INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

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Marketing Research

Lec 15
Sampling Desing and Procedure

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Welcome friends to the class of marketing research and analysis today we will be discussing about a very important part of the marketing research subject earlier we have discuss about the process and things like scale and research design etc. Today what we are going to do is we are going to discuss about another important topic that is sampling okay.

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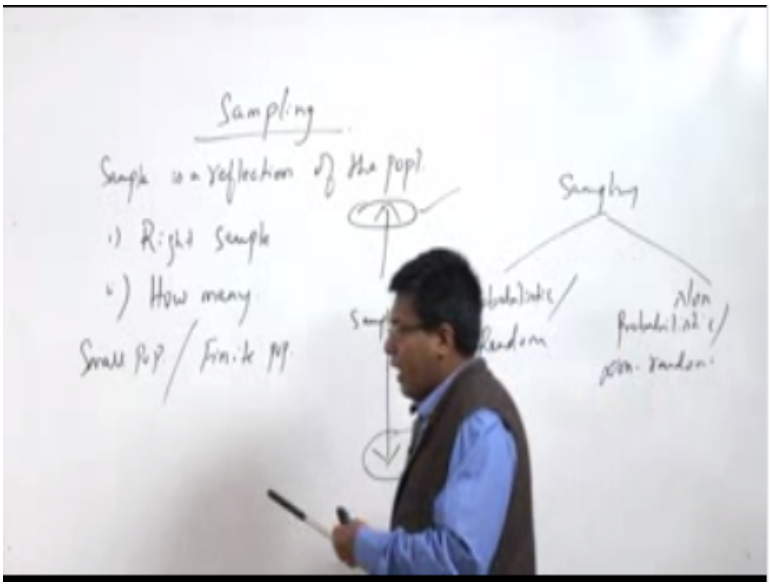

So what exactly is a sample and why is the sample important why do we require a sample? In times it is very tough to it is very difficult to you know analyze over a population that means survey sensors or population or a large set of you know people or anybody right. So in such a

condition what happens? When the market is large or the number of you know people involved in the population is very high in such condition it becomes really impossible or near to impossible to take every element of the or every unit of the you know population and then make a analysis over it.

And it is not advisable also neither it is wise right, so such a situation what we do is we just taken element a part of the population and then decide what is going to you know how it is going to reflects the population taken case for example in many of the households where you know rice is being cooked right. So what As the mother or you know anybody who is cooking, what she does is basically to check whether the rice has been cook properly or not instead of getting in to the whole part of rice the mother tries to find out take a handful of rice or a few rice samples and then checks whether it is actually cooked nor not.

So this is the same thing that we are doing going to do so let us see what is how exactly what is sample and what is the process.

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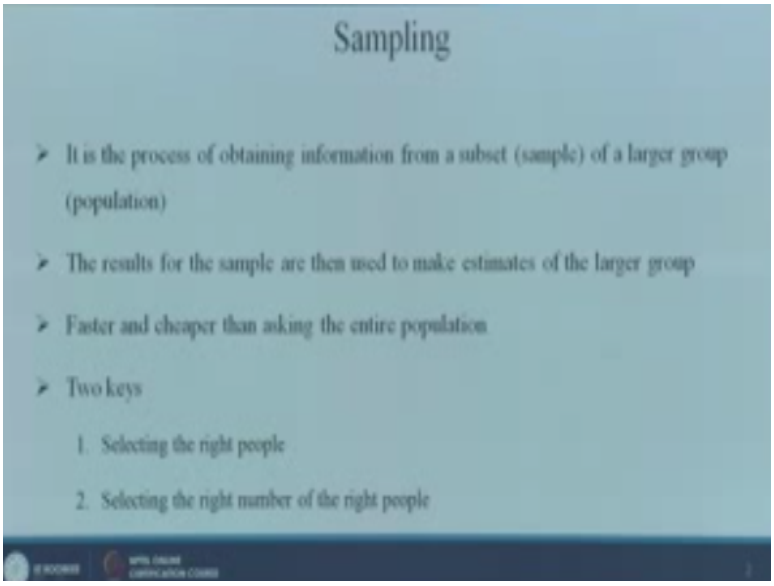

So it says sampling is nothing but the process of obtaining information right in marketing research the very first class we said it is all about information right but here we are saying that the information is brought from a subset or a small group of people or small sample of a large group right that means if this is let us say the board which is the entire market or let us say the entire population instead of taking the entire population we will take a small part of it right.

And then try to say through this small part whether our larger whole would also behave in a particular manner or not okay. The results of the sample are then use to make estimate of the larger group right so the whole as I said to a few you element so rice you take your mother takes and from there she deduces whether the whole part of rice has been properly cooked or not cooked okay.

Obviously it is faster and cheaper so if you go back to the same example and think to elements but in the sample is first is when you are getting in to a sample since you said that we said that the sample is in a way reflecting the population is a reflection or say reflection of the population right. That means we are saying it is true representative in other terms you say it is a true representative right.

So if sample is the reflection of the population rights so what should it have so if you by chance you take those elements which are not correct or not truly representative then it will be a problem. So first thing is the right subjects or the right you know sample you can say it might be people it might be things it could be anything let us not confuse only with people because I have written people her so because if you know company is working on tries to check the whole new

car has come out and the company wants to know Maruti suppose wants to know whether the all the cars have a particular have any problem or not.

They are not going to check the whole lot of the cars, rather they would pick up a few number of cars like a fee batches or a few numbers and then from there they would try to estimate whether the other the whole lot of cars will also have any problem or not have any problem. Suppose let us say the sample says there is a problem in the defect or defect in the let us say the light or let say in the door then from there we can may be conclude that this if this sample is also having this problem then the population will also be have the problem of the defect you know a problem of the doors for example right.

But in this case suppose by mistake we are taking a wrong sample right then what happens? Right, so if we take a wrong sample we will say no there is no problem right or otherwise we will say or we will say there is s a problem whereas actually there was no problem. So just opposite right so selecting the right sample is very important and the point is how many is a question how many is the right one right suppose in the case of rice we said maybe a few flax of rice may be a few you know 3 4 5 120 may be would a good enough right.

But in a case in other cases a very small sample size as so might not be adequate neither a large sample size right, so people have to be very clear that there has to be a balance right so sample size neither can go to down nor it should be extremely high because the whole logic of doing a sample was to not to do a population right not to do a sensor study not to take the overall population.

Because who could save cost and time, so if we are taking too many actually does not give you additional information so why taken unnecessary large samples size it does not make sense, but if you take too less there could be a problem that actually what happens is when you take a particular number of sample size let us say the number if it is right number then what happens? Some of the defects or some of the problems are generally balanced out through this number if you have a sufficient number this will be balance out through or the means or through our particular meals the rough statistics it will help you balance out okay.

