)	3.27 (0.48)	3.27 (0.48)
expenditures food 2017 Fresh fruit juice	5.50 (0.57)	5.50 (0.57)	5.50 (0.57)
expenditures food 2017 Canned and bottled fruit juice	21.73 (1.84)	21.72 (1.84)	21.72 (1.84)
expenditures food 2017 Processed vegetables	53.23 (5.43)	53.21 (5.45)	53.21 (5.45)
expenditures food 2017 Frozen vegetables	14.14 (1.45)	14.13 (1.46)	14.13 (1.46)

expenditures food 2017 Canned and dried vegetables and juices	39.09 (3.98)	39.07 (4.00)	39.07 (4.00)
expenditures food 2017 Other food at home	578.36 (66.98)	577.99 (67.28)	577.99 (67.28)
expenditures food 2017 Sugar and other sweets	62.44 (8.37)	62.39 (8.41)	62.39 (8.41)
expenditures food 2017 Candy and chewing gum	41.69 (6.47)	41.65 (6.50)	41.65 (6.50)
expenditures food 2017 Sugar	7.34 (0.64)	7.34 (0.64)	7.34 (0.64)
expenditures food 2017 Artificial sweeteners	1.72 (0.25)	1.72 (0.25)	1.72 (0.25)
expenditures food 2017 Jams preserves other sweets	12.20 (1.56)	12.19 (1.57)	12.19 (1.57)
expenditures food 2017 Fats and oils etc	44.94 (4.59)	44.92 (4.60)	44.92 (4.60)
expenditures food 2017 Margarine	2.48 (0.29)	2.48 (0.29)	2.48 (0.29)
expenditures food 2017 Fats and oils	14.01 (1.18)	14.01 (1.18)	14.01 (1.18)
expenditures food 2017 Salad dressings	11.53 (1.22)	11.53 (1.22)	11.53 (1.22)
expenditures food 2017 Nondairy cream and imitation milk	8.08 (0.97)	8.08 (0.97)	8.08 (0.97)
expenditures food 2017 Peanut butter	8.64 (1.09)	8.64 (1.09)	8.64 (1.09)
expenditures food 2017 Miscellaneous foods	299.28 (34.24)	299.09 (34.40)	299.09 (34.40)
expenditures food 2017 Frozen prepared foods	53.30 (5.60)	53.27 (5.62)	53.27 (5.62)
expenditures food 2017 Canned and packaged soups	18.04 (2.01)	18.03 (2.02)	18.03 (2.02)
expenditures food 2017 Potato chips nuts and other snacks	70.10 (8.35)	70.05 (8.39)	70.05 (8.39)
expenditures food 2017 Condiments and seasonings	57.32 (7.00)	57.28 (7.03)	57.28 (7.03)
expenditures food 2017 Other canned and packaged prepared foods	100.51 (11.43)	100.44 (11.49)	100.44 (11.49)
expenditures food 2017 Prepared salads	16.41 (1.90)	16.40 (1.91)	16.40 (1.91)
expenditures food 2017 Prepared desserts	5.39 (0.64)	5.38 (0.64)	5.38 (0.64)
expenditures food 2017 Baby food	13.55 (1.64)	13.54 (1.66)	13.54 (1.66)
expenditures food 2017 Nonalcoholic beverages	151.41 (16.68)	151.33 (16.75)	151.33 (16.75)
expenditures food 2017 Cola	29.36 (3.50)	29.34 (3.51)	29.34 (3.51)
expenditures food 2017 Other carbonated drinks	28.38 (3.18)	28.36 (3.19)	28.36 (3.19)
expenditures food 2017 Tea	12.65 (1.36)	12.64 (1.37)	12.64 (1.37)
expenditures food 2017 Coffee	36.34 (5.11)	36.31 (5.14)	36.31 (5.14)

expenditures food 2017 Noncarbonated fruit flavored drinks lemonade	9.11 (0.91)	9.11 (0.91)	9.11 (0.91)
expenditures food 2017 Bottled water	23.74 (1.90)	23.74 (1.90)	23.74 (1.90)
expenditures food 2017 Sports drinks	6.86 (0.69)	6.86 (0.69)	6.86 (0.69)
expenditures food 2017 Nonalcoholic beer	0.08 (0.02)	0.08 (0.02)	0.08 (0.02)
expenditures food 2017 Food prepared by consumer OOT trips	22.07 (3.64)	22.05 (3.66)	22.05 (3.66)
expenditures food 2017 Food away from home	1240.79 (168.64)	1239.89 (169.40)	1239.89 (169.40)
expenditures food 2017 Meals at restaurants carry outs and other	1056.22 (137.20)	1055.49 (137.83)	1055.49 (137.83)
expenditures food 2017 Lunch	330.46 (40.48)	330.25 (40.64)	330.25 (40.64)
expenditures food 2017 Lunch at fastfood, delivery, concession, buffet or cafeteria	157.75 (16.19)	157.68 (16.24)	157.68 (16.24)
expenditures food 2017 Lunch at Restaurant	140.05 (20.21)	139.93 (20.31)	139.93 (20.31)
expenditures food 2017 Lunch at Vending machine	5.42 (0.60)	5.42 (0.60)	5.42 (0.60)
expenditures food 2017 Lunch at employer or school cafeteria	27.30 (3.11)	27.29 (3.12)	27.29 (3.12)
expenditures food 2017 Dinner	510.84 (70.79)	510.45 (71.13)	510.45 (71.13)
expenditures food 2017 Dinner at fastfood, delivery, concession, buffet or cafeteria	174.97 (16.36)	174.91 (16.41)	174.91 (16.41)
expenditures food 2017 Dinner at Rest	333.02 (53.92)	332.70 (54.21)	332.70 (54.21)
expenditures food 2017 Dinner at Vending machine	1.64 (0.16)	1.64 (0.16)	1.64 (0.16)
expenditures food 2017 Dinner at employer or school cafeteria	2.30 (0.25)	2.30 (0.25)	2.30 (0.25)
expenditures food 2017 Snack nonalcoholic beverages	92.42 (11.31)	92.36 (11.38)	92.36 (11.38)
expenditures food 2017 Snack nonalcoholic beverages at Fast Food, Concession, Buffet, Cafe	58.80 (7.65)	58.76 (7.69)	58.76 (7.69)
expenditures food 2017 Snack nonalcoholic beverages at Restaurant	20.58 (2.35)	20.56 (2.36)	20.56 (2.36)
expenditures food 2017 Snack nonalcoholic beverages at Vending Machine	8.89 (0.95)	8.88 (0.95)	8.88 (0.95)
expenditures food 2017 Snack nonalcoholic beverages at Employee or School Cafe	4.19 (0.45)	4.19 (0.45)	4.19 (0.45)
expenditures food 2017 Breakfast and brunch	122.44 (14.66)	122.37 (14.71)	122.37 (14.71)
expenditures food 2017 Breakfast and brunch at Fast Food, Concession, Buffet, Cafe	66.08 (7.24)	66.04 (7.27)	66.04 (7.27)
expenditures food 2017 Breakfast and brunch at Rest	48.20 (6.26)	48.16 (6.28)	48.16 (6.28)
expenditures food 2017 Breakfast and brunch at Vending Machine	3.09 (0.43)	3.09 (0.43)	3.09 (0.43)

expenditures food 2017 Breakfast and brunch at Employee or School Cafe	5.19 (0.50)	5.18 (0.51)	5.18 (0.51)
expenditures food 2017 Food or board at school	12.40 (1.65)	12.39 (1.65)	12.39 (1.65)
expenditures food 2017 Catered affairs	14.95 (3.13)	14.93 (3.15)	14.93 (3.15)
expenditures food 2017 Food on out of town trips	122.68 (22.70)	122.56 (22.79)	122.56 (22.79)
expenditures food 2017 School lunches	25.25 (2.53)	25.24 (2.54)	25.24 (2.54)
expenditures food 2017 Meals as pay	10.43 (1.39)	10.42 (1.39)	10.42 (1.39)
expenditures food 2017 Alcoholic beverages	209.70 (35.96)	209.49 (36.15)	209.49 (36.15)
expenditures food 2017 Alcoholic beverages at home	117.00 (18.54)	116.89 (18.63)	116.89 (18.63)
expenditures food 2017 Beer and ale	49.58 (6.59)	49.54 (6.63)	49.54 (6.63)
expenditures food 2017 Whiskey	4.84 (0.66)	4.84 (0.67)	4.84 (0.67)
expenditures food 2017 Wine	53.36 (10.32)	53.30 (10.36)	53.30 (10.36)
expenditures food 2017 Other alcoholic beverages	9.61 (1.62)	9.60 (1.63)	9.60 (1.63)
expenditures food 2017 Alcoholic beverages away from home	92.80 (17.50)	92.69 (17.60)	92.69 (17.60)
expenditures food 2017 Beer and ale away	30.90 (5.33)	30.86 (5.36)	30.86 (5.36)
expenditures food 2017 Wine away	17.74 (3.79)	17.71 (3.81)	17.71 (3.81)
expenditures food 2017 Other alcoholic beverages away	19.91 (3.52)	19.89 (3.54)	19.89 (3.54)
expenditures food 2017 Alcoholic beverages purchased on trips	24.05 (4.95)	24.03 (4.97)	24.03 (4.97)
expenditures food 2017 Education	555.33 (104.62)	554.87 (104.87)	554.87 (104.87)
expenditures food 2017 College tuition	334.86 (66.99)	334.54 (67.16)	334.54 (67.16)
expenditures food 2017 Elementary and high school tuition	79.48 (19.12)	79.39 (19.17)	79.39 (19.17)
expenditures food 2017 Vocational and technical school tuition	2.59 (0.64)	2.59 (0.64)	2.59 (0.64)
expenditures food 2017 Test preparation tutoring services	6.65 (1.88)	6.65 (1.88)	6.65 (1.88)
expenditures food 2017 Other schools tuition	3.38 (0.80)	3.38 (0.80)	3.38 (0.80)
expenditures food 2017 Other school expenses including rentals	18.34 (3.14)	18.32 (3.16)	18.32 (3.16)
expenditures food 2017 School supplies for college	18.28 (2.01)	18.27 (2.01)	18.27 (2.01)
expenditures food 2017 School supplies for elementary high school	6.80 (0.64)	6.80 (0.64)	6.80 (0.64)



expenditures food 2017 School supplies for vocational and technical schools	0.21 (0.04)	0.21 (0.04)	0.21 (0.04)
expenditures food 2017 School supplies for day care nursery	0.13 (0.02)	0.13 (0.02)	0.13 (0.02)
expenditures home 2017 Total annual expenditures	22727.77 (2912.64)	22714.19 (2922.62)	22714.19 (2922.62)
expenditures home 2017 Housing	7341.23 (835.34)	7337.90 (837.47)	7337.90 (837.47)
expenditures home 2017 Shelter	4266.18 (498.29)	4264.29 (499.44)	4264.29 (499.44)
expenditures home 2017 Owned dwellings	2674.20 (416.41)	2672.18 (418.02)	2672.18 (418.02)
expenditures home 2017 Mortgage interest and charges	1258.57 (208.39)	1257.70 (209.10)	1257.70 (209.10)
expenditures home 2017 Mortgage interest	1204.80 (198.93)	1203.98 (199.59)	1203.98 (199.59)
expenditures home 2017 Interest paid home equity loan	15.30 (2.63)	15.29 (2.64)	15.29 (2.64)
expenditures home 2017 Interest paid home equity line of credit	38.50 (7.43)	38.45 (7.47)	38.45 (7.47)
expenditures home 2017 Property taxes	819.60 (130.29)	818.89 (130.85)	818.89 (130.85)
expenditures home 2017 Main repairs in Other Owned	598.37 (87.01)	597.94 (87.29)	597.94 (87.29)
expenditures home 2017 Homeowners and related insurance	174.47 (26.00)	174.33 (26.08)	174.33 (26.08)
expenditures home 2017 Ground rent	24.04 (5.22)	24.02 (5.22)	24.02 (5.22)
expenditures home 2017 Main repair services Owned	300.43 (45.27)	300.22 (45.39)	300.22 (45.39)
expenditures home 2017 Main repair commodities Owned	37.51 (5.58)	37.48 (5.60)	37.48 (5.60)
expenditures home 2017 Rented dwellings	1309.81 (233.02)	1310.04 (233.35)	1310.04 (233.35)
expenditures home 2017 Rent	1238.51 (222.40)	1238.74 (222.70)	1238.74 (222.70)
expenditures home 2017 Rent as pay	32.20 (6.69)	32.22 (6.71)	32.22 (6.71)
expenditures home 2017 Main insurance and Other Rented	40.95 (7.08)	40.93 (7.08)	40.93 (7.08)
expenditures home 2017 Tenants insurance	7.53 (1.14)	7.53 (1.14)	7.53 (1.14)
expenditures home 2017 Other lodging	307.45 (65.32)	307.16 (65.48)	307.16 (65.48)
expenditures home 2017 Owned vacation homes	108.75 (23.81)	108.65 (23.85)	108.65 (23.85)
expenditures home 2017 Utilities fuels and public services	1537.97 (143.76)	1537.60 (143.90)	1537.60 (143.90)
expenditures home 2017 Natural gas	165.74 (15.19)	165.73 (15.18)	165.73 (15.18)

