VARIABILITY OF EXPENDITURE OVER VARIOUS MEDICAL INSTITUTIONS

INTRODUCTION

I have taken the topic of social consumption and health under the survey of NSSO 75th round which comprise of data from various states and UTs of expenditure on aliments and whether the expenditure occurred due to going to hospital or the expense they occurred while staying at home and the type of disease.

I want to explore that if there is any significant difference between the level of expenditure that has been occurred by different household when they opt for different sectors of hospital and when they don't hospitalize at all.

Purpose of choosing this topic is to find the difference in expenditure of a household when they admitted in a private, public or a charitable hospital among various states for different religion and caste.

Mainly the literature that I have to go through to get the understanding of this data is the data that has been provided by NSSO only.

LITERATURE REVIEW:

While following the data set of NSSO they have provided with the source of literature which is required for the analysis of any individual who is interested in working with this data set of Social Consumption and Health. Literature is given under the key indicators report of household social consumption in India: health 75th round.

OBJECTIVE

The objective is to find the difference in the expenditure that household has occurred on the aliment due to their decision about the type of medical institution they want to get admit to. The difference in expenditure among various sectors and states for various caste and religion is what my regression is going to show here.

METHOD

We are going to run the regression for having analysis on the expenditure occurred by household for various type of hospitals among various states and

for different caste and religion. We will use the liner regression model as that would show us the amount in exact terms and not in percentage.

Keeping total expenditure as our dependent variable we will regress this on nature of hospital, sector, caste and religion.

ANALYSIS OF DESCRIPTIVE STATISTICS

Summary of the variables that I have taken in my regression function is as follows:

Variable	Obs	Mean	Std. Dev.	Min	Max
expenditure	93,770	19931.77	53486.74	0	5051700
type_of_me~n					
public	93,925	0.519127	0.4996367	0	1
charitable	93,925	0.0226883	0.1489087	0	1
private	93,925	0.4581847	0.4982511	0	1
state					
1	159,330	0.0283876	0.1660781	0	1
2	159,330	0.0206552	0.1422277	0	1
3	159,330	0.0328814	0.1783268	0	1
4	159,330	0.0032386	0.0568163	0	1
5	159,330	0.0129166	0.1129151	0	1
6	159,330	0.026216	0.1597777	0	1
7	159,330	0.0108329	0.1035161	0	1
8	159,330	0.0425783	0.201905	0	1
9	159,330	0.0981171	0.2974739	0	1
10	159,330	0.0377393	0.1905656	0	1
11	159,330	0.0060629	0.0776284	0	1
12	159,330	0.0135003	0.1154041	0	1
13	159,330	0.0080776	0.0895119	0	1
14	159,330	0.017423	0.1308415	0	1
15	159,330	0.0110212	0.1044019	0	1
16	159,330	0.014856	0.1209767	0	1
17	159,330	0.0084039	0.0912873	0	1
18	159,330	0.0264608	0.1605017	0	1
19	159,330	0.0756292	0.2644047	0	1
20	159,330	0.0259524	0.1589939	0	1
21	159,330	0.0376891	0.1904438	0	1
22	159,330	0.0237934	0.1524054	0	1
23	159,330	0.0445867	0.2063953	0	1
24	159,330	0.0357748	0.1857288	0	1
25	159,330	0.0008975	0.0299451	0	1
26	159,330	0.0015314	0.0391034	0	1
27	159,330	0.0817988	0.2740588	0	1
28	159,330	0.0454089	0.2081999	0	1
29	159,330	0.037325	0.1895577	0	1
30	159,330	0.0037909	0.0614535	0	1
31	159,330	0.0024854	0.049792	0	1
32	159,330	0.0692462	0.2538732	0	1
33	159,330	0.0569824	0.2318096	0	1

	34	159,330	0.0042741	0.0652373	0	1
	35	159,330	0.0052658	0.0723748	0	1
	36	159,330	0.0281993	0.1655425	0	1
sector						
rural		159,330	0.5555388	0.4969074	0	1
urban		159,330	0.4444612	0.4969074	0	1
religion						
hinduism		125,979	0.7558879	0.4295612	0	1
islam		125,979	0.1369038	0.3437471	0	1
christian~y		125,979	0.0654077	0.2472449	0	1
sikhism		125,979	0.0205828	0.1419835	0	1
jainism		125,979	0.0027624	0.0524858	0	1
budhism		125,979	0.0093984	0.096489	0	1
Zoroastri~m		125,979	0.0001984	0.0140857	0	1
others		125,979	0.0088586	0.0937028	0	1
caste						
st		125,979	0.1274022	0.3334243	0	1
sc		125,979	0.1695283	0.3752193	0	1
obc		125,979	0.3985426	0.4896001	0	1
other		125,979	0.3045269	0.4602086	0	1

