Handling Large-Scale Unit Level Data Using STATA
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Lecture 39
Construction of Panel Data

Welcome once again to the NPTEL module on handling large scale data, using STATA. We are now explaining the panel data and their construction, how we can able to construct the panel data correctly.

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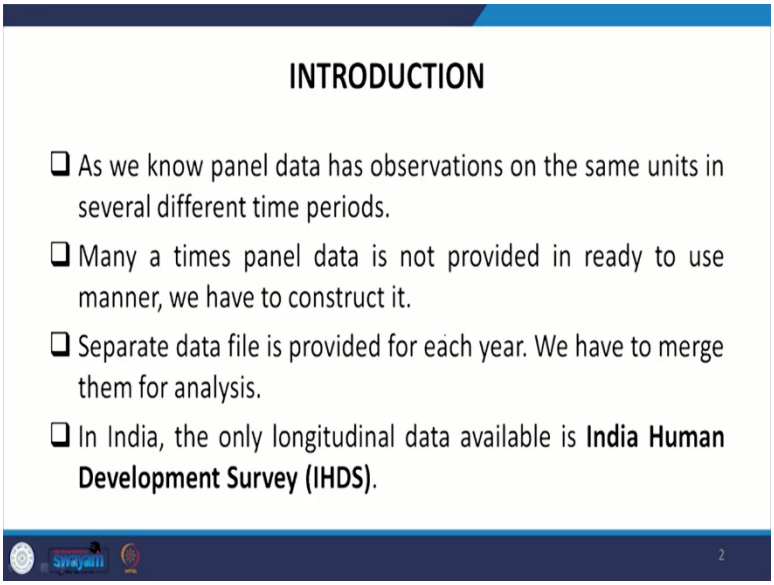

And that will help us to go for panel model and the analysis very systematically and correctly. Coming to the understanding of panel data. Once again, we just wanted to emphasize that panel data has observation on the same units in several time periods. Many times the panel data is not provided in ready to use manner, and we have to construct them in a panel format.

The separate data file that is provided for each year is important. We have to merge them for our analysis. In India particularly, the only longitudinal data in the panel format is through India human development survey datasets. So, IHDS is very important that is unique in this particular direction. And we are just clarifying IHDS data once again though we have done it earlier, but in a panel setup we did not mention earlier.

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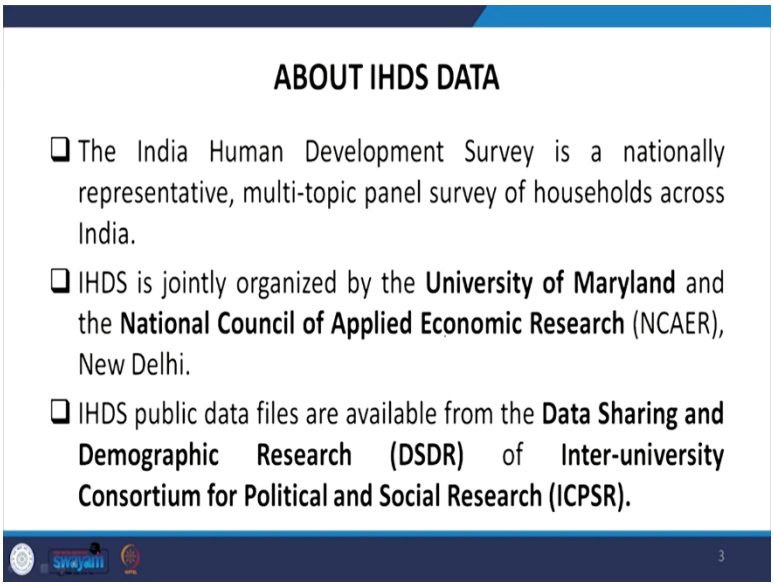

I just wanted to mention once again that IHDS is a national representative data with multi panel survey of households across India. IHDS is jointly organized by University of Maryland. And the NCAER that is the National Council of Applied Economic Research based in New Delhi. IHDS public data files are available from the Data sharing and Demographic Research of inter University Consortium for Political and Social Research. That is ICPSR, I will show you all those links.

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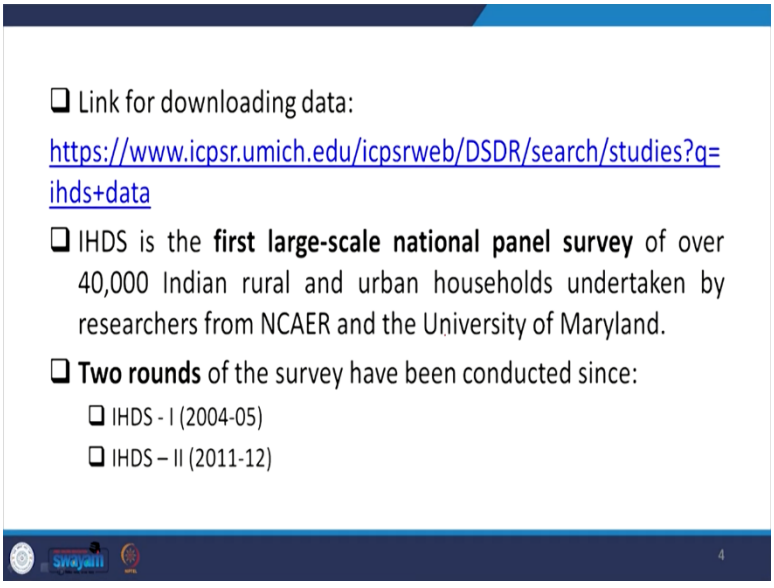

Here is the link ICPSR link once you click on this link, you will be directed to the exact website where the data is available. So, IHDS is the first large scale national panel survey of over 40 thousand Indian rural as well as urban households undertaken by the researchers from NCAER and University of Maryland. There are in fact two rounds of the survey and those have been conducted since 2004-05 till 2011-12. So, 2004-05 is famously known as IHDS one and second that is 2011-12 is called IHDS 2.

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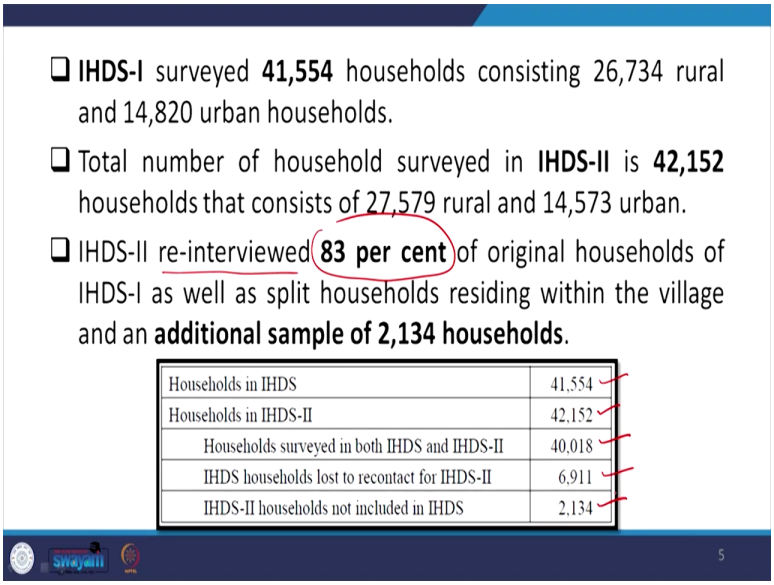

IHDS-1, surveyed over 41554 households. And these numbers are very important. While understanding panel, we need to remember these numbers because then only you can able to understand how many are dropped and how many are exactly matching. This is very very essential while constructing panel data. So, out of 41554 households, 26734 are from rural and 14820 are from urban households.

Total number of household, surveyed in IHDS-2 is of 42152 and those consist of again 27579 rural and 14573 urban households. IHDS-2 re-interviewed that is important to mention re-interviewed. We are going to clarify 83 percent of the original households. So, in the second wave, that is IHDS-2 considered 83 percent of the original that is IHDS-1 data as well as split households residing within the household and additional sample of 2134 households' additional samples.

We are going to clarify everything. This is the number we mentioned and IHDS-2. It is of 42152 households surveying both round that those common is of 40018 and the household lost re-contacted in second wave and they are of 6911 and the households that are not included in the second round of the surveys of 2134. And why these are the cases we are going to clarify right now.

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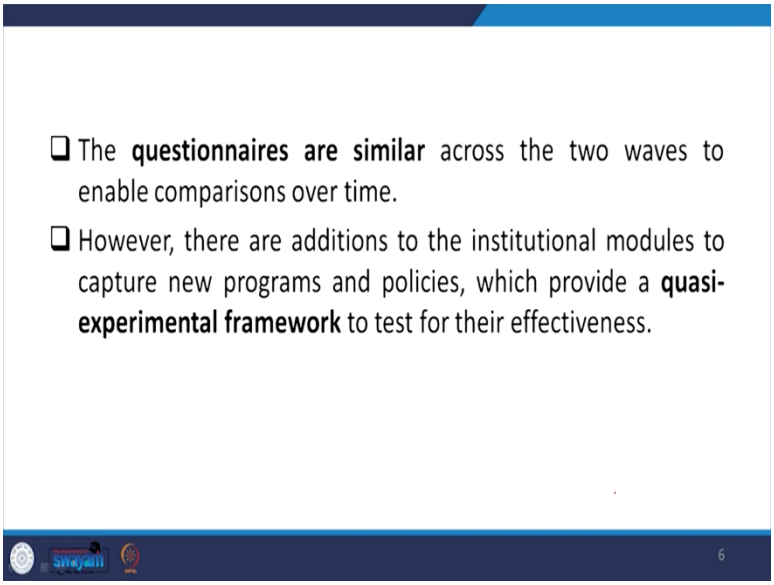

The questionnaires are in fact similar across the two waves to enable comparison over time. And it has been very clearly mentioned that two rounds can be compared. Why comparison important? Those who are interested in doing some experimental framework for analysis, in comparison some effectiveness of a particular policy over that two-time period, if it is somewhere suitable is going to be very useful.

