# **Data Analysis**

# Multivariate regression for the Speaker Corpus, U.S.-conducted in May 2022

```
## Loading required package: zoo
##
## Attaching package: 'zoo'
## The following objects are masked from 'package:base':
##
##
       as.Date, as.Date.numeric
##
## Please cite as:
   Hlavac, Marek (2018). stargazer: Well-Formatted Regression and Summary Statisti
cs Tables.
   R package version 5.2.2. https://CRAN.R-project.org/package=stargazer
## — Attaching packages —
                                                            --- tidyverse 1.3.0 -
## ✓ ggplot2 3.3.3
                                 0.3.4
                      √ purrr
## / tibble 3.0.6
                       ✓ dplyr
                                 1.0.4
## ✓ tidyr 1.1.2
                      ✓ stringr 1.4.0
## ✓ readr
            1.4.0
                       ✓ forcats 0.5.1
## - Conflicts -
                                                          - tidyverse_conflicts() -
## x dplyr::between() masks plm::between()
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()
                     masks plm::lag(), stats::lag()
## x dplyr::lead() masks plm::lead()
```

##		X	speaker	gender	state	house_of_rep	party	Dominant_Topic
##	1	0	Nancy Pelosi	1	California	1	1	0
##	2	1	Jerry McNerney	0	California	1	1	0
##	3	2	Michael C. Burgess	0	Texas	1	0	0
##	4	3	Darren Soto	0	Florida	1	1	1
##	5	4	Debbie Lesko	1	Arizona	1	0	1
##	6	5	Debbie Stabenow	1	Michigan	0	1	1
##			Dominant_topic p	prev_na	t_sec prev_	econ military_	_heavy	
##	1		National_security	0	.6889 0.	3111	1	
##	2		National_security	0	.6867 0.	3133	1	
##	3		National_security	0	.7587 0.	2413	1	
##	4	D	omestic_us_economy	0	.4835 0.	5165	1	
##	5	D	omestic_us_economy	0	.4842 0.	5158	0	
##	6	D	omestic_us_economy	0	.2060 0.	7940	0	

## 1 Check states

How many states does this dataset contain?

```
## [1] "number of states:"

## [1] 34
```

## 2 Standardise DV

Constructing percentage version of the prevalence scores

##		Х	speaker	gender	state	house_of_rep	party
##	1	0	Nancy Pelosi	1	California	1	1
##	2	1	Jerry McNerney	0	California	1	1
##	3	2	Michael C. Burgess	0	Texas	1	0
##	4	3	Darren Soto	0	Florida	1	1
##	5	4	Debbie Lesko	1	Arizona	1	0
##	6	5	Debbie Stabenow	1	Michigan	0	1
##	7	6	Janice D. Schakowsky	1	Illinois	1	1
##	8	7	Fred Keller	0	Pennsylvania	1	0
##	9	8	Jay Obernolte	0	California	1	0
##	10	9	Gwen Moore	1	Wisconsin	1	1
##	11	10	Randy K. Weber	0	Texas	1	0
##	12	11	Louie Gohmert	0	Texas	1	0
##	13	12	Tom Cole	0	Oklahoma	1	0
##	14	13	Susan M. Collins	1	Maine	0	0
##	15	14	Marcy Kaptur	1	Ohio	1	1
##	16	15	Zoe Lofgren	1	California	1	1
##	17	16	Scott Peters	0	California	1	1
##	18	17	Donald Edwin Young	0	Alaska	0	0
##	19	18	Michael Bennet	0	Colorado	0	1

