

## **CERTIFICATE**

This is to certify that the data Anweshan Goswami has successfully completed  
and submitted their research paper titled

Contraceptive Usage Patterns and Sexual Awareness among Indian Youth:

With special emphasis on West Bengal and Uttar Pradesh

As partial fulfillment for the requirement of a degree in Statistics at Banaras  
Hindu University.

The research work presented in this paper is a product of the candidates  
original effort. The data used in this project has been collected, tabulated,  
analyzed and presented by Anweshan Goswami in an authentic and legitimate  
manner.

Hence, this certificate is being awarded to the candidate upon the verification  
and evaluation of the paper.

Dr. Poonam Singh  
Assistant Professor  
Banaras Hindu University

Date :

-----  
Signature

## DECLARATION

I, Anweshan Goswami, certify that this research paper, "Contraceptive Usage Patterns and Sexual Awareness among Indian Youth: With Special Emphasis on West Bengal and Uttar Pradesh," is my original work and that all sources read and cited have been duly recognised. I certify that the data, results, and analysis reported in this work are all real and were acquired legally. I also affirm that this research has not been submitted to any other academic institution for review. I am aware that any form of plagiarism—intentional or not—undermines the objectivity of academic work and is a serious infraction.

In order to verify that the data contained in this work is accurate and that any borrowed information is properly credited and referenced, I have taken all necessary steps.

By acknowledging my obligation to follow the ethical standards of academic research and scholarship and signing this declaration, I express my commitment to upholding these standards in all my future academic undertakings.

Anweshan Goswami

Exam Roll No. 20221STA005

Enrollment : 428435

Date :

-----  
Signature

## **ACKNOWLEDGEMENT**

I want to sincerely thank everyone who has helped me with this research and for their support in the past. I want to start by expressing my gratitude to my supervisor, Dr. Poonam Singh, for her helpful advice, assistance, and criticism during the study process. It would not have been feasible to complete this project without their support and encouragement.

I want to express my gratitude to my family and friends for their continuous support and inspiration over this academic year. I have always found inspiration and drive in their love, tolerance, and encouragement.

As it is said, it takes the combined efforts of many people to accomplish something significant.

I appreciate your encouragement and support.

# CONTENTS

TOPICS	PAGE
• Abstract	5-6
• Introduction	7
• Data and Methodology	8 - 9
• Preliminary Data Exploration	10 - 16
• Data analysis and results	17 - 36
• Analysis of sexual behavior	17 - 18
• CI for mean age	18 - 19
• Hypothesis Testing regarding mean age of first sexual encounter	19 - 20
• Non - consensual first sexual encounter	20 - 21
• Nature of first sexual encounter	21 - 23
• Contraception used in first sexual encounter	23 - 26
• Contraception used in subsequent sexual interactions	26 - 28
• Reasons for skipping contraception	28 - 30
• Risk Factor	31 - 33
• Hypothesis testing regarding preferences of men v/s women	33 - 35
• Sources of buying contraception	35 - 36
• Analysis regarding sexual awareness	37 - 39
• Discussion	40
• Conclusion	41
• References	42

## ABSTRACT

**Background :** The huge ramifications of sexual behavior, particularly for young people, make it crucial to study. It is crucial for their wellbeing that they are aware of their sexuality and safe sex practices. It aids their decision-making. Studying sexual behavior is crucial for understanding patterns in fertility, STDs, unintended pregnancies, abortions, and other issues. Most importantly, it provides an overview of our culture and works to normalize sex.

**Method :** An online survey has been used to gather primary data. The data has been analyzed using python 3.1. This study has 307 individuals in total. To identify the various patterns in various states, the data has been aggregated by state and examined in further detail. Gender, sexual orientation, location, and age were used to analyze the data. Statistical significance has been defined as a p-value 0.05.

**Objective :** The objective of this paper is to examine numerous trends in young Indian people's sexual conduct. We determine the typical age of the first sexual encounter, the types of sexual behavior they engage in, the trends and justifications for using various forms of contraception, how society affects their sexual lives, whether moving away for college has an impact on them, whether certain stereotypes are actually supported by science, and whether people are aware of safe sex practises and whether they engage in them.

**Result :** 45.8% of the respondents engaged in sexual activities. Mean age for first sexual encounters is 18.65 years for males and 18.63 years for females. 95% CI for mean age for first sexual interaction is [18.239434, 19.043583]. Moving

away for college doesn't reduce the average age for first sexual interaction at 95% level of significance. 7.5% of the first sexual encounters were non consensual, where leading (75% of victims) nature was that of genital stimulation with hands. Nature of first sexual encounter included genital stimulation for 74.52% of the respondents. Penetration and oral sex both make up for 44.33% of the respondents' first sexual encounter. 57.44% of people engaging in oral sex during their first encounter did not use a condom, while only 10.63% skipped contraception during penetration. In subsequent sexual encounters, 59.43% of respondents used condoms, while only 8% used other forms of contraception. 38.67% still skipped any form of contraception. Leading causes for skipping contraception include "making it more pleasurable for their partners" (14.15%), "making it more pleasurable for themselves" and "finding it unnecessary" (13.2%), "withdrawal" (12.26%) and "unavailability" (11.32%). We developed a risk factor, with an average person having a risk of 11.16%. Rejected null hypothesis that men skip contraception (and ask their partners to do the same) due to heightened pleasure, at 95% level of significance. 40% of respondents buy contraception themselves from pharmacies, and this is the leading source of contraception. 17.2% of respondents are not aware of STD transmission through oral sex. 28.3% of respondents were not aware of transmission of STDs through cuts and ulcers.

## INTRODUCTION

It is vital to examine sexual behavior because of its enormous consequences, especially for young people. They must understand their sexuality and safe sex practices if they are to live healthy lives. It helps them make decisions. Yet, socio-cultural factors have a significant impact on sexual conduct.

Understanding Indian cultural attitudes and sexual norms is crucial since they have an effect on young people's sexual behaviors. Furthermore, it's possible that young people's access to accurate and trustworthy information regarding sexual health and safe sex practices is limited. This may result in false knowledge and myths, which could seriously harm their sexual health. The way that young people communicate and build relationships has been completely transformed by technology, notably social media and dating applications. Their sexual behavior has also been altered by this. Young people's sexual practices can also be significantly impacted by the stigma and discrimination associated with sex. Indian youth's sexual behaviors can be used to pinpoint knowledge and awareness gaps that can subsequently be filled through focused interventions. Most significantly, understanding patterns in fertility, STDs, unwanted pregnancy, abortions, and other disorders depends on knowing sexual behavior. It gives a broad perspective of our culture and promotes sex as normal. Additionally, it has significant policy ramifications. It can influence policies governing access to sexual health treatments and contraceptives as well as the creation of comprehensive sexual education programmes in schools. Additionally, it can assist in identifying areas in which additional study is necessary to comprehend and address sexual health issues among young people.

## DATA AND METHODOLOGY

The information was gathered via a google forms-based online survey.

The three-part NHANES 2009 Sexual Behaviour Questionnaire served as the model for this survey.

The person's age, gender, sexual orientation, place of residence, and present city are all collected in Section 1. In order to protect the respondents' confidentiality, we don't gather names or email addresses.

### Section 2: Sexual preferences and background

Here, we make an effort to gain insight into our respondents' sexual behavior. We aim to ask them questions regarding the potential risk factors for STDs, RTIs, and unintended pregnancies, as well as whether or not they have been cautious in the past and whether they are cautious today.

In Section 3, we gather information on the respondents' knowledge of sexual health. The data has been stored in a CSV File and then analyzed on python.

Variables have been assigned to each question, which are as follows :

Variable Name	Question it relates to
timestamp	Timestamp
age	What is your age? (In years)
gender	What is your gender?
sex_orient	What is your sexual orientation?
domicile	What's your hometown?
current_home	Where do you currently live?
encounter_check	Have you ever had a sexual encounter?
first_age	At what age did you have your first sexual encounter?
first_consent	Was that encounter consensual?
first_nat	What was the nature of your first sexual encounter?
first_contra	What kind of protection did you use back then?
first_contra_source	Where do you currently get your contraception from?
current_contra_source	Where do you currently get your contraception from?
total_no	How many sexual partners have you had?
current_no	How many sexual partners do you currently have?
current_freq	What is the frequency of your sexual encounters? (Generally)
current_contra	What methods of contraception do you currently use?
skip_freq	How often do you skip protection?
skip_reason	What are your reasons for not using contraception
alcohol_check	Have you ever performed intercourse under the influence of alcohol?
conceive_check	Have you/your partner ever conceived a baby accidentally?
fluids_check	Have you ever come in contact with bodily fluids of your partner (other than saliva), during intercourse?
oral_aware	Are you aware that even oral sex can aid in transmission of STDs?
preg_aware	Are you aware about the pregnancy related risks of skipping contraception?
cut_aware	Are you aware that STDs can be spread through cuts, sores and ulcers as well?
menstrual_aware	Do you know that having unprotected sex at the end of your / your partner's menstrual cycle does not eliminate all chances of unwanted pregnancies?
safe_sex_source	What is your source of knowledge regarding safe sex practices?
risk_count	How many of these risks are you aware of?



The data has respondents in the age group [17-35], with 75% of them being below 21 years from most genders and a wide spectrum of sexualities.

```
(sample_df["encounter_check"].value_counts("Yes"))*314
```

```
No      168.762215
Yes     145.237785
Name: encounter_check, dtype: float64
```

There are 142 responders who have had a sexual interaction, and there are 169 who haven't. Consequently, 142 will comprise the sample size used to make

```
sample_df[["domicile", "current_home"]]
```

	domicile	current_home
0	Jaunpur , UP	Varanasi , UP
1	Biratnagar, Nepal	Varanasi, UP
2	Lucknow, UP	Varanasi, UP
3	Aligarh, UP	Varanasi, UP
4	Sidharth nagar, UP	Varanasi, UP
...	...	...
302	Bhadohi,UP	Varanasi,UP
303	Bankura, WB	Kolkata, WB
304	GORAKHPUR UP	Varanasi, UP
305	Lucknow, UP	Varanasi, UP
306	Ranchi, Jharkhand	Varanasi, UP

307 rows x 2 columns

inferences about sexual behavior.