expenditures home 2017 Electricity	572.73 (51.99)	572.63 (52.01)	572.63 (52.01)
expenditures home 2017 Fuel oil and Other fuels	47.67 (7.29)	47.63 (7.31)	47.63 (7.31)
expenditures home 2017 Fuel oil	25.47 (3.42)	25.45 (3.43)	25.45 (3.43)
expenditures home 2017 Coal wood and Other fuels	3.53 (0.73)	3.53 (0.73)	3.53 (0.73)
expenditures home 2017 Bottled gas	18.69 (3.37)	18.67 (3.38)	18.67 (3.38)
expenditures home 2017 Telephone services	536.89 (49.79)	536.74 (49.87)	536.74 (49.87)
expenditures home 2017 Cell phone service	411.19 (37.82)	411.07 (37.89)	411.07 (37.89)
expenditures home 2017 Water and Other public services	217.87 (22.20)	217.79 (22.23)	217.79 (22.23)
expenditures home 2017 household operations	556.43 (78.96)	556.03 (79.27)	556.03 (79.27)
expenditures home 2017 Personal services	207.96 (28.80)	207.81 (28.93)	207.81 (28.93)
expenditures home 2017 Other household	355.57 (52.56)	355.32 (52.73)	355.32 (52.73)
expenditures home 2017 Housekeeping services	65.05 (18.54)	64.96 (18.58)	64.96 (18.58)
expenditures home 2017 Gardening lawn care service	53.26 (9.64)	53.21 (9.67)	53.21 (9.67)
expenditures home 2017 Water softening service	2.99 (0.31)	2.99 (0.31)	2.99 (0.31)
expenditures home 2017 household laundry dryclean not coin operated	7.29 (1.49)	7.28 (1.49)	7.28 (1.49)
expenditures home 2017 Coin operated household laundry dryclean	3.74 (0.72)	3.75 (0.72)	3.75 (0.72)
expenditures home 2017 Services for Termite pest control	8.24 (1.33)	8.23 (1.34)	8.23 (1.34)
expenditures home 2017 Home security system service fee	11.69 (1.46)	11.69 (1.45)	11.69 (1.45)
expenditures home 2017 Other home services	7.89 (1.48)	7.88 (1.49)	7.88 (1.49)
expenditures home 2017 Termite pest control products	2.04 (0.33)	2.03 (0.33)	2.03 (0.33)
expenditures home 2017 Moving storage freight	17.90 (2.93)	17.89 (2.94)	17.89 (2.94)
expenditures home 2017 Appliance repair including service center	6.42 (0.81)	6.41 (0.81)	6.41 (0.81)
expenditures home 2017 Reupholstering furniture repair	1.94 (0.38)	1.93 (0.39)	1.93 (0.39)
expenditures home 2017 Repairs rentals of law garden power equipment household equipment	2.87 (0.45)	2.87 (0.46)	2.87 (0.46)
expenditures home 2017 Computer information services Internet	163.86 (16.62)	163.79 (16.67)	163.79 (16.67)
expenditures home 2017 Computer Installation	0.08 (0.02)	0.08 (0.02)	0.08 (0.02)
expenditures home 2017 Housekeeping supplies	265.37 (32.09)	265.20 (32.22)	265.20 (32.22)

expenditures home 2017 Laundry and cleaning supplies	62.17 (5.69)	62.15 (5.69)	62.15 (5.69)
expenditures home 2017 Soaps and detergents	33.59 (2.95)	33.58 (2.96)	33.58 (2.96)
expenditures home 2017 Other laundry cleaning products	28.56 (2.76)	28.55 (2.76)	28.55 (2.76)
expenditures home 2017 Other household products	150.51 (19.89)	150.39 (19.98)	150.39 (19.98)
expenditures home 2017 Cleansing and TP towels napkins	47.76 (4.63)	47.74 (4.64)	47.74 (4.64)
expenditures home 2017 misc household products	66.60 (9.52)	66.54 (9.57)	66.54 (9.57)
expenditures home 2017 Lawn and garden supplies	36.84 (6.26)	36.80 (6.29)	36.80 (6.29)
expenditures home 2017 Postage and stationery	53.43 (6.98)	53.39 (7.01)	53.39 (7.01)
expenditures home 2017 Stationery supplies giftwrap	31.64 (4.72)	31.61 (4.75)	31.61 (4.75)
expenditures home 2017 Postage	20.18 (2.23)	20.17 (2.23)	20.17 (2.23)
expenditures home 2017 Delivery services	1.71 (0.28)	1.71 (0.28)	1.71 (0.28)
expenditures home 2017 household furnishings and equipmentt	735.13 (101.29)	734.66 (101.63)	734.66 (101.63)
expenditures home 2017 household textiles	45.82 (4.66)	45.82 (4.66)	45.82 (4.66)
expenditures home 2017 Bathroom linens	10.13 (0.95)	10.13 (0.95)	10.13 (0.95)
expenditures home 2017 Bedroom linens	24.77 (2.46)	24.77 (2.46)	24.77 (2.46)
expenditures home 2017 Curtains and draperies	5.05 (0.75)	5.05 (0.75)	5.05 (0.75)
expenditures home 2017 Slipcovers decorative pillows	1.74 (0.22)	1.74 (0.22)	1.74 (0.22)
expenditures home 2017 Furniture	200.95 (28.06)	200.86 (28.10)	200.86 (28.10)
expenditures home 2017 Mattress and springs	39.65 (5.78)	39.62 (5.80)	39.62 (5.80)
expenditures home 2017 Other bedroom furniture	34.60 (3.59)	34.59 (3.60)	34.59 (3.60)
expenditures home 2017 Sofas	56.31 (7.90)	56.29 (7.90)	56.29 (7.90)
expenditures home 2017 Living room chairs	19.93 (2.78)	19.92 (2.79)	19.92 (2.79)
expenditures home 2017 Living room tables	4.30 (0.79)	4.30 (0.79)	4.30 (0.79)
expenditures home 2017 Kitchen dining room furniture	16.75 (2.88)	16.75 (2.88)	16.75 (2.88)
expenditures home 2017 Infants furniture	3.45 (0.34)	3.45 (0.34)	3.45 (0.34)
expenditures home 2017 Outdoor furniture	10.56 (2.12)	10.55 (2.13)	10.55 (2.13)

expenditures home 2017 Wall units cabinets and Other occasional furniture	15.41 (1.99)	15.41 (1.98)	15.41 (1.98)
expenditures home 2017 Floor coverings	7.30 (1.03)	7.29 (1.03)	7.29 (1.03)
expenditures home 2017 Major appliances	110.54 (14.00)	110.47 (14.06)	110.47 (14.06)
expenditures home 2017 Electric floor cleaning equipment	7.42 (1.03)	7.42 (1.03)	7.42 (1.03)
expenditures home 2017 Sewing machines	2.43 (0.54)	2.43 (0.54)	2.43 (0.54)
expenditures home 2017 Small appliances and Misc housewares	48.57 (6.96)	48.52 (7.00)	48.52 (7.00)
expenditures home 2017 Housewares	33.14 (5.13)	33.10 (5.16)	33.10 (5.16)
expenditures home 2017 Flatware	1.79 (0.30)	1.79 (0.30)	1.79 (0.30)
expenditures home 2017 Nonelectric cookware	9.32 (1.53)	9.31 (1.54)	9.31 (1.54)
expenditures home 2017 Tableware nonelectric kitchenware	9.98 (1.58)	9.97 (1.59)	9.97 (1.59)
expenditures home 2017 Small appliances	15.37 (1.86)	15.36 (1.87)	15.36 (1.87)
expenditures home 2017 Small electric kitchen appliances	11.73 (1.39)	11.73 (1.39)	11.73 (1.39)
expenditures home 2017 Portable heating and cooling equipment	3.64 (0.54)	3.64 (0.54)	3.64 (0.54)
expenditures home 2017 misc household equipment	323.28 (48.70)	323.03 (48.90)	323.03 (48.90)
expenditures home 2017 Window coverings	7.11 (1.68)	7.10 (1.68)	7.10 (1.68)
expenditures home 2017 nfants equipment	11.83 (1.16)	11.82 (1.17)	11.82 (1.17)
expenditures home 2017 Laundry and cleaning equipment	9.02 (1.14)	9.01 (1.15)	9.01 (1.15)
expenditures home 2017 Outdoor equipment	8.78 (1.92)	8.77 (1.93)	8.77 (1.93)
expenditures home 2017 Clocks and decorative items	56.70 (10.82)	56.64 (10.87)	56.64 (10.87)
expenditures home 2017 Telephones and accessories	20.53 (3.66)	20.53 (3.66)	20.53 (3.66)
expenditures home 2017 Lawn and garden equipment	23.16 (2.58)	23.16 (2.57)	23.16 (2.57)
expenditures home 2017 Power tools	13.96 (2.22)	13.95 (2.23)	13.95 (2.23)
expenditures home 2017 Office furniture home use	2.76 (0.76)	2.76 (0.76)	2.76 (0.76)
expenditures home 2017Hand tools	6.07 (0.91)	6.06 (0.92)	6.06 (0.92)
expenditures home 2017 Indoor plants fresh flowers	19.76 (3.39)	19.74 (3.41)	19.74 (3.41)
expenditures home 2017 Closet and storage items	7.98 (1.39)	7.98 (1.40)	7.98 (1.40)
expenditures home 2017 Rental of furniture	1.96 (0.31)	1.96 (0.31)	1.96 (0.31)
expenditures home 2017 Luggage	5.95 (0.65)	5.95 (0.66)	5.95 (0.66)
expenditures home 2017 Computer hardware for non business	54.46 (7.75)	54.42 (7.79)	54.42 (7.79)
expenditures home 2017 Portable memory	1.94 (0.25)	1.94 (0.25)	1.94 (0.25)

expenditures home 2017 Computer software	9.74 (1.65)	9.73 (1.66)	9.73 (1.66)
expenditures home 2017 Computer accessories	13.72 (1.50)	13.72 (1.50)	13.72 (1.50)
expenditures home 2017 Internet services away from home	2.48 (0.28)	2.47 (0.28)	2.47 (0.28)
expenditures home 2017 Business equipment home use	1.67 (0.25)	1.67 (0.25)	1.67 (0.25)
expenditures home 2017 Other hardware	8.06 (1.63)	8.05 (1.64)	8.05 (1.64)
expenditures home 2017 Misc household equipment parts	18.46 (2.57)	18.44 (2.58)	18.44 (2.58)
expenditures home 2017 Apparel and services	750.58 (105.06)	750.17 (105.28)	750.17 (105.28)
expenditures home 2017 Men and Boys clothing	174.68 (19.94)	174.61 (19.98)	174.61 (19.98)
expenditures home 2017 Men 16 and over clothing	134.98 (17.63)	134.92 (17.67)	134.92 (17.67)
expenditures home 2017 Mens suits	9.97 (2.32)	9.97 (2.32)	9.97 (2.32)
expenditures home 2017 Mens sportcoats tailored jackets	3.15 (0.79)	3.15 (0.79)	3.15 (0.79)
expenditures home 2017 Mens coats and jackets	10.16 (1.13)	10.15 (1.14)	10.15 (1.14)
expenditures home 2017 Mens underwear	13.18 (1.54)	13.17 (1.54)	13.17 (1.54)
expenditures home 2017 Mens hosiery	7.01 (0.75)	7.01 (0.75)	7.01 (0.75)
expenditures home 2017 Mens nightwear	0.81 (0.11)	0.81 (0.11)	0.81 (0.11)
expenditures home 2017 Mens accessories	12.67 (1.41)	12.66 (1.41)	12.66 (1.41)
expenditures home 2017 Mens active sportswear	10.85 (1.66)	10.84 (1.67)	10.84 (1.67)
expenditures home 2017 Mens pants and shorts	31.54 (3.36)	31.53 (3.37)	31.53 (3.37)
expenditures home 2017 Mens uniforms	1.20 (0.17)	1.20 (0.17)	1.20 (0.17)
expenditures home 2017 Mens costumes	0.49 (0.08)	0.49 (0.08)	0.49 (0.08)
expenditures home 2017 Boys 2-15 clothing	41.96 (2.95)	41.96 (2.95)	41.96 (2.95)
expenditures home 2017 Boys coats and jackets	2.59 (0.23)	2.59 (0.23)	2.59 (0.23)
expenditures home 2017 Boys underwear	5.15 (0.52)	5.15 (0.52)	5.15 (0.52)
expenditures home 2017 Boys nightwear	0.42 (0.05)	0.42 (0.05)	0.42 (0.05)
expenditures home 2017 Boys hosiery	2.46 (0.17)	2.46 (0.17)	2.46 (0.17)
expenditures home 2017 Boys accessories	2.64 (0.35)	2.64 (0.35)	2.64 (0.35)
expenditures home 2017 Boys suits sportcoats vests	0.46 (0.06)	0.46 (0.06)	0.46 (0.06)
expenditures home 2017 Boys pants and shorts	10.56 (0.77)	10.56 (0.77)	10.56 (0.77)
expenditures home 2017 Boys costumes	0.43 (0.05)	0.43 (0.05)	0.43 (0.05)
expenditures home 2017 Women and girls clothing	284.46 (37.53)	284.29 (37.66)	284.29 (37.66)
expenditures home 2017 Women 16 and over clothing	241.93 (32.70)	241.77 (32.80)	241.77 (32.80)