I					
## 20 19	Cynthia Lummis	1	Wyoming	1	0
## 21 20	French Hill	0	Arkansas	1	0
## 22 21	Jared Golden	0	Maine	1	1
## 23 22	-	0	Connecticut	1	1
## 24 23	Patrick McHenry	0	North Carolina	1	0
## 25 24	3 - 1	0	New York	1	1
## 26 25	Raja Krishnamoorthi	0	Illinois	1	1
## 27 26	Rick Crawford	0	Arkansas	1	0
## 28 27	Donald Norcross	0	New Jersey	1	1
## 29 28	Robin Kelly	1	Illinois	1	1
## 30 29	Kat Cammack	1	Florida	1	0
## 31 30	Pat Fallon	0	Texas	1	0
## 32 31	Kathy Manning	1	North Carolina	1	1
## 33 32	Jon Tester	0	Montana	0	1
## 34 33	Chuck Grassley	0	Iaowa	0	0
## 35 34	Brenda Lawrence	1	Michigan	1	1
## 36 35	Tom Cotton	0	Arkansas	0	0
## 37 36	Mitch McConnell	0	Kentucky	0	0
## 38 37	Ben Sasse	0	Nebraska	0	0
## 39 38	Vicky Hartzler	1	Missouri	1	0
## 40 39	Stephanie Murphy	1	Florida	1	1
## 41 40	Trent Kelly	0	Mississippi	1	0
## 42 41	James Edward Banks	0	Indiana	1	0
## 43 42	Donald John Bacon	0	Nebraska	1	0
## 44 43	Stephanie Bice	1	Oklahoma	1	0
## 45 44	<del>-</del>	0	Tennessee	1	0
## 46 45	Matt Gaetz	0	Florida	1	0
## 47 46	Frank Pallone	0	New Jersey	1	1
## 48 47	Gus Bilirakis	0	Florida	1	0
## 49 48	Eleanor Norton	-	District of Columbia	1	1
## 50 49	Eddie Bernice Johnson	1	Texas	0	1
## 51 50		0	Oklahoma	1	0
## 52 51		1	Texas	1	1
## 53 52		0	Rhode Island	1	1
## 54 53	•	0	Wisconsin	1	0
## 55 54	<b>-</b>	0	Ohio	1	0
## 56 55		0	Mississippi	0	0
## 57 56	<del>-</del>	0	Alaska	0	0
## 58 57		0	Rhode Island	0	1
## 59 58		0	Washington	1	1
## 60 59			washington Texas	1	
## 60 59	_	0	California	1	0
		0		_	0
	Jennifer Gonzalez-Colon	1	Puerto Rico	1	0
## 63 62	-	0	Alabama	0	0
## 64 63		0	Oklahoma	0	0
## 65 64	-	0	Texas	0	0
## 66 65		0	South Dakota	0	0
## 67 66	•	0	Alabama	1	0
## 68 67	<u>.</u>	0	Colorado	1	0
## 69 68		0	California	1	1
## 70 69	Rob Wittman	0	Virginia	1	0

## 71	70 Ja	ckie Speier	1	Cal	ifornia	1	_	1
## 72		Rand Paul	0		entucky	C	)	0
## 73		ben Gallego	0		Arizona	1	_	1
## 74		e Gallagher	0	Wis	sconsin	1	_	0
## 75		Marco Rubio	0	]	Florida	C	)	0
## 76	75 Ch	uck Schumer	0	Ne	ew York	C	)	1
## 77	76 Marsh	a Blackburn	1	Tei	nnessee	C	)	0
## 78	77 Mar.	ia Cantwell	1	Wasl	nington	C	)	1
## 79	78	Dick Durbin	0	I	llinois	C	)	1
##	Dominant_Topic	Dominant	_topic	prev_nat_sec	prev_econ	military_	heav	У
## 1	0	National_se	curity	0.6889	0.3111			1
## 2	0	National_se	curity	0.6867	0.3133			1
## 3	0	National_se	curity	0.7587	0.2413			1
## 4	1	Domestic_us_e	conomy	0.4835	0.5165			1
## 5	1	Domestic_us_e	conomy	0.4842	0.5158			0
## 6	1	Domestic_us_e	conomy	0.2060	0.7940			0
## 7	0	National_se	curity	0.5046	0.4954			0
## 8	0	National_se	curity	0.5122	0.4878			0
## 9	0	National_se	curity	0.5541	0.4459			1
## 10	1	Domestic_us_e	conomy	0.4548	0.5452			0
## 11	1	Domestic_us_e	_	0.2734	0.7266			1
## 12	0	National_se	curity	0.6786	0.3214			1
## 13	1 1	Domestic_us_e	conomy	0.4815	0.5185			0
## 14	1 1	Domestic_us_e	conomy	0.4395	0.5605			0
## 15		Domestic_us_e		0.4958	0.5042			0
## 16	1	Domestic_us_e	conomy	0.4487	0.5513			1
## 17	1	Domestic_us_e	conomy	0.3017	0.6983			1
## 18	1	Domestic_us_e		0.3459	0.6541			0
## 19	0	National_se	-	0.5373	0.4627			0
## 20		Domestic_us_e		0.2440	0.7560			0
## 21	0	National_se	-	0.5192	0.4808			0
## 22	0	National_se			0.2754			0
## 23	0	National_se	-		0.3406			0
## 24	0	National_se	-		0.3547			1
## 25	0	National_se	_		0.3761			0
## 26		Domestic_us_e	_		0.5798			0
## 27	0	National_se			0.3753			0
## 28	0	National_se	_					0
## 29	0	National_se	_		0.3688			0
## 30	0	National_se	_		0.4187			1
## 31	0	National_se	_		0.3960			1
## 32	0	National_se			0.3664			1
## 33	0	National_se	_		0.4240			0
## 34		Domestic_us_e			0.5489			0
## 35	0	National_se	_		0.3170			0
## 36	0	National_se	_		0.4269			0
## 37		Domestic_us_e	_		0.5630			0
## 38		Domestic_us_e			0.6170			0
## 39	0	National_se			0.2769			0
## 40	0	National_se	_		0.2991			1
## 41	0	National_se	curity	0.6612	0.3388			0

