# Trends in Contraception Usage in India

## Answer 1

The methods used by couples to limit or space children are referred to as contraceptive methods. Contraception also has the following uses, prevention of pregnancy related health risks in women, reducing IMR i.e. Infant Mortality Rate, preventing HIV/AIDS, empowering people and enhancing education, reducing teenage pregnancies, slowing population growth rates. (World Health Organisation, 2018). Given, India's explosive growth rate and need for contraception we use the data available from NFHS – IV to study the trends in usage of contraception. Previous studies have suggested that even though there is awareness about contraceptives, their usage remains limited. (Makade, Padhyegurjar, Padhyegurjar, & Kulkarni, 2012). Another study provided a similar result that while women are aware of contraceptive methods most does not use contraception and of those using contraception female sterilization is by far the most prevalent method (TH & Desai, 2013). We test some hypothesis about the decision to not use contraception. One hypothesis is that contraception usage would be adversely affected by belief in certain religions such as Christianity and Islam because of the belief systems. Similar hypothesis have been tested in the past and concluded that Muslim women have higher fertility rates (Moulasha & Rao, 1999). Another research suggested that the usage contraception has in some parts of society been restricted by low levels of education (Kumar, et al., 2011).

## Works Cited

Kumar, M., Meena, J., Sharma, S., Poddar, A., Dhalliwal, V., Modi, M.-S. C., et al. (2011). Contraceptive use among low-income urban married women in India. *Journal of Sexual Medicine;8*, 376–382.

Makade, K. G., Padhyegurjar, M., Padhyegurjar, S. B., & Kulkarni, R. N. (2012). STUDY OF CONTRACEPTIVE USE AMONG MARRIED. *National Journal of Community Medicine Vol 3 Issue 1*, pp. 40-43.

Moulasha, K., & Rao, G. R. (1999). Religion-Specific Differentials in Fertility and Family Planning. *Economic & Political Weekly, Vol. 34, No. 42/43*, pp. 3047-3051.

TH, S., & Desai, R. M. (2013). Knowledge, attitude and practice of contraception among women attending tertiary care hospital in India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology Volume 2 · Issue 2*, pp 172-176.

World Health Organisation. (2018, February 8). Retrieved from http://www.who.int/news-room/fact-sheets/detail/family-planning-contraception

## Answer 2

The simple tabulation of our 'main variable' gives a misleading picture at first.

```
.
. tab v312
```

| current contraceptive method | Freq. | Percent | Cum. |
|---|---|---|---|
| not using | 438,428 | 62.66 | 62.66 |
| pill | 21,623 | 3.09 | 65.75 |
| iud | 9,554 | 1.37 | 67.12 |
| injections | 1,075 | 0.15 | 67.27 |
| diaphragm | 1 | 0.00 | 67.27 |
| condom | 29,517 | 4.22 | 71.49 |
| female sterilization | 165,650 | 23.67 | 95.16 |
| male sterilization | 1,787 | 0.26 | 95.42 |
| rhythm/periodic abstinence | 17,873 | 2.55 | 97.97 |
| withdrawal | 13,557 | 1.94 | 99.91 |
| lactational amenorrhea (lam) | 448 | 0.06 | 99.98 |
| female condom | 126 | 0.02 | 99.99 |
| foam or jelly | 8 | 0.00 | 99.99 |
| standard days | 39 | 0.01 | 100.00 |
| Total | 699,686 | 100.00 | |

The first row which shows the number of people not using contraceptives includes those among the population who have never had a sexual relation. We would be wrong to interpret this in way where we assume they'll never be using contraceptives. To rectify this anomaly, we excluded those people who've never had sex from those who've never used a contraceptive. This gives us an accurate understanding of further analysis we perform.