So that why these two are very important so left in the right sample and this is the right number okay. So what is how do you do it? Sampling it is contacting the portion or the population it is

good when you have a very large population so suppose you want to study about Indian so are we going to study of the whole of India 1.2 billion population impossible right, so where is the large very large population one second is it is easy when the population is homogeneous obviously right, a population if it is heterogeneous then the characteristics are different and if the characteristic are different then it is very difficult to say that there it would be a true representation there would be a true representation right, to have true representation it should be as homogeneous as similar as possible okay.

When you which cases are censes better census is nothing but the same population right, it is useful when the population is the finite population a case of let us say finite population or a small population let us say a small population or in some cases you may also understand as some of the times is a finite population. So finite actually does not make the true meaning out of it but what I want to explain here is finite means when I am saying a small number of or when the entire population is also finite is limited is small rather you can say.

Second is if the cost of making an error is extremely high right, now suppose let us say now there is a study let us understand in this way there is study being conducted about a particular ray disease right, particular ray disease which is very new in the world right. So in such a condition if you take a let us say if you take a small sample already there is a population is very small is limited and if you take a small and then if you make an error then maybe they are interpretation for the population might go wrong and which can be very dangerous.

Suppose you say that this is not infectious let us say this is actually infectious but from the population from the sample you said it is not infectious then is such a condition designs being very important thing it very dangerous thing it becomes extremely harsh and dangerous and we should be very careful about it okay.

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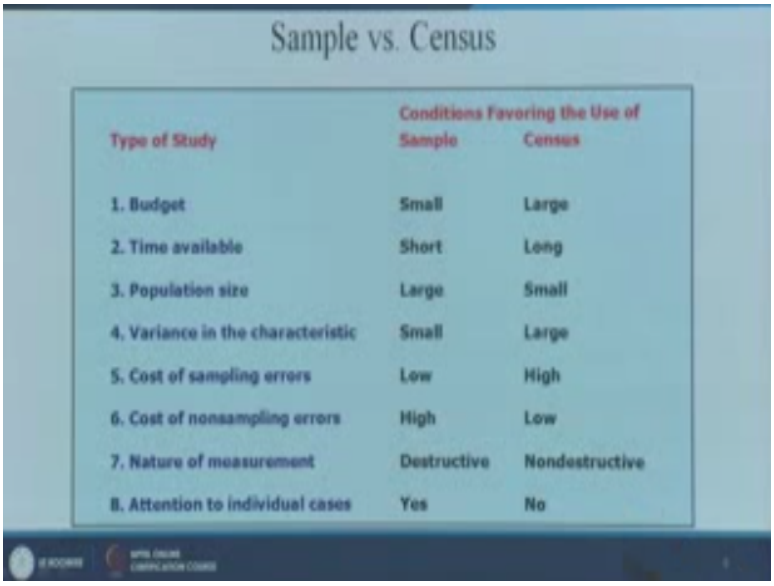

Now so when we have do so the conditions favoring at budget here is small populations censes is large time short you take a long time populations size is good when the large population size is there when it is going to when the small populations size is there right. So there are some of the differences you have to see right like the nature of measurement is destructive for example and this is non-destructive.

Now what you understand you have to see all these things right attention to individual cases yes there is an attention to individual cases here there is no attention because obviously the sample is so large so you cannot have an you want to attention so these are the some of the problems here the variants in the characteristics is small while because this is sample study here the variants would automatically be large because the population so large in number.

So what did you saying this conditions are favoring the use of census when the census is to used when the sampling errors are high so it is better to use a census when the sampling errors are low you have to understand a you have to take a sample. So all these are similarly you have to understand to when to use sample when to use census as I said again short it is a you know a time you have less time so go for a sample you have a large time go for a census. So these are a differences okay.

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Now this is something like a population a part this is a sample right now this is if the population is sample a two different things they are not explaining about each other the sample does not represent the population then what is the use of doing such a study.

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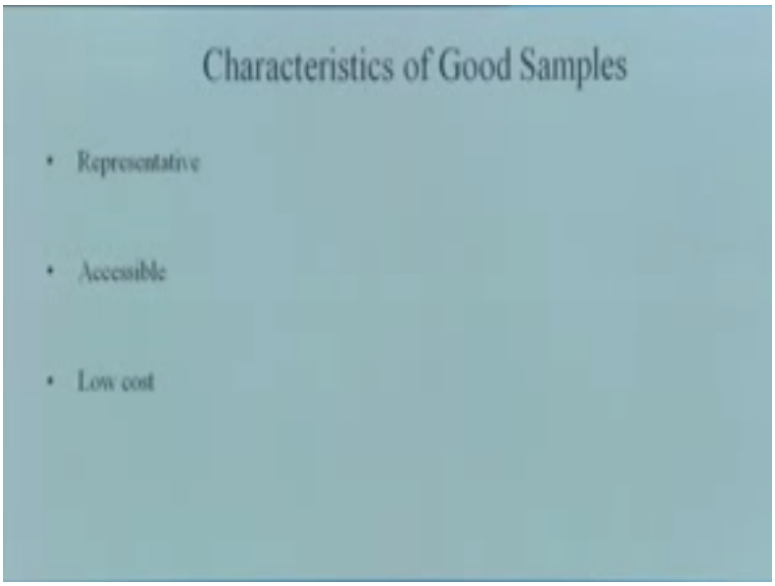

So the characteristic are it should be accessible first of all it should be representative accessible and low cost that means the sample when you draw a sample the sample should be a representative it should be easily accusable measurable so these are the characteristic right and it should be consuming low cost so these tare the some of the characteristics.

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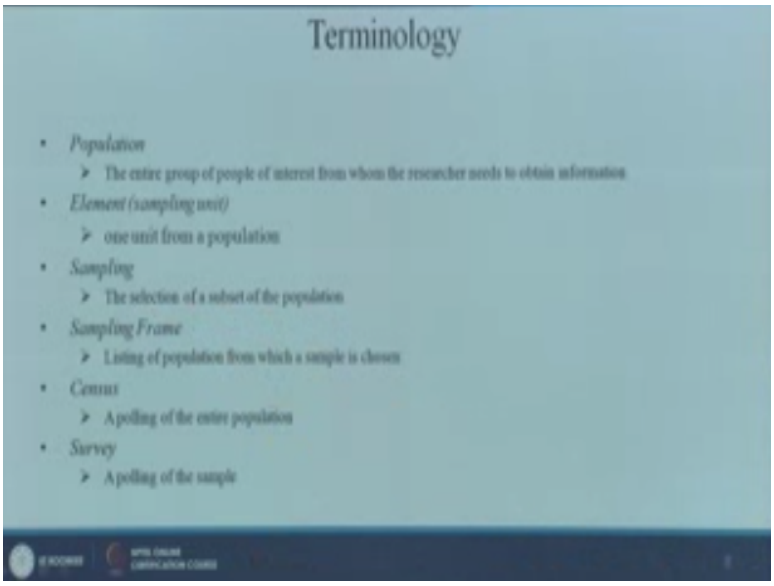

Let us see the terminology is involved as I discussed population we know right the entire group element or sampling unit is one single unit let us say in a class of 50 students the class let us say the population is 50 so each student 1 2 3 4 each is an unit or element right. So sampling the selection of the subset so from the sample 50 let us say you are trying to take only five students or ten students so that is the sample. The sampling frame is basically as I earlier also as status if I remember sampling frame is that directory or any available document for which the data is

generated or extracted right. So listing of population from which is sample is chosen so entire census okay.