Describing the variables that I have taken in my regression function

storage type	display format	value label	variable label
variable name			
expenditure long	%10.0g		Expenditure (Rs.): Total (items 11 to 13)
type_of_medic~n byte	%10.0g	e9	Type of medical institution
state float	%9.0g		
sector byte	%10.0g	a6	Sector
religion byte	%14.0g	b9	Religion
caste byte	%10.0g	b10	Social group

ANALYSIS OF TABLE

The table below is showing the relation between sector religion and mean expenditure.

					Religion				
Sector	Hinduism	Islam	Christianity	Sikhism	Jainism	Buddhism	Zoroastrianism	others	Total
rural	14809.998	12105.19	16986.031	24269.466	26592.91	13286.338	6565	8573.9812	1464
urban	26326.363	18707.182	32328.06	29461	55217.588	22460.329	31560.296	25446.47	2532
Total	18350.564	14607.646	22310.591	25724.105	49825.996	17592.016	31156.243	12048.848	1807

The table below is showing the relation between sector caste and mean expenditure

	Social group				
Sector	S.T.	S.C.	O.B.C.	other	Total
rural	9262.4169	12357.03	14454.627	19150.17	14649.513
urban	17039.195	18585.809	21167.181	33014.761	25322.068
Total	10242.233	13863.568	16547.704	25200.289	18074.915

The table below is showing the relation between religion type of medical institute and mean expenditure

Type of medical institution	Religion								
	hinduism	islam	christianity	sikhism	jainism	budhism	Zoroastrianism	others	Total
public	4520.1553	3907.828	5140.4956	8453.5074	3852.0708	5584.4645	61591.81	5705.1809	4488.8247
charitable	25640.811	28776.782	17053.979	25306.403	18456.981	23844.239	17016.829	8225.7933	25461.348
private	33056.587	27527.792	35827.01	36406.051	59298.842	24361.132	32048.782	25909.836	32472.813
Total	18350.564	14607.646	22310.591	25724.105	49825.996	17592.016	31156.243	12048.848	18074.915

The table below is showing the relation between religion type of medical institute and mean expenditure.

Type of medical institution	Social group				
	st	sc	obc	other	Total
public	3093.3597	4132.3044 4285.4838		5831.4993	4488.8247
charitable	16761.795	19649.538 22264.733		33457.728	25461.348
private	32157.966	30406.433 28284.819		39094.09	32472.813
Total	10242.233	13863.568 16547.704		25200.289	18074.915

The table below is showing the relation between type of medical institute state and mean expenditure

Type of medical institution	state												
	1	2	3	4	5	6	7	8	9	10	11	12	13
public	6669.9839	1277 0.384	1038 6.451	1794 7.333	5652.8643	5560.7091	3680.9834	5674.4301	4432.9771	3233.2833	5696.97	5518.4684	6257.0133
charitable	1251 0.601	1472 58.73	2663 0.877	5361.7027	2721 9.715	4518 7.413	2790 2.226	1978 5.116	2949 8.494	1379 7.568	3450 0	8554.8402	8487.8485
private	4270 9.656	4091 5.048	3755 2.72	1068 00.66	3232 9.577	3320 5.198	5989 3.616	2796 6.563	3254 1.123	1841 1.536	2920 3.536	1920 4.497	2018 9.534
Total	9478.5158	2007 7.826	2756 6.47	4280 9.357	1979 9.762	2231 4.352	2435 4.072	1396 9.082	1992 5.064	8978.7883	1021 3.927	6517.1001	9746.4584

Type of medical institution	state												
	14	15	16	17	18	19	20	21	22	23	24	25	26
public	9473.3422	6896.4711	5145.1835	3491.386	4817.8167	3780.5979	4946.3841	6111.3792	3216.5276	2194.2783	2156.8799	1432.6935	838.9417
charitable	1858 9.551	1909 3.991	3666 0.042	2732 8.582	1316 6.646	2275 9.981	2221 2.034	2247 3.119	2094 0.208	3365 4.979	1435 4.967		
private	5003 9.185	3737 8.013	6138 5.471	2643 2.208	4344 1.762	4867 8.214	2915 5.537	3352 5.302	4904 5.155	2909 6.858	2532 0.037	2883 3.525	1719 0.108
Total	1578 3.644	1151 9.32	8155.7919	6295.9065	1159 7.138	1650 2.117	1449 7.325	1248 5.922	1777 2.982	1168 2.335	1604 2.22	1713 2.732	5020.2511