These are the updated results. You can see a considerable decrease in those who are not using contraceptives. This shows that female sterilization is the most preferred method of contraception among Indians, followed by using a condom.

```
. tab v312
```

| current contraceptive method | Freq. | Percent | Cum. |
|---|---|---|---|
| not using | 273,488 | 51.14 | 51.14 |
| pill | 21,623 | 4.04 | 55.19 |
| iud | 9,554 | 1.79 | 56.97 |
| injections | 1,075 | 0.20 | 57.17 |
| diaphragm | 1 | 0.00 | 57.17 |
| condom | 29,517 | 5.52 | 62.69 |
| female sterilization | 165,650 | 30.98 | 93.67 |
| male sterilization | 1,787 | 0.33 | 94.01 |
| rhythm/periodic abstinence | 17,873 | 3.34 | 97.35 |
| withdrawal | 13,557 | 2.54 | 99.88 |
| lactational amenorrhea (lam) | 448 | 0.08 | 99.97 |
| female condom | 126 | 0.02 | 99.99 |
| foam or jelly | 8 | 0.00 | 99.99 |
| standard days | 39 | 0.01 | 100.00 |
| Total | 534,746 | 100.00 | |

We chose to cross-tabulate the main variable with religion, wealth index, educational level, and place of residence. The results are discussed below:

RELIGION-

On cross tabulating use of contraceptives and religion, we found that individuals identifying as Muslims are least likely to use contraceptives after Parsis and those who chose to withhold their religion. On the other hand, Sikhs are most likely to use contraceptives, according to the tabulation.

```
.
. *religion

.
. svy: tab v312 v130, col
(running tabulate on estimation sample)

Number of strata   =         1                  Number of obs      =    534746
Number of PSUs     =     28518                  Population size    = 5460608.5
                                                Design df          =     28517
```

| current contraceptive method | religion | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | hindu | muslim | christia | sikh | buddhist | jain | jewish | parsi/zo | no relig | other | Total |
| not usin | .468 | .5615 | .5027 | .283 | .3407 | .3896 | .6974 | .8138 | .767 | .5997 | .4775 |
| pill | .032 | .0755 | .0289 | .0231 | .0312 | .0142 | 0 | 0 | .0311 | .1608 | .0381 |
| iud | .0136 | .0133 | .0162 | .0626 | .0146 | .0296 | 0 | 0 | .004 | .0158 | .0145 |
| injectio | .0015 | .0032 | .0015 | .0015 | .0024 | 6.8e-04 | 0 | 0 | 0 | .002 | .0017 |
| diaphrag | 2.6e-06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.1e-06 |
| condom | .0493 | .069 | .0221 | .1638 | .0694 | .1304 | .0706 | 0 | .0029 | .0269 | .0533 |
| female s | .3791 | .2067 | .3957 | .379 | .5138 | .3805 | .232 | .1862 | .169 | .1414 | .3569 |
| male ste | .0028 | 6.8e-04 | .002 | .0063 | .0063 | .0129 | 0 | 0 | .0064 | .0017 | .0026 |
| rhythm/p | .0326 | .0385 | .0137 | .0524 | .007 | .0197 | 0 | 0 | .016 | .0399 | .0331 |
| withdraw | .0199 | .0306 | .0166 | .0278 | .0141 | .0225 | 0 | 0 | .0034 | .0117 | .0212 |
| lactatio | 7.8e-04 | 6.6e-04 | 4.5e-04 | 4.6e-04 | 6.2e-04 | 0 | 0 | 0 | 7.0e-05 | 1.6e-04 | 7.5e-04 |
| female c | 2.7e-04 | 2.1e-04 | 7.0e-05 | 7.1e-06 | 1.9e-06 | 0 | 0 | 0 | 0 | 0 | 2.5e-04 |
| foam or | 4.0e-05 | 2.9e-05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.7e-05 |
| standard | 8.0e-05 | 5.5e-05 | 1.4e-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.6e-05 |
| Total | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

```
Key:  column proportions

Pearson:
  Uncorrected   chi2(117)       =  1.74e+04
```