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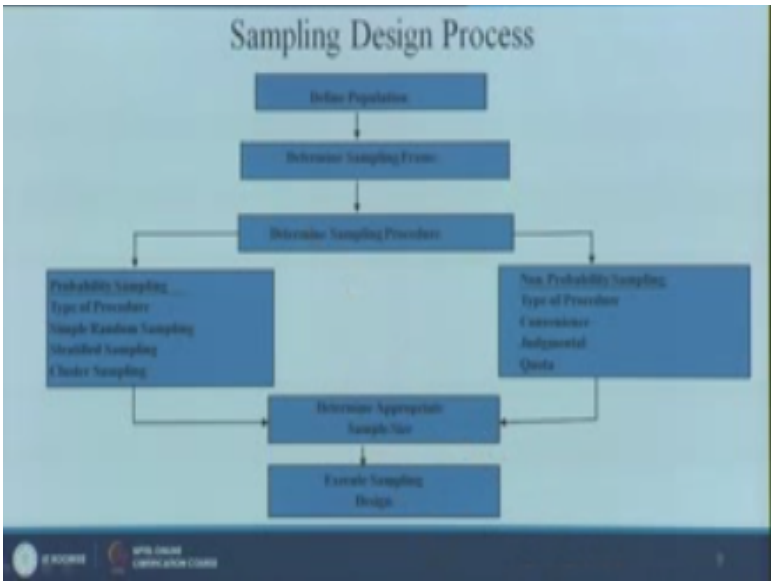

So let us see how this sampling design process goes first we defined the population right this is the first thing then is you define the sample frame for that is means the from where we are going to collect the sample okay third is to determine the sampling procedure. Now here actually what happens when you determine the sampling procedure there are two things right sampling that is sampling is done in two ways, so one we say is probabilistic or random sampling right or random sampling the other is non probabilistic or non random okay.

So now again each of them have their own set of once right so once you decide what sampling method should I use in my study weather should I use a probabilistic method a random method or a non random method we will see. And then after deciding right you determine what is the right sample size, now there are no one can use statistic but there but generally sometimes we have some thumbs rules like in a rule of thumb where we decided key what is a number samples

I will tell you also that, so finally after doing this either you calculate or you have or the other methods and then you execute the sampling design.

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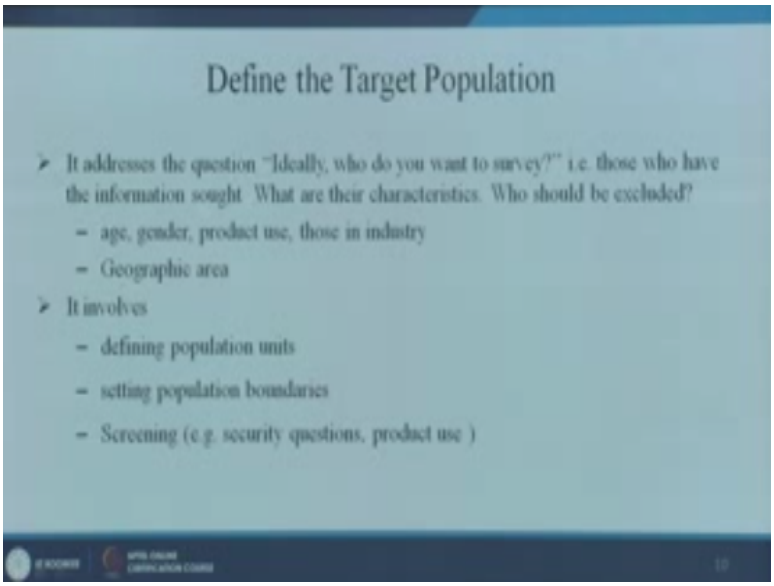

My target population basically it says ideally who do you want to survey that is those who are the information sort what are their characteristics who should be excluded, so this is what is basically the target population the target population is somebody from where for which our research you know is the objective of the research is connected to basically let us understand that way right.

So it for example what age of people what is our what should be the gender are they the users the uses of nay product right so they are some of the things which are which help in defining the target population it involves the population units it establish a boundary for example if you do a study in let us say Asia or let us say in India or let us say in Kerala then the sample it is changing the pollution is changing right. So having a boundary and then you have the screening questions right.

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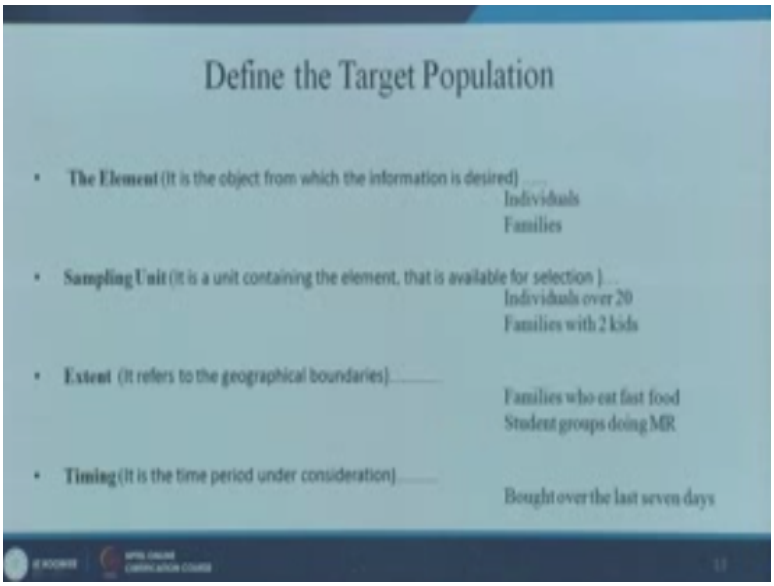

So these are some these are something like you let us begin with so the element is the most smallest unit or element of the unit let us say these two are very similar so it is an individual or family right then while defining the element we say individuals over 20 families with two kids for example right extend the geographical boundaries are people or we can have you know the extent it might be geographical or it might be something like only 3 families who eat fast food right.

So we have a it might be not geographical boundary has such so it could be a boundary that is there is a limitation that means only people who are eating fast food not necessarily geographical boundary right students who grow are doing a MR a marketing research okay now timing, also is very important while defining the position so that means a study only which has been deduct a form of people who within the last seven days in this case or only with the last one year or what is your time frame that you have to decided right.