However, conclusions about sexual awareness are drawn using a sample size of 314.

There are 142 responders who have had a sexual interaction, and there are 169 who haven't. Consequently, 142 will comprise the sample size used to make inferences about sexual behavior. However, conclusions about sexual awareness are drawn using a sample size of 314.

As we can see, city names are also

included in the data for domicile and present location. To make the analysis more effective, we group the responses into their different states.

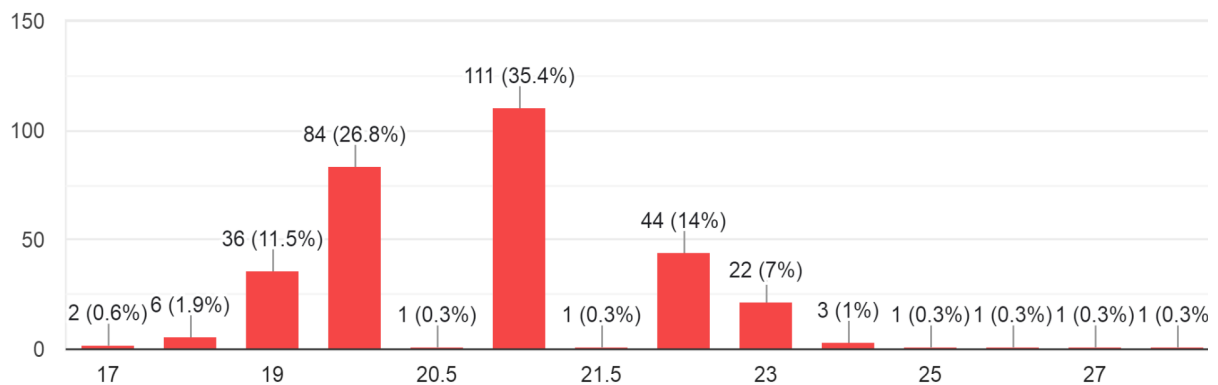
As a result of grouping, we can observe that Delhi (23), West Bengal (74), and Uttar Pradesh (157), which received the most responses, are the top 3 states. The remaining states are unsuitable because they received a relatively tiny number of answers. The reason for this is the online mode of the survey. We base our analysis only on the top 2 states, U.P. and W.B. Keep in mind that these locations are based on present location and not domicile.

## PRELIMINARY DATA EXPLORATION

We originally received 314 responses. But like any other dataset, some of them were bad values (missing data, erroneous data). Therefore, they were removed. Let us begin analyzing some of the responses of the questions.

What is your age? (In years)

314 responses



This is the age distribution of the 314 responses. Most of the data is concentrated between ages 19-23, with 17 and above 25 being outliers.

We will club the respondents aged 20.5 into 21 years old, and the 21.5 years old into 22.

Number of responses from each age group are as follows :

1. 17 years - 2 people forming 0.6% of the sample
2. 18 years - 6 people forming 1.9% of the sample
3. 19 years - 36 people forming 11.5% of the sample
4. 20 years - 84 people forming 26.8% of the sample
5. 21 years - 112 people forming 35.7% of the sample

6. 22 years - 45 people forming 14.3% of the sample
7. 23 years - 22 people forming 7% of the sample
8. 24 years - 3 people forming 1% of the sample
9. 25 years - 1 person forming 0.3% of the sample
10. 26 years - 1 person forming 0.3% of the sample
11. 27 years - 1 person forming 0.3% of the sample
12. 35 years - 1 person forming 0.3% of the sample

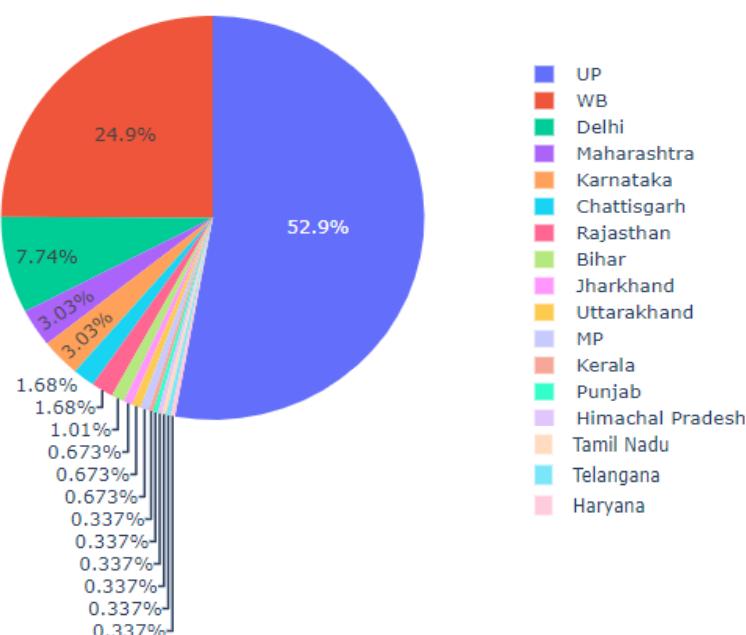
The Maximum number of respondents are 21 years old. The age distribution approximately follows a bell-curve shape.

Now we will look into the home-state and present-state where they live.

*We focus on the current state because we are assuming that present-circumstances affect one's sexual behavior more than the circumstances that they grew up in.* It is an undeniable fact that childhood vastly shapes one's outlook for sex, but we make our assumption to reduce complexity.

```
fig = px.pie(india_sample_df, values = india_sample_df.groupby("current_state").count().sort_values(by = "timestamp", ascending=False)["timestamp"],
            names = india_sample_df.groupby("current_state").count().sort_values(by = "timestamp", ascending=False)["timestamp"].index,
            title = "All states and their representation in our sample",)
fig.show()
```

Representation of states in our sample size



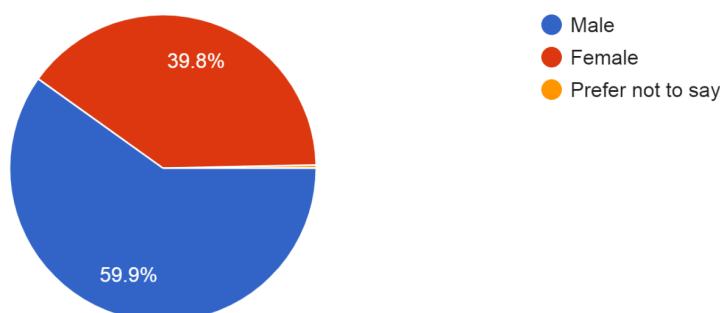
Out of the 314 responses , each state contributes accordingly

1. Uttar Pradesh - 157 people comprising 52.7% of the sample
2. West Bengal - 74 people comprising 24.9% of the sample
3. Delhi - 23 people comprising 7.74% of the sample
4. Maharashtra - 9 people comprising 3.03% of the sample
5. Karnataka - 9 people comprising 3.03% of the sample
6. Chattisgarh - 5 people comprising of 1.68% of the sample
7. Rajasthan 5 - 5 people comprising of 1.68% of the sample
8. Bihar - 3 people comprising of 1.01% of the sample
9. Jharkhand, Uttarakhand and Madhya Pradesh - 2 people from each state, forming 2.019% of the sample and
10. Kerala, Punjab and Himachal Pradesh- 1 person from each state, forming 1.011% of the sample

Now let us look into the sex distribution in the sample.

What is your gender?

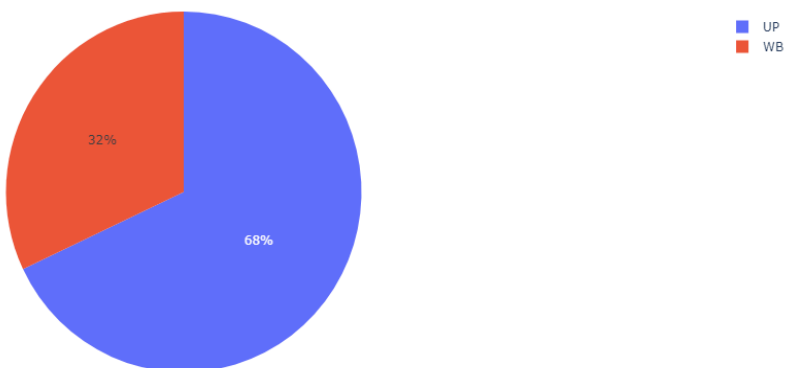
314 responses



Out of the 314 responses, 125 (39.8% of the sample) are females, while 188 (59.9% of the sample) are males. The sample sizes are >70, so they're adequate for making inferences about the population. Since our focus is on the 2 states, let us look at their sex distribution.

However, since we're going to make inferences only about Uttar Pradesh and West Bengal, we should drop the other states. We see that we will be left with 74 (32% of the new sample) respondents from West Bengal and 157 (68% of the new sample) respondents from Uttar Pradesh.

Top states and their representation in our sample



That is the gender distribution between the 2 states.

```
[121] table = pd.pivot_table(sample_df, values = ["gender"], index = ["current_state"], columns=sample_df['gender'], aggfunc="count")
      table.replace(np.nan, 0, inplace=True)
      table
```

gender	gender		
	Female	Male	Prefer not to say
current_state			
UP	58.0	98.0	1.0
WB	30.0	44.0	0.0

When the statistics on young people's sexual behavior in India were analyzed, a clear difference in the sex distribution between the states of West Bengal and Uttar

Pradesh was found.

- In Uttar Pradesh, 156 individuals took part in the survey, of whom 58 identified as female, 98 as male, and 1 as non-binary.
- However, in West Bengal, where there were a total of 74 respondents, 44 of them identified as male, 30 as female, and none as non-binary.

This is because our poll is conducted online and has a limited audience owing to the manner the survey form is distributed.