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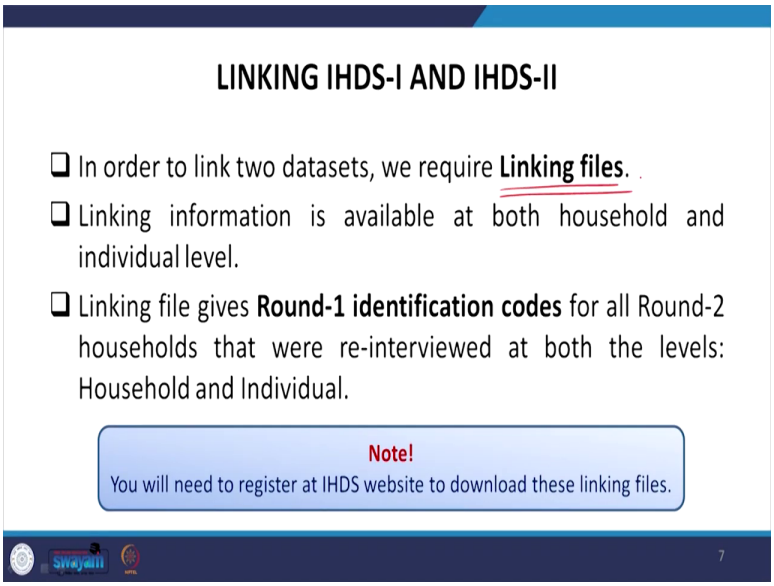

Understanding the linking of the both the rounds of the data in order to link two datasets, we require a linking file that is important I am underlying it so, just to emphasize that whenever two rounds of data to be merged to make a panel which one are common by the exact unit, the exact respondent or the household is the unit of the survey. Those linking files must have been available.

So, linking information is available at both households and individual level in the IHDS website. So, linking files gives round one identification codes for all the round two households that were interviewed at both the levels, that is for individual level as well as household level. You will need to register at IHDS Website to download this linking data.

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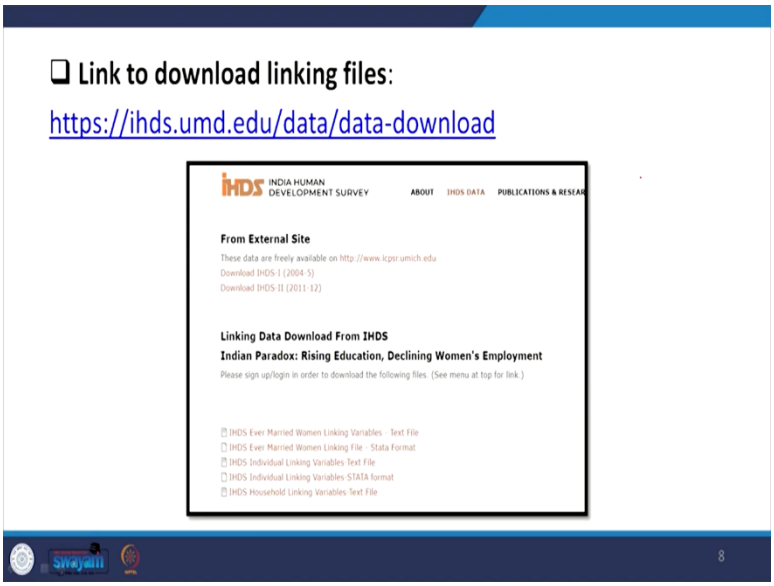

So, just registration. If you do it, it is freely available. You need to give minimum information for registration. You will be given this page to download the data. It gives information such as understanding ever married women. They are in also text file, in STATA file also, individual linking variables are available. Then household linking variables are also available.

Linking data is essential sometimes, as they also mentioned, that understanding rising level of education, declining women empowerment, some paradoxical changes in two rounds are also important.

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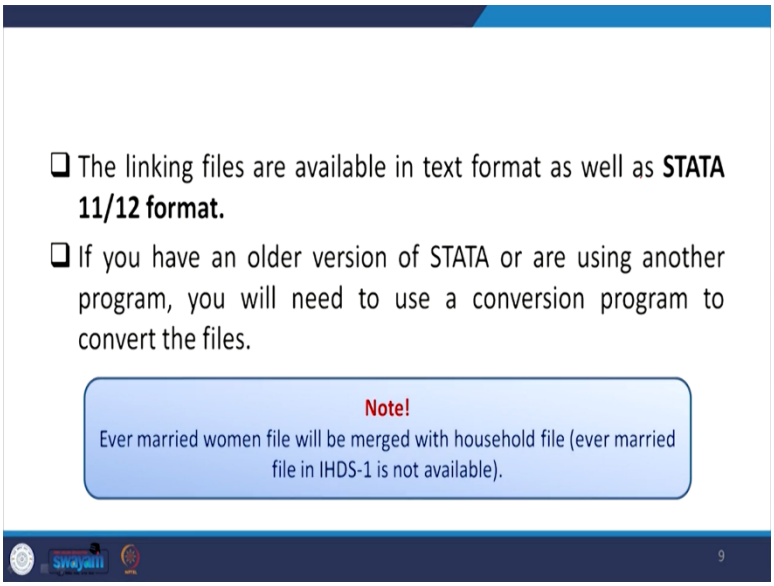

Coming to the linking files that are available in text format as well as in STATA format of 2011-12 format. If you have earlier version, you can convert it to the other version of the data also. A note here that ever married women file will be merged with the household file. it is important to mention, ever married women file will be merged with Household File since IHDS-1 does not give information specifically on ever married.

So, in that case, you have to merge with the household file and household file will be merged with certain limited information related to ever married women. Basically it is 15 to 49 age of women. Further clarifications on understanding the relationship between these two rounds for merging to make a panel data.

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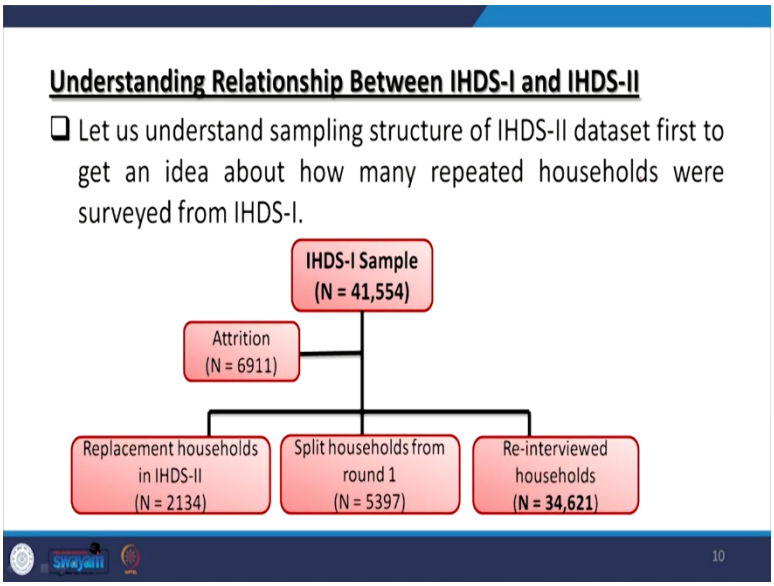

We first try to understand the structure of the data in both the rounds. In IHDS-1 sample, if we consider it in total, it is of 41554, and there were attrition number of observations. Those have been dropped is of 6911 may not be those observations are available. And there might have been some migration or that might have been some lapses. And there are various reasons of not covering the same individual household from the same location there might even change sifted to another place. So there is an attrition that will be subtracted from the original data.

How many replacements are there in that place in the new round that is of 2134 will clarify in our next slides in detail. There are some split households also like in the household gets splited to a number of observations like in different lead to different households, so those all have been included. That is of number 5397. Some re-interviewed households are there. This is the re-interviewed means whatever they are, out of 41000 straight away 31621 have been directly re-interviewed in the next round.