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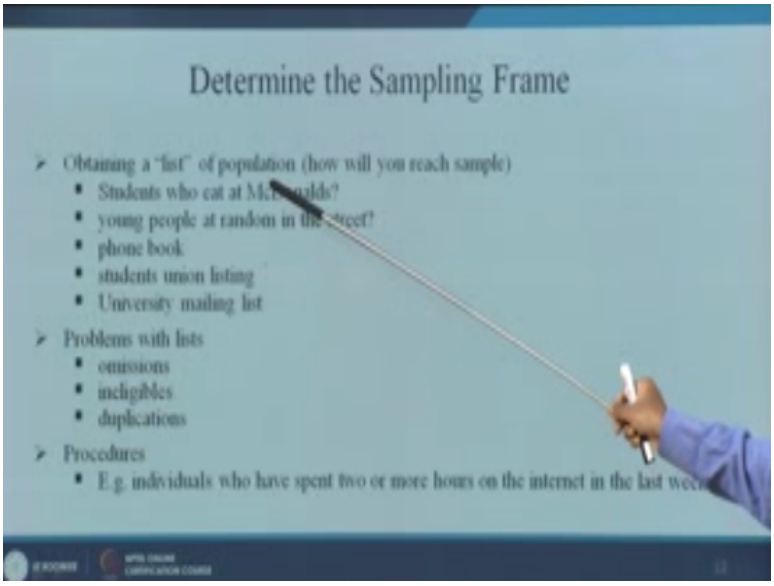

So let us say the sampling frame now earlier also I have said students who eater McDonalds is a list of population right young people at random in the street phone book right your yellow pages we said right university mailing list just some of the ways you collect the sampling frame this is what sampling frame actually is completely comprising of right.

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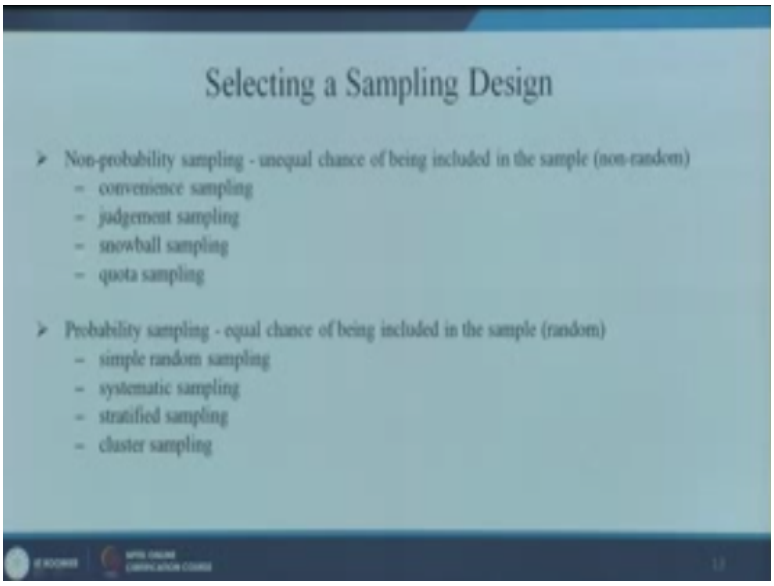

So while designing the sampling frame after design sampling frame then we get into this sampling design right so as I said we have two types designs so the probabilistic and the probabilistic or the producer via visa right so let us start with the one which is non probabilistic in nature right.

So what does a non probabilistic sample say right anon probabilistic as the name suggest to you is something that is let us say random in nature non probabilistic.

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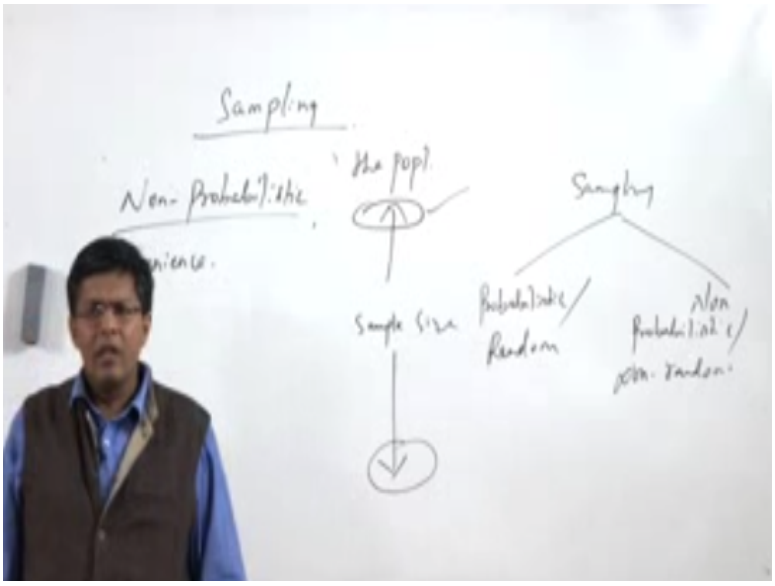

So the probabilistic the probability of choosing a sample is not equal right so probability say that the chances of selecting somebody say unit or an element from more population every unit is equal right but here in a non probabilistic case we are saying it is not equal right so if it is not equal then what is there so what are the different ways of what are the different sampling non probabilistic sampling techniques the first is the convenience so as the name suggest as you we understand convince sampling is nothing but something that is available close to you right easily available right so let us see right I am not getting into this.

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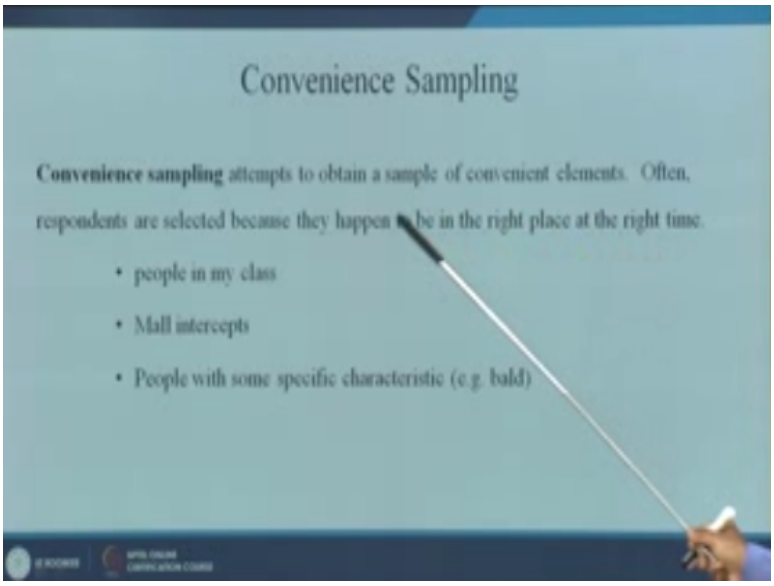

Let us say good way sampling convenient sampling it attempts to obtain a sample of convenient elements right respondents are selected because they are happen to be in the right place at the right time so luckily you are going on the street and you know you found somebody he smiled at you and you are now asking him to fill up your data.