In order to spot any changes in respondents' preferences based on their gender and state of residency, a study of the respondents' sexual orientations was also conducted. A two-level pivot table was created to do this. This analysis showed that the distribution of sexual preferences between male and female respondents, as well as between respondents from the two states, varied significantly.

```
[277] table = pd.pivot_table(sample_df, values = ["sex_orient"], index = ["current_state", "gender"], columns=sample_df['sex_orient'], aggfunc="count")
      table.replace(np.nan, 0, inplace=True)
      table
```

		sex_orient					
		sex_orient	Asexual	Bisexual	Heterosexual / Straight	Homosexual	Pansexual
current_state	gender						
UP	Female		2.0	7.0	45.0	2.0	2.0
	Male		1.0	4.0	90.0	3.0	0.0
	Prefer not to say		0.0	0.0	1.0	0.0	0.0
WB	Female		0.0	0.0	30.0	0.0	0.0
	Male		0.0	0.0	41.0	3.0	0.0

## In Uttar Pradesh

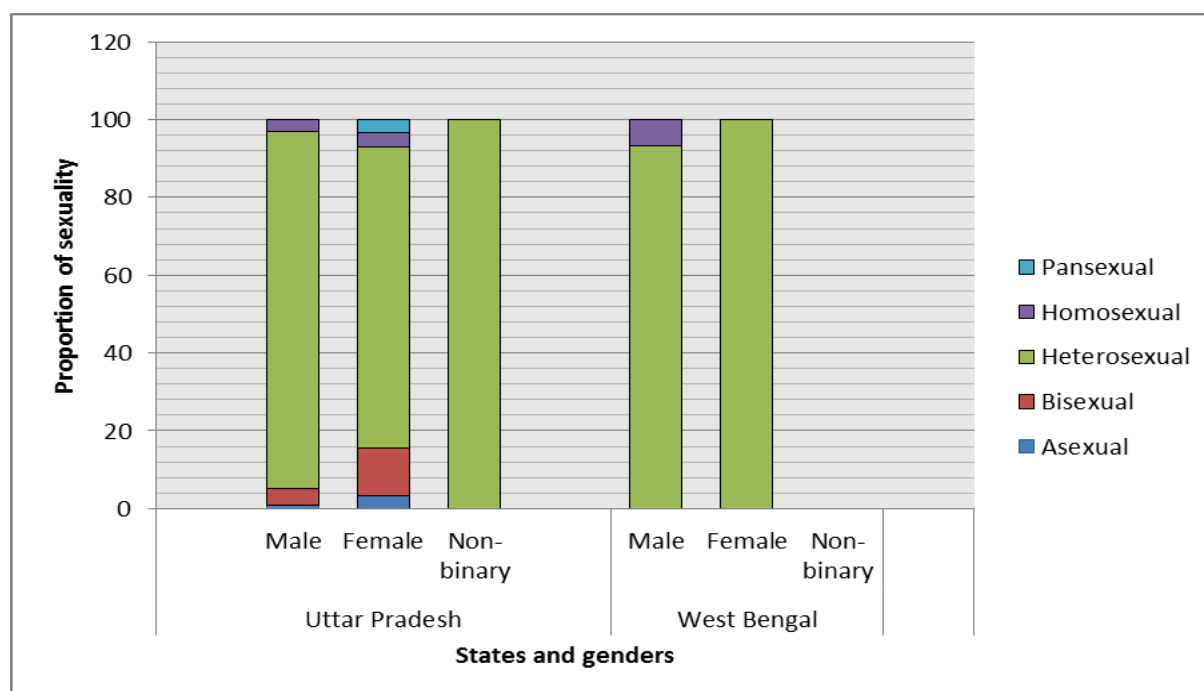
- Out of 58 female respondents
  - 2 respondents (3.44% of the females in UP sample) identify as **asexual**
  - 7 respondents (12.06% of the females in UP sample) identify as **bisexuals**
  - 45 respondents (77.58% of the females in UP sample) identify as **heterosexual or straight**
  - 2 respondents (3.44% of the females in UP sample) identify as **homosexual**

- 2 respondents (3.44% of the females in UP sample) identify as **pansexual**
- Out of the 98 males
  - 1 person (1.02% of the males in UP sample) identifies as **asexual**
  - 4 people (4.08% of the males in UP sample ) identify as **bisexual**
  - 90 people (91.83% of the males in UP sample) identify as **heterosexuals or straight**
  - 3 people (3.06% of the males in UP sample) identify as **homosexuals**

#### In West Bengals

- Out of 44 male respondents
  - 41 people (93.18% of the males in WB sample) identify as **heterosexuals**
  - 3 people (6.81% of the males in WB sample) identify as **homosexuals**
- All 30 out of 30 females identified as **heterosexuals**

The following graph summarizes it



Overall, this finding sheds light on how cultural and socioeconomic influences may affect young people's sexual behavior in India. The results raise the possibility that sexual preferences and gender identities differ significantly depending on geographic location and cultural context, which is an important point to keep in mind for policymakers and healthcare professionals attempting to meet the needs of young people in India in terms of sexual and reproductive health.



# DATA ANALYSIS AND RESULTS

## 1. Analysis of the sexual behavior

First, we examine the data from individuals who had previously engaged in sexual activity. In our survey, we used the term "sexual encounter" to refer to any sexual activity between two persons that does not involve kissing. Given that kissing doesn't always result in another sexual activity, it hasn't been included under sexual activities because doing so would make it difficult to study sexual activity. Therefore, genital stimulation by the partner, foreplay, and intercourse are all considered sexual encounters or activities.

Let's look at the percentage of respondents in our sample who have experienced at least one sexual interaction. They will serve as the basis for the sample used in our analysis. Earlier, we noted that 145 participants had had a sexual interaction whereas 169 did not in our whole dataset. But right now we have focused our study on the 2 top states.

```

table = pd.pivot_table(sample_df, values = ["encounter_check"],
                        index = ["current_state", "gender"],
                        columns=sample_df['encounter_check'],
                        aggfunc="count")
table.replace(np.nan, 0, inplace=True)
table

```

		encounter_check	
		No	Yes
current_state	gender		
	UP		
	Female	34.0	24.0
	Male	56.0	42.0
	Prefer not to say	1.0	0.0
WB	Female	8.0	22.0
	Male	26.0	18.0

We see that in Uttar Pradesh

- 24 female respondents have engaged in sexual activities while 34 have not (Total 58 female respondents)
- 42 male respondents have engaged in sexual activities while 56 have not (Total 98 male respondents)
- The single non-binary respondent is yet to have a sexual encounter.

While in West Bengal, we have

- 22 female respondents out of 30 have engaged in sexual activities but the rest 8 have not.
- 18 out of 44 male respondents have engaged in sexual activities while the other 26 have not

In total, 106 respondents from our sample have had sexual encounters.

Now let us dive into some specific cases.

### Confidence Interval for mean age

When we study the measures of central tendencies of the respondents who have

	count	mean	std	min	25%	50%	75%	max
gender								
<b>Female</b>	46.0	18.652174	1.864491	12.0	18.0	19.0	20.0	21.0
<b>Male</b>	60.0	18.633333	2.299349	12.0	17.0	19.0	20.0	23.0

```
[495] sample_df[sample_df["encounter_check"] == "Yes"].groupby("gender")["first_age"].describe()
```

engaged in sexual activities, we find that the mean age for first sexual interaction is 18.64 years (male and female combined). Therefore, we can say that on average a person from our sample has their first sexual encounter at age 18.6 years.

We can calculate the Confidence Interval for population mean using our data. Population variance is unknown, but sample size is >30, so we use the formula

$$C. I. = (\bar{X} \pm Z_{\alpha/2} \frac{s}{\sqrt{n}})$$

The combined mean = 18.641509 years

Sample standard deviation = 2.112046

Sample size n = 106

C. I. = [18.239434, 19.043583]. **Therefore, we can say with 95% certainty that the population mean lies between 18.2394 years and 19.0435 years.**

### Hypothesis Testing regarding mean age of first sexual encounter

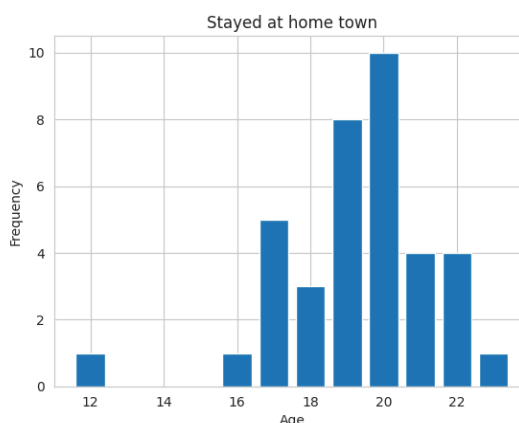
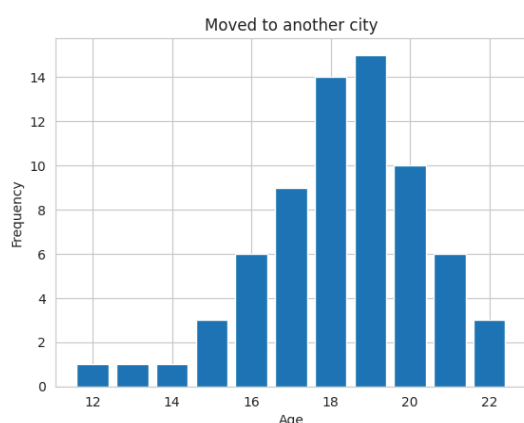
We previously saw that the median age for first sexual encounter was 19 years. It means that an average person in our sample has their first sexual encounter at the age of 19 years. Generally, at the age of 19, students are in college. **So, I have a hypothesis that the students who move to a different city for college, engage in sexual activities before the students who stay home.**

First, we need to divide our sample into 2 groups -

1. People who moved to a different city (*moved\_df*)
2. People who stayed in their hometown (*stayed\_df*)

```
stayed_df = sample_df[sample_df["domicile"].str.split(",").str[0] == sample_df["current_home"].str.split(",").str[0]]
moved_df = sample_df[sample_df["domicile"].str.split(",").str[0] != sample_df["current_home"].str.split(",").str[0]]
```

We can proceed with a parametric test only if the sample is normally distributed. Let us create a frequency distribution of ages and check graphically if it's normal.