Type of medical institution	state										
	27	28	29	30	31	32	33	34	35	36	Total
public	5294.5625	2857.3068	4356.158	4709.0517	2361.5229	6562.1792	2844.3136	3001.0179	4397.5725	3794.8855	4488.8247
charitable	4014	1668	2321		2021	2195	1369	2055	3824	1647	2546
private	3289	2748	2515	3874	5597	3127	3821	5985	1292	3437	3247
Total	2461	1914	1791	1601	1744	2174	1909	1897	2417	2455	1807

The dependent variable in my analysis of the NSSO 75th round of data survey around the topic Social Consumption and health is TOTAL EXPENDITURE.

The independent variables that I have taken in my regression model are as follows:

TYPE OF MEDICAL INSTITUTION:

1------ Public hospitals

2------ NGO or charitable hospitals

3------Private hospitals

STATE:

Andhra Pradesh 28 Karnataka 29 Tamil Nadu 33 Arunachal Pradesh 12 Kerala 32 Tripura 16
Assam 18 Madhya Pradesh 23 Telangana 36 Bihar 10 Maharashtra 27 Uttar Pradesh 09 Chhattisgarh 22 Manipur 14
Uttarakhand 05 Delhi 07 Meghalaya 17 West Bengal 19
Goa 30 Mizoram 15 A & N Islands 35 Gujarat 24 Nagaland 13 Chandigarh 04
Haryana06 Odisha 21 Dadra & Nagar Haveli 26 Himachal Pradesh 02 Punjab 03
Daman & Diu 25 Jammu & Kashmir01 Rajasthan 08 Lakshadweep 31 Jharkhand20
Sikkim 11 Puducherry 34

RELIGION:

1----hinduism

2----islam

3----christianity

4----sikhism

5----jainism

6----budhism

7-----zoroastianism

9----others

CASTE:

1---- schedule tribe

2-----schedule caste

3-----other backward classes

9----others

ANALYSIS OF THE REGRESSION

Given the details above here are the results of my model 1 regression function which is a linear function.

	(1)
VARIABLES	Model1
2.type_of_medical_institution	22,759***
	(1,694)
3.type_of_medical_institution	29,872***
	(420.8)
2.state	5,486***
	(1,574)
3.state	-4,168***
	(1,370)

4.state	19,440***
	(4,685)
5.state	-4,704***
	(1,321)
6.state	-7,311***
	(1,090)
7.state	4,274*
	(2,431)
8.state	-4,589***
	(919.1)
9.state	-3,331***
	(900.8)
10.state	-11,195***
	(948.0)
11.state	-2,915***
	(1,095)
12.state	-9,512***
	(3,153)
13.state	-5,156***
	(1,441)
14.state	4,968**
	(2,126)
15.state	-443.2
	(2,807)
16.state	-1,702**
	(859.8)
17.state	-5,452***
	(1,288)
18.state	571.4
	(1,127)
19.state	-911.3
	(881.0)
20.state	-5,225***
	(1,320)
21.state	-1,161
	(903.4)
22.state	-4,204***
	(1,425)
23.state	-5,645***
	(897.2)
24.state	-11,699***
	(1,011)
25.state	-6,512**
	(3,283)
26.state	-12,689***
	(1,365)
27.state	-3,421***
	(1,012)
28.state	-8,785***
	(963.7)
29.state	-7,695***

	(1,058)
30.state	-5,382***
	(1,797)
31.state	3,896**
	(1,715)
32.state	-4,721***
	(1,004)
33.state	-1,514
	(1,017)
34.state	-872.3
	(3,446)
35.state	4,868
	(3,027)
36.state	-4,426***
	(1,093)
2.sector	4,500***
	(337.8)
2.religion	-4,544***
	(437.8)
3.religion	155.3
	(1,003)
4.religion	3,181*
	(1,684)
5.religion	21,958***
	(8,222)
6.religion	1,518
	(1,466)
7.religion	-6,998
	(9,142)
9.religion	14,305
	(9,423)
2.caste	-424.7
	(633.4)
3.caste	712.8
	(669.8)
9.caste	6,024***
	(661.7)
Constant	5,857***
	(864.1)
Observations	93,770
R-squared	0.089

Jammu and Kashmir as base in state

Schedule tribe as base in caste

Hinduism as base in religion

Rural as base for the sector

Public hospitals as base in type of medical institutions.