## 12

67.86

## 42	0	National_security	0.5926	0.4074	0
## 43	0	National_security	0.6052	0.3948	0
## 44	0	National_security	0.6691	0.3309	0
## 45	0	National_security	0.6056	0.3944	0
## 46	0	National_security	0.5919	0.4081	1
## 47	0	National_security	0.7619	0.2381	0
## 48	0	National_security	0.6704	0.3296	1
## 49	0	National_security	0.5787	0.4213	0
## 50	1	Domestic_us_economy	0.2916	0.7084	1
## 51	1	Domestic_us_economy	0.3114	0.6886	0
## 52	0			0.2319	1
## 53	0			0.4506	0
## 54		Domestic_us_economy		0.5706	0
## 55	0			0.2863	0
## 56		Domestic_us_economy		0.6627	0
## 57		Domestic_us_economy		0.7331	0
## 58	0			0.3428	0
## 59	0			0.1653	0
## 60	0			0.2959	1
## 61	0			0.3667	1
## 62	0			0.2552	0
## 63	0			0.1611	0
## 64	0			0.4779	0
## 65		Domestic_us_economy		0.6950	1
## 66	0			0.4609	0
## 67	0			0.2334	0
## 68	0			0.2576	0
## 69	0			0.1436	1
## 70	0			0.3186	1
## 71	0				1
## 72		Domestic_us_economy	0.1522	0.8478	0
## 73	0		0.7609	0.2391	0
## 74 ## 75	0	National_security Domestic us economy	0.7197	0.2803 0.8107	0 1
## 75		Domestic_us_economy	0.1893 0.3001		0
## 77		Domestic_us_economy	0.3001	0.6999 0.5433	0
## 78		Domestic_us_economy	0.1188	0.3433	0
## 79		Domestic us economy	0.2049	0.7951	0
## 13	nat_sec_per_ec		0.2049	0.7931	U
## 1	68.89	31.11			
## 2	68.67	31.33			
## 3	75.87	24.13			
## 4	48.35	51.65			
## 5	48.42	51.58			
## 6	20.60	79.40			
## 7	50.46	49.54			
## 8	51.22	48.78			
## 9	55.41	44.59			
## 10	45.48	54.52			
## 11	27.34	72.66			
## 12	67 96	32 14			