So it is as good as that right so when you are doing it so people in my class mall in the mall right value of the malls so people with some specific characteristics you found a ball man and you feel is your because your studies related to something baldness and you feel anybody could be a one.

So that us something like what we says in the convenience sampling but the danger of convenience sampling is when you get something very easy there are some fit falls also convenience sampling is should be is not accurate to be used during any conclusive study please remember this conclusive means what I say is descriptive or casual right or and casual.

So in these two types of studies convenience sampling should not be used so if you are a researcher if you are a PH.D student or you or a any student in research please remember it this might be the question that might be asked you in nay panel any panelist might ask you if you have by chance used a convenient sampling by how did you used this tools and statistical tools and all because they are not appropriate because convenient sampling thus not allow you to do that right.

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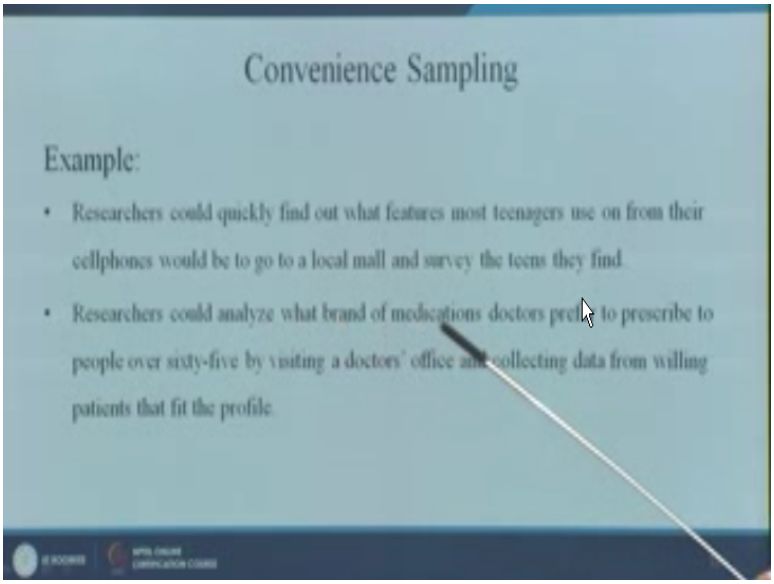

It is not permissible it is not desirable to do you right so what is convenience sampling now when you are doing a exploratory study so when you are in the form of process so building a hypothesis so and you are doing it at that time it is good right so researches would quickly find out what features most teenagers used from the cell phones would go to would be go to the local mall and survey the teens they fins so any teen there would be a part of the convenient sampling similarly what brand of medications doctors prefer to prescribe to people over 65 you can find out the researcher can find out visiting a doctor's office and collecting data from willing patients that fit the profile.

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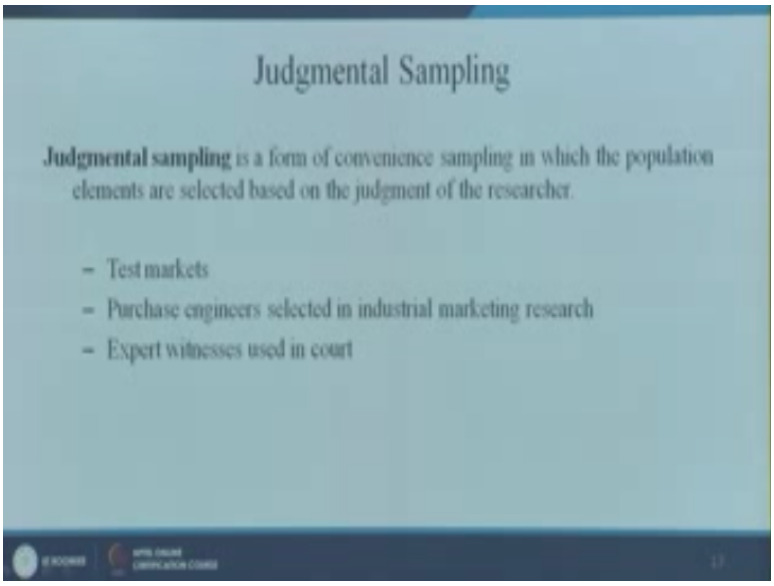

Now willing patients are not necessarily the right patients so we are not questioning right or wrong right now but whatever so that is only the way of convenience okay second is judgment now convenience had its problems right so once convenient suggest problems we think of the next so what is the next, next we are saying talking about is judgment okay so now the researcher fields let us use some kind of a judgment.

Now convenience was not exactly also judgment is also part of the convenient sampling only but only convenience does not help so let us make it little more refined little more eager right and we will what will do is we use the judgmental sampling so he uses his judgment here right so let say for example I have already given you explained you test market earlier.

So test markets are markets where a company wants to test whether a new product they have brought to the market will do well or not now how do they do it that do a test market initially you have to find out which is the right test market okay so how do you do that now you first of all go to you think who would be a target population.

So once you understand your target population then automatically from here you try to see okay which are the cities or town's right which have such a kind of structure of population right such a population structure in terms of age in terms of income in terms of gender in terms of religion demography generally speaking okay.

From there you tested so now I am using suppose in the case of test markets I will use a judgmental sampling because all the test so many citizens in India but to wide a have a right test

market I would use by judgment okay so which is the one so it is not convenience any cities not one I am selecting I am selecting only the ones which are fitting to my target population right.

So my target market purchase engineers selected in an industrial marketing research because these are the best people who are involved in the purchase process so they would be the best to tell us about any industrial marketing study expert witnesses used in court now anybody in a court asked only people who are experts right expert witnesses means this way are the people who have an idea what has actually happen right.