The coefficients of the charitable hospital and private hospital are statistically significant under the head of type of medical institutions.

Coefficients of Islam and Jainism are significant at 1 percent ,coefficients of other castes are significant at 5 percent whereas that of the rest of them are not statistically significant.

Coefficient of Other castes are significant whereas that of SC and OBC are not statistically significant.

Urban sector is also having a significant coefficient.

Given the details above here are the results of my model 2 regression function which is a linear function.

	(1)
VARIABLES	Model2
1.type_of_medical_institution	-22,759***
	(1,694)
3.type_of_medical_institution	7,112***
	(1,713)
2.state	5,486***
	(1,574)
3.state	-4,168***
	(1,370)
4.state	19,440***
	(4,685)
5.state	-4,704***
	(1,321)
6.state	-7,311***
	(1,090)
7.state	4,274*
	(2,431)
8.state	-4,589***
	(919.1)
9.state	-3,331***
	(900.8)
10.state	-11,195***

	(948.0)
11.state	-2,915***
	(1,095)
12.state	-9,512***
	(3,153)
13.state	-5,156***
	(1,441)
14.state	4,968**
	(2,126)
15.state	-443.2
	(2,807)
16.state	-1,702**
	(859.8)
17.state	-5,452***
	(1,288)
18.state	571.4
	(1,127)
19.state	-911.3
	(881.0)
20.state	-5,225***
	(1,320)
21.state	-1,161
	(903.4)
22.state	-4,204***
	(1,425)
23.state	-5,645***
	(897.2)
24.state	-11,699***
	(1,011)
25.state	-6,512**
	(3,283)
26.state	-12,689***
	(1,365)
27.state	-3,421***
	(1,012)
28.state	-8,785***
	(963.7)
29.state	-7,695***
	(1,058)
30.state	-5,382***
	(1,797)
31.state	3,896**
	(1,715)
32.state	-4,721***
	(1,004)
33.state	-1,514
	(1,017)
34.state	-872.3
	(3,446)
35.state	4,868
	(3,027)

36.state	-4,426***
	(1,093)
1.sector	-4,500***
	(337.8)
1.religion	4,544***
	(437.8)
3.religion	4,699***
	(1,062)
4.religion	7,724***
	(1,728)
5.religion	26,502***
	(8,227)
6.religion	6,061***
	(1,539)
7.religion	-2,454
	(9,146)
9.religion	18,849**
	(9,464)
1.caste	424.7
	(633.4)
3.caste	1,137***
	(376.9)
9.caste	6,449***
	(464.3)
Constant	28,148***
	(1,837)
Observations	93,770
R-squared	0.089

Jammu and Kashmir as base for state

Schedule caste as base for caste

Islam as base for religion

Urban as base for sector

Charitable hospitals as base for type of medical institutions

In religion Zoroastrianism and other religion ‘s coefficients are insignificant rest are significant.

In caste ST caste has an insignificant coefficient.

Rest every caste and sector are significant

Given the details above here are the results of my model 3 regression function which is a linear function.

	(1)
VARIABLES	Model3
1.type_of_medical_institution	-29,872***
	(420.8)
2.type_of_medical_institution	-7,112***
	(1,713)
2.state	5,486***
	(1,574)
3.state	-4,168***
	(1,370)
4.state	19,440***
	(4,685)
5.state	-4,704***
	(1,321)
6.state	-7,311***
	(1,090)
7.state	4,274*
	(2,431)
8.state	-4,589***
	(919.1)
9.state	-3,331***
	(900.8)
10.state	-11,195***
	(948.0)
11.state	-2,915***
	(1,095)
12.state	-9,512***
	(3,153)
13.state	-5,156***
	(1,441)
14.state	4,968**
	(2,126)
15.state	-443.2
	(2,807)
16.state	-1,702**
	(859.8)
17.state	-5,452***
	(1,288)
18.state	571.4
	(1,127)
19.state	-911.3
	(881.0)
20.state	-5,225***
	(1,320)
21.state	-1,161