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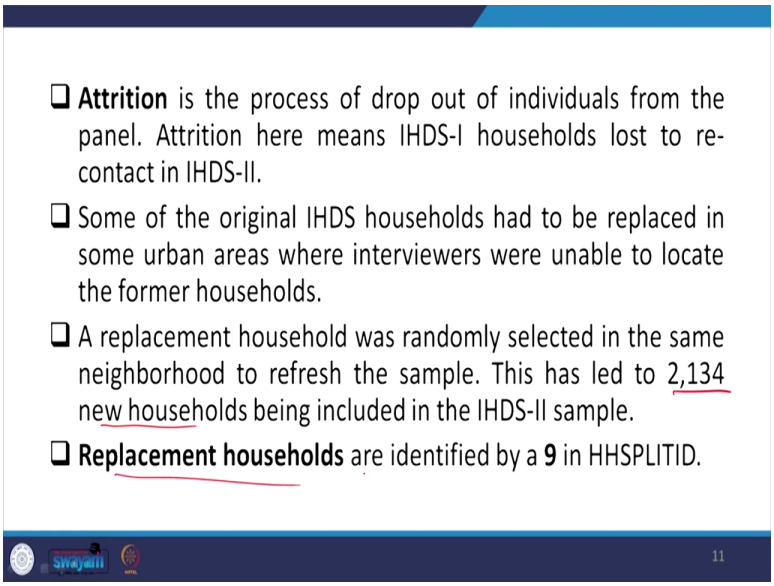

We will clarify this replacement and split household once again. Also, the attrition households are the one who are in the process get dropped out from the questioning round or the question round of the next level. Attrition it means that IHDS-1 household lost to re-contact in IHDS-2. Some of the original IHDS households had to be replaced in some urban areas where interviewers were unable to locate the former households,

So, those have been shifted or like replaced in some urban areas, very difficult to locate. They are also part of the attrition level. But a clarity is also given in the dataset related to the replacement household like a replacement household was randomly selected in the same neighbourhood to refresh the sample. This has led to 2134 new households being included in the IHDS-2 sample. So, that has been contacted to the neighbourhood and more or less the same nature of sample has been replaced. That is of 2134 new households. These are called new replacement household. So, replacement households are identified by a 9 in the split file 9 is the code entered for the replacement household.

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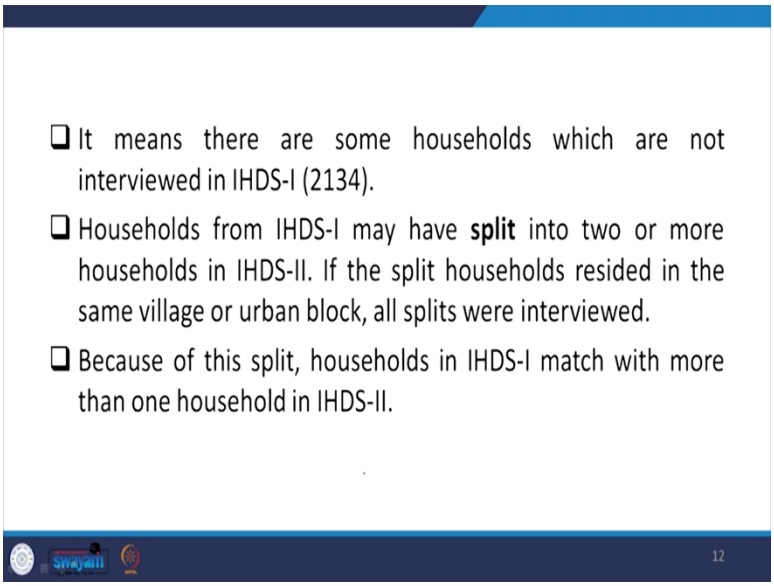

It means there are some households which are not interviewed in IHDS-1. Basically, since they are replaced in a new survey. That is very clear that number that is of 2134 have not been included or were not including IHDS-1. So, households from IHDS-1 may have split into two or more households in IHDS-2. Like one household between IHDS-1 and IHDS-2 the number of years, from 2005 till 2011-12 around 5-6 years in between, there are high possibility of some split households.

One household gets split to two or more households. And they are all included in IHDS-2. If the split household resided in the same village or urban block. All splits were included for survey. Because of the split households in IHDS-1 match with more than one households in IHDS-2. Because of the split. So, the total number of household surveyed in IHDS-2 is what exactly that is.

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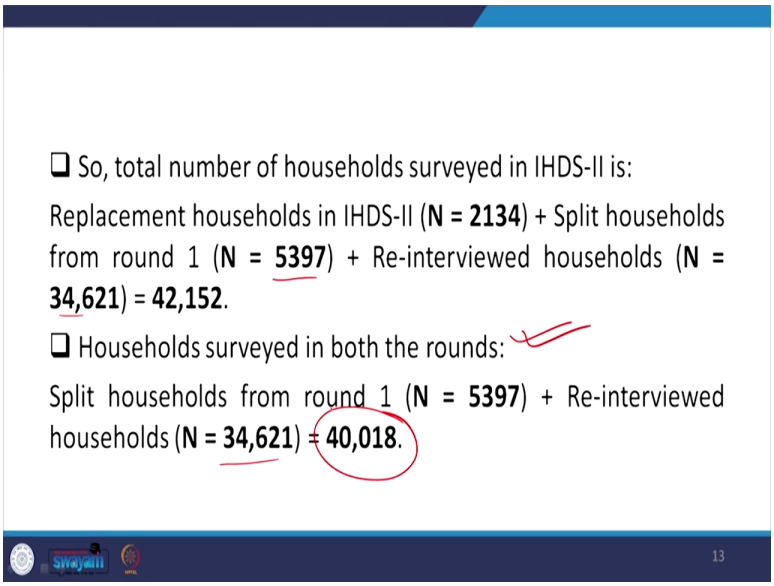

N equal to 2134, plus 2134. We have said that the new replacement households, and the split household that would of 5397 plus re-interviewed households. So, they are of 34621 in total it is of 42152. So, the total observation we get in IHDS-2 but they may not be entirely of longitudinal type, entirely of final types. The exact number we are going to discuss right now.

Households surveyed in both the rounds, this is more important to be noted for our analysis that is split household from around 5397 that we have already mentioned, plus the re-interviewed that is of this. So, 34621 if you add these two. So, both the rounds and their observations are now similar and that is of 40018 number similar in both rounds.

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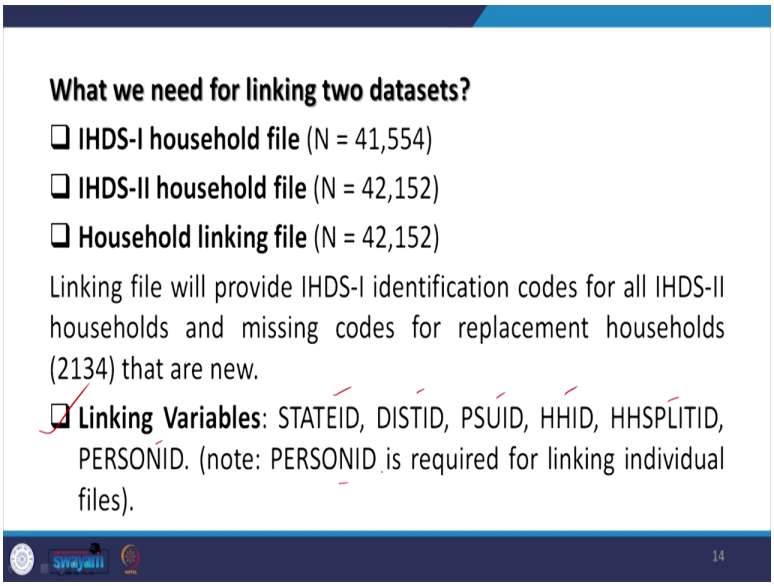

And this number is important for panel analysis. Coming to the linking of two datasets once again to mention that IHDS-1 household in total were of 41554 and in two it is 42152 household link file contains household linking, file contains the entire 42152 households so linking file will provide IHDS-1 identification codes for all IHDS-2 households and missing codes for replacement households that we have already mentioned, as 9 is the code with the number 2134, And those are very new.

Coming to the linking variables, mark it very carefully linking variables. They are specifically state ID, district ID, psu ID, HHID, household basically the ID label. Then this is of primary sample unit they have defined then with an id this is the split id and this is person ID. So, to be noted here that the person ID is required, especially this particular ID is required when we are linking for the individual files, not for the household files.

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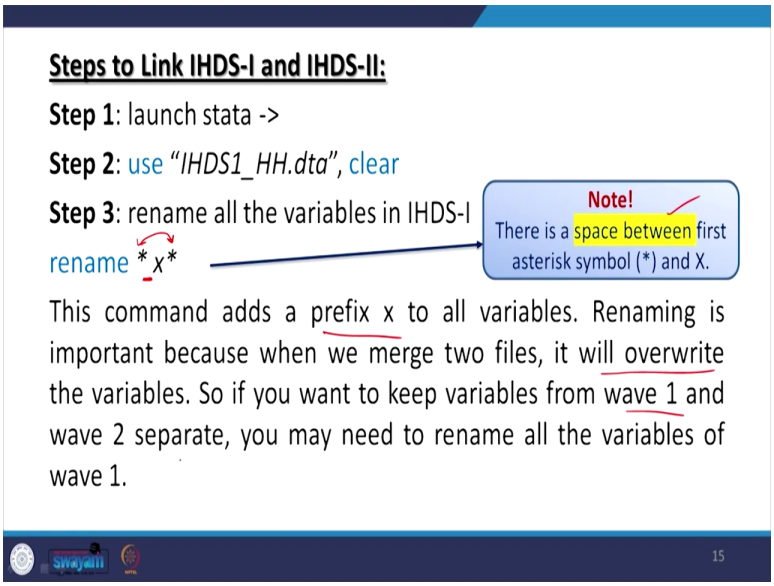

Coming to the steps of linking IHDS and IHDS-2, we need to launch the data now onwards, for another 15 to 20, around 13-14 slides will be experimenting with the original data for linking its one and two to make a panel data. With 40000, the number of which already 40018 is the number and wanted to find out by linking. So, let us use the dataset that is IHDS-1 household data. At this moment we are linking and we will open.