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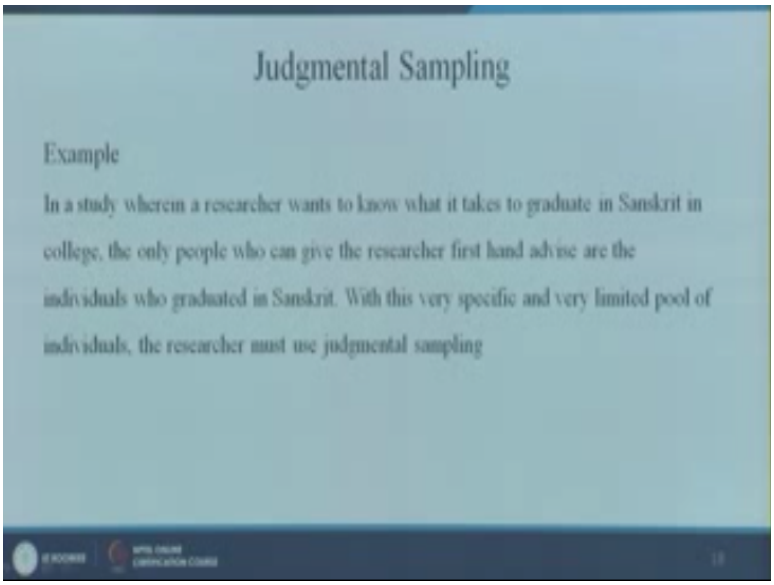

So this are the example a study even the researcher wants to know what it takes to the graduate how difficult or how easy it is to graduate in Sanskrit in college right a people who gave the researcher first hand advice are the ones who have done in graduation in Sanskrit, suppose if you have not done the graduation in Sanskrit how would you be the best people. So this is what we do in judgmental sampling.

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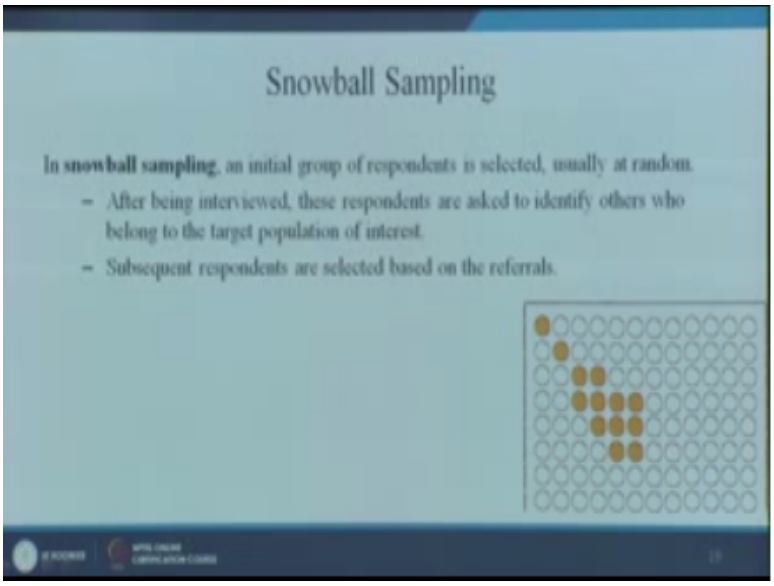

3rd is the snowball sampling, so the snow ball sampling is something very popular nowadays in many of the forms also right. What happens in the snow ball, as you see snow ball samplings that first of all you select initial group of responded and then these representatives are responded will help in you know collecting the responded or pilling in the other responded for studies right? So what I mean here is snowballing it is also called as reference sampling, referral sampling, so for example if you see a software companies.

What they do they try to bring in they ask there employee to hive a name of any other friend or somebody who is good at the subject right so that particular of language or platform or something. So in such a condition this is snowball sampling.

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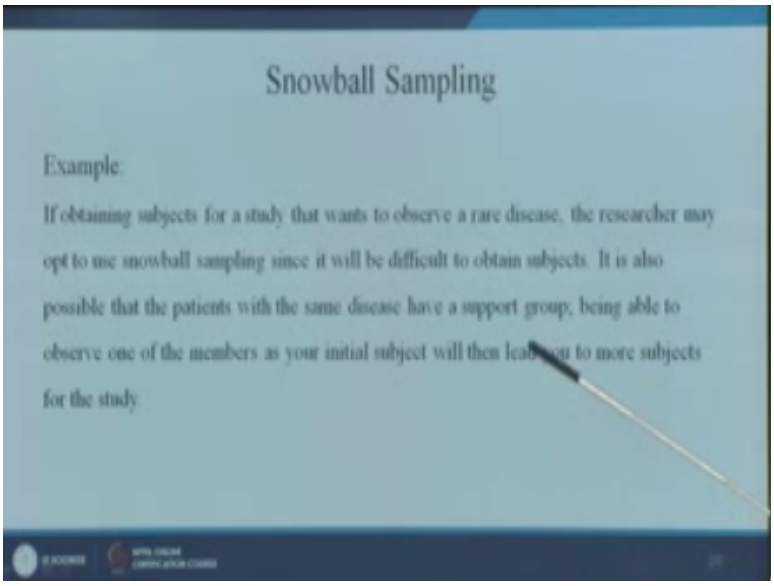

Suppose for example there is the rare disease it is snowball sampling because it is difficult to obtain the subjects, suppose there is rare disease, there is something like study on those people who are ambidextrous is use they use both the hands right, some players you must see they are right handed balers, and the left hand batsman. So now such people are not generally found right, so if one is there then we always vary to refer somebody else names, because he might who are similar or who are having similar behavior like him/ her. So this is something called snowball sampling.

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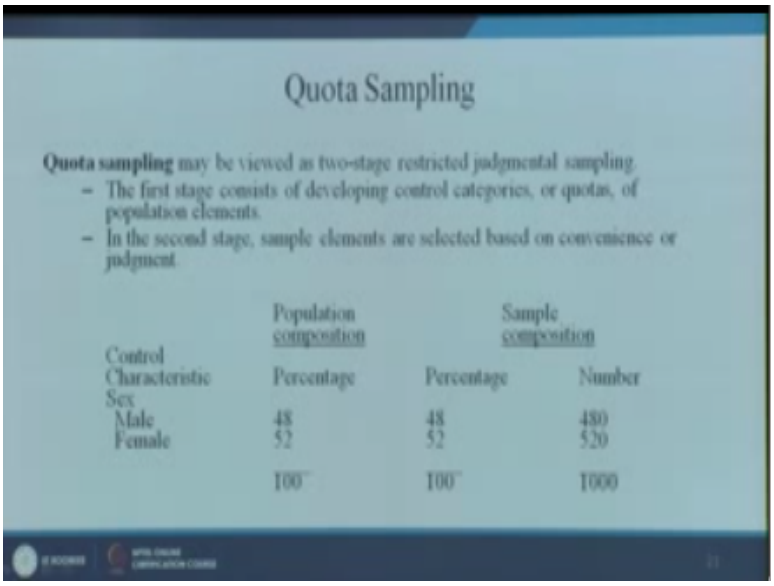

Now comes the quota sampling the 4th is the quota sampling, so what is the quota sampling? A quota sampling if you see it is the two stage judgmental sampling, so what is the two stages? The 1st stage consists of developing the category or what you say is quota right at the population. So the population has been divided into different control categories which are quota. In the 2nd stage sample elements are selected based on some method like convince or judgment.

So let take this example, suppose in case now you want to do a quota sampling, so the entire population let say this is the population right this is the sample. So what we do is the entire population they are divided into male and female and you want 1000 responded all together. So now for example let say they are in the population of whatever, let say there are 60% male and 40 % female let us say. So when I am taking sample of all it is same.