32.14

## 13	48.15	51.85
## 14	43.95	56.05
## 15	49.58	50.42
## 16	44.87	55.13
## 17	30.17	69.83
## 18	34.59	65.41
## 19	53.73	46.27
## 20	24.40	75.60
## 21	51.92	48.08
## 22	72.46	27.54
## 23	65.94	34.06
## 24	64.53	35.47
## 25	62.39	37.61
## 26	42.02	57.98
## 27	62.47	37.53
## 28	71.04	28.96
## 29	63.12	36.88
## 30	58.13	41.87
## 31	60.40	39.60
## 32	63.36	36.64
## 33	57.60	42.40
## 34	45.11	54.89
## 35	68.30	31.70
## 36	57.31	42.69
## 37	43.70	56.30
## 38	38.30	61.70
## 39	72.31	27.69
## 40	70.09	29.91
## 41	66.12	33.88
## 42	59.26	40.74
## 43	60.52	39.48
## 44	66.91	33.09
## 45	60.56	39.44
## 46	59.19	40.81
## 47	76.19	23.81
## 48	67.04	32.96
## 49	57.87	42.13
## 50	29.16	70.84
## 51	31.14	68.86
## 52	76.81	23.19
## 53	54.94	45.06
## 54	42.94	57.06
## 55	71.37	28.63
## 56	33.73	66.27
## 57	26.69	73.31
## 58	65.72	34.28
## 59	83.47	16.53
## 60	70.41	29.59
## 61	63.33	36.67
## 62	74.48	25.52
## 63	83.89	16.11

```
## 64
             52.21
                        47.79
## 65
             30.50
                        69.50
## 66
             53.91
                        46.09
## 67
             76.66
                        23.34
## 68
             74.24
                        25.76
## 69
             85.64
                        14.36
## 70
             68.14
                        31.86
## 71
             75.99
                        24.01
## 72
             15.22
                        84.78
## 73
             76.09
                        23.91
## 74
             71.97
                        28.03
## 75
             18.93
                        81.07
## 76
             30.01
                        69.99
             45.67
                        54.33
## 77
                        88.12
## 78
             11.88
## 79
             20.49
                        79.51
```

#### 3 Regressions

#### 3.1 OLS

Run a full model with all state individual effects and a model excluding states and checking the effect of a state being one of the states with the most active and reserve military members

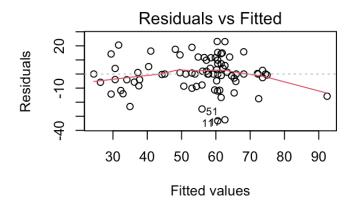
```
##
## Call:
   lm(formula = nat_sec_per ~ party + gender + house_of_rep + (state),
##
       data = usa_reg)
##
## Residuals:
##
                    Median
       Min
                1Q
                                 3Q
                                        Max
  -33.205
           -5.797
                      0.000
                                     23.083
##
                              7.338
##
## Coefficients:
##
                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                                68.120
                                            11.576
                                                     5.885 5.82e-07 ***
## party
                                 2.417
                                             6.279
                                                     0.385
                                                            0.70228
## gender
                                -1.114
                                             5.427
                                                   -0.205
                                                            0.83840
## house_of_rep
                                             5.199
                                                     4.676 3.03e-05 ***
                                24.309
## stateAlaska
                               -37.480
                                            16.163
                                                    -2.319
                                                            0.02534 *
## stateArizona
                               -30.826
                                            16.527
                                                    -1.865
                                                            0.06916 .
## stateArkansas
                               -27.093
                                            14.589
                                                    -1.857
                                                            0.07031 .
## stateCalifornia
                               -32.203
                                                    -2.364
                                                            0.02278 *
                                            13.622
## stateColorado
                               -17.498
                                            16.259
                                                    -1.076
                                                            0.28796
## stateConnecticut
                               -28.906
                                            20.673
                                                   -1.398
                                                            0.16938
## stateDistrict of Columbia
                               -35.863
                                            20.834
                                                    -1.721
                                                            0.09254 .
## stateFlorida
                               -35.191
                                            13.340
                                                    -2.638
                                                            0.01165 *
## stateIaowa
                                                    -1.167
                               -23.010
                                            19.710
                                                            0.24962
## stateIllinois
                               -44.190
                                            15.067
                                                    -2.933
                                                            0.00542 **
## stateIndiana
                                                    -1.683
                               -33.170
                                            19.710
                                                            0.09982 .
```