Both the groups approximately fit a normal curve, therefore we can proceed to apply a parametric test. We can use t-test to check for equality of 2 means. First we have to check if both the groups have sample variance - if not, we have to perform t-test for equality of 2 means with unequal variances.

```
moved_group_age = np.array(moved_df[moved_df["encounter_check"] == "Yes"]["first_age"])
stayed_group_age = np.array(stayed_df[stayed_df["encounter_check"] == "Yes"]["first_age"])

print("Variance in the group that stayed is = ", np.var(stayed_group_age),
      "\nVariance in the group that moved is = ", np.var(moved_group_age))
```

```
Variance in the group that stayed is = 4.208911614317019
Variance in the group that moved is = 4.176853602184415
```

The deviations are clearly not equal, despite being extremely near to one another. Even if both variances are identical, the t-test for equivalence to two means for different variances finally yields the same results. So, we'll start with the first option. Let us form our hypothesis.

$$H_0 : \bar{x}_{\text{moved}} = \bar{x}_{\text{stayed}}$$

$$v/s$$

$$H_1 : \bar{x}_{\text{moved}} < \bar{x}_{\text{stayed}}$$

```
[56] stats.ttest_ind(a=stayed_group_age, b=moved_group_age, equal_var=True)

Ttest_indResult(statistic=2.393044423871248, pvalue=0.0185024758783401)
```

The p-value is greater than our threshold for significance ( $=0.05$ ) at 0.0185. Consequently, we don't have enough evidence to disprove our null hypothesis. However, at 80% level of significance, we can reject the null hypothesis.

**Therefore, there is an 80% certainty that the average age of the first sexual encounter when you move out (18.289 years) is lower than the average age of the first encounter when we remain at home (19.29 years).**

### People with non - consensual first sexual encounter

For those whose first sexual contact was not consenting, we examine the nature of that first encounter as well as the type of contraception employed.

```
non_consensual_df = sample_df[sample_df["first_consent"] == "No"]
non_consensual_df[["gender", "current_state", "first_age", "first_nat", "first_contra"]]
```

	gender	current_state	first_age		first_nat	first_contra
117	Male	WB	22.0		NaN	NaN
119	Female	WB	18.0	Penetrative, Oral, Genital simulation by hand		Did not use
127	Female	WB	16.0	Oral, Genital simulation by hand		Did not use
221	Male	WB	12.0	Genital simulation by hand		Did not use
244	Male	UP	20.0	Penetrative, Oral, Genital simulation by hand		Did not use
246	Female	UP	10.0	Genital simulation by hand		Did not use
256	Female	UP	19.0	Genital simulation by hand		Did not use
267	Female	UP	18.0		Penetrative	Did not use

We observe that

- Around 7.5% of the respondents' (who have engaged in sexual activities) first sexual encounter was non-consensual
- 50% of respondents are from West Bengal and 50% from Uttar Pradesh
- 5 out of 8, that is 62.5% of them are female
- 37.5% of the victims were penetrated, while 37.5% were orally
- 75% of the victims' were stimulated by hands

### **Nature of first sexual encounter**

Here we analyze the nature of the respondents first sexual encounter. This will help us to see patterns in preferences of the youth and their safe sex practices. Our questionnaire involved 4 kinds of sexual activities - oral, penetrative, genital stimulation by hands. We need to remember that each person does not necessarily belong to 1 kind only, their first sexual interaction could have included multiple ways. Some also preferred not to disclose that information.

We consider each individual who has engaged in sexual activities, go to their first encounter's nature, and count each kind. Then, we add them up state-wise.

```
West bengal {'Oral': 19, 'Genital simulation by hand': 27, 'Penetrative': 13, 'Prefer not to say': 2}
UP {'Penetrative': 34, 'Genital simulation by hand': 39, 'Oral': 28, 'Prefer not to say': 1}
```

Out of West Bengal's 40 respondents

- 19 (47.5%) engaged in oral sex
- 40 (67.5%) engaged in genital stimulation with hands only
- 13 (32.5%) went all the way to penetration
- 2 (5%) preferred not to disclose the nature of their first sexual encounter

Out of Uttar Pradesh's 66 respondents

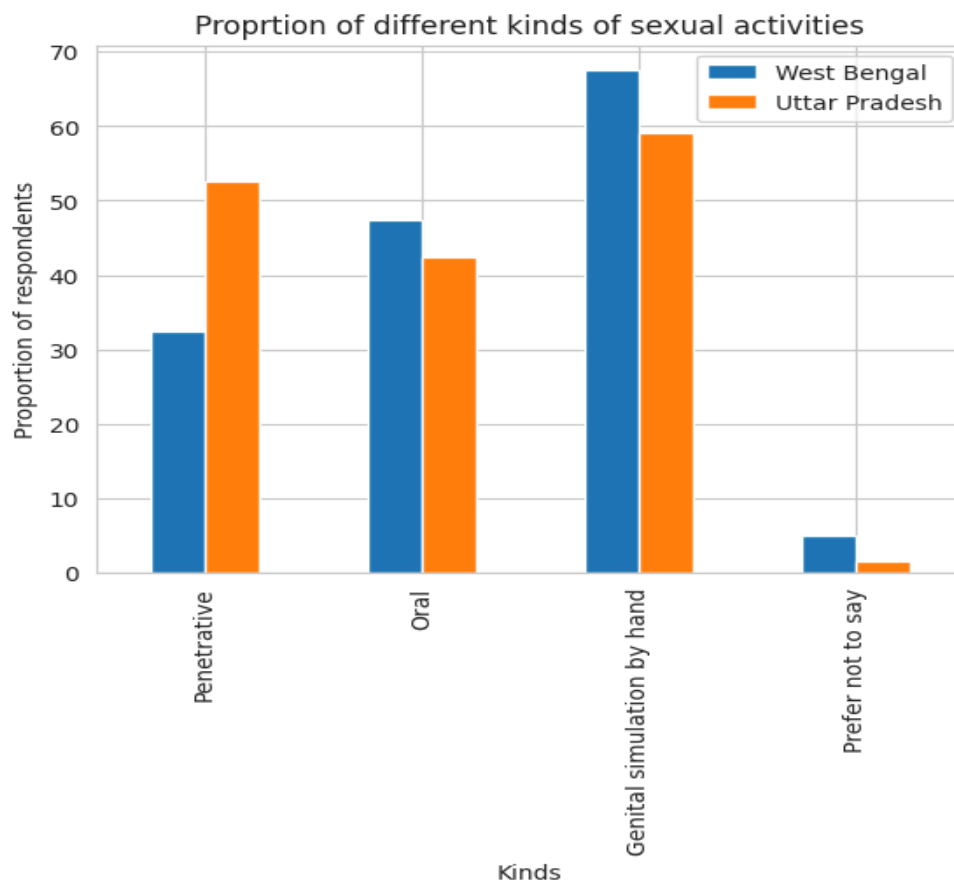
- 28 (42.42%) engaged in oral sex
- 39 (59.09%) engaged only in genital stimulation with hands
- 34 (52.51%) went all the way to penetration
- 1 (1.5%) did not disclose information about their first sexual encounter

We need to keep in mind that these percentages don't add up to 100%, because 1 person could have engaged in more than 1 activity.

We can summarize these ratios with a graph

```
sns.set_style("whitegrid")
d = { "West Bengal" : {'Penetrative': 32.5, 'Oral': 47.5,
                      'Genital simulation by hand': 67.5,
                      'Prefer not to say': 5},
      "Uttar Pradesh" : {'Penetrative': 52.51, 'Oral': 42.42,
                        'Genital simulation by hand': 59.09,
                        'Prefer not to say': 1.5},}

pd.DataFrame(d).plot(kind='bar')
plt.title('Proprtion of different kinds of sexual activities')
plt.xlabel('Kinds')
plt.ylabel('Proportion of respondents')
plt.show()
```



While more first-timers in West Bengal choose oral stimulation or hand stimulation, those who are just starting out in Uttar Pradesh prefer to go all the way to penetration. The larger share of genital stimulation is appropriate because it is so basic. The high percentages of oral and penetrative sex, however, point to a favorable attitude towards sex. However, in order to truly qualify as well-informed, one must exercise prudence in addition to having a positive attitude towards sex. This raises the issue of whether or not these respondents engaged in safe sex.