expenditures home 2017 Womens coats and jackets	13.14 (1.32)	13.13 (1.32)	13.13 (1.32)
expenditures home 2017 Womens dresses	29.62 (2.93)	29.62 (2.93)	29.62 (2.93)
expenditures home 2017 Womens sportcoats tailored jackets	3.40 (1.19)	3.40 (1.19)	3.40 (1.19)
expenditures home 2017 Womens skirts	4.73 (0.75)	4.73 (0.75)	4.73 (0.75)
expenditures home 2017 Womens pants and shorts	34.10 (4.51)	34.07 (4.53)	34.07 (4.53)
expenditures home 2017 Womens active sportswear	17.68 (2.62)	17.67 (2.63)	17.67 (2.63)
expenditures home 2017 Womens sleepwear	9.04 (1.07)	9.03 (1.08)	9.03 (1.08)
expenditures home 2017 Womens undergarments	14.14 (1.53)	14.14 (1.53)	14.14 (1.53)
expenditures home 2017 Womens hosiery	8.77 (1.00)	8.77 (1.00)	8.77 (1.00)
expenditures home 2017 Womens suits	2.24 (0.26)	2.24 (0.26)	2.24 (0.26)
expenditures home 2017 Womens accessories	35.18 (7.78)	35.14 (7.80)	35.14 (7.80)
expenditures home 2017 Womens uniforms	2.18 (0.22)	2.18 (0.22)	2.18 (0.22)
expenditures home 2017 Womens costumes	0.59 (0.12)	0.59 (0.12)	0.59 (0.12)
expenditures home 2017 Girls 2-15 clothing	44.96 (4.52)	44.94 (4.53)	44.94 (4.53)
expenditures home 2017 Girls coats and jackets	2.16 (0.17)	2.16 (0.17)	2.16 (0.17)
expenditures home 2017 Girls dresses and suits	5.83 (0.90)	5.83 (0.90)	5.83 (0.90)
expenditures home 2017 Girls skirt pant short	9.84 (0.76)	9.84 (0.76)	9.84 (0.76)
expenditures home 2017 Girls active sportswear	5.20 (0.77)	5.20 (0.78)	5.20 (0.78)
expenditures home 2017 Girls underwear and sleepwear	3.88 (0.34)	3.88 (0.34)	3.88 (0.34)
expenditures home 2017 Girls hosiery	1.73 (0.14)	1.73 (0.14)	1.73 (0.14)
expenditures home 2017 Girls accessories	2.01 (0.35)	2.01 (0.35)	2.01 (0.35)
expenditures home 2017 Girls uniforms	1.01 (0.10)	1.01 (0.10)	1.01 (0.10)
expenditures home 2017 Girls costumes	1.08 (0.17)	1.08 (0.17)	1.08 (0.17)
expenditures home 2017 Children under 2 clothing	35.61 (4.01)	35.59 (4.03)	35.59 (4.03)
expenditures home 2017 Infant coat jacket snowsuit	0.42 (0.04)	0.42 (0.04)	0.42 (0.04)
expenditures home 2017 Infant dresses outerwear	10.60 (1.83)	10.59 (1.84)	10.59 (1.84)
expenditures home 2017 Infant underwear	15.74 (1.17)	15.74 (1.17)	15.74 (1.17)
expenditures home 2017 Infant nightwear loungewear	2.70 (0.18)	2.70 (0.18)	2.70 (0.18)
expenditures home 2017 Infant accessories	6.36 (1.27)	6.35 (1.27)	6.35 (1.27)
expenditures home 2017 Footwear	145.54 (16.34)	145.50 (16.36)	145.50 (16.36)
expenditures home 2017 Mens footwear	46.94 (5.14)	46.92 (5.16)	46.92 (5.16)

expenditures home 2017 Boys footwear	20.98 (2.22)	21.00 (2.23)	21.00 (2.23)
expenditures home 2017 Womens footwear	63.39 (9.45)	63.35 (9.48)	63.35 (9.48)
expenditures home 2017 Girls footwear	16.14 (1.51)	16.15 (1.51)	16.15 (1.51)
expenditures home 2017 Other apparel products and services	114.14 (27.95)	114.05 (27.95)	114.05 (27.95)
expenditures home 2017 Audio and visual equipment and services	422.06 (40.84)	421.94 (40.90)	421.94 (40.90)
expenditures home 2017 Televisions	38.10 (4.24)	38.09 (4.25)	38.09 (4.25)
expenditures home 2017 Cable and satellite television services	293.68 (27.53)	293.63 (27.54)	293.63 (27.54)
expenditures home 2017 Satellite radio service	6.16 (0.80)	6.15 (0.81)	6.15 (0.81)
expenditures home 2017 Sound equipment accessories	3.23 (0.44)	3.23 (0.44)	3.23 (0.44)
expenditures home 2017 Online gaming services	1.41 (0.21)	1.41 (0.21)	1.41 (0.21)
expenditures home 2017 VCRs and video disc players	1.53 (0.13)	1.53 (0.13)	1.53 (0.13)
expenditures home 2017 Video cassettes tapes and discs	9.59 (0.99)	9.59 (0.99)	9.59 (0.99)
expenditures home 2017 Video game software	4.72 (0.41)	4.72 (0.41)	4.72 (0.41)
expenditures home 2017 Video game hardware and accessories	19.84 (2.65)	19.82 (2.67)	19.82 (2.67)
expenditures home 2017 Streaming downloading video	9.05 (1.14)	9.05 (1.15)	9.05 (1.15)
expenditures miscellaneous 2017 Applications games ringtones for handheld devices	1.26 (0.13)	1.26 (0.13)	1.26 (0.13)
expenditures miscellaneous 2017 Repair of tv radio and sound equipmentt	0.54 (0.05)	0.54 (0.05)	0.54 (0.05)
expenditures miscellaneous 2017 Rental of televisions	0.21 (0.17)	0.21 (0.17)	0.21 (0.17)
expenditures miscellaneous 2017 Personal digital audio players	0.75 (0.12)	0.75 (0.12)	0.75 (0.12)
expenditures miscellaneous 2017 Satellite dishes	0.47 (0.14)	0.47 (0.14)	0.47 (0.14)
expenditures miscellaneous 2017 CDs records audio tapes	2.88 (0.40)	2.87 (0.40)	2.87 (0.40)
expenditures miscellaneous 2017 Streaming downloading audio	1.88 (0.33)	1.87 (0.33)	1.87 (0.33)
expenditures miscellaneous 2017 Musical instruments and accessories	9.12 (1.54)	9.11 (1.55)	9.11 (1.55)
expenditures miscellaneous 2017 Rental and repair of musical instruments	0.93 (0.20)	0.92 (0.20)	0.92 (0.20)
expenditures miscellaneous 2017 Rental of video cassettes tapes films and discs	9.26 (0.97)	9.25 (0.98)	9.25 (0.98)
expenditures miscellaneous 2017 Live entertainment for catered affairs	4.10 (0.86)	4.09 (0.86)	4.09 (0.86)
expenditures miscellaneous 2017 Rental of party supplies for catered affairs	5.02 (1.37)	5.02 (1.37)	5.02 (1.37)
expenditures miscellaneous 2017 Automobile ser clubs and GPS sers	10.50 (1.22)	10.50 (1.22)	10.50 (1.22)

expenditures miscellaneous 2017 Cash downpayment car trucklease	9.50 (1.12)	9.50 (1.13)	9.50 (1.13)
expenditures miscellaneous 2017 Extra fees for car trucklease	0.51 (0.17)	0.51 (0.17)	0.51 (0.17)
expenditures miscellaneous 2017 car trucklease payments	104.91 (15.92)	104.85 (15.94)	104.85 (15.94)
expenditures miscellaneous 2017 Auto.truck rental	17.39 (2.63)	17.38 (2.63)	17.38 (2.63)
expenditures miscellaneous 2017 Auto.truck rental out of tow	9.15 (1.68)	9.15 (1.68)	9.15 (1.68)
expenditures miscellaneous 2017 Termination fee for car trucklease	0.16 (0.03)	0.16 (0.03)	0.16 (0.03)
expenditures miscellaneous 2017 Trade in allowance for car trucklease	15.76 (1.87)	15.75 (1.88)	15.75 (1.88)
expenditures miscellaneous 2017 Finance late interest charges for credit cards	111.11 (11.36)	111.07 (11.39)	111.07 (11.39)
expenditures miscellaneous 2017 Finance late interest charges for other loans	17.09 (2.17)	17.07 (2.18)	17.07 (2.18)
expenditures miscellaneous 2017 Finance late interest charges for student loans	60.62 (7.69)	60.63 (7.68)	60.63 (7.68)
expenditures miscellaneous 2017 Gas tank repair replacement	5.26 (1.17)	5.25 (1.17)	5.25 (1.17)
expenditures miscellaneous 2017 Fee for ser health plan BCBS	219.91 (33.43)	219.70 (33.62)	219.70 (33.62)
expenditures miscellaneous 2017 Fee for ser health plan not BCBS	235.79 (33.50)	235.61 (33.66)	235.61 (33.66)
expenditures miscellaneous 2017 Health maintenance organization BCBS	167.05 (18.59)	166.98 (18.64)	166.98 (18.64)
expenditures miscellaneous 2017 Health maintenance organization not BCBS	251.79 (28.74)	251.66 (28.85)	251.66 (28.85)
expenditures miscellaneous 2017 Magazines	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)
expenditures miscellaneous 2017 material supp sew needlework	8.97 (1.65)	8.96 (1.66)	8.96 (1.66)
expenditures miscellaneous 2017 Movies parks museums	25.37 (3.84)	25.35 (3.86)	25.35 (3.86)
expenditures miscellaneous 2017 Newspapers	0.02 (0.00)	0.02 (0.00)	0.02 (0.00)
expenditures miscellaneous 2017 Play theater opera concert	19.35 (4.45)	19.33 (4.47)	19.33 (4.47)
expenditures miscellaneous 2017 Value of savings checking money market and CDs	5197.20 (933.94)	5191.14 (938.97)	5191.14 (938.97)
expenditures miscellaneous 2017 Value .surrender. of whole life insur policy	3189.04 (808.50)	3185.84 (809.28)	3185.84 (809.28)
expenditures miscellaneous 2017 Value of other financial assets	1815.99 (465.14)	1813.32 (466.86)	1813.32 (466.86)
expenditures miscellaneous 2017 Value of retirement plan	29504.94 (5747.93)	29471.23 (5774.60)	29471.23 (5774.60)
expenditures miscellaneous 2017 Value of stocks bonds mutual funds	6201.44 (1546.75)	6192.90 (1551.84)	6192.90 (1551.84)



expenditures miscellaneous 2017 Vehicle or engine repairs	76.62 (9.61)	76.56 (9.65)	76.56 (9.65)
expenditures miscellaneous 2017 Total annual expenditures	22727.77 (2912.64)	22714.19 (2922.62)	22714.19 (2922.62)
expenditures miscellaneous 2017 Care for elderly invalids handicapped etc	12.30 (2.53)	12.28 (2.54)	12.28 (2.54)
expenditures miscellaneous 2017 Day care centers nursery and preschools	144.11 (19.55)	144.02 (19.62)	144.02 (19.62)
expenditures miscellaneous 2017 Watches	26.51 (8.83)	26.49 (8.83)	26.49 (8.83)
expenditures miscellaneous 2017 Jewelry	31.45 (7.19)	31.42 (7.21)	31.42 (7.21)
expenditures miscellaneous 2017 Shoe repair and other shoe service	0.65 (0.11)	0.65 (0.11)	0.65 (0.11)
expenditures miscellaneous 2017 Coin operated apparel laundry dryclean	14.11 (2.75)	14.12 (2.75)	14.12 (2.75)
expenditures miscellaneous 2017 Alteration repair tailor apparel access	2.58 (0.43)	2.58 (0.43)	2.58 (0.43)
expenditures miscellaneous 2017 Clothing rental	0.83 (0.17)	0.83 (0.17)	0.83 (0.17)
expenditures miscellaneous 2017 Watch and jewelry repair	11.68 (4.85)	11.66 (4.85)	11.66 (4.85)
expenditures miscellaneous 2017 Apparel laundry dryclean not coin.operated	17.92 (4.15)	17.91 (4.14)	17.91 (4.14)
expenditures miscellaneous 2017 Transportation	3867.00 (448.77)	3865.05 (450.21)	3865.05 (450.21)
expenditures miscellaneous 2017 Vehicle purchases net outlay	1645.74 (196.15)	1644.88 (196.82)	1644.88 (196.82)
expenditures miscellaneous 2017 Cars and trucks new	817.58 (119.02)	816.95 (119.54)	816.95 (119.54)
expenditures miscellaneous 2017 New cars	302.29 (36.18)	302.16 (36.26)	302.16 (36.26)
expenditures miscellaneous 2017 New trucks	517.75 (84.83)	517.24 (85.29)	517.24 (85.29)
expenditures miscellaneous 2017 Cars and trucks used	804.30 (73.42)	804.11 (73.54)	804.11 (73.54)
expenditures miscellaneous 2017 Used cars	346.58 (31.91)	346.62 (31.88)	346.62 (31.88)
expenditures miscellaneous 2017 Used trucks	455.83 (49.02)	455.59 (49.24)	455.59 (49.24)
expenditures miscellaneous 2017 other vehicles	23.91 (3.91)	23.88 (3.93)	23.88 (3.93)
expenditures miscellaneous 2017 New motorcycles	12.86 (2.54)	12.84 (2.56)	12.84 (2.56)
expenditures miscellaneous 2017 Used motorcycles	11.00 (1.42)	10.99 (1.43)	10.99 (1.43)
expenditures miscellaneous 2017 Gasoline and motor oil	844.40 (86.51)	844.03 (86.78)	844.03 (86.78)
expenditures miscellaneous 2017 other vehicle expenses	1115.26 (120.79)	1114.76 (121.13)	1114.76 (121.13)

expenditures miscellaneous 2017 Vehicle finance charges	87.57 (8.99)	87.55 (9.01)	87.55 (9.01)
expenditures miscellaneous 2017 Maintenance and repairs	338.94 (39.24)	338.75 (39.39)	338.75 (39.39)
expenditures miscellaneous 2017 Coolant brake fluid transmission and OT additives	2.88 (0.24)	2.88 (0.24)	2.88 (0.24)
expenditures miscellaneous 2017 Tires purchased replaced installed	52.25 (6.60)	52.22 (6.63)	52.22 (6.63)
expenditures miscellaneous 2017 Parts equipment and accessories	20.38 (2.76)	20.36 (2.77)	20.36 (2.77)
expenditures miscellaneous 2017 Vehicle products and cleaning services	5.61 (0.77)	5.61 (0.77)	5.61 (0.77)
expenditures miscellaneous 2017 Misc. auto repair servicing	39.96 (4.69)	39.94 (4.70)	39.94 (4.70)
expenditures miscellaneous 2017 Body work and painting	12.65 (1.75)	12.64 (1.76)	12.64 (1.76)
expenditures miscellaneous 2017 Motor tune.up	16.53 (1.98)	16.52 (1.99)	16.52 (1.99)
expenditures miscellaneous 2017 Lube oil change and oil filters	35.30 (3.53)	35.29 (3.53)	35.29 (3.53)
expenditures miscellaneous 2017 Front.end alignment wheel balance and rotation	10.30 (1.08)	10.30 (1.08)	10.30 (1.08)
expenditures miscellaneous 2017 Shock absorber replacement	5.05 (0.58)	5.05 (0.58)	5.05 (0.58)
expenditures miscellaneous 2017 Repair tires and OT repair work	42.58 (4.32)	42.57 (4.32)	42.57 (4.32)
expenditures miscellaneous 2017 Auto repair ser policy	13.94 (1.61)	13.93 (1.61)	13.93 (1.61)
expenditures miscellaneous 2017 Vehicle insurance	433.67 (42.18)	433.54 (42.24)	433.54 (42.24)
expenditures miscellaneous 2017 Vehicle rental leases licenses and OT charges	257.02 (36.16)	256.86 (36.26)	256.86 (36.26)
expenditures miscellaneous 2017 Leased and rented vehicles	157.78 (22.40)	157.69 (22.45)	157.69 (22.45)
expenditures miscellaneous 2017 Rented vehicles	26.98 (4.36)	26.97 (4.36)	26.97 (4.36)
expenditures miscellaneous 2017 Leased vehicles	130.86 (18.08)	130.79 (18.12)	130.79 (18.12)
expenditures miscellaneous 2017 Vehicle registration state	38.44 (5.08)	38.41 (5.10)	38.41 (5.10)
expenditures miscellaneous 2017 Vehicle registration local	3.78 (0.66)	3.77 (0.66)	3.77 (0.66)
expenditures miscellaneous 2017 drivers license	3.49 (0.31)	3.49 (0.31)	3.49 (0.31)
expenditures miscellaneous 2017 Vehicle inspection	5.04 (0.59)	5.03 (0.59)	5.03 (0.59)
expenditures miscellaneous 2017 Parking fees	19.39 (4.02)	19.38 (4.02)	19.38 (4.02)
expenditures miscellaneous 2017 Parking fees in home city excluding residence	16.50 (3.45)	16.49 (3.46)	16.49 (3.46)
expenditures miscellaneous 2017 Parking fees out of town	2.86 (0.52)	2.86 (0.52)	2.86 (0.52)