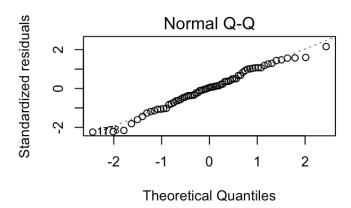
```
## stateKentucky
                             -38.660
                                         16.163 -2.392 0.02132 *
## stateMaine
                             -22.721
                                         16.290 -1.395 0.17040
## stateMichigan
                             -37.128
                                         17.261 -2.151 0.03728 *
## stateMississippi
                             -30.350
                                         15.953 -1.902 0.06398 .
## stateMissouri
                             -19.006
                                         20.508 -0.927 0.35934
## stateMontana
                             -12.937
                                         20.699
                                                -0.625 0.53535
## stateNebraska
                             -30.865
                                         15.953 -1.935 0.05977 .
## stateNew Jersey
                             -21.231
                                         17.325
                                                -1.226 0.22721
## stateNew York
                             -36.492
                                         17.144 -2.129 0.03920 *
## stateNorth Carolina
                             -29.136
                                         16.527 -1.763 0.08519 .
## stateOhio
                             -32.606
                                         16.527
                                                -1.973 0.05512 .
## stateOklahoma
                             -36.471
                                         13.954
                                                -2.614 0.01238 *
## statePennsylvania
                             -41.210
                                         19.710 -2.091 0.04264 *
## statePuerto Rico
                             -16.836
                                         20.508 -0.821 0.41630
## stateRhode Island
                             -22.362
                                         17.144
                                                 -1.304 0.19922
## stateSouth Dakota
                             -14.210
                                         19.710 -0.721 0.47493
## stateTennessee
                             -26.603
                                         16.182 -1.644 0.10764
## stateTexas
                             -31.884
                                         12.795 -2.492 0.01674 *
## stateVirginia
                             -24.290
                                         19.710 -1.232 0.22468
                                         16.987
                                                -2.029 0.04888 *
## stateWashington
                             -34.460
## stateWisconsin
                                                 -2.630 0.01187 *
                             -39.401
                                         14.979
## stateWyoming
                             -66.916
                                         20.508 -3.263 0.00219 **
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15.95 on 42 degrees of freedom
## Multiple R-squared: 0.5731, Adjusted R-squared: 0.2073
## F-statistic: 1.566 on 36 and 42 DF, p-value: 0.08093
```

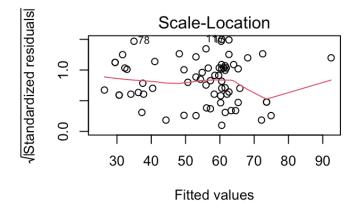
```
##
## Call:
## lm(formula = nat_sec_per ~ party + gender + house_of_rep + military_heavy,
      data = usa_reg)
##
##
## Residuals:
##
      Min
                1Q Median
                                3Q
                                       Max
## -33.901 -9.557
                    2.089
                           10.452 43.753
##
## Coefficients:
##
                 Estimate Std. Error t value Pr(>|t|)
## (Intercept)
                    40.137
                                3.465 11.583 < 2e-16 ***
## party
                     2.139
                                3.653
                                        0.586
                                                 0.560
## gender
                    -4.930
                                3.971 -1.242
                                                 0.218
## house of rep
                                      5.607 3.36e-07 ***
                    22.007
                                3.925
## military heavy
                    -0.903
                                3.810 - 0.237
                                                 0.813
## Signif. codes: 0 '***' 0.001 '**' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15.22 on 74 degrees of freedom
## Multiple R-squared: 0.3154, Adjusted R-squared:
## F-statistic: 8.523 on 4 and 74 DF, p-value: 1.033e-05
```

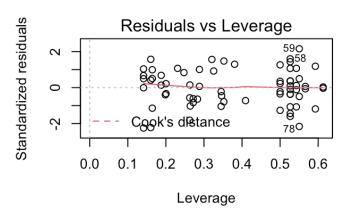
#### 3.2 Run regression diagnostics on full model

```
## Warning: not plotting observations with leverage one:
## 8, 20, 23, 33, 34, 39, 42, 49, 62, 66, 70
```