But I wanted to mention here that in order to get the link very clearly it might be the case that both the datasets that is IHDS-1 household and IHDS-2 household datasets have the same name, If the same name is there but we are linking from Masters to the new both the variable name might be merged with the same name and the information with the new variable that will be identified in the mod database will carry the master's variable name.

So, what does this mean basically when it has two variables separately and to both the variables, give different information. But, we are carrying the same name that will be misleading. Alright. Since both the variables are different in different rounds and they give different information, so in order to differentiate the variables, we are renaming the variable. first of all, we rename the one dataset that is IHDS-1.

So, you need to rename the entire set of variables. Those are given in IHDS-1 household data. I suggest that you please likewise do for renaming of the variable name of a particular variable, then its new name, it gets renamed. But since we want to differentiate by all the variables with all

the variables in another round, for simplicity we take x is another indicator addition to the name of the variable.

So, the exact suggestion is that there is space mark here between the asterisks to asterisks mark. There is a space here. So, we are highlighting here there is space between first asterisks symbol and X, in between this space mark, if you will just do that, all the variables will be added with x. We are going to show it, with the IHDS-1 household data. So, it is here.

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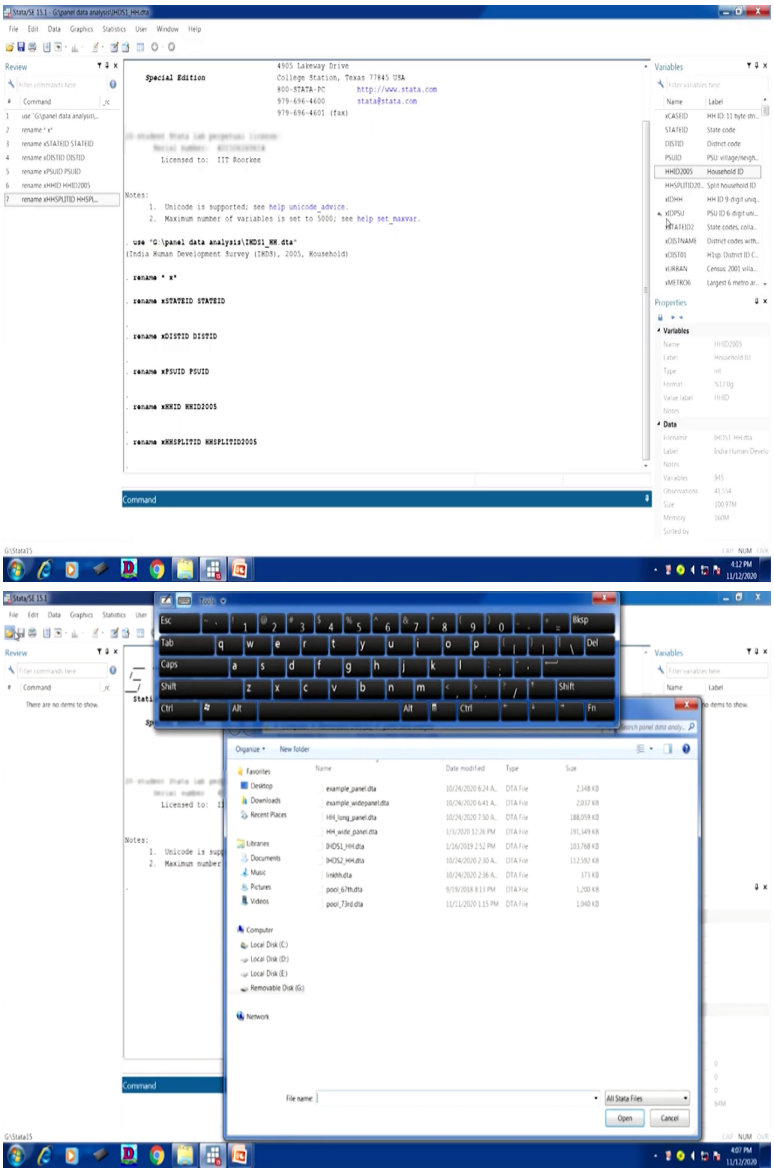

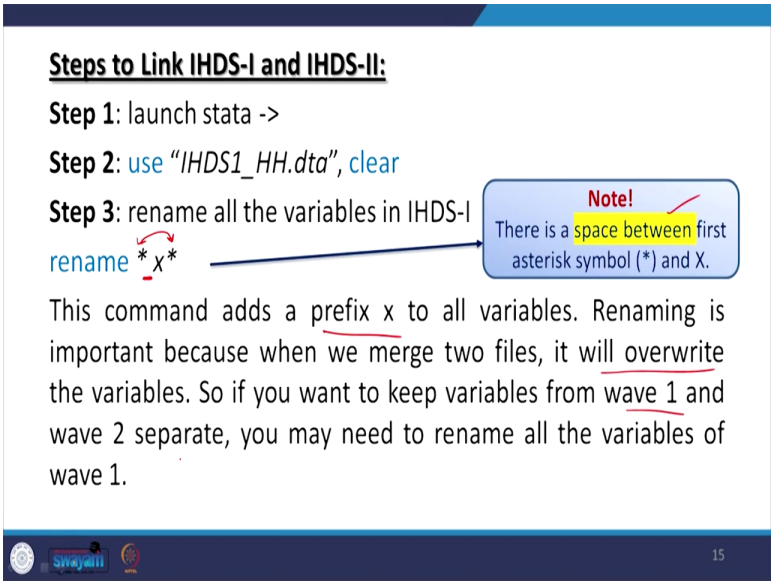

So, we are going to open it. It is here. IHDS-1 household data this is the one, isn't it? And so we will rename. Then asterisks say space is there then x and with asterisk enter. You just mark all the variables having added with x, x was not there earlier. All the variables are added with x before the variable name you just mark very carefully. X is there in every variable alright. Coming to the same interpretation.

This is what we have clarified, this command adds a prefix of x to all variables. Renaming is important because when we merge two files, it will overwrite the variables. So, if you want to keep variables from wave one, that is IHDS-1 and we have to separate. You want to just keep all the variables separate. You may need to rename all the variables and we have already renamed.

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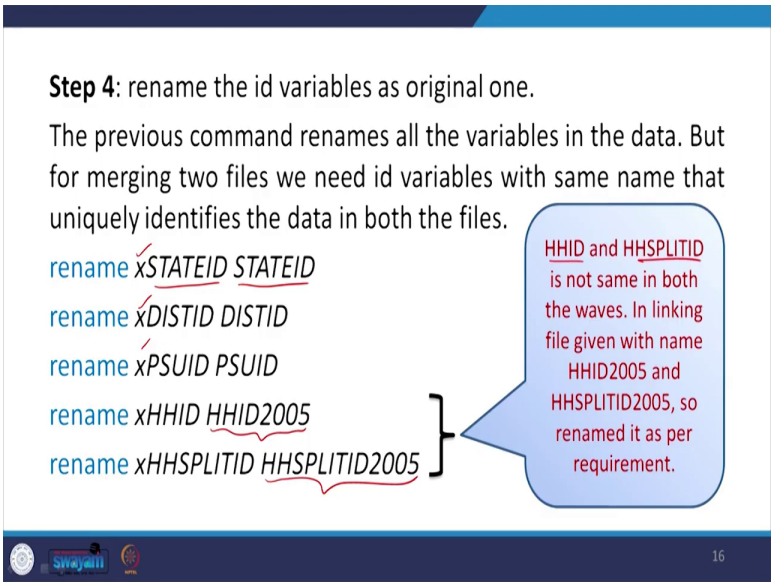

So, rename the id variables as original. One id variable to be original then only based on the id variable. Such as the similar id variable which are based on that. The same id will be carried to another one and that same information against the individual id will be added with different variables, different information. So, ID variables should be the same. What we will do? We will change the ID variable. We have now changed all ID variables to be added prefix with x, x is there. We will change to only the same name that is state ID.

Similarly, district ID, PSUID but another information to be very important that the household ID. Since we have changed the variable name of Particularly 2005. Our household ID is added with x but we wanted to mark that it is of 2005 households because in split ID we are going to the split folder, split file the variable name with HHID 2005 is given also a split household 2005 is given.

So, we have to make the renamed the household file to be HHID household ID with 2005. So, if you do that, simply renaming this we will get those name, which is going to be very useful. So, HHID and household split ID is not same in both the waves. Which I just said now. In linking file given with name HHID 2005. When HHID split ID2005. So, renamed it as per requirement. Since it is essential we will rename it. So, you can follow this step on your own and it is very easy to do alright. So, like we can do it so rename we will do it here. Alright. We will get to that clearly, so it is here, we will simply rename all those files. Alright.