WEALTH INDEX-

The trend of contraceptive usage found on cross-tabulating Wealth index and use of contraceptives can be summarized as a increasing relation of wealth and increasing use of contraceptives. The richest are most likely to use contraceptives and the poorest, least likely. This might be an outcome of the lack of information among the poor about the existence of contraceptives or the process of using them.

```
.
. *wealth index

. svy: tab v312 v190, col
(running tabulate on estimation sample)

Number of strata   =         1                  Number of obs      =    534746
Number of PSUs     =     28518                  Population size    = 5460608.5
                                                Design df          =     28517
```

| current contraceptive method | wealth index | | | | | |
|---|---|---|---|---|---|---|
| | poorest | poorer | middle | richer | richest | Total |
| not usin | .5938 | .495 | .4539 | .4383 | .4197 | .4775 |
| pill | .0412 | .0546 | .0389 | .0323 | .0244 | .0381 |
| iud | .0051 | .0085 | .0098 | .0174 | .0304 | .0145 |
| injectio | .0015 | .0015 | .0014 | .0019 | .0023 | .0017 |
| diaphrag | 1.1e-05 | 0 | 0 | 0 | 0 | 2.1e-06 |
| condom | .0172 | .0293 | .0406 | .0597 | .1156 | .0533 |
| female s | .2846 | .3495 | .4002 | .3958 | .3454 | .3569 |
| male ste | .0022 | .0027 | .0023 | .0026 | .0031 | .0026 |
| rhythm/p | .036 | .0354 | .0306 | .0298 | .034 | .0331 |
| withdraw | .0173 | .0222 | .0214 | .0208 | .0241 | .0212 |
| lactatio | .0011 | 9.9e-04 | 5.5e-04 | 7.8e-04 | 3.9e-04 | 7.5e-04 |
| female c | 1.0e-05 | 1.9e-04 | 2.4e-04 | 4.4e-04 | 3.3e-04 | 2.5e-04 |
| foam or | 0 | 0 | 0 | 1.7e-05 | 1.6e-04 | 3.7e-05 |
| standard | 6.1e-05 | 7.1e-05 | 8.5e-05 | 9.0e-05 | 7.2e-05 | 7.6e-05 |
| Total | 1 | 1 | 1 | 1 | 1 | 1 |

```
  Key:  column proportions

  Pearson:
    Uncorrected   chi2(52)         =  2.33e+04
    Design-based  F(22.09,  6.3e+05)=  132.3921   P = 0.0000
```

EDUCATION-

Cross-tabulating education level and contraceptive usage gives counterintuitive results. In a way, it shows the education level is inversely proportional to contraceptive usage. This can be treated as an outlier.

```
. *highest educational level

.
. svy: tab v312 v106, col
(running tabulate on estimation sample)

Number of strata   =         1                  Number of obs
Number of PSUs     =     28518                  Population si
                                                Design df
```

| current contraceptive method | highest educational level | | | | |
|---|---|---|---|---|---|
| | no educa | primary | secondar | higher | Total |
| not usin | .472 | .4326 | .4818 | .5427 | .4775 |
| pill | .0242 | .0486 | .0479 | .0285 | .0381 |
| iud | .0056 | .0098 | .0187 | .0332 | .0145 |
| injectio | .0014 | .0015 | .0017 | .0031 | .0017 |
| diaphrag | 6.3e-06 | 0 | 0 | 0 | 2.1e-06 |
| condom | .0235 | .0318 | .0641 | .1391 | .0533 |
| female s | .4234 | .4208 | .3226 | .1851 | .3569 |
| male ste | .0027 | .0028 | .0025 | .0023 | .0026 |
| rhythm/p | .0329 | .0311 | .0329 | .0373 | .0331 |
| withdraw | .0138 | .0202 | .0263 | .0267 | .0212 |
| lactatio | 5.1e-04 | 6.9e-04 | 9.6e-04 | 7.1e-04 | 7.5e-04 |
| female c | 3.7e-05 | 1.6e-04 | 3.0e-04 | 8.8e-04 | 2.5e-04 |
| foam or | 0 | 0 | 2.0e-05 | 2.8e-04 | 3.7e-05 |
| standard | 4.2e-05 | 2.8e-05 | 1.2e-04 | 7.0e-05 | 7.6e-05 |
| Total | 1 | 1 | 1 | 1 | 1 |

```
  Key:  column proportions

  Pearson:
    Uncorrected   chi2(39)         =  2.63e+04
    Design-based  F(23.29,   6.6e+05)=  214.7271   P = 0.0000
```