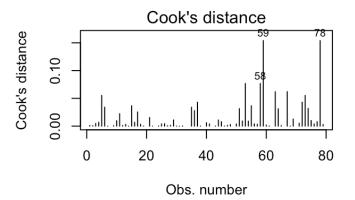


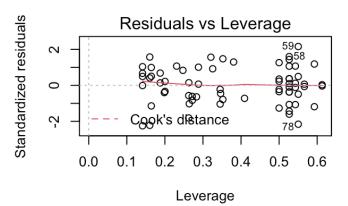






## Warning: not plotting observations with leverage one: ## 8, 20, 23, 33, 34, 39, 42, 49, 62, 66, 70





#### 3.3 Fixed effects model

```
## Oneway (individual) effect Within Model
##
## Call:
## plm(formula = nat_sec_per ~ party + house_of_rep + gender + factor(state),
       data = usa req, model = "within", index = "state")
##
##
## Unbalanced Panel: n = 34, T = 1-8, N = 79
##
## Residuals:
##
      Min. 1st Ou.
                       Median 3rd Ou.
                                           Max.
## -33.2054 -5.7966
                       0.0000
                                7.3376
                                        23.0835
##
## Coefficients:
##
                Estimate Std. Error t-value Pr(>|t|)
                             6.2789 0.3849
## party
## house_of_rep 24.3094
                             5.1992 4.6756 3.03e-05 ***
## gender
                 -1.1136
                             5.4267 -0.2052
                                             0.8384
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares:
                            16372
## Residual Sum of Squares: 10689
## R-Squared:
                   0.34712
## Adj. R-Squared: -0.21249
## F-statistic: 7.44353 on 3 and 42 DF, p-value: 0.00041728
```

## [1] "/Users/charlottekaiser/Documents/uni/Hertie/master\_thesis/10\_code/10\_analys
is"

## [1] "/Users/charlottekaiser/Documents/uni/Hertie/master\_thesis/20\_results/10\_ana
lysis/LDA speaking-points"

## 4 Save table output

```
##
## <caption><strong>Multivariate OLS Regressions f
or topic 'National security'</strong></caption>
## td>## ## ## ## ## ## ## ## ## ## <td style="text-alig
```

```
## (3.6526)(6.2789)(6.27
## House of Representative (1 = Yes/0 = Senate)
>22.0066<sup>***</sup>24.3094<sup>***</sup>24.3094<sup>***</s
up>
## (3.9249)(5.1992)(5.19
92)
## Gender (1 = female/0 = male-4.9304
-1.1136-1.1136
## (3.9710)(5.4267)(5.42
67)
## Belongs to a state with the most active-duty and
/td>
## (3.8097)
## State (Reference = Alabama)
d>-37.4803<sup>**</sup>
## 
## stateArizona-30.8262<
sup>*</sup>
## 
## stateArkansas
<sup>*</sup>
## <(14.5886)</td>
## stateCalifornia
33<sup>**</sup>
## 
## stateColorado
## (16.2587)
## stateConnecticut
063
## <(td><(20.6733)</td>
## stateDistrict of Columbia
-35.8626<sup>*</sup>
## <(20.8338)</td>
## stateFlorida-35.1908<
sup>**</sup>
## 
## stateIaowa
d>
## 
## stateIllinois
<sup>***</sup>
## 
## stateIndiana-33.1697<
sup>*</sup>
## stateKentucky
<sup>**</sup>
```

```
## stateMaine
## <(16.2898)</td>
## stateMichigan
<sup>**</sup>
## 
## stateMississippi
500<sup>*</sup>
## stateMissouri
## <(20.5076)</td>
## stateMontana-12.9369<
/td>
## <(20.6991)</td>
## stateNebraska
<sup>*</sup>
## 
## stateNew Jersey-21.23
13
## 
## stateNew York
<sup>**</sup>
## <(17.1440)</td>
## stateNorth Carolina-2
9.1362<sup>*</sup>
## 
## stateOhio
>*</sup>
## (16.5275)
## stateOklahoma
<sup>**</sup>
## (13.9544)
## statePennsylvania-41.
2097<sup>**</sup>
## 
## statePuerto Rico
361
## <(20.5076)</td>
## stateRhode Island-22.
3616
## 
## stateSouth Dakota-14.
2103
## 
## stateTennessee
## 
## stateTexas<31.8843<su
p>**</sup>
##
```

```
## stateVirginia
## 
## stateWashington
97<sup>**</sup>
## 
## stateWisconsin
7<sup>**</sup>
## 
## stateWyoming-66.9161<
sup>***</sup>
## <(20.5076)</td>
## Constant40.1369<sup>***</sup><
/td>68.1203<sup>***</sup>
## (3.4652)(11.5760)</td
>
## N7979
## R<sup>2</sup>0.31540.3471
0.5731
## Adjusted R<sup>2</sup>0.2784-0
.2125>0.2073
## col
span="4" style="text-align:left">Standard errors given in parentheses.
## ***p<0.01; **p<0.05; *p<0.1.</td>
r>
## Prevalence measured in %
##
```