expenditures miscellaneous 2017 Tolls or electronic toll passes	15.47 (2.57)	15.46 (2.58)	15.46 (2.58)
expenditures miscellaneous 2017 Tolls on out of town	2.16 (0.34)	2.16 (0.34)	2.16 (0.34)
expenditures miscellaneous 2017 Towing charges	1.61 (0.18)	1.61 (0.18)	1.61 (0.18)
expenditures miscellaneous 2017 Public and other transportation	274.47 (58.61)	274.25 (58.68)	274.25 (58.68)
expenditures miscellaneous 2017 Airline fares	174.85 (40.09)	174.68 (40.16)	174.68 (40.16)
expenditures miscellaneous 2017 Intercity bus fares	4.54 (0.56)	4.54 (0.56)	4.54 (0.56)
expenditures miscellaneous 2017 Intracity mass transit fares	34.07 (5.85)	34.10 (5.85)	34.10 (5.85)
expenditures miscellaneous 2017 Local trans on out of tow	5.41 (1.30)	5.40 (1.30)	5.40 (1.30)
expenditures miscellaneous 2017Taxi fares and limousine sers on trips	3.16 (0.76)	3.16 (0.76)	3.16 (0.76)
expenditures miscellaneous 2017Taxi fares and limousine sers	13.35 (2.40)	13.34 (2.40)	13.34 (2.40)
expenditures miscellaneous 2017Intercity train fares	7.00 (1.27)	7.00 (1.27)	7.00 (1.27)
expenditures miscellaneous 2017Ship fares	30.01 (6.73)	29.97 (6.77)	29.97 (6.77)
expenditures miscellaneous 2017School bus	2.60 (0.98)	2.59 (0.98)	2.59 (0.98)
expenditures miscellaneous 2017Healthcare	1773.09 (242.26)	1771.71 (243.30)	1771.71 (243.30)
expenditures miscellaneous 2017 Health insurance	1209.18 (156.31)	1208.34 (156.91)	1208.34 (156.91)
expenditures miscellaneous 2017 Commercial health insurance	235.79 (33.50)	235.61 (33.66)	235.61 (33.66)
expenditures miscellaneous 2017Blue Cross Blue Shield	413.19 (54.50)	412.89 (54.76)	412.89 (54.76)
expenditures miscellaneous 2017 Commercial medicare supp BCBS	15.62 (3.89)	15.60 (3.89)	15.60 (3.89)
expenditures miscellaneous 2017 other health insurance BCBS	12.05 (1.53)	12.05 (1.53)	12.05 (1.53)
expenditures miscellaneous 2017 Medicare payments	178.27 (34.93)	178.17 (34.90)	178.17 (34.90)
expenditures miscellaneous 2017 Medicare prescription drug premium	39.06 (8.16)	39.04 (8.16)	39.04 (8.16)
expenditures miscellaneous 2017 Commercial medicare supps and OT health insur	78.74 (15.78)	78.66 (15.82)	78.66 (15.82)
expenditures miscellaneous 2017 Commercial medicare supp not blue cross	43.12 (10.78)	43.07 (10.79)	43.07 (10.79)
expenditures miscellaneous 2017 other health insurance not BCBS	35.82 (5.64)	35.78 (5.67)	35.78 (5.67)
expenditures miscellaneous 2017 Long term care insurance	33.51 (5.51)	33.48 (5.53)	33.48 (5.53)
expenditures miscellaneous 2017 Medical services	331.20 (53.07)	330.84 (53.39)	330.84 (53.39)
expenditures miscellaneous 2017 physicians services	73.01 (10.87)	72.94 (10.94)	72.94 (10.94)

expenditures miscellaneous 2017 Dental services	119.74 (19.14)	119.62 (19.24)	119.62 (19.24)
expenditures miscellaneous 2017 Eyecare services	18.53 (2.56)	18.52 (2.57)	18.52 (2.57)
expenditures miscellaneous 2017 services by professionals other than physician	25.02 (4.20)	24.99 (4.23)	24.99 (4.23)
expenditures miscellaneous 2017 Lab tests x.rays	19.55 (3.24)	19.53 (3.26)	19.53 (3.26)
expenditures miscellaneous 2017 Hospital room and service	56.13 (9.75)	56.06 (9.81)	56.06 (9.81)
expenditures miscellaneous 2017 Care in convalescent or nursing home	9.72 (2.70)	9.71 (2.70)	9.71 (2.70)
expenditures miscellaneous 2017 other medical care services	10.45 (2.05)	10.43 (2.06)	10.43 (2.06)
expenditures miscellaneous 2017 Drugs	173.14 (26.15)	172.99 (26.25)	172.99 (26.25)
expenditures miscellaneous 2017 Nonprescription drugs	40.93 (5.94)	40.89 (5.97)	40.89 (5.97)
expenditures miscellaneous 2017 Nonprescription vitamins	23.64 (3.55)	23.62 (3.57)	23.62 (3.57)
expenditures miscellaneous 2017 Prescription drugs	108.57 (16.90)	108.48 (16.94)	108.48 (16.94)
expenditures miscellaneous 2017 Medical supplies	60.31 (8.52)	60.26 (8.56)	60.26 (8.56)
expenditures miscellaneous 2017 Eyeglasses and contact lenses	29.76 (3.77)	29.74 (3.78)	29.74 (3.78)
expenditures miscellaneous 2017 Hearing aids	9.51 (2.41)	9.49 (2.41)	9.49 (2.41)
expenditures miscellaneous 2017 Topicals and dressings	16.71 (2.40)	16.69 (2.41)	16.69 (2.41)
expenditures miscellaneous 2017 Adult diapers	1.07 (0.11)	1.07 (0.11)	1.07 (0.11)
expenditures miscellaneous 2017 Medical equipment for general use	1.82 (0.36)	1.82 (0.36)	1.82 (0.36)
expenditures miscellaneous 2017 Supportive and convalescent medical equipment	1.27 (0.23)	1.27 (0.23)	1.27 (0.23)
expenditures miscellaneous 2017 Rental of medical equipment	0.23 (0.05)	0.23 (0.05)	0.23 (0.05)
expenditures miscellaneous 2017 Rental of supportive convalescent medical equipment	0.22 (0.04)	0.22 (0.04)	0.22 (0.04)
expenditures miscellaneous 2017 Entertainment	1164.41 (169.61)	1163.45 (170.43)	1163.45 (170.43)
expenditures miscellaneous 2017 Fees and admissions	282.98 (57.32)	282.67 (57.56)	282.67 (57.56)
expenditures miscellaneous 2017 Recreation expenses out of town	8.96 (1.78)	8.95 (1.78)	8.95 (1.78)
expenditures miscellaneous 2017 Social recreation health club membership	70.60 (15.34)	70.52 (15.40)	70.52 (15.40)
expenditures miscellaneous 2017 Fees for participant sports	41.89 (7.67)	41.83 (7.72)	41.83 (7.72)

expenditures miscellaneous 2017 Participant sports out of town	8.43 (2.03)	8.42 (2.03)	8.42 (2.03)
expenditures miscellaneous 2017 Movie other admissions out of town	24.25 (5.08)	24.22 (5.09)	24.22 (5.09)
expenditures miscellaneous 2017 Admission to sporting events	18.71 (4.64)	18.69 (4.65)	18.69 (4.65)
expenditures miscellaneous 2017 Admission to sports events out of town	8.06 (1.69)	8.06 (1.70)	8.06 (1.70)
expenditures miscellaneous 2017 Fees for recreational lessons	49.74 (10.84)	49.68 (10.88)	49.68 (10.88)
expenditures miscellaneous 2017 other entertainment services out of town	8.96 (1.78)	8.95 (1.78)	8.95 (1.78)
expenditures miscellaneous 2017 Pets toys hobbies and playground equipment	271.69 (44.42)	271.39 (44.69)	271.39 (44.69)
expenditures miscellaneous 2017 Pets	218.71 (35.94)	218.47 (36.15)	218.47 (36.15)
expenditures miscellaneous 2017 Pet food	96.65 (16.15)	96.54 (16.24)	96.54 (16.24)
expenditures miscellaneous 2017 Pet purchase supplies medicine	47.78 (7.85)	47.72 (7.90)	47.72 (7.90)
expenditures miscellaneous 2017 Pet services	20.46 (4.04)	20.44 (4.06)	20.44 (4.06)
expenditures miscellaneous 2017 Vet services	54.29 (8.92)	54.23 (8.97)	54.23 (8.97)
expenditures miscellaneous 2017 Toys games arts and crafts and tricycles	52.01 (8.12)	51.95 (8.18)	51.95 (8.18)
expenditures miscellaneous 2017 Stamp and coin collecting	1.59 (0.36)	1.59 (0.36)	1.59 (0.36)
expenditures miscellaneous 2017 Playground equipment	1.60 (0.25)	1.59 (0.26)	1.59 (0.26)
expenditures miscellaneous 2017 other entertainment supplies equipment and services	192.66 (36.15)	192.43 (36.35)	192.43 (36.35)
expenditures miscellaneous 2017 Unmotored recreational vehicles	34.30 (7.49)	34.25 (7.52)	34.25 (7.52)
expenditures miscellaneous 2017 Boat without motor and boat trailers	4.30 (1.16)	4.29 (1.16)	4.29 (1.16)
expenditures miscellaneous 2017 Trailer and other attachable campers	30.25 (7.04)	30.21 (7.06)	30.21 (7.06)
expenditures miscellaneous 2017 Motorized recreational vehicles	61.44 (13.76)	61.35 (13.84)	61.35 (13.84)
expenditures miscellaneous 2017 Purchase of motorized camper	24.53 (5.83)	24.49 (5.86)	24.49 (5.86)
expenditures miscellaneous 2017 Purchase of other vehicle	21.38 (5.02)	21.35 (5.05)	21.35 (5.05)
expenditures miscellaneous 2017 Purchase of boat with motor	16.14 (3.45)	16.12 (3.47)	16.12 (3.47)
expenditures miscellaneous 2017 Sports recreation and exercise equipment	55.49 (9.87)	55.43 (9.91)	55.43 (9.91)
expenditures miscellaneous 2017 Athletic gear game tables and exercise equipment	18.63 (3.29)	18.61 (3.31)	18.61 (3.31)
expenditures miscellaneous 2017 Bicycles	9.85 (1.67)	9.84 (1.68)	9.84 (1.68)

expenditures miscellaneous 2017 Camping equipment	4.77 (0.67)	4.76 (0.67)	4.76 (0.67)
expenditures miscellaneous 2017 Hunting and fishing equipment	13.73 (2.78)	13.72 (2.80)	13.72 (2.80)
expenditures miscellaneous 2017 Winter sports equipment	2.22 (0.47)	2.21 (0.47)	2.21 (0.47)
expenditures miscellaneous 2017 Water sports equipment	1.80 (0.43)	1.80 (0.43)	1.80 (0.43)
expenditures miscellaneous 2017 other sports equipment	3.22 (0.49)	3.22 (0.49)	3.22 (0.49)
expenditures miscellaneous 2017 Global positioning system devices	0.39 (0.32)	0.39 (0.33)	0.39 (0.33)
expenditures miscellaneous 2017 Rental and repair of misc sports equipment	0.65 (0.13)	0.65 (0.13)	0.65 (0.13)
expenditures miscellaneous 2017 Photographic equipment supplies and services	18.18 (2.31)	18.17 (2.32)	18.17 (2.32)
expenditures miscellaneous 2017 Film	0.41 (0.09)	0.41 (0.09)	0.41 (0.09)
expenditures miscellaneous 2017 other photographic supplies	0.21 (0.06)	0.21 (0.06)	0.21 (0.06)
expenditures miscellaneous 2017 Photo processing	2.91 (0.49)	2.90 (0.49)	2.90 (0.49)
expenditures miscellaneous 2017 Photographic equipment	7.12 (1.02)	7.11 (1.02)	7.11 (1.02)
expenditures miscellaneous 2017 Photographer fees	7.23 (0.93)	7.23 (0.93)	7.23 (0.93)
expenditures miscellaneous 2017 Fireworks	2.58 (0.66)	2.58 (0.66)	2.58 (0.66)
expenditures miscellaneous 2017 Souvenirs	0.91 (0.19)	0.91 (0.19)	0.91 (0.19)
expenditures miscellaneous 2017 Visual goods	0.35 (0.08)	0.35 (0.08)	0.35 (0.08)
expenditures miscellaneous 2017 Pinball electronic video games	0.78 (0.13)	0.78 (0.14)	0.78 (0.14)
expenditures miscellaneous 2017 Personal care products and services	275.08 (31.56)	274.96 (31.64)	274.96 (31.64)
expenditures miscellaneous 2017 Personal care products	152.56 (18.05)	152.47 (18.12)	152.47 (18.12)
expenditures miscellaneous 2017 Hair care products	29.88 (3.37)	29.87 (3.38)	29.87 (3.38)
expenditures miscellaneous 2017 Nonelectric articles for the hair	5.62 (0.71)	5.61 (0.71)	5.61 (0.71)
expenditures miscellaneous 2017 Wigs and hairpieces	0.90 (0.72)	0.91 (0.73)	0.91 (0.73)
expenditures miscellaneous 2017 Oral hygiene products articles	17.81 (2.05)	17.80 (2.05)	17.80 (2.05)
expenditures miscellaneous 2017 Shaving needs	9.01 (1.30)	9.00 (1.31)	9.00 (1.31)
expenditures miscellaneous 2017 Cosmetics perfume bath preparations	68.01 (8.29)	67.96 (8.33)	67.96 (8.33)
expenditures miscellaneous 2017 Deodorants feminine hygiene misc personal care	17.35 (2.10)	17.34 (2.11)	17.34 (2.11)
expenditures miscellaneous 2017 Electric personal care appliances	4.10 (0.59)	4.09 (0.59)	4.09 (0.59)
expenditures miscellaneous 2017 Personal care services	122.54 (14.14)	122.51 (14.14)	122.51 (14.14)
expenditures miscellaneous 2017 Reading	46.00 (7.01)	45.96 (7.05)	45.96 (7.05)
expenditures miscellaneous 2017 Books through book clubs	1.39 (0.26)	1.38 (0.26)	1.38 (0.26)