Place of residence-

```
.
. *type of place of residence Urban/Rural

. svy: tab v312 v025, col
(running tabulate on estimation sample)

Number of strata   =         1                  Number of obs      =    534746
Number of PSUs     =     28518                  Population size    = 5460608.5
                                                Design df          =     28517
```

| current contraceptive method | type of place of residence urban | rural | Total |
|---|---|---|---|
| not usin | .4424 | .4952 | .4775 |
| pill | .033 | .0407 | .0381 |
| iud | .0223 | .0105 | .0145 |
| injectio | .0021 | .0015 | .0017 |
| diaphrag | 0 | 3.2e-06 | 2.1e-06 |
| condom | .0853 | .0371 | .0533 |
| female s | .3561 | .3573 | .3569 |
| male ste | .0024 | .0027 | .0026 |
| rhythm/p | .033 | .0331 | .0331 |
| withdraw | .0224 | .0206 | .0212 |
| lactatio | 5.5e-04 | 8.5e-04 | 7.5e-04 |
| female c | 3.1e-04 | 2.2e-04 | 2.5e-04 |
| foam or | 1.1e-04 | 0 | 3.7e-05 |
| standard | 6.3e-05 | 8.3e-05 | 7.6e-05 |
| Total | 1 | 1 | 1 |

```
  Key:  column proportions

  Pearson:
    Uncorrected   chi2(13)        = 7341.8978
    Design-based  F(9.16,  2.6e+05)=  112.1495    P = 0.0000
```

The results obtained by cross tabulating place of residence and contraceptive usage conform to the intuitions of a sane mind. A person residing in an urban locality is more likely to use contraceptives than someone living in a rural household.

## Answer 3

The nominal variable we defined was “contra_use”. It is with this nominal variable that we are going to cross-tabulate the others.

```
.
. gen contra_use=.
(699686 missing values generated)

.
. replace contra_use=0 if [v312==0]
(273488 real changes made)

.
. replace contra_use=1 if [v312>=1 & v312<=18]
(261258 real changes made)

.
. label define i_contra_use 0 NO 1 YES

.
. label value contra_use i_contra_use

.
. tab contra_use
```

| contra_use | Freq. | Percent | Cum. |
|---|---|---|---|
| NO | 273,488 | 51.14 | 51.14 |
| YES | 261,258 | 48.86 | 100.00 |
| Total | 534,746 | 100.00 | |

We cross-tabulated it against religion, wealth index, educational level and place of residence. The results are as shown below.

Religion- This result shows that people identifying as Jains are the second most probable people to use contraceptives. The data pertaining to the Parsi community may not be as reliable as the others as it may have been taken from a comparably lower sample size.

```
.
. *religion

.
. svy: tab contra_use v130, col
(running tabulate on estimation sample)

Number of strata   =         1                  Number of obs      =    534746
Number of PSUs     =     28518                  Population size    = 5460608.5
                                                Design df          =     28517
```

| contra_use | religion | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | hindu | muslim | christia | sikh | buddhist | jain | jewish | parsi/zo | no relig | other | Total |
| NO | .468 | .5615 | .5027 | .283 | .3407 | .3896 | .6974 | .8138 | .767 | .5997 | .4775 |
| YES | .532 | .4385 | .4973 | .717 | .6593 | .6104 | .3026 | .1862 | .233 | .4003 | .5225 |
| Total | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

```
  Key:  column proportions

  Pearson:
    Uncorrected   chi2(9)         = 4041.9679
    Design-based  F(5.56,  1.6e+05)=  101.6813    P = 0.0000
```