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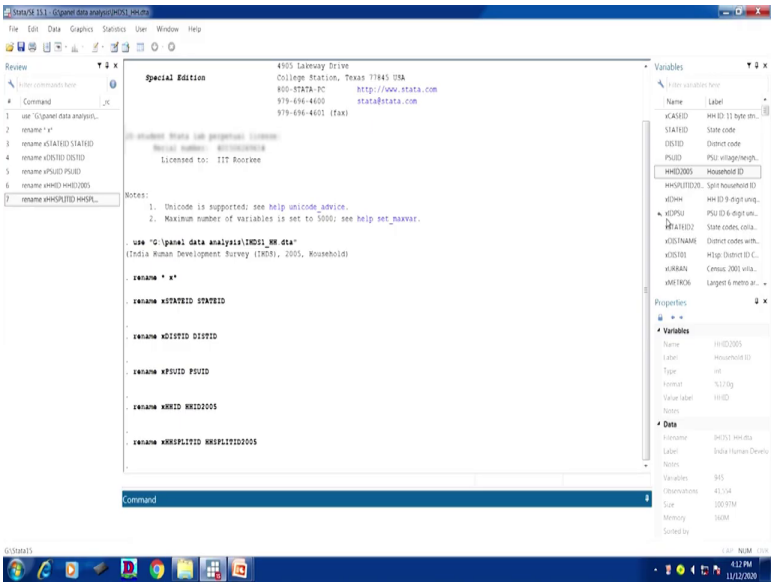

Simply, if you have renamed those ID, specifically the common ID which we wanted to discuss that state ID, district ID, PSUID has been removed with x and others are also removed with x and we added 2005 against to this HHID 2005 and HHID split ID 2005 rest variables we have kept it with x as the prefix. That is one of the guidance, have done it.

We have very clearly marked the variables. Those are common, we will sort those as for merging because there are two rounds. In any case, we have to merge with their common ID. So, this common ID which we have already defined and it has been already instructed in IHDS rounds also which are the common ID for both the periods and for individual periods.

So, since these are the common ID, we will sort first. As per the merging guidance we have already given in earlier lectures. So, we will sort it. We will simply sort those five IDs state ID these, this, this and this, and we will save and replace. Alright. So, with a name, I think it has already been saved.

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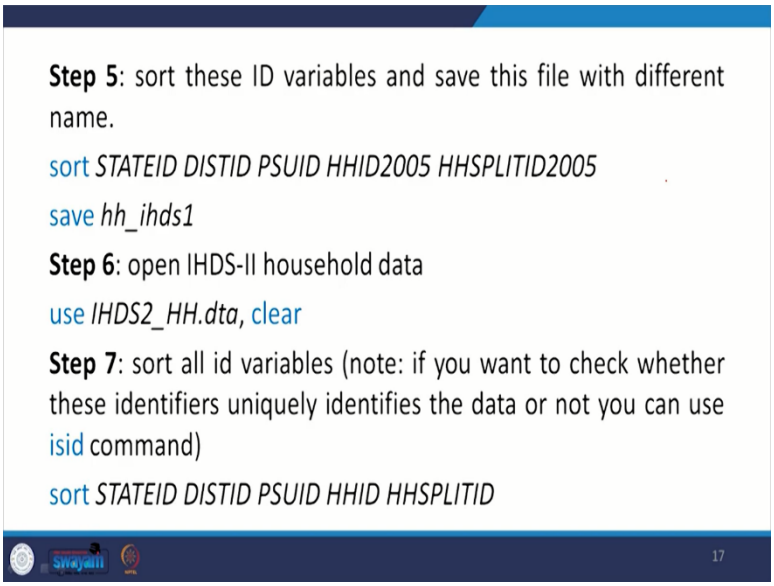

So, it is with IHDS-1 alright.

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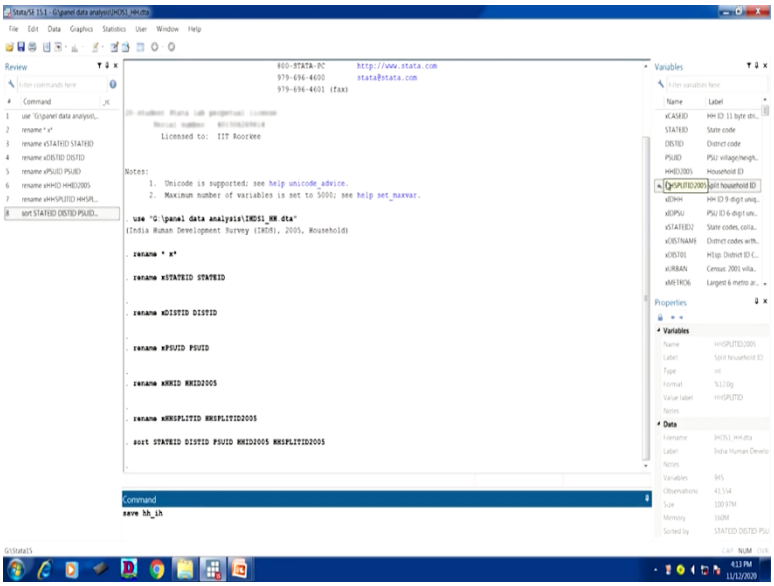

So, you have already saved. So, we come to the guidance once again.

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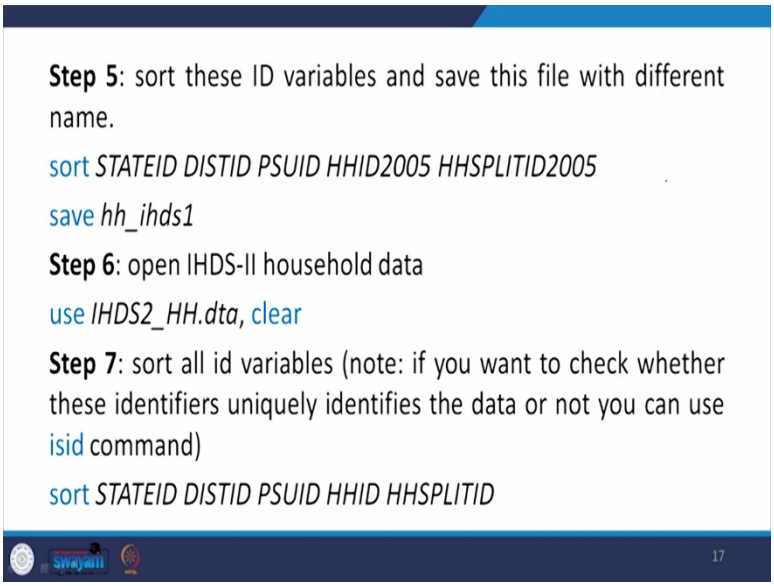

Coming to another step, the first step related to sorting, the important common IDs we have made. Now will process it for the IHDS-2 household. Similarly, will open IHDS-2 household data because now we are merging the household data. So, in this case, again, let me open that first. So, let me clear it here. So, where is clear.

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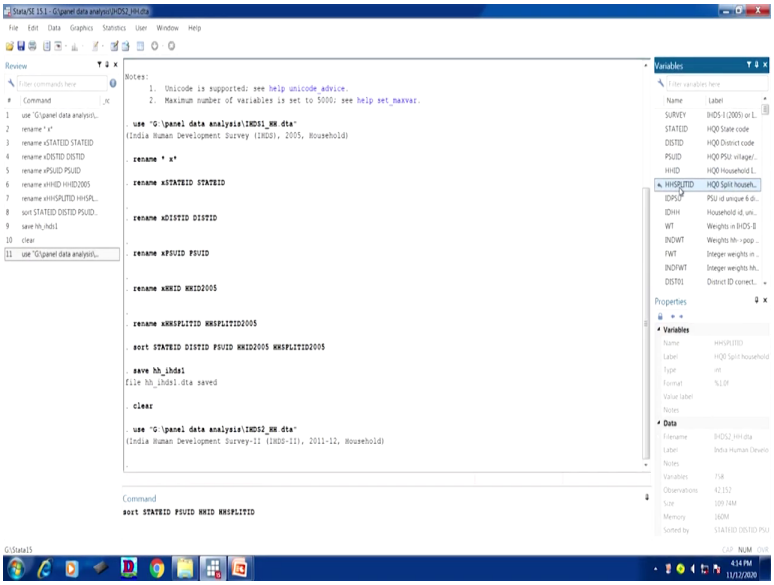

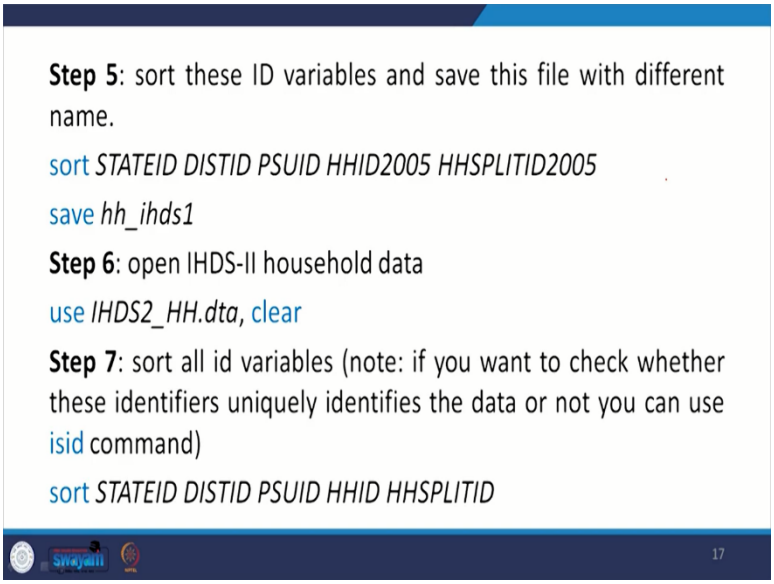

So, we will open the household two. Alright. This one, so this has been opened. It is in front of you, we will sort the important variables, those common IDs. Alright. So, this has already been sort. So, this step for you have now guided to you so sort all those indicator or important identifier, unique variables. We also check, check the IHDS ID as well. Just a minute, we have already sorted it out.