### **Contraception used in first sexual encounter**

Genital stimulation using hands doesn't require usage of contraception, but oral and penetrative sex do. Therefore, for this analysis, for each state, we divide the respondents into groups who engaged in oral sex and respondents who

engaged in penetration. For each individual in those groups, we then count the number of people who among them took necessary precautions for each kind of sex. Upon running the code, we find

---

```
WB Oral {'Did not use': 10, 'Condom for oral sex': 2}
WB Penetration {'Did not use': 1, 'Condom for penetrative/anal sex': 5, 'Morning after pill': 1}
UP Oral {'Did not use': 17, 'Condom for oral sex': 3}
UP Penetration {'Did not use': 4, 'Condom for penetrative/anal sex': 15, 'Morning after pill': 0}
```

### In West bengal

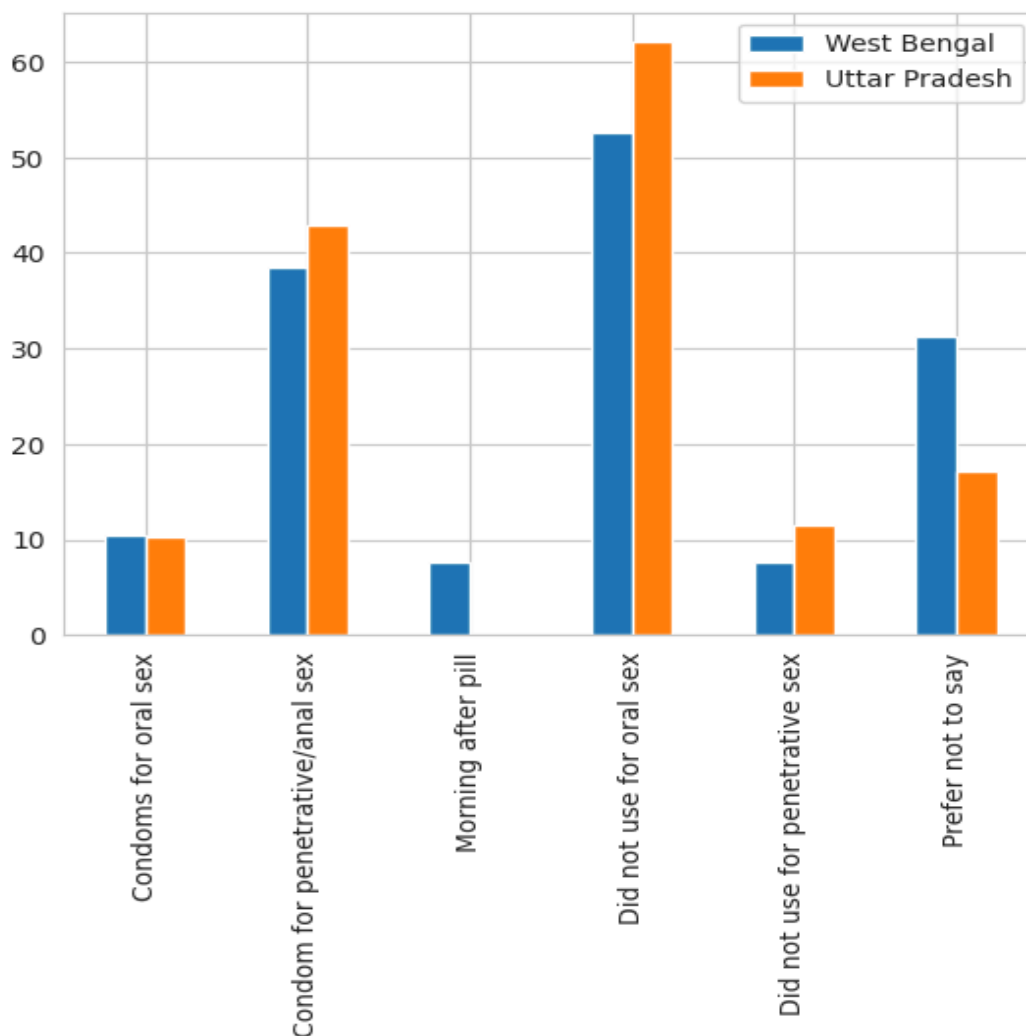
- Out of 19 who engaged in oral sex
  - 10 (52.63%) respondents did not use oral contraception
  - Only 2 (10.52%) used a condom for oral sex
  - 7 (36.84%) did not disclose this information. It's safe to assume that they did not use protection, which takes percentage of people not using for oral sex during their first interaction to 89.47%
- Out of 13 who engaged in penetrative sex
  - 1 (7.6%) respondents skipped contraception
  - 5 (38.46%) respondents used condoms
  - 1 (7.6%) respondent used a morning after pill

### In Uttar Pradesh

- Out of 28 that engaged in oral sex
  - 17 (60.71%) skipped contraception
  - 3 (10.71%) used a condom for oral sex
  - 8 (28.5%) did not disclose this information, which we can assume that skipped contraception. That takes the percentage to 89.28%
- Out of 34 that engaged in penetration
  - 4 (11.76%) skipped any form of contraception
  - 15 (44.11%) respondents used a condom
  - None of them resorted to morning after pills

We can visualize this using the following graph





In terms of penetration, respondents from West Bengal and Uttar Pradesh used some kind of contraception at rates of 46.36% and 44.11%, respectively. This represents less than 50% of respondents, which is hardly encouraging. But we must keep in mind that it was their first sexual experience, and they were not properly informed about safe sex.

Worrisome statistics surround oral sex, though. In West Bengal and Uttar Pradesh, respectively, 52.63% (upper bound 89.47%) and 60.71% (upper bound 89.28%) of respondents skipped oral contraception. This further demonstrates that sex education at the school level is insufficient since young people are unaware of the dangers of oral sex. Since it was their first sexual encounter, it is

likely that their partner was STD-free. We must still exercise caution, though. UTIs are still capable of spreading.

### Contraception used in subsequent sexual encounters

People can be cut some slack for not practicing safe sex during their first sexual encounter. However, that is not the case for subsequent encounters. As the number of partners increase and frequency of sexual encounters increase, one must educate herself/himself with safe sex practices. In this section, we study the contraception usage patterns in subsequent sexual encounters. Unlike before, we do not have data regarding the kind of sexual habits that respondents engage in currently. So, we will calculate usage of different kinds of contraception as a percentage of total respondents who engage in any kind of sexual activity. Due to the broader denominator, this indicator will be imperfect and more crude.

```

d = {"West Bengal" : {"Condoms": 21/40*100,
                      'Oral contraceptive pills (before sex)': 3/40*100,
                      'Morning after pill': 4/40*100,
                      'None': 17/40*100,
                      'Prefer not to say': 1/40*100},
     "Uttar Pradesh" : {"Condoms": 42/66*100,
                       'Oral contraceptive pills (before sex)': 1/66*100,
                       'Morning after pill': 1/66*100,
                       'None': 24/66*100,
                       'Prefer not to say': 0/66*100 }}

pd.DataFrame(d).plot(kind='bar')
plt.show()

```

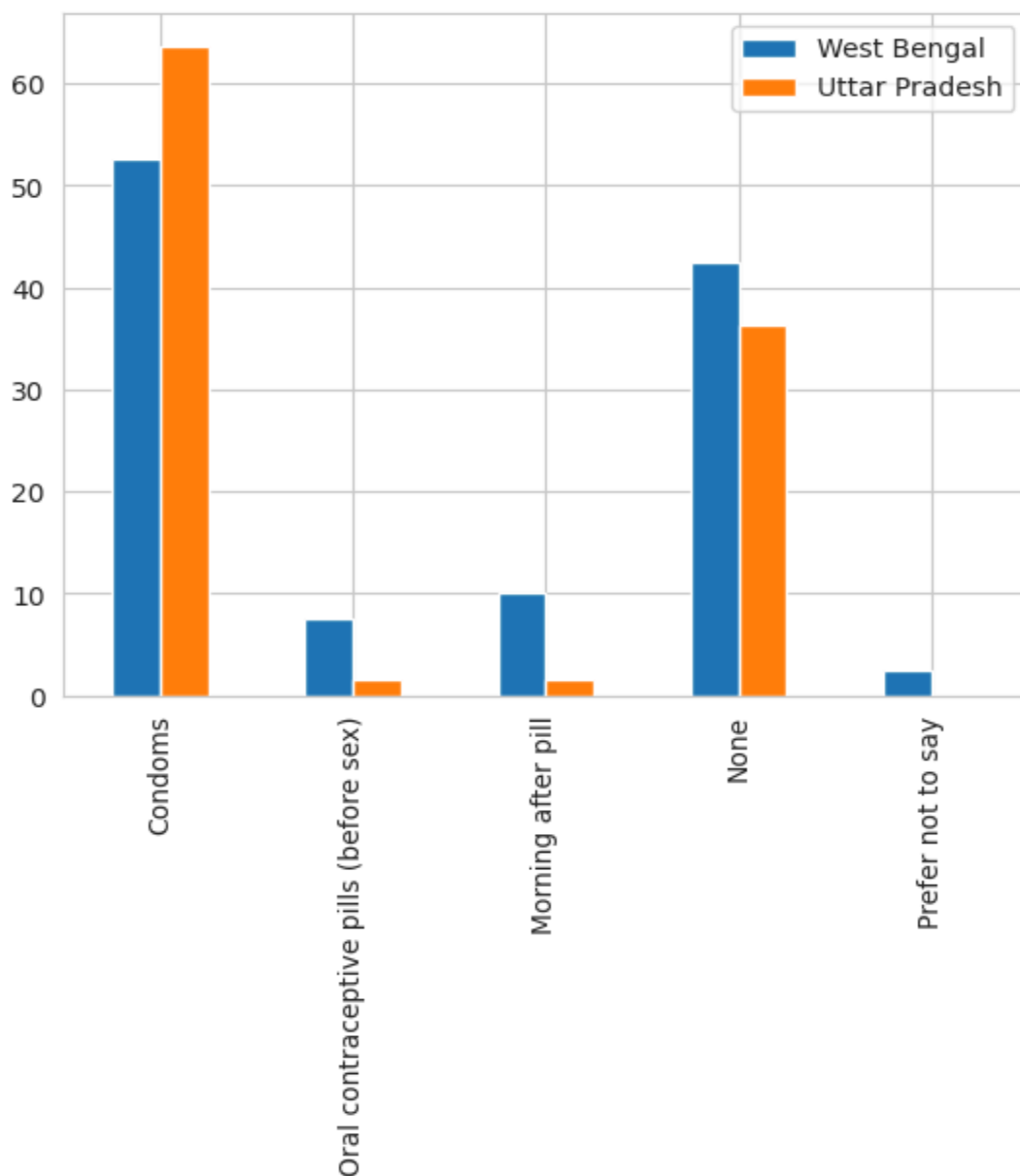
Out of West Bengal's 40 observations

- 21 (52.5%) respondents use condoms
- 3 (7.5%) respondents use Oral contraceptive pills to be taken before sex
- 4 (10%) resort to morning after pills
- 17 (42.5%) respondents still skip contraception

Out of Uttar Pradesh's 66 observations

- 42 (63.63%) respondents use condoms
- 1 (1.5%) use oral contraceptive pills to be taken before sex
- 1 (1.5%) resort to morning after pill
- 24 (36.36%) respondents skip contraception

This can be summarized with the help of a graph



The number of people skipping any form of contraception is alarming. We do not have information whether or not they skip contraception during oral,

penetration, or both, but the number of risks still stands. While oral sex can't result in accidental pregnancies, it can still lead to UTIs and STDs.