Suppose I have 1000 responded so I will take 600 from male and 400 from female, now suppose you have divided from the term say let say religion, now say Hindu, Christian and Muslim. Now Hindus say are 34%, let say Christian, Hindu will be little bit higher 54%, Christian 21% and 22% is Muslim, others rest okay. So when I am doing this what I will do out of that means 1540 will be my sample. 210, 220 and 3 right 330. So this is my entire way of collecting the sample quota sampling but here when I have collected, I have collected these samples on the basis of convince or judgment. That is the difference between the quota sampling and others okay.

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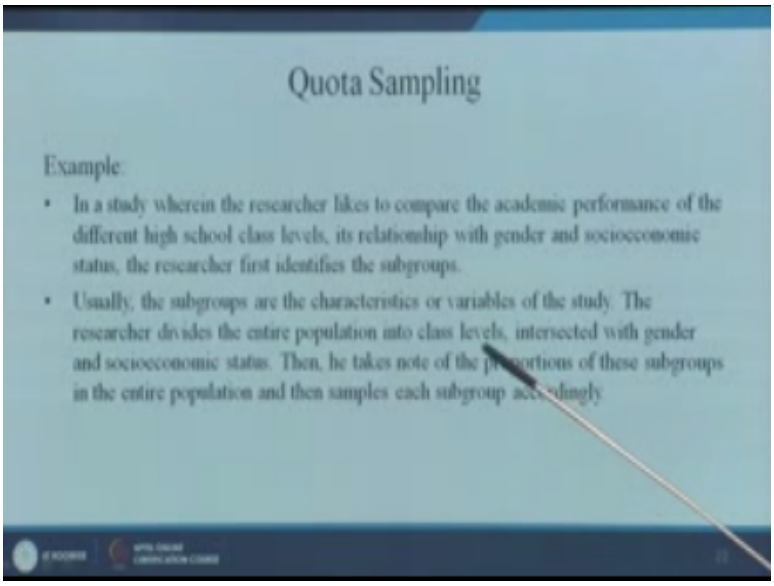

So in the study suppose let say the researchers like to compare the academic performance of different high school class levels it is relationship with gender and social activities status first it identifiers the subgroups are character tics or variables of the study okay the researcher divide the entire population into two classes or class level intersected with gender and social economics so the same thing that I explain right in the last class once you have done with this has something we have talked about our non probabilistic sampling okay.

Now we will go to the next that is the probabilistic sampling so what is the probabilistic sampling as we said probabilistic sampling is something where the chance of selecting a respondent is equal right the respondent that you are sample is choosing is equal everybody has got an equal chance of getting selected so let us say let us go to the one so what it is saying.

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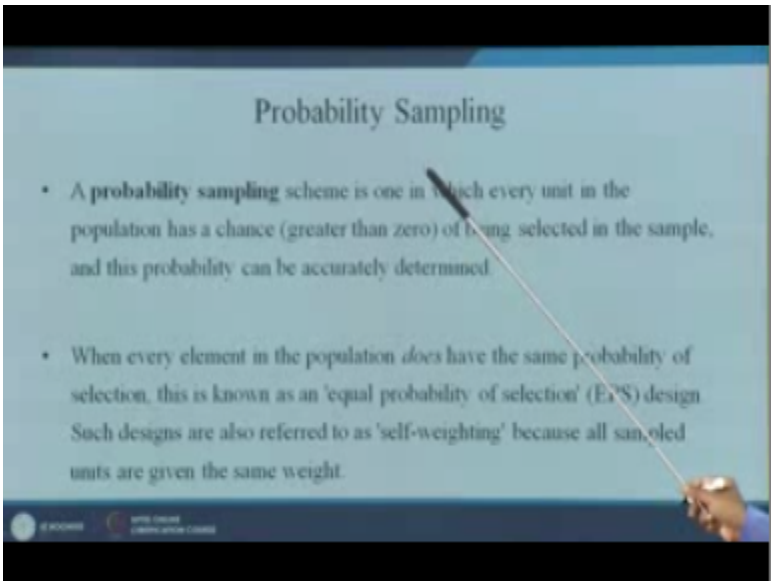

Every unit have the population of the chance greater than zero are being selected in the sample and this probability can be accurately determined every population every element in the population does have the same probability of selection right so everybody has a equal chance.

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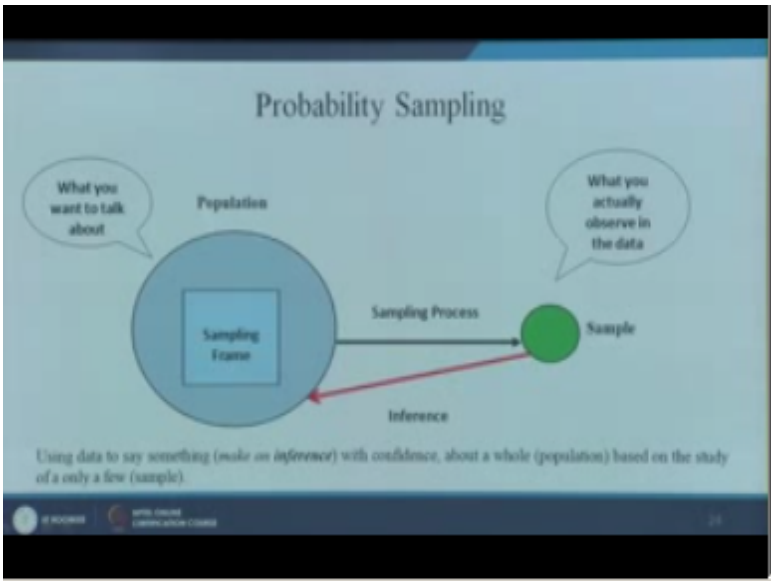

Okay now let us say this is the population this is the sampling frame and this is the sample right so this sample is chosen and this sample here why this diagram is shown that this sample is nothing but it is whatever you will inference from this sample will be used to define this population okay so in a way during the probability sampling.