	(903.4)
22.state	-4,204***
	(1,425)
23.state	-5,645***
	(897.2)
24.state	-11,699***
	(1,011)
25.state	-6,512**
	(3,283)
26.state	-12,689***
	(1,365)
27.state	-3,421***
	(1,012)
28.state	-8,785***
	(963.7)
29.state	-7,695***
	(1,058)
30.state	-5,382***
	(1,797)
31.state	3,896**
	(1,715)
32.state	-4,721***
	(1,004)
33.state	-1,514
	(1,017)
34.state	-872.3
	(3,446)
35.state	4,868
	(3,027)
36.state	-4,426***
	(1,093)
1.sector	-4,500***
	(337.8)
1.religion	-14,305
	(9,423)
2.religion	-18,849**
	(9,464)
3.religion	-14,150
	(9,342)
4.religion	-11,125
	(9,544)
5.religion	7,653
	(12,563)
6.religion	-12,788
	(8,880)
7.religion	-21,303
	(13,062)
1.caste	-6,024***
	(661.7)
2.caste	-6,449***
	(464.3)

3.caste	-5,311***
	(446.8)
Constant	60,558***
	(9,705)
Observations	93,770
R-squared	0.089

Taking Jammu and kashmir as base for my model 3 in states

Private hospitals as base in type of medical institution

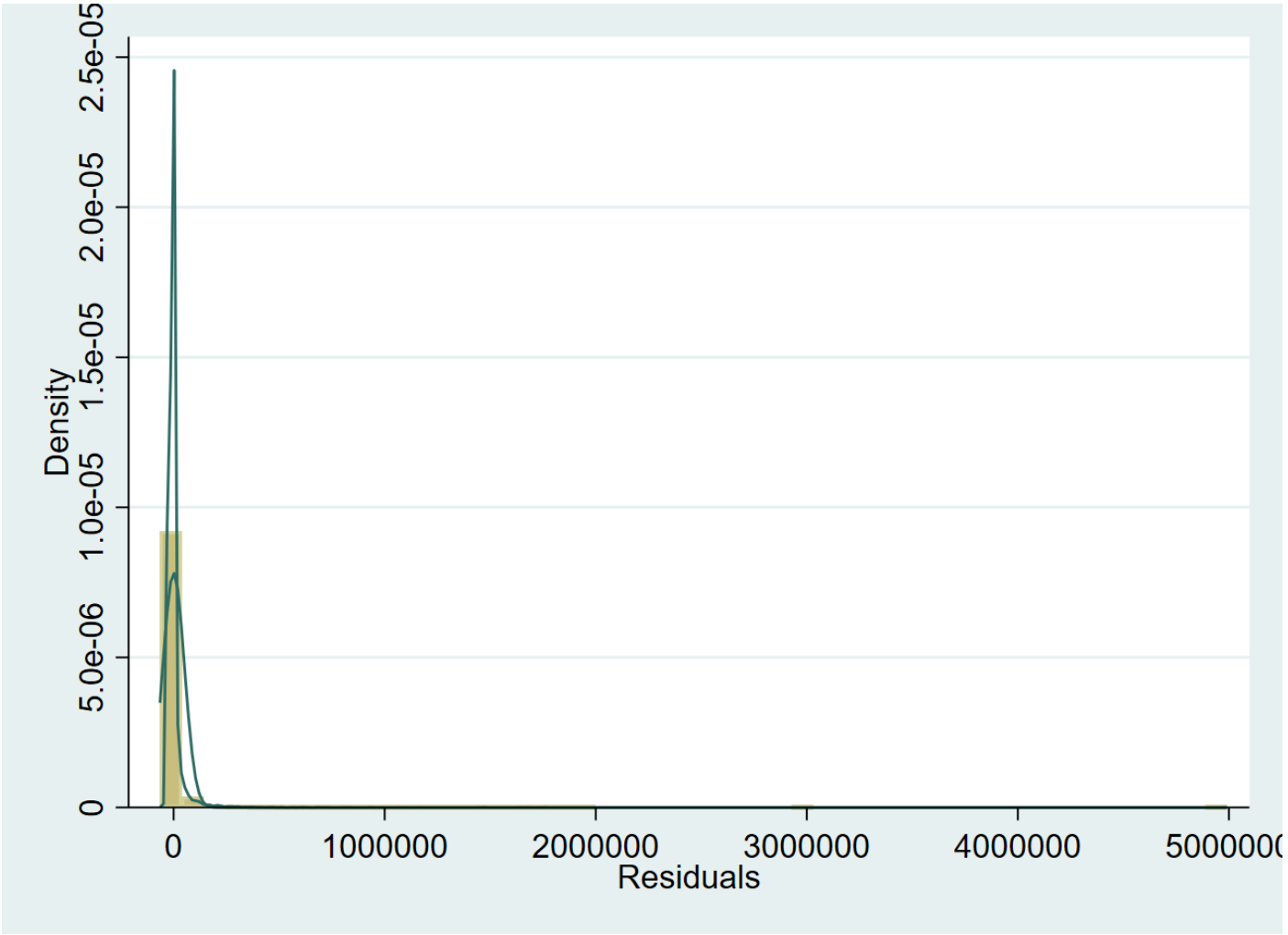
Urban as a base for sector

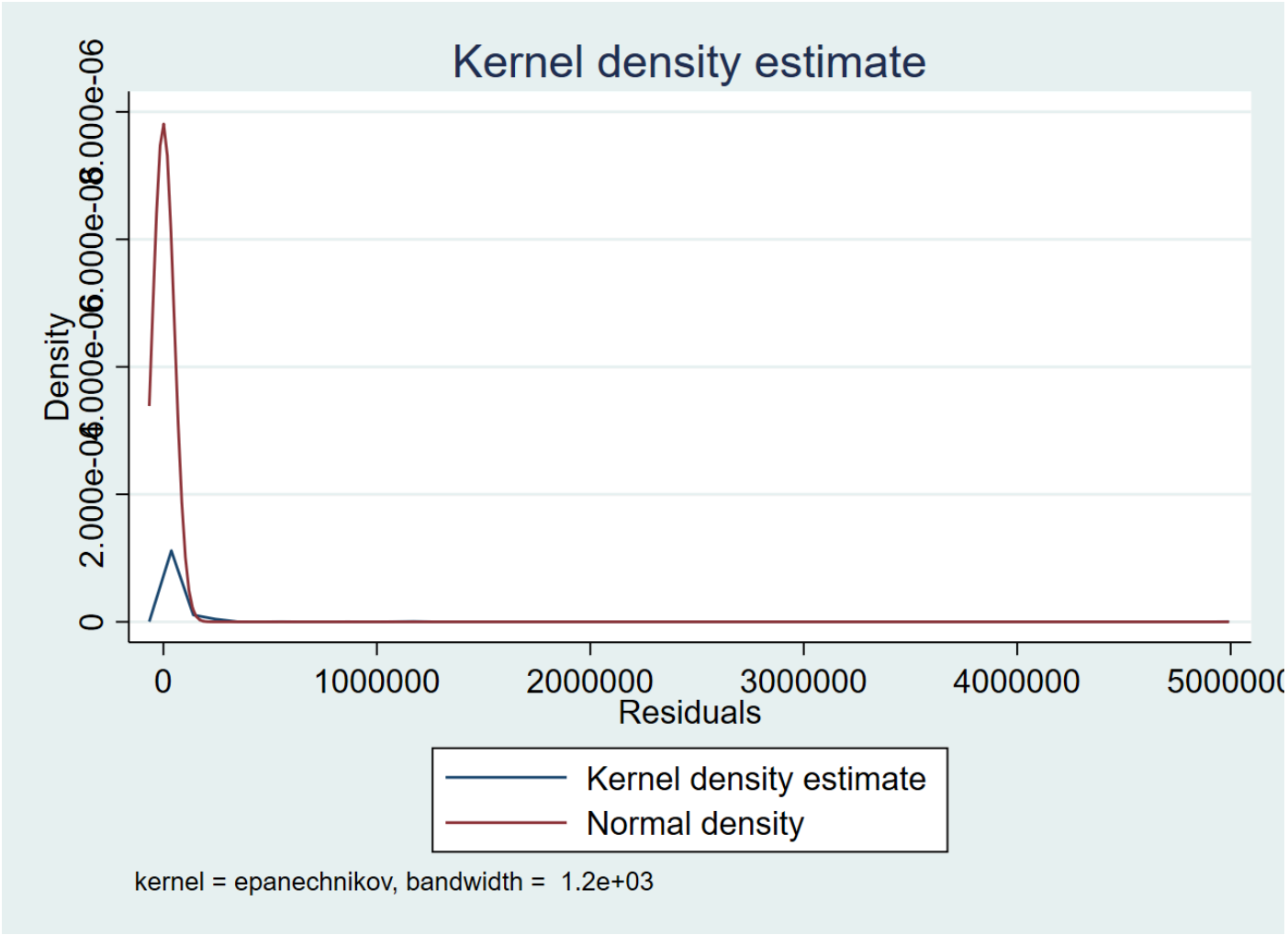
Other religion and caste as base for religion and caste variable

In the religion part only the coefficient of Islam is significant at 5 percent rest all are insignificant.