### Reasons for skipping contraception

There are various reasons for skipping contraception. From the data, we have calculated the following values. Note that these are expressed in percentage of total number of respondents who have had sexual encounters in the given state.

	Uttar Pradesh	West Bengal
I find it unnecessary	6.060606	10.0
My partner finds it unnecessary	4.545455	7.5
My partner finds a reduction in pleasure on using it	12.121212	17.5
I find a reduction in pleasure on using it	13.636364	12.5
It's usually unplanned	19.696970	5.0
Unavailability	13.636364	7.5
I / My partner partner prefers methods like withdrawal (pull out)	10.606061	15.0
The cost adds up as the frequency increases	1.515152	0.0
We find it expensive even for infrequent usage	1.515152	7.5
We're unable to procure contraception at medical shops due to social stigma attached	7.575758	0.0
We skip it at the end of mine / my partner's menstrual cycle	3.030303	5.0
Prefer not to say	42.424242	40.0
Others	0.000000	7.5
I / my partner am on birth control	0.000000	2.5

#### In Uttar Pradesh

- 6.06% of respondents skip contraception because they find it unnecessary
- 4.54% skip it because their partner finds it unnecessary
- 12.12% skip it to make it more pleasurable for their partners
- 13.63% skip to make the experience more pleasurable for themselves
- 19.69% skip contraception because it's unplanned
- 13.63% skip it due to unavailability
- 10.6% skip it because they practice withdrawal/coitus interruptus/pull out
- 1.51% skip it because of the increasing costs with increasing frequency

- 1.51% skip it due to higher cost even at lower frequency
- 7.57% are unable to procure contraceptives from medical shops due to social stigma
- 3.03% of the respondents skip contraception because they believe having sex at the end of their/their partner's menstrual cycle is safe
- 42% of the respondents did not disclose this information

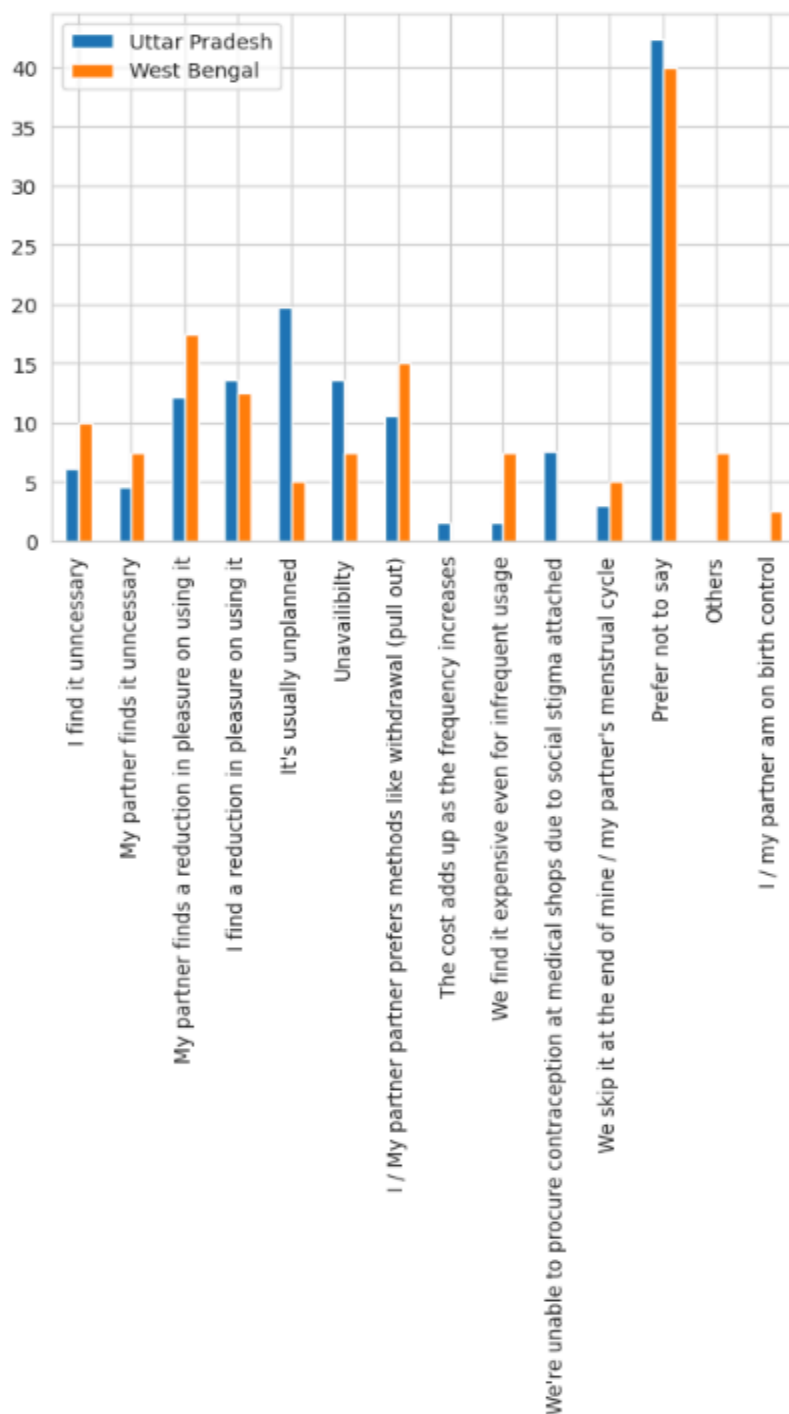
#### In West Bengal

- 10% of respondents skip contraception because they find it unnecessary
- 7.5% skip it because their partner finds it unnecessary
- 17.5% skip it to make it more pleasurable for their partners
- 12.5% skip to make the experience more pleasurable for themselves
- 5% skip contraception because it's unplanned
- 7.5% skip it due to unavailability
- 15% skip it because they practice withdrawal/coitus interruptus/pull out
- 7.5% skip it due to higher cost even at lower frequency
- 5% of the respondents skip contraception because they believe having sex at the end of their/their partner's menstrual cycle is safe
- 40% of the respondents did not disclose this information
- 2.5% of the respondents are on birth control
- 7.5% use other methods of contraception

This gives us a clearer picture as to why people skip contraception.

However, we notice that genuine reasons (like being on birth control) represent a small section of the sample. We also get a snapshot of the socio-economic conditions by looking at the percentage of people who skip contraception due to costs involved. Although, even this number is very small. Skipping it because they're unable to buy contraceptives from pharmacies represents a very small percentage of the sample (7.5% in Uttar Pradesh and 0% in West Bengal). This is not surprising because in today's day and age, one can easily buy it online, or ask friends to buy it for them. The majority of respondents skip it due to totally

avoidable reasons (like finding it unnecessary, heightened pleasure). This can indicate two things - **poor sex education, and not being careful despite knowing the risks involved. It speaks to us about the psychology of the youth.**



### **Risk Factor on basis of frequency of sex and frequency of skipping contraception**

When people have unprotected sex, they expose themselves to the risks of STDs, UTIs and unwanted pregnancies. This risk can vary depending on the number of partners, the frequency of sexual encounters and frequency of skipping contraceptives. We aim to make a coefficient that will quantify the amount of risk you're exposed to. Since most of our respondents have 1 sexual partner, we will formulate the coefficient based only on frequency of sexual encounters and frequency of skipping contraception.

In our questionnaire, respondents rated themselves on a scale of 0 (never skip) to 10 (always skip). However, we have no such numerical indicator to express the frequency of sexual encounters. Therefore, we will convert those values in the following way :

Frequency of sexual encounter	Numerical Equivalent
None	0
Few times a year	1
Once a month	2
Few times a month	3
2 to 7 times a week	4
More than 7 times a week	5

We define our indicator as

$$\begin{aligned}
 \text{Risk Indicator} &= \frac{\text{Numerical value of frequency of sexual encounters} * \text{skip frequency}}{\max(\text{Numerical value of frequency of sexual encounters} * \text{skip frequency})} \\
 &100\% \\
 &= \frac{\text{Numerical value of frequency of sexual encounters} * \text{skip frequency}}{50} 100\%
 \end{aligned}$$

When a person doesn't have sex, risk indicator = 0

When a person has sex but doesn't skip contraception, risk indicator = 0


When a person has sex and skips contraceptives sometimes, risk indicator

$$0 \leq x \leq 100$$

When a person has sex more than 7 times a week and never uses contraception, risk indicator = 100

Note.: These values don't always reflect real life situations. For example, even if one never skips contraception, he/she/they might still be exposed to some extent of risks like unwanted pregnancies.