expenditures miscellaneous 2017 Books not through book clubs	10.97 (2.21)	10.96 (2.22)	10.96 (2.22)
expenditures miscellaneous 2017 Digital book readers	9.63 (1.35)	9.63 (1.35)	9.63 (1.35)
expenditures miscellaneous 2017 School supplies unspecified	24.24 (3.03)	24.22 (3.04)	24.22 (3.04)
expenditures miscellaneous 2017 Tobacco products and smoking supplies	134.34 (14.24)	134.28 (14.28)	134.28 (14.28)
expenditures miscellaneous 2017 Cigarettes	116.47 (11.88)	116.43 (11.91)	116.43 (11.91)
expenditures miscellaneous 2017 other tobacco products	13.50 (1.86)	13.48 (1.87)	13.48 (1.87)
expenditures miscellaneous 2017 Smoking accessories	3.19 (0.43)	3.18 (0.43)	3.18 (0.43)
expenditures miscellaneous 2017 misc expenses	353.70 (47.72)	353.45 (47.93)	353.45 (47.93)
expenditures miscellaneous 2017 Lotteries and mutuel losses	21.29 (3.26)	21.27 (3.27)	21.27 (3.27)
expenditures miscellaneous 2017 Legal fees	62.71 (11.32)	62.64 (11.38)	62.64 (11.38)
expenditures miscellaneous 2017 Funeral	27.38 (4.57)	27.37 (4.57)	27.37 (4.57)
expenditures miscellaneous 2017 Safe deposit box rental	1.61 (0.27)	1.61 (0.27)	1.61 (0.27)
expenditures miscellaneous 2017 Checking accounts other bank ser charges	11.83 (1.00)	11.83 (1.00)	11.83 (1.00)
expenditures miscellaneous 2017 Cemetery lots vaults maintenance fees	2.32 (0.42)	2.32 (0.42)	2.32 (0.42)
expenditures miscellaneous 2017 Accounting fees	26.16 (5.28)	26.13 (5.30)	26.13 (5.30)
expenditures miscellaneous 2017 misc personal services	16.42 (2.36)	16.41 (2.38)	16.41 (2.38)
expenditures miscellaneous 2017 Dating services	0.22 (0.04)	0.22 (0.04)	0.22 (0.04)
expenditures miscellaneous 2017 Occupational expenses	18.62 (2.64)	18.61 (2.65)	18.61 (2.65)
expenditures miscellaneous 2017 expenses for other properties	17.31 (2.97)	17.29 (2.99)	17.29 (2.99)
expenditures miscellaneous 2017 Credit card memberships	1.99 (0.48)	1.99 (0.48)	1.99 (0.48)
expenditures miscellaneous 2017 Shopping club membership fees	7.31 (1.02)	7.31 (1.02)	7.31 (1.02)
expenditures miscellaneous 2017 Vacation clubs	11.29 (4.47)	11.28 (4.47)	11.28 (4.47)
expenditures miscellaneous 2017 Cash contributions	734.69 (107.99)	734.24 (108.24)	734.24 (108.24)
expenditures miscellaneous 2017 Support for college students	41.57 (6.82)	41.54 (6.83)	41.54 (6.83)
expenditures miscellaneous 2017 Alimony expenditures	29.37 (5.15)	29.34 (5.16)	29.34 (5.16)
expenditures miscellaneous 2017 Child support expenditures	85.04 (8.61)	85.02 (8.62)	85.02 (8.62)

expenditures miscellaneous 2017 Gift to non credit union members of stock bond mutual	25.11 (3.34)	25.11 (3.33)	25.11 (3.33)
expenditures miscellaneous 2017 Cash contributions to charities and other organizations	90.76 (20.88)	90.65 (20.95)	90.65 (20.95)
expenditures miscellaneous 2017 Cash contributions to church religious organizations	317.66 (39.27)	317.53 (39.33)	317.53 (39.33)
expenditures miscellaneous 2017 Cash contributions to educational institutions	15.45 (4.87)	15.43 (4.88)	15.43 (4.88)
expenditures miscellaneous 2017 Cash contributions to political organizations	3.23 (0.60)	3.23 (0.60)	3.23 (0.60)
expenditures miscellaneous 2017 other cash gifts	130.01 (17.72)	129.91 (17.79)	129.91 (17.79)
expenditures miscellaneous 2017 Personal insurance and pensions	2710.00 (499.34)	2707.94 (500.55)	2707.94 (500.55)
expenditures miscellaneous 2017 Life and other personal insurance	139.93 (21.23)	139.84 (21.28)	139.84 (21.28)
expenditures miscellaneous 2017 Life endowment annuity other personal insurance	130.33 (19.61)	130.25 (19.65)	130.25 (19.65)
expenditures miscellaneous 2017 other non-health insurance	9.62 (1.63)	9.61 (1.64)	9.61 (1.64)
expenditures miscellaneous 2017 Pensions and Social Security	2570.38 (477.85)	2568.41 (479.01)	2568.41 (479.01)



Appendix F.1. Consumer expenditure second order variables, expressed as 2017 county per capita or per capita %, eligible for feature selection, for each outcome

<b>Log ER Visits (2,475)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
expenditures food 2017 Baby food *expenditures home 2017 Rent as pay	430.78 (74.50)
expenditures food 2017 Nonalcoholic beer *expenditures home 2017 Rent as pay	2.41 (0.72)
expenditures food 2017 Dinner at Employer or School Cafeteria *expenditures home 2017 Rent as pay	74.56 (19.25)
expenditures food 2017 Snack nonalcoholic beverages at Employer or School cafeteria *expenditures home 2017 Rent as pay	133.93 (25.86)
expenditures food 2017 Breakfast and brunch at Employer or School Cafeteria *expenditures home 2017 Rent as pay	167.33 (40.03)
expenditures food 2017 Meals as pay *expenditures home 2017 Rent as pay	335.55 (85.01)
expenditures food 2017 Test preparation tutoring services *expenditures home 2017 Rent as pay	210.95 (67.98)
expenditures food 2017 School supplies for day care nursery *expenditures home 2017 Rent as pay	4.17 (0.88)
expenditures home 2017 Mortgage interest *expenditures home 2017 Rent as pay	38173.45 (7208.87)
expenditures home 2017 Interest paid home equity loan *expenditures home 2017 Rent as pay	483.27 (86.20)
expenditures home 2017 Ground rent *expenditures home 2017 Rent as pay	768.25 (199.37)
expenditures home 2017 Rented dwellings *expenditures home 2017 Rent as pay	43546.27 (18100.82)
expenditures home 2017 Rent *expenditures home 2017 Rent as pay	41189.88 (17218.55)
expenditures home 2017 Main insurance and other Rented *expenditures home 2017 Rent as pay	1313.95 (347.46)
expenditures home 2017 Tenants insurance *expenditures home 2017 Rent as pay	249.27 (95.14)
expenditures home 2017 Coin operated household laundry dryclean *expenditures home 2017 Rent as pay	124.85 (55.39)
expenditures home 2017 Computer Installation *expenditures home 2017 Rent as pay	2.72 (0.75)
expenditures home 2017 Delivery services *expenditures home 2017 Rent as pay	54.35 (10.40)
expenditures home 2017 Sewing machines *expenditures home 2017 Rent as pay	77.07 (18.81)

expenditures home 2017 Flatware *expenditures home 2017 Rent as pay	58.04 (17.32)
expenditures home 2017 Telephones and accessories *expenditures home 2017 Rent as pay	661.17 (189.82)
expenditures home 2017 Lawn and garden equipment *expenditures home 2017 Rent as pay	744.22 (164.21)
expenditures home 2017 Rental of furniture *expenditures home 2017 Rent as pay	64.93 (26.22)
expenditures home 2017 Boys hosiery *expenditures home 2017 Rent as pay	79.11 (16.74)
expenditures home 2017 Womens sport coats tailored jackets *expenditures home 2017 Rent as pay	107.26 (40.12)
expenditures home 2017 Girls hosiery *expenditures home 2017 Rent as pay	56.09 (14.78)
expenditures home 2017 Girls uniforms *expenditures home 2017 Rent as pay	32.83 (9.76)
expenditures home 2017 Girls costumes *expenditures home 2017 Rent as pay	34.17 (5.54)
expenditures home 2017 Infant nightwear loungewear *expenditures home 2017 Rent as pay	86.98 (19.62)
expenditures misc 2017 Online gaming services *expenditures home 2017 Rent as pay	44.72 (8.12)
expenditures misc 2017 Repair of tv radio and sound equipment*expenditures home 2017 Rent as pay	17.68 (4.81)
expenditures misc 2017 Rental of televisions *expenditures home 2017 Rent as pay	7.51 (8.74)
expenditures misc 2017 Personal digital audio players *expenditures home 2017 Rent as pay	24.01 (5.54)
expenditures misc 2017 Satellite dishes *expenditures home 2017 Rent as pay	15.06 (5.34)
expenditures misc 2017 Termination fee for car trucklease *expenditures home 2017 Rent as pay	5.07 (1.33)
expenditures misc 2017 Gas tank repair replacement *expenditures home 2017 Rent as pay	165.04 (35.70)
expenditures misc 2017 Value surrender of whole life insurance policy *Rexpenditures home 2017 ent as pay	101364.47 (30390.01)
expenditures misc 2017 Watches *expenditures home 2017 Rent as pay	841.94 (313.89)
expenditures misc 2017 Coin operated apparel laundry dryclean *expenditures home 2017 Rent as pay	472.11 (213.15)
expenditures misc 2017 Clothing rental *expenditures home 2017 Rent as pay	26.24 (5.58)
expenditures misc 2017 Watch and jewelry repair *expenditures home 2017 Rent as pay	365.99 (156.91)
expenditures misc 2017 Vehicle purchases net outlay *expenditures home 2017 Rent as pay	52544.90 (10130.09)

expenditures misc 2017 School bus *expenditures home 2017 Rent as pay	81.74 (33.76)
expenditures misc 2017 Medicare payments *expenditures home 2017 Rent as pay	5715.07 (1448.99)
expenditures misc 2017 Long term care insurance *expenditures home 2017 Rent as pay	1065.42 (215.29)
expenditures misc 2017 Care in convalescent or nursing home *expenditures home 2017 Rent as pay	307.19 (89.10)
expenditures misc 2017 Medical equipment for general use *expenditures home 2017 Rent as pay	57.70 (13.02)
expenditures misc 2017 Supportive and convalescent medical equipment *expenditures home 2017 Rent as pay	40.02 (7.73)
expenditures misc 2017 Unmotored recreational vehicles *expenditures home 2017 Rent as pay	1079.67 (238.35)
expenditures misc 2017 Boat without motor and boat trailers *expenditures home 2017 Rent as pay	134.26 (33.49)
expenditures misc 2017Trailer and other attachable campers *expenditures home 2017 Rent as pay	953.00 (226.56)
expenditures misc 2017 Global positioning system devices *expenditures home 2017 Rent as pay	14.07 (16.32)
expenditures misc 2017 Fireworks *expenditures home 2017 Rent as pay	80.90 (19.02)
expenditures misc 2017 Visual goods *expenditures home 2017 Rent as pay	10.92 (2.42)
expenditures misc 2017 Wigs and hairpieces *expenditures home 2017 Rent as pay	32.76 (37.79)
expenditures misc 2017 Expenses for other properties *expenditures home 2017 Rent as pay	548.05 (106.33)
expenditures misc 2017 Cash contributions to political organizations *expenditures home 2017 Rent as pay	102.28 (21.14)
<b>Log IP Days (2,491)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
expenditures food 2017 Prepared flour mixes *expenditures home 2017 Rent	6485.41 (1393.23)
expenditures food 2017 Sugar *expenditures home 2017 Rent	9158.72 (2192.24)
expenditures food 2017 Baby food *expenditures home 2017 Rent	16680.99 (3175.11)
expenditures food 2017 Nonalcoholic beer *expenditures home 2017 Rent	93.83 (30.52)
expenditures food 2017 Dinner at Employer or School Cafeteria *expenditures home 2017	2878.93 (757.33)
expenditures food 2017 Breakfast and brunch at Employer or School Cafeteria *expenditures home 2017 Rent	6465.70 (1581.26)