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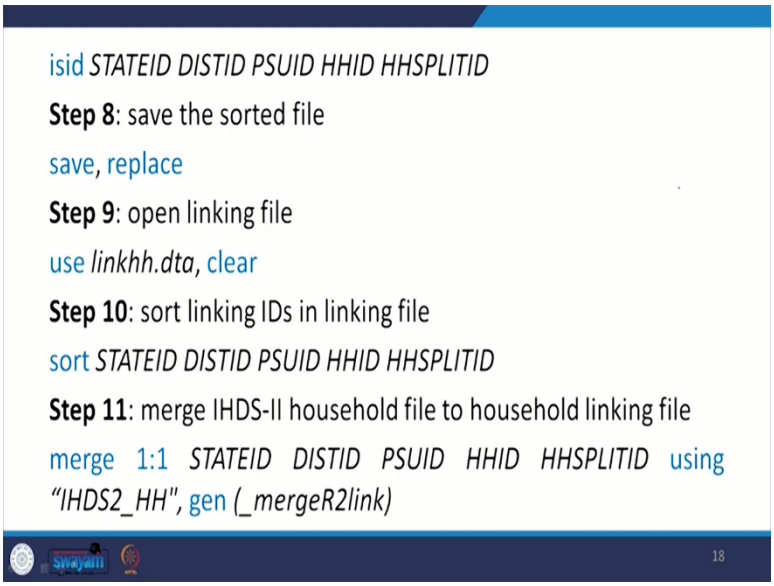

We can check their IHDS also, whether they are uniquely identified or not.

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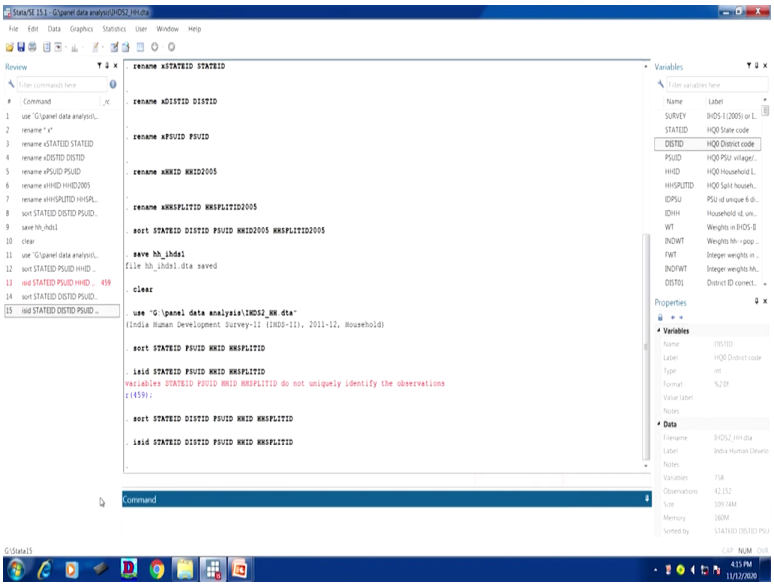

Simply will change a two IHDS. So, variable. These are not uniquely identifying the observations. Alright, State ID then district ID, PSUID then household, ID then split ID, 1, 2, 3, 4, 4 were only mentioned earlier. 4 to be 5, So, that is why there are some error mark. But it has been corrected. After understanding their unique identifiers, we have also saved and we have also sorted those file we will open the linking file, we will save it then save and replace then we will find the linking files.

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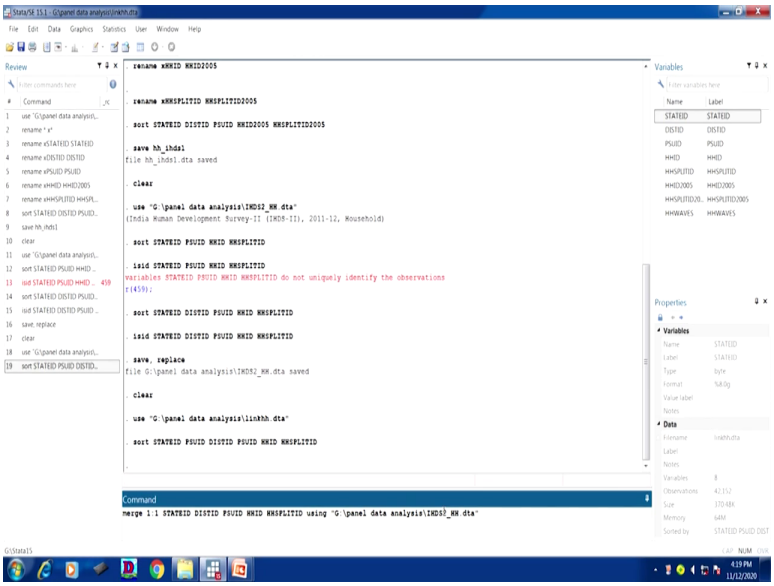

Linking files are here. Let me just open, It is here. Then we will go for understanding the linking files. It is linked HHID. Alright. So, the linking file is already given in IHDS website for our clarification. I just wanted to give some information that it gives the unique identifiers the state ID, district ID, PSUID. , interestingly, it gives information about HHID.

And split ID of that without the name of 2012, but only given HHID. This means it is of 2012 household ID and split ID, households split ID that mean this is of 2012 and these are these last two are of household ID of 2005 and household split ID of 2005. So, while we merge the two dataset we have to take very carefully about which linking files we are supposed to connect.

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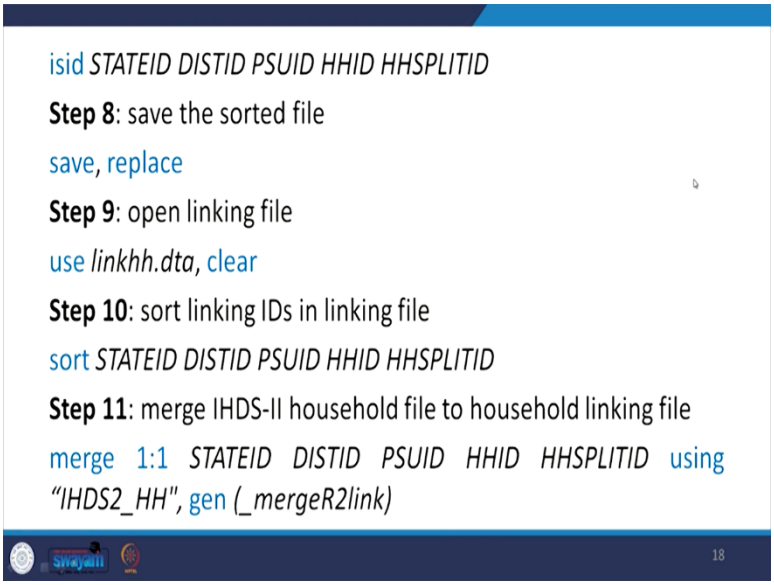

Our important linking files for merging two datasets like linking file with IHDS-2. So, we have to sort those 5 ID. So, as per 2011-12 data, these three, four, five. Alright. So, we have already sorted out. We can also check the IHDS ID as well. But since it has already been defined so no need to check. We will simply merge, merge it here,

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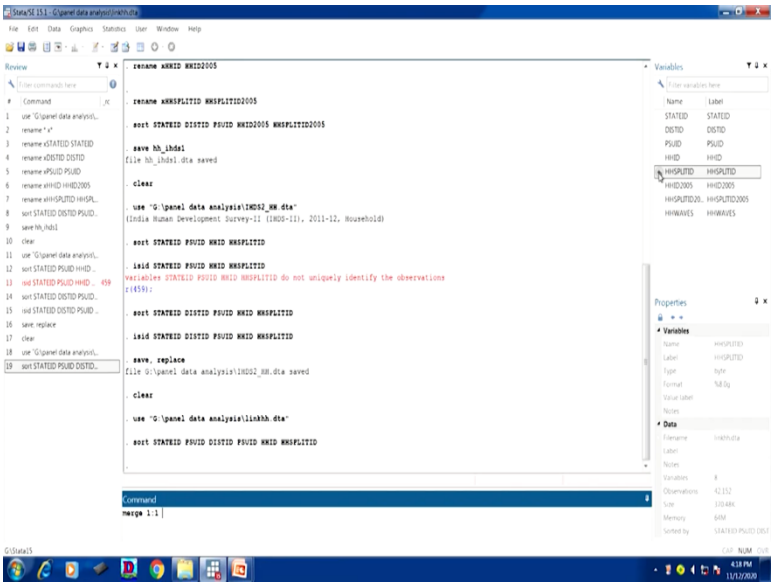