Wealth Index-

The cross-tabulation of our nominal variable with wealth index shows that the richest are more likely to use contraceptives as compared to the others.

```
. *wealth index

.
. svy: tab contra_use v190, col
(running tabulate on estimation sample)

Number of strata   =         1                  Number of obs      =    534746
Number of PSUs     =     28518                  Population size    = 5460608.5
                                                Design df          =     28517
```

| contra_use | wealth index | | | | | |
|---|---|---|---|---|---|---|
| | poorest | poorer | middle | richer | richest | Total |
| NO | .5938 | .495 | .4539 | .4383 | .4197 | .4775 |
| YES | .4062 | .505 | .5461 | .5617 | .5803 | .5225 |
| Total | 1 | 1 | 1 | 1 | 1 | 1 |

```
  Key:  column proportions

  Pearson:
    Uncorrected   chi2(4)         = 7834.6048
    Design-based  F(3.49, 99465.26)=  518.3884    P = 0.0000
```

Educational Level-

The outcome of this cross-tabulation doesn't give any conclusive data about the relation between educational level and contraceptive usage. We might get more reliable data if we take into account other factors affecting the use of contraceptives as well.

```
. *highest educational level

.
. svy: tab contra_use v106, col
(running tabulate on estimation sample)

Number of strata   =         1                  Number of obs      =    534746
Number of PSUs     =     28518                  Population size    = 5460608.5
                                                Design df          =     28517
```

| contra_use | highest educational level | | | | |
|---|---|---|---|---|---|
| | no educa | primary | secondar | higher | Total |
| NO | .472 | .4326 | .4818 | .5427 | .4775 |
| YES | .528 | .5674 | .5182 | .4573 | .5225 |
| Total | 1 | 1 | 1 | 1 | 1 |

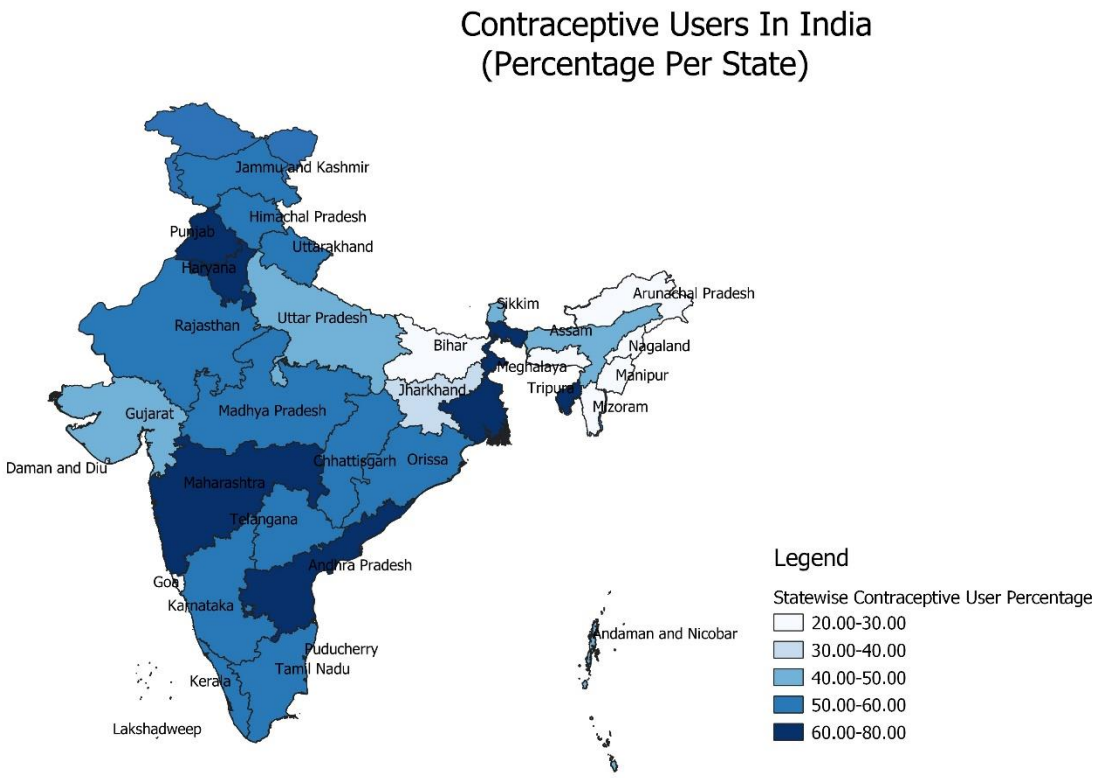
```
  Key:  column proportions

  Pearson:
    Uncorrected   chi2(3)         = 1570.9388
    Design-based  F(2.77, 79124.61)=  145.8316    P = 0.0000
```