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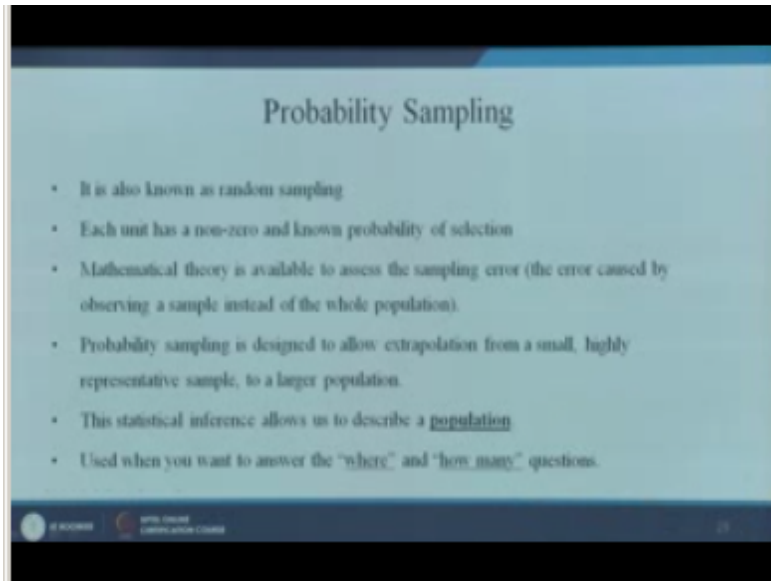

Therefore let me tell you this I do not know whether I have mentioned it here or not so the probabilistic sampling is more is much better to or more advisable to be used in all kind of experimental studies in all kind of experimental studies it is advisable to go for a probabilistic method of sampling okay.

So what it is doing it is mathematical theory for example each unit has a non zero and non probability selection mathematical theory is available to access the sampling error now sampling error is something which is you can say the researcher is expecting the amount of mistake that can be other allocable mistake you can say right so this are some of the things let us go to the first one right so simple random sampling is most pure.

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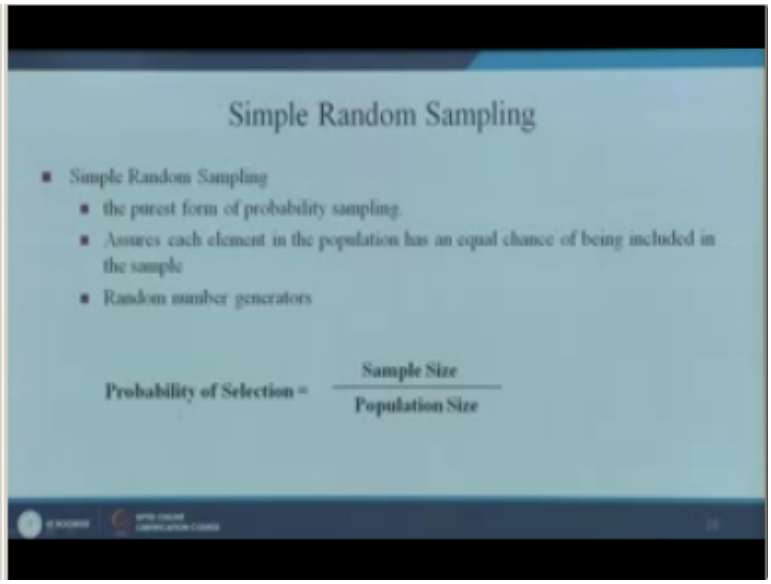

The first one is called the simple random sampling so simple random sampling says you just simply you know select the respondent by a chance method right by a probabilistic method so if there are let us say 50 people in my class so I blindly I just pull out 5 people I do not see and pull out 5 people and this 5 people when I see it might be a girl it might be a boy it might be somebody who is not a part of my class but by chance he has come out into the class and sitting that could be possible.

But this is a way to thing we should not we should avoid this discussion but generally I do not know whether he might be a student who is never is attaining the class is very absent minded student so he might not be the right desirable student but still I have given equal chance to everybody okay so this is my simple random so the population applicable.

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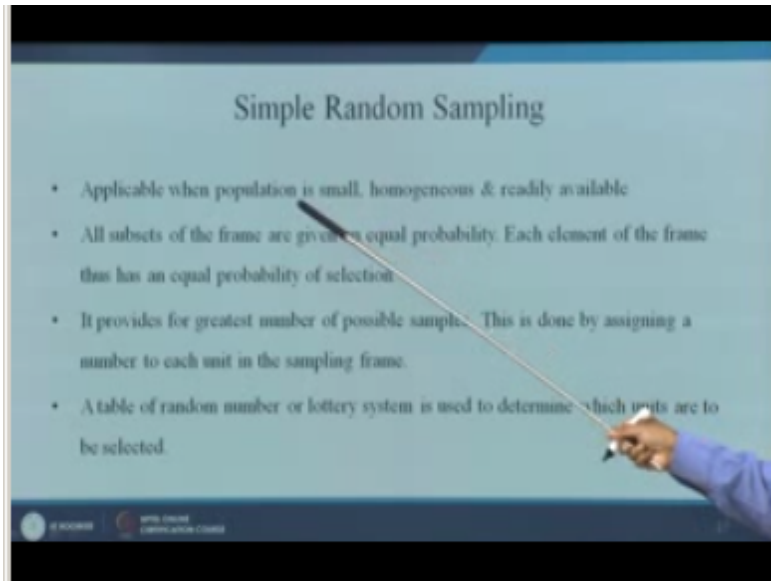

When the population is small homogenous and readily available in many classes is said right so this is like the lottery system okay so I'm not spending too much of time in this so let me go to the how it looks like the simple random sampling.

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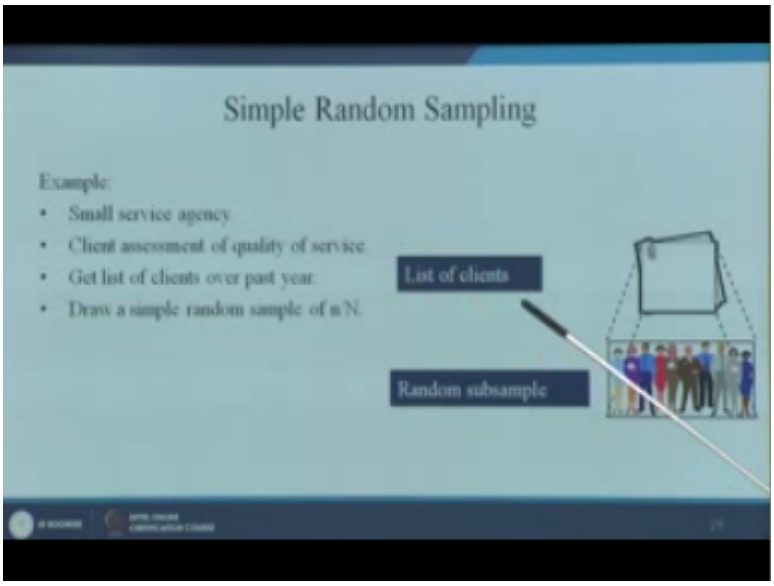

So this is the list of clients and randomly this number of people have been selected now it is not necessary that there should be equal number of male equal number of female and all but so be it so what we will do is we will continue the section in the next section with the probability sampling and also we will get into how to understand the right sample size right.

So what is the right sample size and how either you can go through a mathematical method or I will also explain you tell you a method in which you can a non mathematically also but you can use your some kind of a rule some students will say to determine what should be your sample size okay thanks for the moment.

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