We have calculated the values of the risk indicator for every respondent in the sample. We can see that there are 106 values. The average risk indicator is

 `yes_sample_df["risk_ind"].describe()`

```
count    106.000000
mean      11.169811
std       20.503877
min        0.000000
25%        0.000000
50%        0.000000
75%       13.500000
max       100.000000
Name: risk_ind, dtype: float64
```

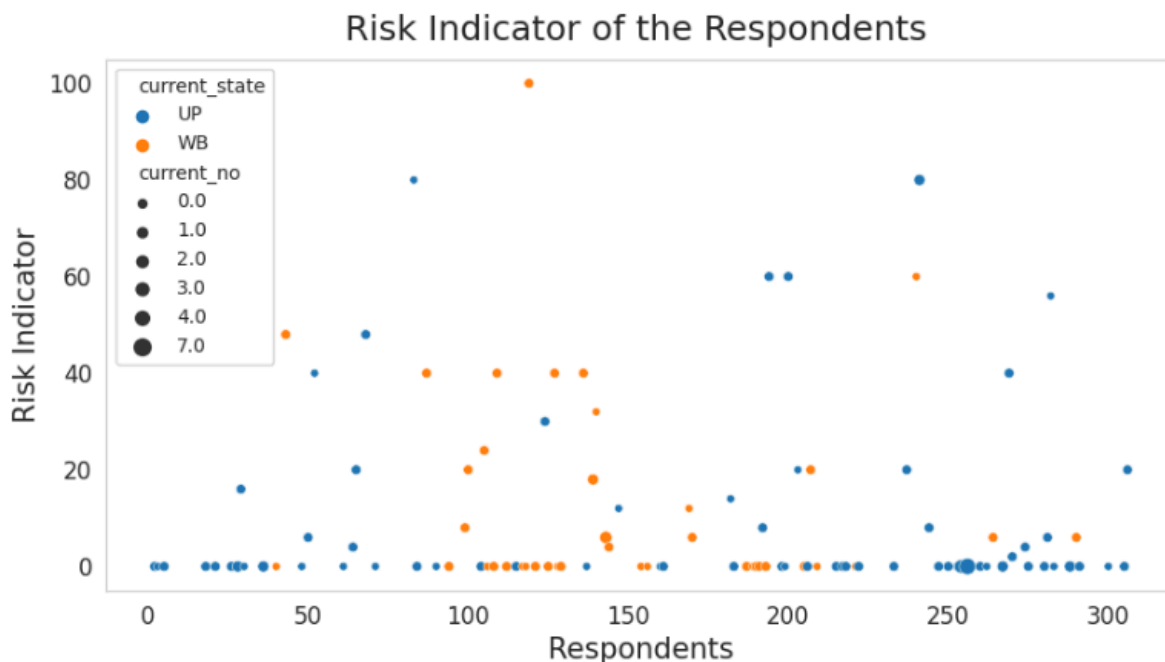
11.16%, with a standard deviation of 20.50. This is quite high, and indicates the vast spectrum of sexual practices that the youth engage in. The minimum is 0 and max is 100, as expected. However, we see that 75% of the respondents are at a very low risk of 13.5%. This

indicates that most of the people practice comparatively safer sexual practices. A small percentage of people are extremely unsafe which drives up the average. We create a scatter plot, where the size of the bubbles indicates the number of partners(also an indicator of risk) and the color of the bubbles indicates the region.

```
sns.set_style("whitegrid", {'axes.grid' : False})
plt.figure(figsize=(10,5))
plt.xticks(fontsize=12)
plt.yticks(fontsize= 12)
plt.xlabel(xlabel = "Respondents",fontsize = 15)
plt.ylabel(ylabel= "Risk Indicator", fontsize= 15)
plt.title("Risk Indicator of the Respondents ", fontsize = 18, pad=10)
sns.scatterplot(x= yes_sample_df.index, y = 'risk_ind', hue="current_state", size="current_no", data=yes_sample_df );
```



The graph obtained is used to summarize our data



### **Hypothesis testing regarding preferences of men v/s women**

When analyzing the reasons for skipping contraceptives, we saw the two of the major reasons were

- I find a reduction in pleasure on using it (13.63% in UP, 12.5% in WB)
- My partner finds reduction in pleasure on using it (12.12% in UP, 17.5% in WB)

It is believed that males prioritize their sexual pleasure over their sexual health since they experience more sexual pleasure when they engage in sexual activity without using protection. Women use this to make their male partners more pleasurable. This theory is based on cultural and societal norms that support the idea that men like raw sex more than women do and that women should put their male partners' sexual pleasure before their own. In this section, we try to see if this hypothesis is true.

Assuming the hypothesis is true, we will see 2 things occurring :

- When the reason for skipping contraceptives is “I find a reduction in pleasure”, a larger proportion of men will be in that group as compared to females.
- When the reason for skipping contraception is “ My partner finds reduction in pleasure”, a larger proportion of women will be in that group as compared to men

For every individual in our sample, we need to check the reasons for them skipping contraceptives. When either of those 2 come up, we note their gender. Then we create a table based on this data and then check if these variables are independent by using the chi-square test of independence. If they're

	own pleasure	partner's pleasure
male	8	3
female	4	3

independent, we will say that the notion that men prefer unprotected sex is not significant. We use this contingency table to perform a

chi-square test for independence of attributes. We use the scipy library's chi2\_contingency module to do that. It calculates the p value for us. If the resulting p value is less than our level of significance, we reject the null hypothesis, otherwise we accept it. Our hypothesis are as follows

$H_0$  : The attributes are independent v/s

$H_1$  : The attributes are dependent on each other

Level of significance  $\alpha = 0.05$

```

data = [[8,3],[4,3]]
stat, p, dof, expected = chi2_contingency(data)

alpha = 0.05
print("p value is " + str(p))
if p <= alpha:
    print('We reject null hypothesis H0')
else:
    print('Not enough evidence to reject null hypothesis')

p value is 0.8642702641586778
Not enough evidence to reject null hypothesis

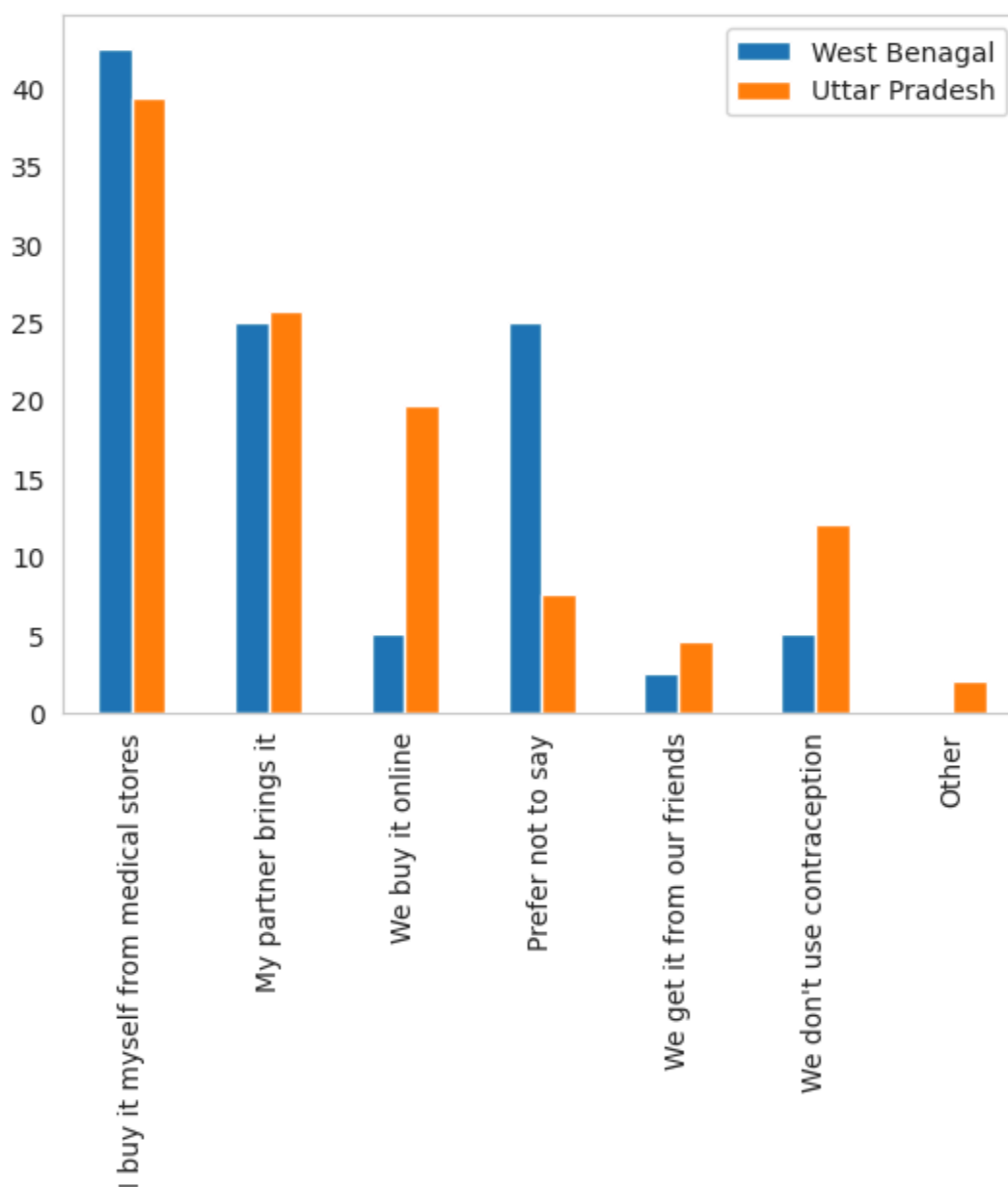
```

Therefore, we can say with 95% certainty that the attributes are independent.

**So, the notion that men prefer to skip contraception to increase their pleasure is not correct.**

### Sources of buying contraception

From our data, we have found out that



### In West Bengal

- 17 (42.5%) of respondents buy contraception from medical stores
- 10 (25%) get theirs from their partner
- 2 (5%) buy it online
- 10 (25%) did not disclose this information

### In Uttar Pradesh

- 26 (39.39%) of respondents buy it from pharmacies
- 17 (25.75%) get theirs from their partner
- 13 (19.69%) buy it online

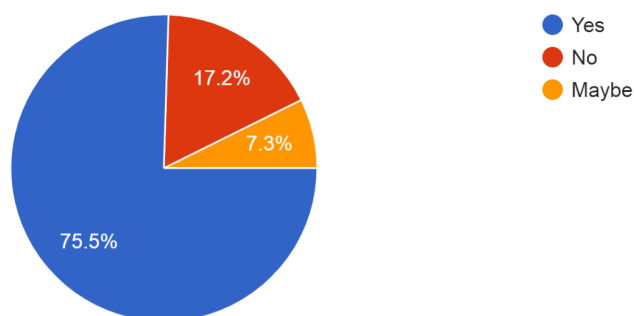
We observe that people procure their contraception mostly from pharmacies, or their partner brings it (which they probably buy from a medical store themselves). The proportion of people buying it online is comparatively lower. This indicates that people have grown less embarrassed of buying it and this is a positive attitude towards sex. Additionally, buying it online would take many days. Only people who plan before engaging in sexual activities can do that. However, it's usually unplanned or a frequent occurrence, so it makes more sense to buy it from a pharmacy.