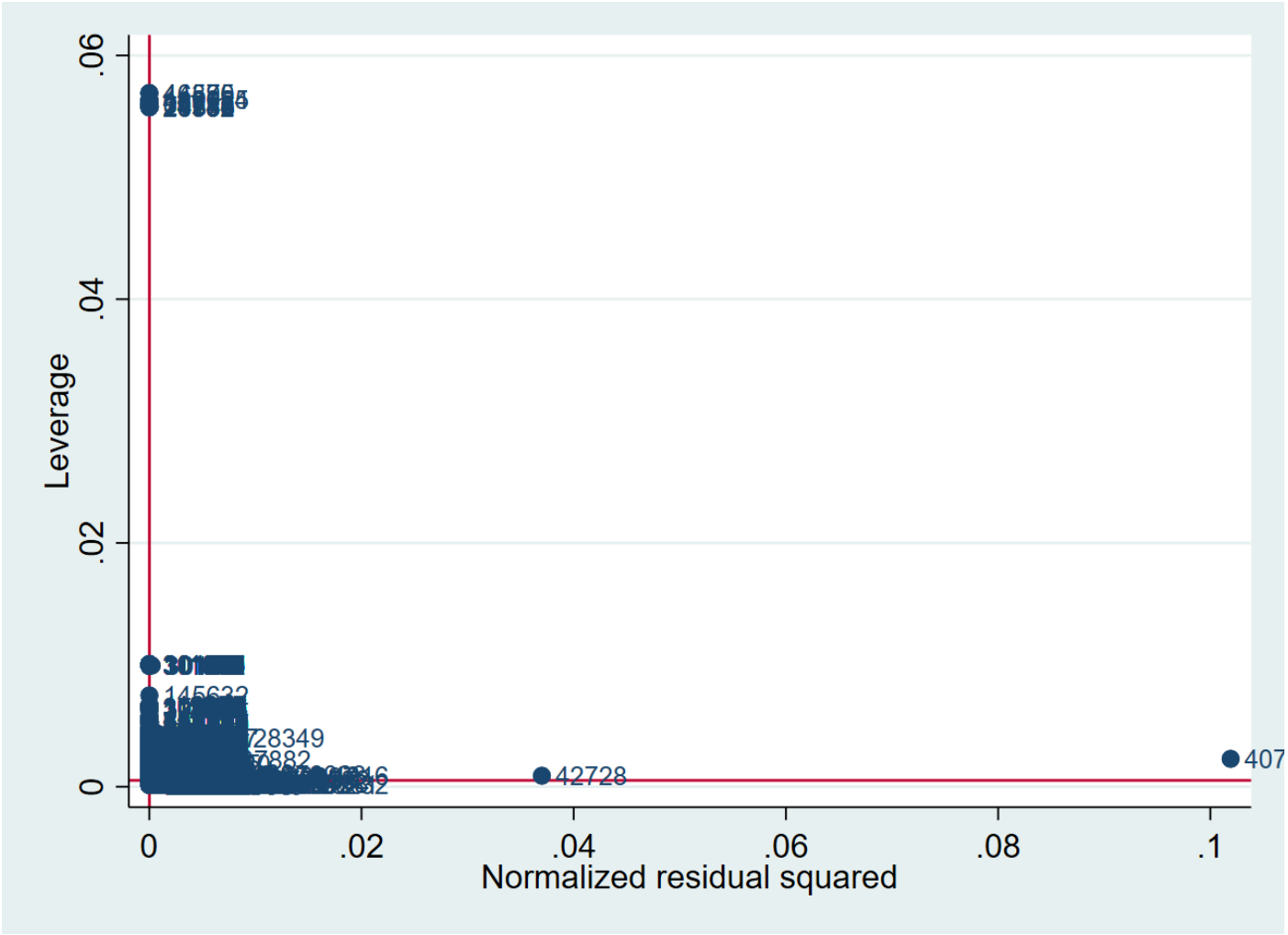
In all the other variables every coefficient is significant.