expenditures food 2017 School supplies for elementary high school *expenditures home 2017 Rent	8407.86 (1627.09)
expenditures food 2017 School supplies for vocational and technical schools *expenditures home 2017 Rent	258.48 (62.71)
expenditures food 2017 School supplies for day care nursery *expenditures home 2017 Rent	161.48 (37.49)
expenditures home 2017 Ground rent *expenditures home 2017 Rent	29385.39 (6548.13)
expenditures home 2017 Rented dwellings *expenditures home 2017 Rent	1674740.98 (671854.73)
expenditures home 2017 Rent as pay *expenditures home 2017 Rent	41232.61 (17252.16)
expenditures home 2017 Tenants insurance *expenditures home 2017 Rent	9582.80 (3491.74)
expenditures home 2017Coal wood and Other fuels *expenditures home 2017 Rent	4296.75 (883.44)
expenditures home 2017 household laundry dryclean not coin.operated *expenditures home 2017 Rent	9052.20 (2750.59)
expenditures home 2017 Computer Installation *expenditures home 2017 Rent	104.52 (27.88)
expenditures home 2017 Kitchen dining room furniture *expenditures home 2017 Rent	20860.64 (5976.12)
expenditures home 2017 Sewing machines *expenditures home 2017 Rent	2960.04 (659.05)
expenditures home 2017 Flatware * expenditures home 2017 Rent	2245.14 (683.62)
expenditures home 2017 Telephones and accessories * expenditures home 2017 Rent	25651.07 (7965.37)
expenditures home 2017 Office furniture home use * expenditures home 2017 Rent	3447.22 (1329.65)
expenditures home 2017 Rental of furniture *expenditures home 2017 Rent	2484.82 (895.21)
expenditures home 2017 Mens sportcoats tailored jackets *expenditures home 2017 Rent	3919.36 (1369.16)
expenditures home 2017 Boys 2 15 clothing *expenditures home 2017Rent	52070.66 (10500.37)
expenditures home 2017 Boys accessories *expenditures home 2017 Rent	3303.06 (927.59)
expenditures home 2017 Boys suits sportcoats vests *expenditures home 2017 Rent	568.51 (127.26)
expenditures home 2017 Boys pants and shorts *expenditures home 2017 Rent	13159.06 (2993.98)
expenditures home 2017 Womens uniforms *expenditures home 2017 Rent	2719.71 (638.87)
expenditures home 2017 Girls coats and jackets *expenditures home 2017 Rent	2682.53 (603.73)

expenditures home 2017 Girls hosiery *expenditures home 2017 Rent	2156.39 (501.45)
expenditures home 2017 Infant coat jacket snowsuit *expenditures home 2017 Rent	521.81 (123.98)
expenditures home 2017 Infant nightwear loungewear *expenditures home 2017 Rent	3352.67 (714.38)
expenditures home 2017 Boys footwear *expenditures home 2017 Rent	26259.14 (6937.01)
expenditures home 2017 VCRs and video disc players *expenditures home 2017 Rent	1901.96 (437.20)
expenditures misc 2017 Repair of tv radio and sound equipment *expenditures home 2017 Rent	677.85 (157.63)
expenditures misc 2017 Rental of televisions *expenditures home 2017 Rent	105.93 (251.35)
expenditures misc 2017 Termination fee for car trucklease *expenditures home 2017 Rent	196.08 (51.08)
expenditures misc 2017 Trade in allowance for car trucklease *expenditures home 2017 Rent	19416.24 (3593.33)
expenditures misc 2017 Gas tank repair replacement *expenditures home 2017 Rent	6376.91 (1385.94)
expenditures misc 2017 Watches *expenditures home 2017 Rent	32935.35 (13991.83)
expenditures misc 2017 Coin operated apparel laundry dryclean *expenditures home 2017 Rent	18060.41 (7445.67)
expenditures misc 2017 Apparel laundry dryclean not coin.operated *expenditures home 2017 Rent	22297.31 (7423.46)
expenditures misc 2017 New motorcycles *expenditures home 2017 Rent	15720.71 (3620.90)
expenditures misc 2017 Towing charges *expenditures home 2017 Rent	2018.99 (590.41)
expenditures misc 2017 Intracity mass transit fares *expenditures home 2017 Rent	43221.20 (15870.19)
expenditures misc 2017 Medicare prescription drug premium *expenditures home 2017 Rent	47878.98 (10791.16)
expenditures misc 2017 Commercial medicare supp not blue cross *expenditures home 2017 Rent	52525.09 (13062.01)
expenditures misc 2017 Medical equipment for general use *expenditures home 2017 Rent	2215.99 (446.46)
expenditures misc 2017 Rental of medical equipment *expenditures home 2017 Rent	277.92 (64.83)
expenditures misc 2017 Rental of supportive convalescent medical equipment *expenditures home 2017 Rent	267.85 (57.57)
expenditures misc 2017 Purchase of boat with motor *expenditures home 2017 Rent	19688.89 (4623.05)
expenditures misc 2017 Souvenirs *expenditures home 2017 Rent	1119.75 (277.84)

expenditures misc 2017 Pinball electronic video games *expenditures home 2017 Rent	982.62 (328.98)
expenditures misc 2017 Wigs and hairpieces *expenditures home 2017 Rent	1218.68 (1265.01)
expenditures misc 2017 Electric personal care appliances *expenditures home 2017 Rent	5065.65 (1205.85)
expenditures misc 2017 Dating services *expenditures home 2017 Rent	272.58 (65.31)
expenditures misc 2017 Gift to non credit union members of stock bond mutual *expenditures home 2017 Rent	31227.25 (7592.57)
<b>Log Hospital Expenditures (2,491)</b>	
<i>Variable Name</i>	<i>Mean (SD)</i>
expenditures food 2017 Rice *expenditures home 2017 Tenants insurance	77.71 (17.85)
expenditures food 2017 Lamb organ meats and others *expenditures home 2017 Tenants insurance	44.72 (9.56)
expenditures food 2017 Baby food *expenditures home 2017 Tenants insurance	101.65 (17.90)
expenditures food 2017 Nonalcoholic beer *expenditures home 2017 Tenants insurance	0.57 (0.19)
expenditures food 2017 Lunch at Vending machine *expenditures home 2017 Tenants insurance	40.87 (7.97)
expenditures food 2017 Dinner at Employer or School Cafeteria *expenditures home 2017 Tenants insurance	17.36 (3.32)
expenditures food 2017 Snack nonalcoholic beverages at Restaurants *expenditures home 2017 Tenants insurance	155.21 (31.16)
expenditures food 2017 Breakfast and brunch at Employer or School cafeteria *expenditures home 2017 Tenants insurance	39.30 (8.55)
expenditures food 2017 Meals as pay *expenditures home 2017 Tenants insurance	79.02 (19.51)
expenditures food 2017 Other alcoholic beverages away *expenditures home 2017 Tenants insurance	149.14 (32.85)
expenditures food 2017 College tuition *expenditures home 2017 Tenants insurance	2522.43 (680.40)
expenditures food 2017 School supplies for college *expenditures home 2017 Tenants insurance	138.44 (30.82)
expenditures food 2017 School supplies for vocational and technical schools *expenditures home 2017 Tenants insurance	1.58 (0.36)
expenditures food 2017 School supplies for day care nursery *expenditures home 2017 Tenants insurance	0.98 (0.20)
expenditures home 2017 Mortgage interest and charges *expenditures home 2017 Tenants insurance	9436.83 (1931.24)
expenditures home 2017 Interest paid home equity loan *expenditures home 2017 Tenants insurance	114.44 (22.63)

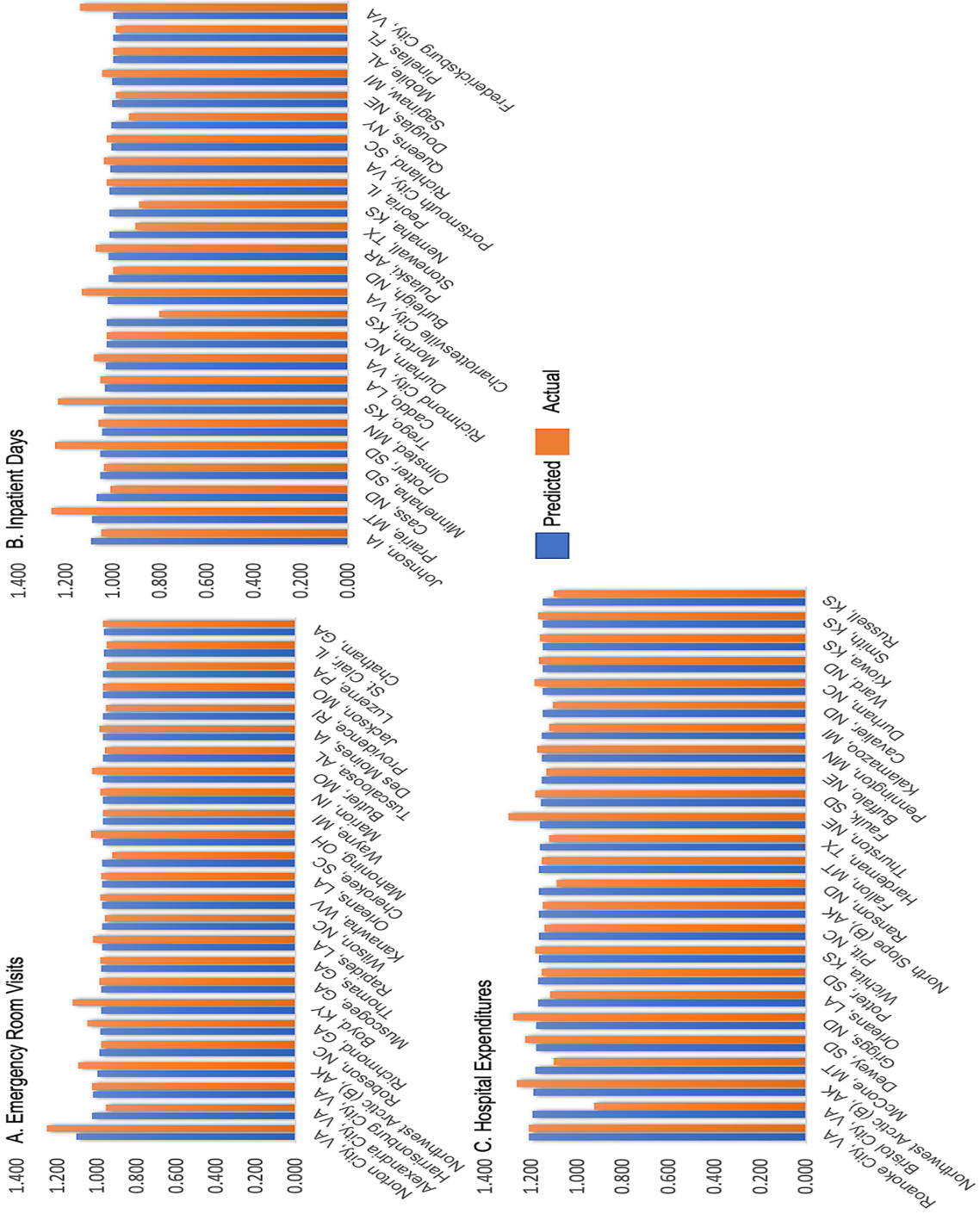
expenditures home 2017 Ground rent *expenditures home 2017 Tenants insurance	179.78 (41.69)
expenditures home 2017 Rented dwellings *expenditures home 2017 Tenants insurance	10132.20 (3671.41)
expenditures home 2017 Rent *expenditures home 2017 Tenants insurance	249.51 (95.35)
expenditures home 2017 Main insurance and Other Rented *expenditures home 2017 Tenants insurance	310.02 (82.30)
expenditures home 2017 Coin operated household laundry dryclean *expenditures home 2017 Tenants insurance	28.87 (10.25)
expenditures home 2017 Computer Installation *expenditures home 2017 Tenants insurance	0.64 (0.17)
expenditures home 2017 Infants equipment *expenditures home 2017 Tenants insurance	89.23 (17.09)
expenditures home 2017 Mens sportcoats tailored jackets *expenditures home 2017 Tenants insurance	23.81 (7.66)
expenditures home 2017 Boys nightwear *expenditures home 2017 Tenants insurance	3.19 (0.55)
expenditures home 2017 Boys hosiery *expenditures home 2017 Tenants insurance	18.56 (3.27)
expenditures home 2017 Boys accessories *expenditures home 2017 Tenants insurance	20.05 (4.94)
expenditures home 2017 Boys pants and shorts *expenditures home 2017 Tenants insurance	80.00 (16.09)
expenditures home 2017 Womens sport coats tailored jackets *expenditures home 2017 Tenants insurance	25.58 (10.38)
expenditures home 2017 Girls underwear and sleepwear *expenditures home 2017 Tenants insurance	29.30 (5.29)
expenditures home 2017 Girls hosiery *expenditures home 2017 Tenants insurance	13.11 (2.72)
expenditures home 2017 Girls uniforms *expenditures home 2017 Tenants insurance	7.65 (1.72)
expenditures home 2017 Infant dresses outerwear *expenditures home 2017 Tenants insurance	79.36 (17.44)
expenditures home 2017 Infant nightwear loungewear *expenditures home 2017 Tenants insurance	20.39 (3.84)
expenditures home 2017 Boys footwear *expenditures home 2017 Tenants insurance	159.52 (37.67)
expenditures home 2017 Girls footwear *expenditures home 2017 Tenants insurance	122.46 (26.63)
expenditures misc 2017 Sound equipment accessories *expenditures home 2017 Tenants insurance	24.30 (4.94)
expenditures misc 2017 Repair of tv radio and sound equipment *expenditures home 2017 Tenants insurance	4.13 (0.88)
expenditures misc 2017 Rental of televisions *expenditures home 2017 Tenants insurance	1.68 (1.70)

expenditures misc 2017 Extra fees for car trucklease *expenditures home 2017 Tenants insurance	3.81 (1.51)
expenditures misc 2017 Gas tank repair replacement *expenditures home 2017 Tenants insurance	39.04 (8.89)
expenditures misc 2017 Value .surrender. of whole life insurance policy *expenditures home 2017 Tenants insurance	24054.59 (7744.74)
expenditures misc 2017 Apparel laundry dryclean not coin.operated *expenditures home 2017 Tenants insurance	135.47 (41.38)
expenditures misc 2017 Parking fees in home city excluding residence *expenditures home 2017 Tenants insurance	124.55 (35.21)
expenditures misc 2017 Taxi fares and limousine services on trips *expenditures home 2017 Tenants insurance	23.73 (6.99)
expenditures misc 2017 Adult diapers *expenditures home 2017 Tenants insurance	8.10 (1.59)
expenditures misc 2017 Global positioning system devices *expenditures home 2017 Tenants insurance	3.17 (3.31)
expenditures misc 2017 other photographic supplies *expenditures home 2017 Tenants insurance	1.60 (0.57)
expenditures misc 2017 Fireworks *expenditures home 2017 Tenants insurance	19.27 (5.27)
expenditures misc 2017 Pinball electronic video games *expenditures home 2017 Tenants insurance	5.96 (1.81)
expenditures misc 2017 Wigs and hairpieces *expenditures home 2017 Tenants insurance	7.30 (7.26)
expenditures misc 2017 Dating services *expenditures home 2017 Tenants insurance	1.66 (0.38)
expenditures misc 2017 Vacation clubs *expenditures home 2017 Tenants insurance	84.99 (38.81)
expenditures misc 2017 Cash Contributions to educational institutions *expenditures home 2017 Tenants insurance	115.93 (42.21)

An \* is placed between 2 features to indicate interaction



Figure A. Top 5% of Predicted Counties from Best Performing Machine Learning Prediction Model for Emergency Room Visits, Inpatient Days, and Hospital Expenditures among U.S. Counties in 2017.