Place of Residence-

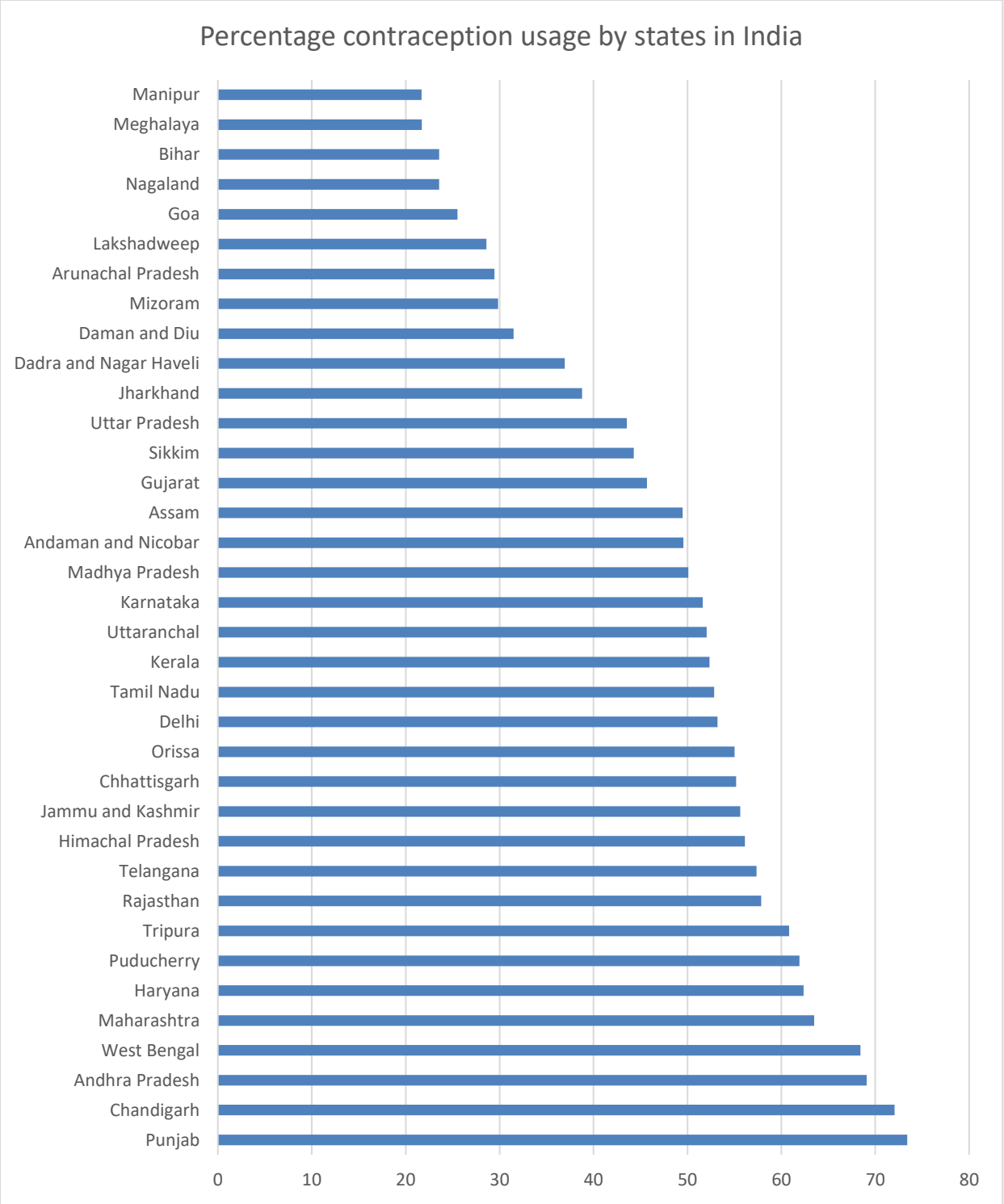
Although the result of our last cross-tabulation shows that people living in urban areas are more likely to use contraceptives than those living in rural areas, we can observe more than half of the people use contraceptives in both.

```
.
. *type of place of residence Urban/Rural

.
. svy: tab contra_use v025, col
(running tabulate on estimation sample)

Number of strata   =         1                  Number of obs      =    534746
Number of PSUs     =     28518                  Population size    = 5460608.5
                                                Design df          =     28517

------------------------------------------------
contra_us |  type of place of
e         |      residence
          |  urban   rural   Total
----------+-------------------------------------
       NO |  .4424   .4952   .4775
      YES |  .5576   .5048   .5225
          |
    Total |     1        1       1
------------------------------------------------
  Key:  column proportions

  Pearson:
    Uncorrected   chi2(1)         = 1333.0371
    Design-based  F(1, 28517)     =  161.3837     P = 0.0000

. log close
      name:  <unnamed>
       log:  C:\Users\vkasa\Desktop\BEGIN LOG.smcl
  log type:  smcl
 closed on:  24 Oct 2018, 19:06:34
```