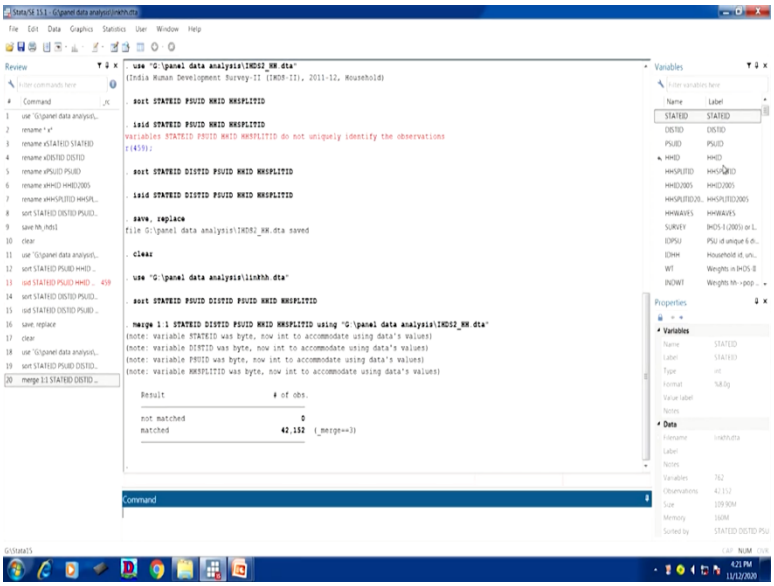

So, it is basically 1 to 1 merging and 3. So, this is 5 IDs using our linking file. So, using our IHDS-2 here. You can close. So, this we have already sorted out all its unique identifier, alright. It is already opened. So, it is here then once again we will open. Alright. So, IHDS-2 we have used now there is a merging, we have gone through the merging. The merging has already been completed at this moment.

You can mark, which we have guided from the beginning, that 42152 are the total observation in IHDS-2 and the linking file also the entire information were also available for and that to we followed one to one merging. So, that is very clearly understood and our merging has been

successful because of this linking file with IHDS-2. So, what we will do, we have a combined IHDS-2 with linking file information has already been included in this file. So, what we will do will then generate a merge file.

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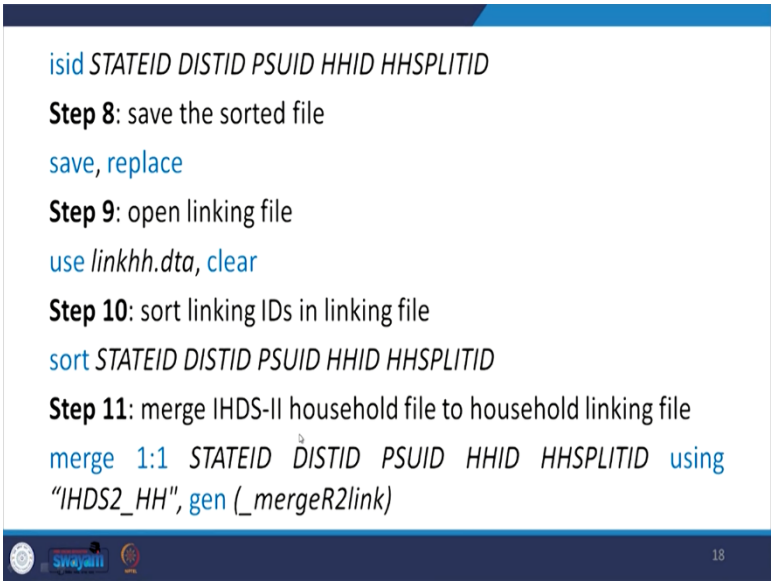

So far since we are trying to link and merge the round 2 dataset, we can generate file with this name. So, already generated.

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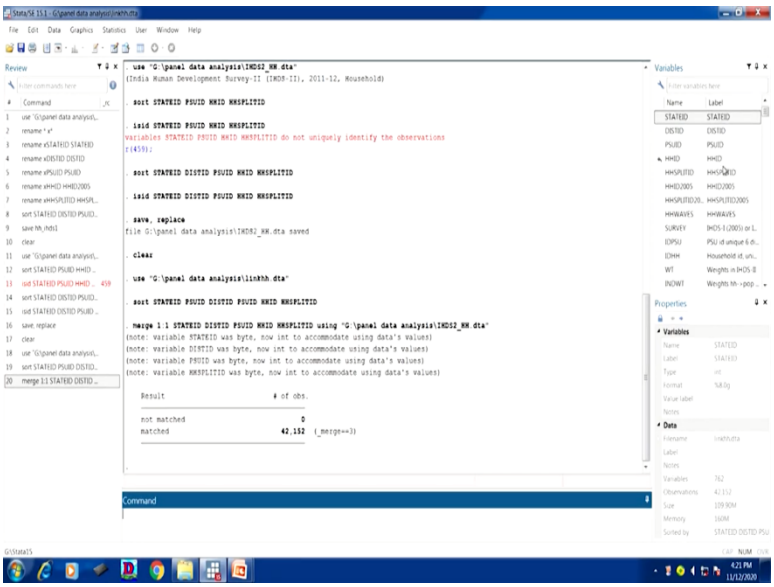

I can show you that is already there at the end. So, this can be renamed with the merge. Since merge either merge is to right link? So, we have created a variable with this particular name. Alright. So, we will come back to this further clarification.

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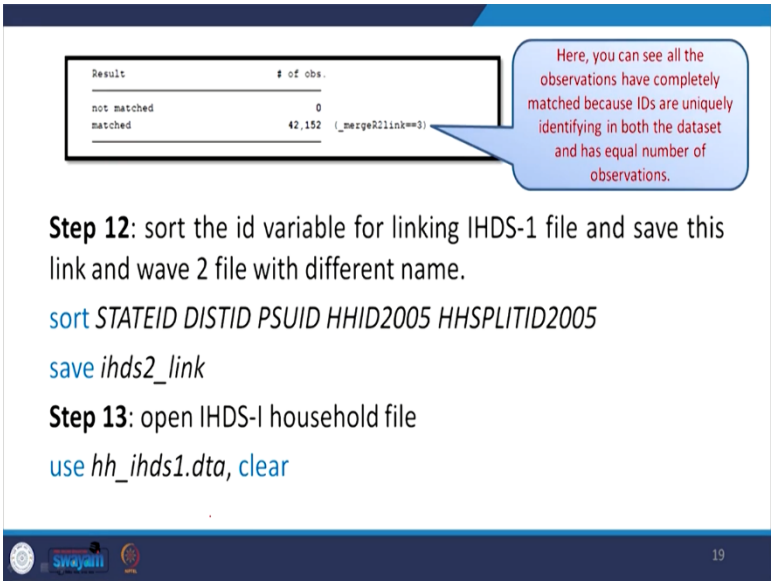

So, this is what we have guided. And here you can see all the observations that have already been completely merged because IDs are uniquely identifying both the datasets and has equal number of observations. Coming to the next step, that sort the ID variables of IHDS-1 and the IHDS-2 and the linking file, we have already merged. We have a combined dataset of that.

We need to get the IHDS-1 into it. So, IHDS-1 we already saved by sorting their unique identifiers. We will save that then we have two file with different name. There will also save it accordingly. What is suggested here that you need to sort identifier of IHDS-1, that we have already done it.

So, we saved it with this name as well. But this is the file we have created basically the merge file we have created. But we will try to merge with IHDS-1. IHDS-1 contains the unique file and information like this and this. Since this file has not been sorted with this information. First duty is to sort with these names, these variables, then only we can able to merge correctly. So, let us sort these five indicators.

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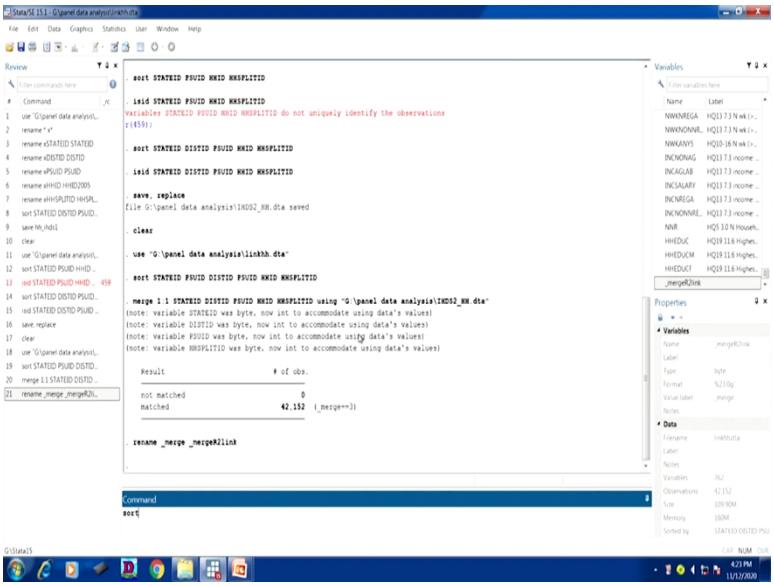

So, sort just a minute. It is here, so 1, 2, 3, then 5. So, we have sorted out. So, this we are naming it, save with IHDS-2 with link IHDS-2 and link file has already been saved. So, what is the next important aspect we will open the IHDS-1 household file that those IDs we have already sorted in IHDS-1. So, we need not sort further.