- A. Log Emergency Room visits per capita
- B. Log Inpatient Days per Capita
- C. Log Hospital Expenditures per capita

Appendix G. Variable importance ('model outputs') for best performing machine learning prediction model for log ER visits per capita (Test set: MSE 0.003, R<sup>2</sup> 0.279)

<b>Variable Name</b>	<b>Variable Importance</b>
census demographics 2017 other Female head household with no husband present	0.407669151
census demographics 2017 Male head household	0.341058616
census demographics 2017 household No Vehicles	0.258742704
census demographics 2017 Female household head	0.236075048
census employment 2017 Employee travel time between 30-59 min empl 16 persons	0.235364151
census demographics 2017 population density per square mile	0.225819506
census employment 2017 Employed civilian males pop 16 persons	0.214749995
census housing units 2017 House heating fuel bottled tank or LP gas count housing units	0.213198471
census housing 2017 House renter occupied count housing units	0.209666632
census employment 2017 Employed in agriculture Forestry Fishing and Hunting pop 16 persons	0.192311087
census demographics 2017 other female household head with no husband present with children less than 18	0.191062392
expenditures of misc 2017 Rental of supportive convalescent medical equip	0.188363825
census demographics 2017 Asian households	0.162098302
census demographics 2017 Asian population alone persons	0.158794001
expenditures misc 2017 Care in convalescent or nursing home	0.158048354
census employment 2017 Employed in healthcare and social assistance pop 16 persons	0.142497686
census employment 2017 Employed as self employed workers in own another incorporated business pop 16 persons	0.125613582
census employment 2017 Occupation management business and financial operations pop 16 persons	0.11690899
census employment 2017 Occupation farming fishing and forestry pop 16 persons	0.113730219
health children 2017 dental visit more than 5 years count of households persons	0.103370947
census employment 2017 Employee work at home pop 16 persons	0.103289687
census demographics 2017 population rural persons	0.101119195
expenditures food 2017 School supplies for day care nursery	0.099322044
census demographics 2017 Male Head of family	0.096866267
census demographics 2017 population urban persons	0.096003183
census housing 2017 House rent less than 250 count housing units	0.090579753
census housing 2017 House owner occupied count housing units	0.084580296
census housing 2017 House year moved in 2010 or later count housing units	0.077609943
health adults 2017 Overweight BMI count of households persons	0.076797243
census employment 2017 Employee travel time between 60-89 min. empl 16 persons	0.076767911

expenditures misc 2017 other photographic supplies	0.074580968
health children 2017 Not enrolled in school among school aged population count of households persons	0.074507416
health children 2017 hay fever count of households persons	0.070590957
health adults 2017 Healthy BMI count of households persons	0.069678701
census housing 2017 House owner households wit any mortgage count housing units	0.069243142
census demographics 2017 Two or more Races Head of households	0.068297749
expenditures home 2017 Ground rent	0.06638319
expenditures home 2017 Computer Installation	0.064111537
census demographics 2017 population 5+ Speaking Asian or Pacific Islander Language	0.063045426
health children 2017 3-5 missed school days count of households persons	0.062970339
census demographics 2017 household income 75,000-99,999	0.060504744
census demographics 2017 American Indian and Alaska Native Head of households	0.059853511
health children 2017 Children 3-17 with ADHD count of households persons	0.059750515
expenditures food 2017 School supplies for vocational and technical schools	0.059417665
expenditures home 2017 Rented dwellings	0.058253495
expenditures home 2017 Rent	0.05801939
expenditures home 2017 Rent as pay	0.056607465
health children 2017 Children 2-17years no unmet dental needs count of households persons	0.053910624
expenditures home 2017 Tenants insurance	0.053472601
expenditures misc 2017 Vacation clubs	0.053392024
health adults 2017 Doctor visits 6 months or less count of households persons	0.05331679
health adults 2017 Alcohol current infrequent consumer count of households persons	0.052498754
expenditures home 2017 Infant nightwear loungewear	0.051937753
expenditures home 2017 Watch and jewelry repair	0.051093674
expenditures food 2017 School supplies for college	0.0493621
health adults 2017 Regular healthcare some other place count of households persons	0.048508908
expenditures home 2017 Boys suits sport coats vests	0.047465803
expenditures home 2017 Boys hosiery	0.047228813
health children 2017 Delayed care due to cost count of households persons	0.046993716
expenditures misc 2017 Global positioning system devices	0.046971387
health adults 2017 Obese BMI count of households persons	0.046066957
expenditures misc 2017 Gas tank repair replacement	0.045043114
health children 2017 No missed school days count of households persons	0.044422177
expenditures misc 2017 Repair of tv radio and sound equipment	0.043704043
expenditures misc 2017 Dating services	0.043610776
expenditures misc 2017 Gift to non Credit Union members of stock bond mutual	0.041802763
expenditures food 2017 Nonalcoholic beer	0.041219906

expenditures misc 2017 Fireworks	0.040519808
expenditures home 2017 Boys costumes	0.039328543
health children 2017 Health status respondent assessed very good count of households persons	0.038270419
expenditures misc 2017 Termination fee for car trucklease	0.038250312
expenditures home 2017 Infant coat jacket snowsuit	0.037603924
expenditures misc 2017 Coin operated apparel laundry dryclean	0.037473156
expenditures misc 2017 Personal services	0.037390914
expenditures misc 2017 Wigs and hairpieces	0.037137284
expenditures home 2017 Rental of televisions	0.036195602
expenditures food 2017 Baby food	0.034991127
expenditures home 2017 Boys nightwear	0.034179792
expenditures misc 2017 Interest paid home equity loan	0.03162744
expenditures misc 2017 Playground equip	0.030220488
expenditures home 2017 Flatware	0.030018882
expenditures home 2017 Boys accessories	0.030013783
expenditures home 2017 Infant underwear	0.029858278
expenditures food 2017 Dinner at employer or school cafeteria	0.029833939
expenditures misc 2017 Pinball electronic video games	0.029695913
expenditures misc 2017 Souvenirs	0.029520011
expenditures misc 2017 Visual goods	0.029188891
expenditures home 2017 Boys footherwear	0.029049197
expenditures home 2017 Boys pants and shorts	0.028865228
expenditures food 2017 Meals as pay	0.028838501
expenditures home 2017 Girls hosiery	0.028731204
expenditures misc 2017 Coin operated household laundry dryclean	0.028490959
expenditures food 2017 Sugar	0.027682097
expenditures misc 2017 Checking accounts other bank service charges	0.02761838
expenditures home 2017 Rental of furniture	0.026877704
expenditures home 2017 Telephones and accessories	0.026649667
expenditures misc 2017 Finance late interest charges for student loans	0.025985169
expenditures food 2017 Lamb organ meats and others	0.024814683
expenditures food 2017 Rice	0.024208605
expenditures misc 2017 Intracity mass transit fares	0.023136845
expenditures misc 2017 Towing charges	0.021659495
expenditures misc 2017 Video game software	0.021346333

Appendix H. Relative influence (‘model outputs’) for best performing machine learning prediction model for log inpatient days per capita (Test set: MSE 0.009, R<sup>2</sup> 0.267)

<b>Variable name</b>	<b>Relative Influence</b>
census employment 2017 Employed in healthcare and social assistance pop 16 persons	18.3438457
census demographics 2017 household Income Median	14.7410182
expenditures home 2017 Rent	8.0915424
census demographics 2017 Female household head	6.278138
census demographics 2017 White Non-Hispanic household	4.0457959
census housing units 2017 House structure with 50 units count housing units	3.9181835
census demographics 2017 Non family female head of household	3.87898
census demographics 2017 other female head household no husband present with no children less than 18	3.5994429
census employment 2017 Employee travel time between 60-89 min. empl 16 persons	3.2672725
expenditures misc 2017 Coin operated apparel laundry dryclean	3.0649698
expenditures misc 2017 Intracity mass transit fares	2.9511729
census employment 2017 Employed in agriculture, forestry, fishing and hunting pop 16 persons	2.8192517
census demographics 2017 Female head of Fam	2.441348
census demographics 2017 population 25+ with professional degree	2.4303614
census housing units 2017 House owner household valued 25,000-29,999 count housing units	2.2064714
expenditures misc 2017 Gas tank repair or replacement	2.1581848
census employment 2017 Employee travel time between 30-59 min. empl 16 persons	1.9667907
census housing units 2017 House structure with 5-9 units count housing units	1.4598712
census housing units 2017 household with 4+ vehicles count housing units	1.4432175
health adults 2017 Overweight BMI count of households persons	1.3629276
census housing units 2017 House heating fuel bottled tank or LP gas count housing units	1.2688923
health children 2017 3-5 missed school days count of households persons	1.0503803
health children 2017 Not enrolled in school among school aged population count of households persons	1.0475996
health children 2017 Children2-17years dental visit more than 5 years count of households persons	0.7093975
expenditures food 2017 School supplies for vocational and technical schools	0.6503734
census demographics 2017 households 1 Vehicle	0.5844223
health children 2017 Doctor visits more than 2 years less than 5 years count of households persons	0.5643008
expenditures home 2017 Girls underwear and sleepwear	0.5594537
census demographics 2017 Two or more Races Head of households	0.5594537

expenditures misc 2017 Sewing machines	0.4926511
expenditures misc 2017 Wigs and hairpieces	0.4477749
census housing units 2017 House Rent 2000+ count housing units	0.4276178
expenditures food 2017 Nonalcoholic beer	0.4276178
expenditures misc 2017 Rental of medical equip	0.3968204
expenditures home 2017Boys nightwear	0.3950608

\* Only variables with non-zero relative influence are included

Appendix I. Variable importance ('model outputs') for best performing machine learning prediction model for log hospital expenditures per capita (Test set MSE 0.003, R<sup>2</sup> 0.447)

<b>Variable</b>	<b>Variable Importance</b>
census employment 2017 Employee Travel Time 30 between 59 min. empl 16 persons	0.82150455
census employment 2017 Employed in healthcare and Social Assistance empl 16 persons	0.65523231
census employment 2017 Employee walked to work empl 16 persons	0.40309645
census demographics 2017 Non families aged under 25 years households	0.37325685
census employment 2017 Employee travel time less than 15 min.empl 16 persons	0.36979848
census demographics 2017 Median income per capita	0.33549655
census demographics 2017 White population alone persons	0.3016138
expenditures food 2017 Dinner at employer or school cafeteria	0.26379745
census employment 2017 Employed in private not for profit wage and salary workers empl 16 persons	0.25479591
census demographics 2017 population 25+ with professional degree	0.21234366
census demographics 2017 White Non-Hispanic households	0.20854437
health children 2017 Children 2-17years dental visit more than 5 years count of households persons	0.19966901
expenditures home 2017 Tenants insurance	0.19620218
census demographics 2017 population density per square mile	0.18956363
census housing units 2017 House built between 1990-1999 count housing units	0.1654846
census demographics 2017 Non families aged 25-34 years households	0.16079443
census housing units 2017 Housing structure with 50 units count housing units	0.15219448
census housing units 2017 House renter occupied count housing units	0.14277415
census demographics 2017 household No Vehicles	0.13636079
expenditures food 2017 Breakfast and brunch at employer or school cafeteria	0.13053485
census employment 2017 Employed in accommodation and food services empl 16 persons	0.12924738
expenditures home 2017 Rented dwellings	0.12909878
expenditures home 2017 Rent	0.11903522
census demographics 2017 population Living in Non-Institutional Group Quarters	0.11808155
census housing units 2017 House median year built count year	0.1094216
census housing units 2017 House owner occupied count housing units	0.10386566
census housing units 2017 House owner households with any mortgage count housing units	0.10041333
census demographics 2017 households 4+ Vehicles	0.09980707
expenditures food 2017 Meals as pay	0.09815594
census housing units 2017 House year moved in between 2000-2009 count housing units	0.0969702
census employment 2017 Employed in private for profit wage and salary workers empl 16 persons	0.0955506
health adult 2017 Overweight BMI count of households persons	0.09495769

census employment 2017 Employed in white collar	0.09083353
expenditures home 2017 Rent as pay	0.0879176
health children 2017 respiratory allergies count of households persons	0.08753535
health adult 2017 Cervical cancer count of households persons	0.08599195
expenditures food 2017 School supplies for college	0.08547209
expenditures food 2017 School supplies for day care nursery	0.08421733
census demographics 2017 Asian population alone persons	0.08106055
census demographics 2017 population rural persons	0.08019181
health children 2017 with prescribed medication for 3 months count of households persons	0.07833704
census demographics 2017 Asian households	0.07255549
expenditures misc 2017 Computer Installation	0.07204103
expenditures misc 2017 Coin operated apparel laundry dryclean	0.07175207
census demographics 2017 population urban persons	0.07132792
health children 2017 Doctor visits more than 5 years count of households persons	0.07115858
expenditures food 2017 Lunch at Vending machine	0.07100503
expenditures food 2017 School supplies for vocational and technical schools	0.07056304
health children 2017 Doctor visit more than 6 months less than 1 year count of households persons	0.06999761
health adult 2017 Aerobic exercise insufficiently active	0.06954969
health adult 2017 Obese BMI count of households persons	0.06886809
health adult 2017 Alcohol current infrequent user	0.06521236
health adult 2017 Breast cancer count of households persons	0.06171417
expenditures home 2017 Rental of furniture	0.05929783
census demographics 2017 Black households	0.05787219
expenditures misc 2017 other photographic supplies	0.05752996
health adult 2017 Healthy BMI count of households persons	0.05748918
health children 2017 Health status respondent assessed very good count of households persons	0.05659049
expenditures misc 2017 Dating services	0.0561638
expenditures home 2017 Infant nightwear loungewear	0.0559804
expenditures misc 2017 Coin.operated household laundry dryclean	0.0559133
expenditures food 2017 Snack nonalcoholic beverages at Restaurant	0.05507692
expenditures misc 2017 Termination fee for car trucklease	0.05489505
health children 2017 11+ missed school days count of households persons	0.05426642
expenditures misc 2017 Gift to non credit union members of stock bond mutual	0.05394819
expenditures home 2017 Infants equipment	0.05333773
expenditures misc 2017 Day care centers nursery and preschools	0.05296786
expenditures misc 2017 Main insurance and Other expenses Rented	0.05268474
expenditures food 2017 Nonalcoholic beer	0.0511552
expenditures misc 2017 Rental of supportive convalescent medical equipment	0.05081056