## 2. Analysis regarding awareness surrounding sex

We examine part 3 of our questionnaire in this part. Let's examine each one in turn. Our sample size for this part is 314, as we won't be determining awareness at the state level. Everyone is linked in this era of the internet. Therefore, rather than states, awareness depends on how an individual uses the power of the internet. Since sex education is not a separate topic in any jurisdiction, it cannot have an impact on one's awareness.

Are you aware that even oral sex can aid in transmission of STDs?

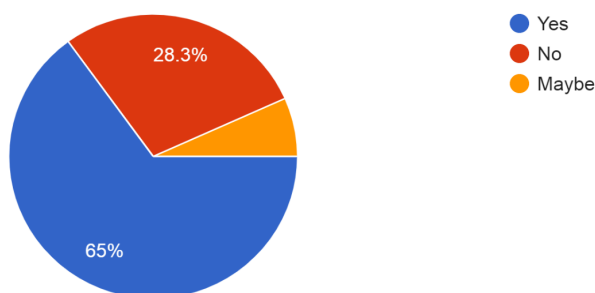
314 responses



- 54 (17.2%) of the respondents were not aware about the transmission of STDs through oral sex. It explains why so many people have unprotected oral sex, as the only concern for them is accidental pregnancy.
- 237 (75.5%) of the respondents were aware

Are you aware that STDs can be spread through cuts, sores and ulcers as well?

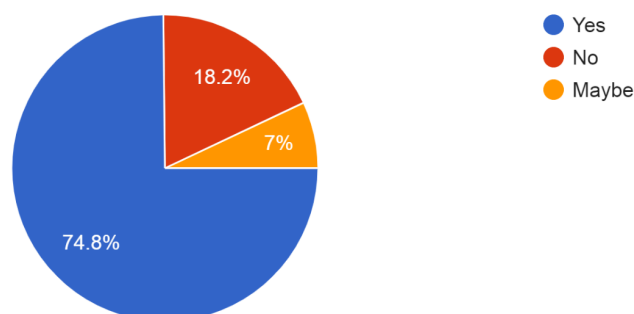
314 responses



- 89 (28.3%) of the respondents were not aware about transmission of STDs through ulcers and cuts. For example, an infected person can transmit a virus by kissing someone with a cut lip.
- 204 (65%) of the respondents were aware of this

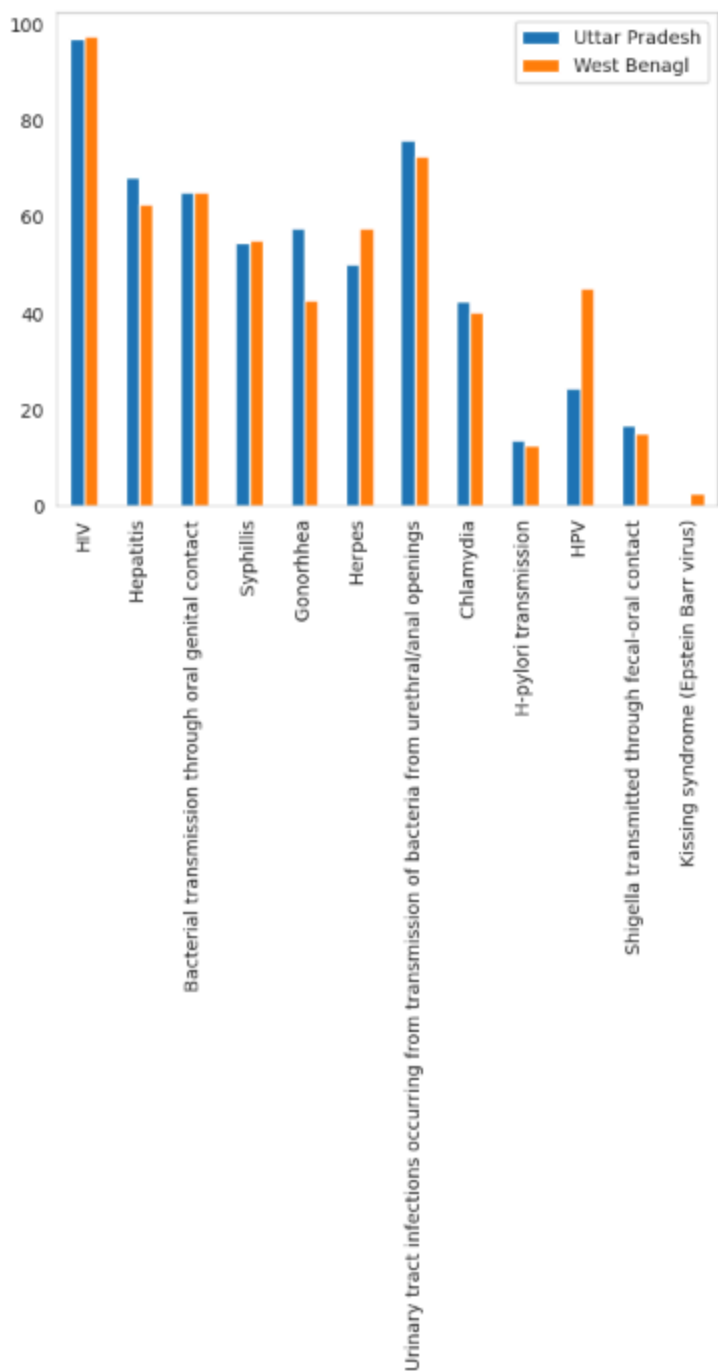
Do you know that having unprotected sex at the end of your / your partner's menstrual cycle does not eliminate all chances of unwanted pregnancies?

314 responses



- 57 (18.2%) of the respondents did not know that having unprotected sex at the end of their/their partner's menstrual cycle doesn't eliminate pregnancy, while 22 (7%) were unsure. The reason why it's not safe is because sperm can survive in the vagina for about 6 days. Therefore, with shorter menstrual cycles, the chances of pregnancy are not eliminated.
- 235 (74.8%) of the respondents were aware of this fact

In the next question, we listed some diseases that can occur when involved in unprotected sexual activities. We asked the respondents to check all the options that they were aware of. We have divided this data into states. That is because safe sex practices are usually not a part of mainstream discussion. However, the spreading of diseases becomes part of news on state levels, and also on social media.



However, we see no considerable difference in the proportion of people aware about a disease across the states. This goes on to prove that our statement regarding everybody being connected to the internet is not absurd.

## DISCUSSION

One of the biggest contributors to morbidity, mortality, and social stigma in the developing world are sexually transmitted diseases (STIs), which also place a significant financial and health burden on the region. Syphilis, gonorrhea, chlamydia, and trichomoniasis are the four treatable STIs, and their frequency and incidence vary significantly across various geographical regions. Between 0 to 3.9 percent<sup>[2]</sup> of the general population in India has one of the four treatable STIs. However, it is believed that subpopulations engaging in high-risk conduct have considerably greater STI prevalence than the general population. such as transgender people, IDUs who inject drugs, MSMs (men who have sex with men), and FSWs (female sex workers).

Between 1990-1994 and 2015-2019, the unplanned pregnancy rate in India decreased by 25%. The abortion rate grew 23% throughout this time, initially declining 10% until 2000–2004 and then rising 37% by 2015–2019. Abortion rates for unwanted pregnancies increased from 47% to 77%.<sup>[3]</sup>

From 2015 to 2019, there were 48,500,000 pregnancies in India. Of them, 16,600,000 of the 21,500,000 pregnancies resulted in abortions. For broader societal or economic reasons, abortion is permitted in India.

If all needs were met for contraceptive, maternal and newborn, and abortion care in India the following sexual and reproductive health outcomes for women aged 15-49 years, then unintended pregnancies and unsafe abortions would drop by 77%. Therefore, we see how important the study of sexual behavioral patterns is. Other developed countries have surveys related to sexual preferences of people, but India doesn't. Being knowledgeable about this would make new paths in sexual awareness in India. A more positive attitude towards sex and open discussions regarding it would not only decrease STDs and unwanted pregnancies, but also crimes.



## CONCLUSION

It is clear from the results that it is necessary to investigate how Indian young behave sexually and how they use contraceptives. The results show that although a sizable portion of Indian teenagers participate in sexual activity, their knowledge of and use of safe sex practices and contraception is subpar. The findings show that a sizable portion of those surveyed engage in sexual activity without using condoms or any other method of birth control, placing them at risk for unintended pregnancy and STDs. The fact that a sizable percentage of respondents were unaware that STDs may spread through oral intercourse, wounds, and ulcers is especially troubling. As a result, there is an obvious need for Indian youth to get more education and understanding regarding sexual health and safe sex practices. The report also showed that a considerable portion of respondents bought their own contraception from pharmacies, showing that access to contraceptives is not a serious problem.

The results of this study demonstrate the necessity for comprehensive sexual education programmes that emphasize the value of contraception and safe sexual behavior among Indian adolescents. Such initiatives can support the promotion of healthy sexual practices while addressing the knowledge and awareness gaps shown in this study. These findings must be considered by policymakers who must then take steps to make sure that there are enough resources for effective sexual health education and access to contraception. Overall, this study emphasizes the significance of comprehending sexual behavior, knowledge, and influence on public health among Indian young.

## REFERENCES

1. [NHANES survey questionnaire](#)
2. Mihir Bhatta, Agniva Majumdar, Utsha Ghosh, Piyali Ghosh, Papiya Banerjee, Santhakumar Aridoss, Abhishek Royal, Subrata Biswas, Bhumika Tumkur Vekatesh, Rajatsuvra Adhikary, Shanta Dutta [Sexually transmitted infections among key populations in India: A protocol for systematic review](#)
3. [Guttmacher Institute study on unintended pregnancy and abortion in India](#)