## Answer 4




The map represents the percentage users of contraception in each state in India. The results are similar to the data in the NFHS-IV report for percentage users of contraception among married women. We note that the people in the states of Meghalaya and Manipur are least likely to contraceptive methods while the highest proportion of the contraceptive users are in the states of Punjab and Chandigarh(UT). We can conclude a very distinct geographic trends in the usage of contraception. We could assert that people in the northeastern states are less likely to use contraception but states of West Bengal and Tripura are strong outliers to this trend. The following table gives details of the percentage users of contraception in each State and Union Territory in India.




Bihar has quite a low usage of contraceptives relatively. This could be explained intuitively as consequences of a comparative lack of education and strong socio-cultural factors. One way of interpreting the high percentage of contraceptive usage in Punjab is the fact that a majority of Punjab's

population follow Sikhism. (which was earlier shown as the religion whose practitioners had the highest contraceptive usage). It depicts a liberal approach to contraceptive usage in Punjab.

## Answer 5

On running the linear regression model on the variable contra_use (contraception use) which gives whether or not the individual uses contraception using four variables which are religion, wealth index, highest education level and type of place of residence, we found a constant value of 0.47 and different coefficients for all the attributes of the religion, wealth, type of place of residence and highest level of education. All the four variables had significant p value, i.e., they had p value less than <0.05. In the religion variable Buddhist and join have p value greater than so these variables don't have a large impact on the dependent variable which is contra_use. In wealth index variable all p values are less than, so all of them are essential in the equation and influence the dependent variable. In the variable v106, which is highest level of education, primary level education can be removed from the regression equation as it has p-value of 0.8 which is greater than considerable value of 0.05. And finally, the type of place of variable which is urban or rural has p-value also less than 0.05 so it should be included in the regression equation. Of all the independent variables, wealth index has heavy impact on the dependent variable