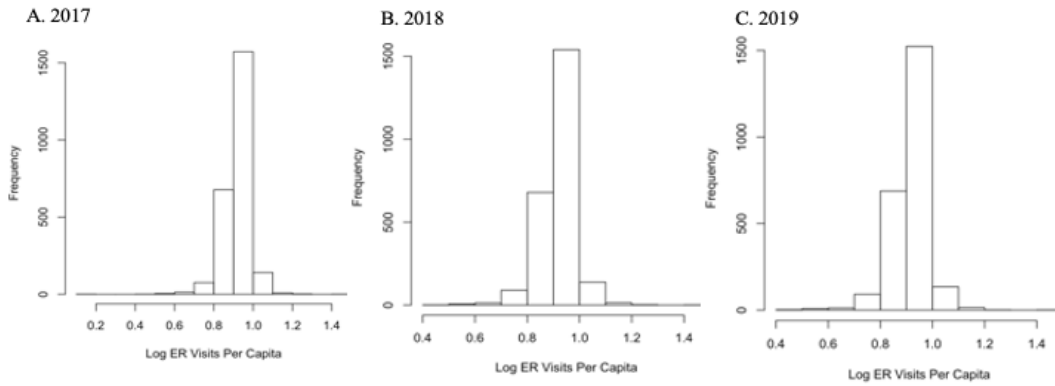
expenditures misc 2017 Repair of tv radio and sound equipment	0.05026984
expenditures misc 2017 Rental of televisions	0.05007451
health adult 2017 Underweight BMI count of households persons	0.04943173
expenditures home 2017 Infant coat jacket snowsuit	0.04939549
expenditures misc 2017 Video game software	0.04808385
expenditures food 2017 Lamb organ meats and others	0.04715627
expenditures food 2017 Baby food	0.04626239
expenditures food 2017 Medical equipment for general use	0.04604314
expenditures home 2017 Telephones and accessories	0.04572196
expenditures home 2017 Boys hosiery	0.04522888
expenditures misc 2017 Wigs and hairpieces	0.04507369
expenditures misc 2017 Global positioning system devices	0.04366803
expenditures misc 2017 Pinball electronic video games	0.04336407
expenditures misc 2017 Watch and jewelry repair	0.04225349
expenditures misc 2017 Boys nightwear	0.0420863
expenditures misc 2017 Rental of medical equipment	0.04137262
expenditures misc 2017 Vacation clubs	0.04098154
expenditures misc 2017 Interest paid home equity loan	0.04062316
expenditures misc 2017 Mortgage interest	0.04036718
expenditures misc 2017 Cash contribution to educational institutions	0.04008163
expenditures misc 2017 Fireworks	0.0399075
expenditures misc 2017 Towing charges	0.03941961
expenditures home 2017 Girls uniforms	0.03881726
expenditures home 2017 Boys footwear	0.03860485
expenditures misc 2017 Watches	0.03686927
expenditures home 2017 Girls hosiery	0.03551689
expenditures home 2017 Girls underwear and sleepwear	0.03296941
expenditures home 2017 Boys 2 15 clothing	0.03242311
expenditures home 2017 Boys coats and jackets	0.03213292
expenditures home 2017 Girls coats and jackets	0.03208482
expenditures misc 2017 Mortgage interest and charges	0.03092974
expenditures home 2017 Girls skirt pant short	0.02910507

Appendix J. Median and IQR values for per capita ER Visits, IP Days, and Hospital Expenditures in 2017, 2018, and 2019

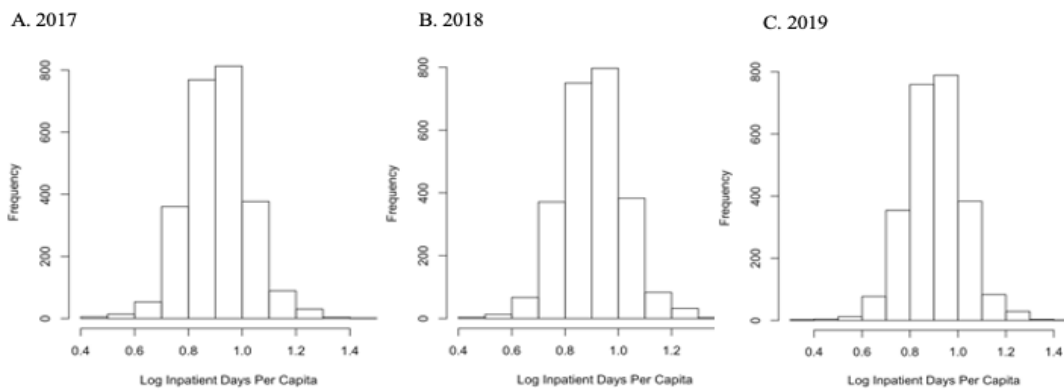
		<b>2017</b>	<b>2018</b>	<b>2019</b>
<b><i>ER Visits</i></b>	<i>N</i>	2475	2483	2476
	<i>Median</i>	0.45	0.443	0.443
	<i>IQR</i>	0.318, 0.618	0.312, 0.615	0.305, 0.443
<b><i>Inpatient Days</i></b>	<i>N</i>	2491	2505	2498
	<i>Median</i>	0.368	0.36	0.361
	<i>IQR</i>	0.176, 0.826	0.170, 0.818	0.169, 0.807
<b><i>Hospital Expenditures</i></b>	<i>N</i>	2491	2505	2498
	<i>Median</i>	2.10	2.17	2.26
	<i>IQR</i>	1.29, 3.62	1.33, 3.49	1.36, 3.63

ER visits, inpatient days, and hospital expenditures were re-calculated in 2018 and 2019, using the same data source and definitions used in the original study. The impetus of this small sensitivity analysis was to examine the stability of the cross-sectional estimates over this 3-year time-period.

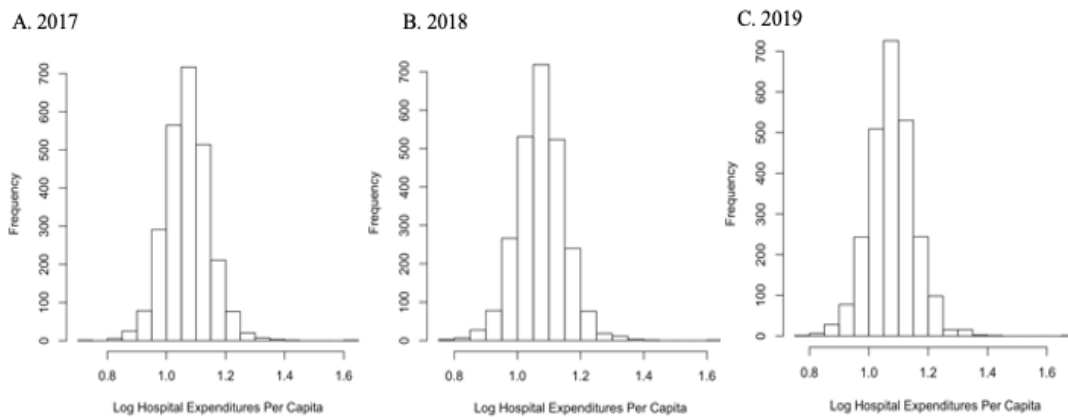
## Appendix K. Histograms of ER visits, Inpatient Days, and Hospital Expenditures in 2017, 2018, and 2019



N1. Histogram of Log ER Visits Per Capita for 2017 (A), 2018 (B), and 2019 (C). The same outcome definitions and data sources were used to generate across the presented time-periods.

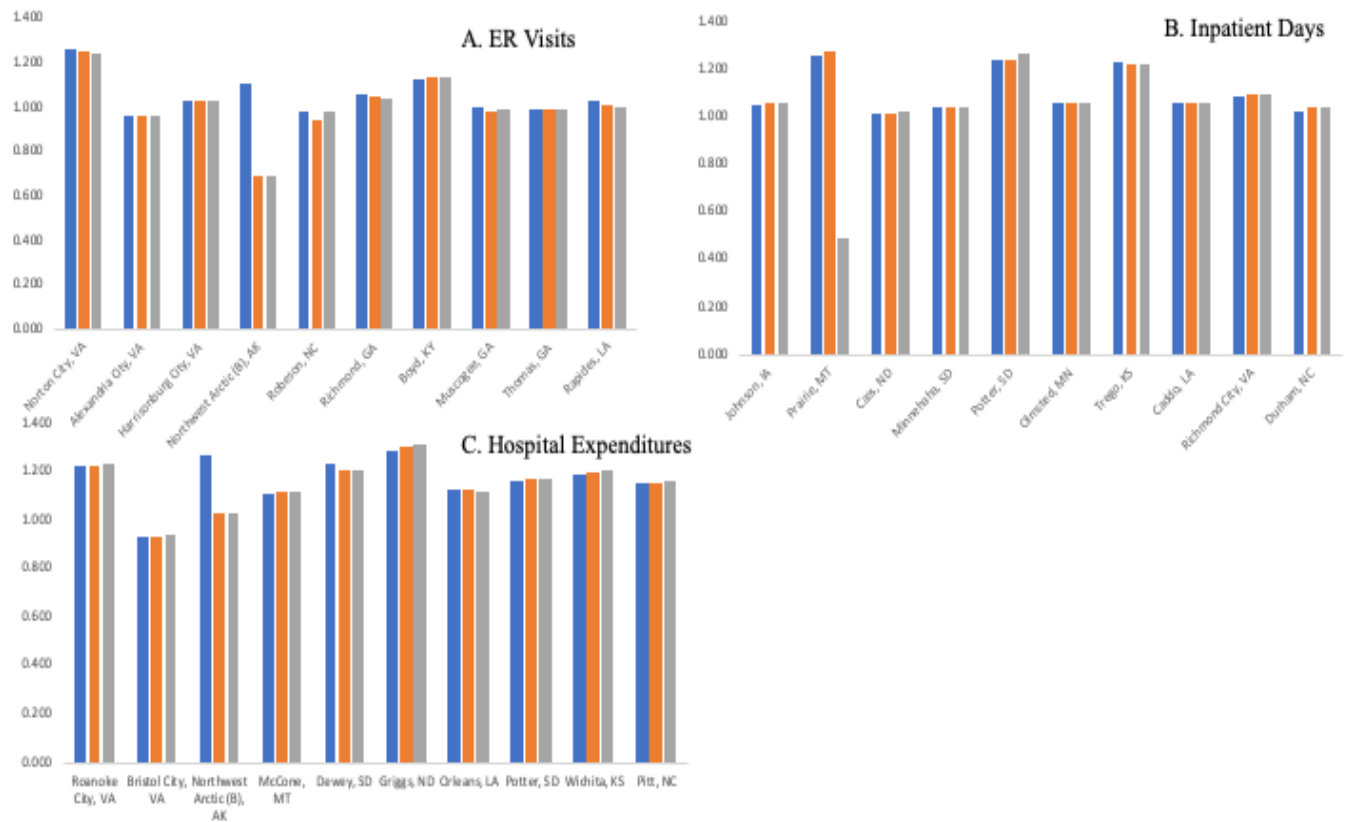


N 2. Histogram of Log Inpatient Days Per Capita in 2017 (A), 2018 (B), and 2019 (C). The same outcome definitions and data sources were used to generate across the presented time-periods)



N 3. Histogram of Log Hospital Expenditures Per Capita in 2017 (A), 2018 (B), and 2019 (C). The same outcome definitions and data sources were used to generate across the presented time-periods)

Appendix L. Per capita trends in ER Visits (A), Inpatient Days (B) and Hospital Expenditures (C) overtime (2017-2019) for top 10 counties based on 2017 Utilization Values



O. Top 10 counties based on 2017 ER visits (A), inpatient days (B), and hospital expenditures (C), including corresponding utilization for 2018 and 2019. ER visits, inpatient days, and hospital expenditures calculated as log per capita values for 2017, 2018, and 2019.

## References

1. Lundberg SM, Lee, SI. A Unified Approach to Interpreting Model Predictions. *31st Conference on Neural Information Processing Systems 2017*.
2. Molnar C. *Interpretable machine learning. A Guide for making black box models explainable*. 2019.
3. Lundberg SM, Erion, G., Chen, H., DeGrave, A., Prutkin, J.M., Nair, B., Katz, R., Himmelfarb, J., Bansal, N., Lee, SI. From Local Explanations to Global Understanding with Explainable AI for Trees. *Nature Machine Intelligence*. 2020;2:56-67.