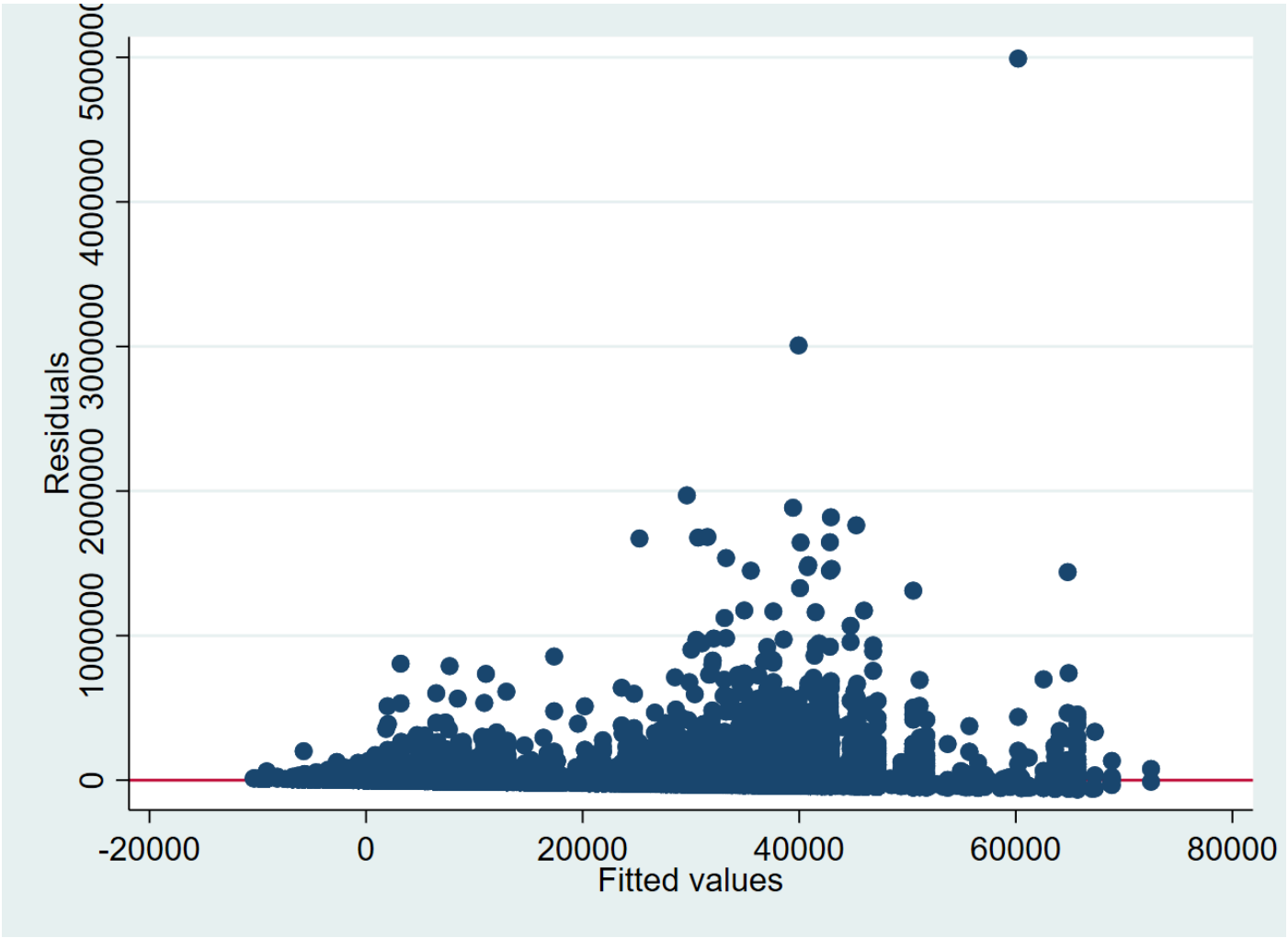
DIAGNOSTIC TESTING


Density
0
5.0e-06
1.0e-05
1.5e-05
2.0e-05
2.5e-05
0
1000000
2000000
3000000
4000000
5000000
Residuals



The residuals are not normalized. It's an assumption which is not necessary for our analysis. So, we won't do anything to correct it.


Leverage
.06
.04
.02
0
0
.02
.04
.06
.08
.1
Normalized residual squared
42728
407



Heteroscedasticity is present,so we will correct using robust standard errors.

CONCLUSION

- The coefficients of the type of medical institutions are always significant whether I change the base for them or not.
- The type of sectors that we have the coefficients of them inspite of what we take as base are significant.
- When taken other caste as base all the three caste ST SC OBC come out to be significant.
- Religion and state have shown us vague results as we keep on changing the bases for our model.

REFERENCES

NSSO 75th round of data set of social consumption and health.

Major help taken by Shivani mam and Dr. Krishna ram sir.