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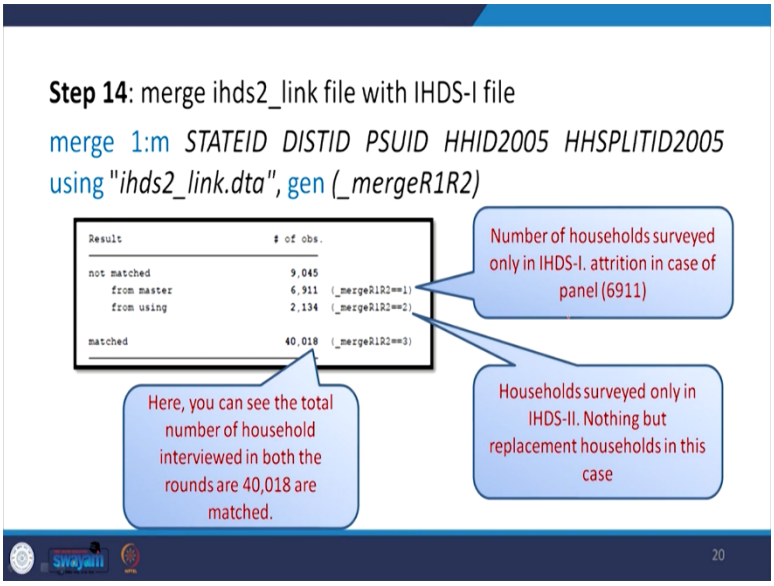

We will open that first then we will merge with the IHDS-2 link file. So, let me first clear this out. So, we will clear now will open IHDS-1 Household file.

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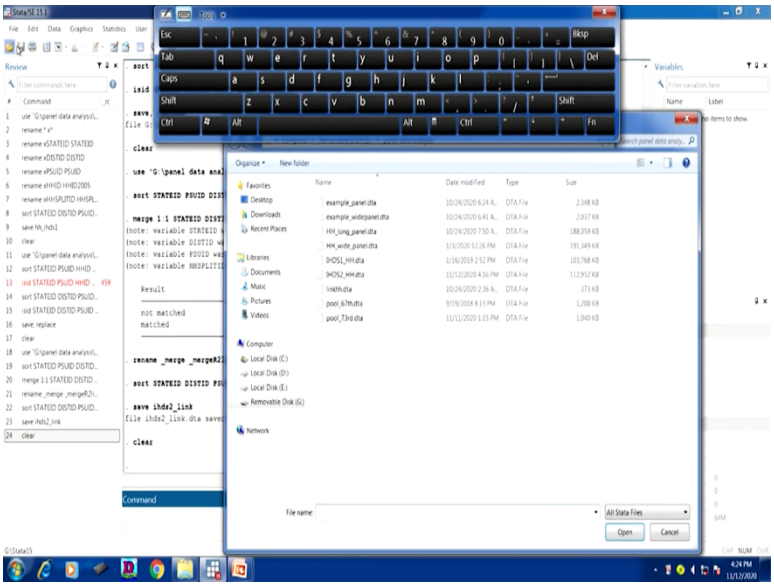

So, IHDS-1 and that we have already sorted has been opened. Now, what will do? will merge.

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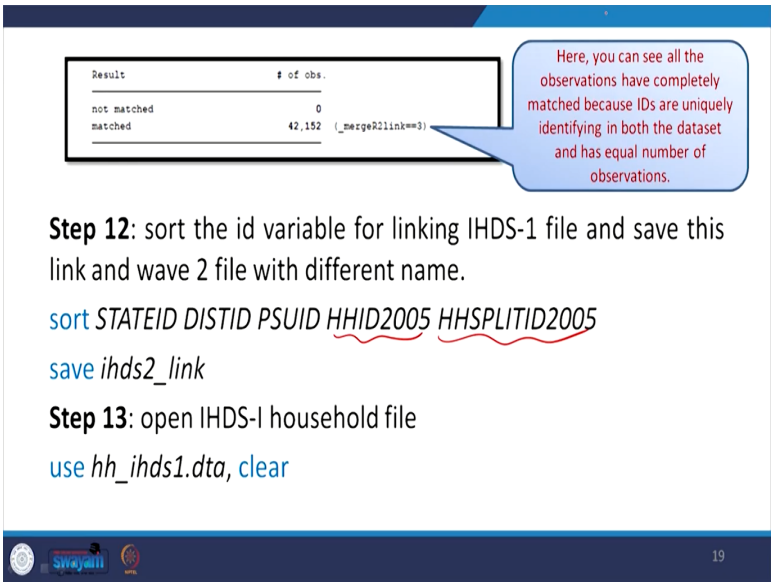

So, we have used this file, isn't it? And I think we have already sorted it.

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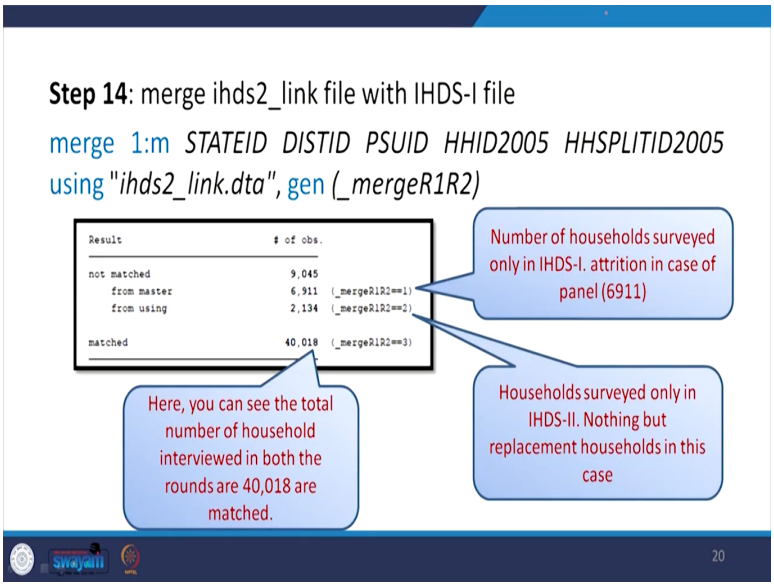

All those indicators. So, we are supposed to go for merging. So, we will merge it with this information, we will straight away take this command, straight away copied. Why copied because we will carry with the same name generate the way we defined earlier will go by that only. And this is here.

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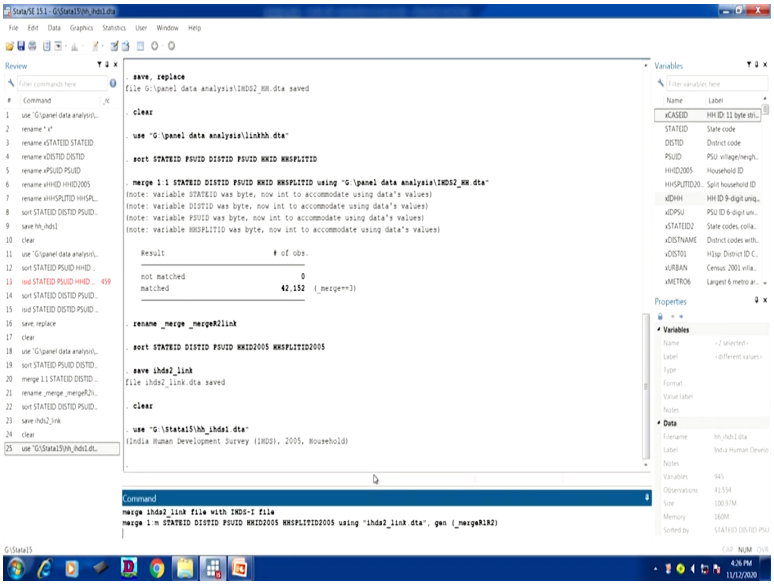

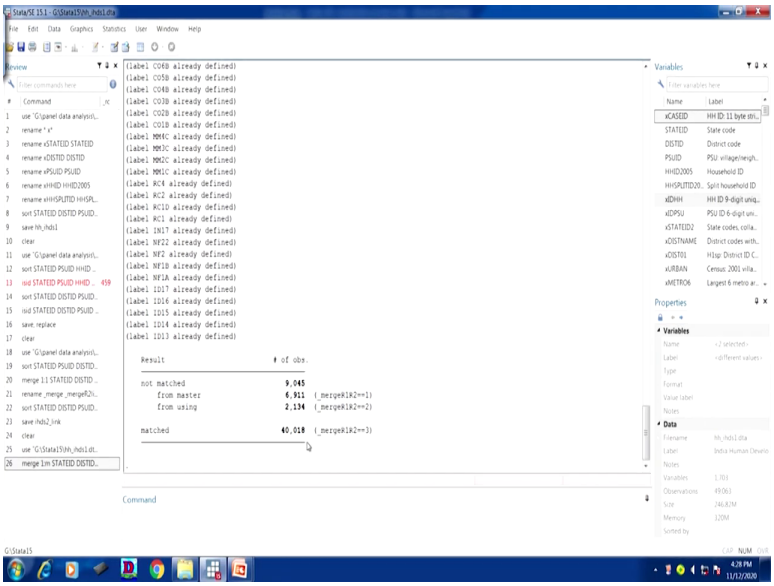

I think merge know the first line to be. So, it is the link to be given. So, that is basically here using file that has to be first deleted. Then now this is not there it is here. The link we have created, alright. Basically, after using the path name correctly, we observed that we have successfully matched the correct number that is of 40018. And from the Masters, those who are not included.

That is of 6911. And from the using file, that is basically the merge file, the replacement numbers that is up to 2134 we guided from the beginning. Those are not included. So, the net number to be defined as the merge is the panel information is of 40018.

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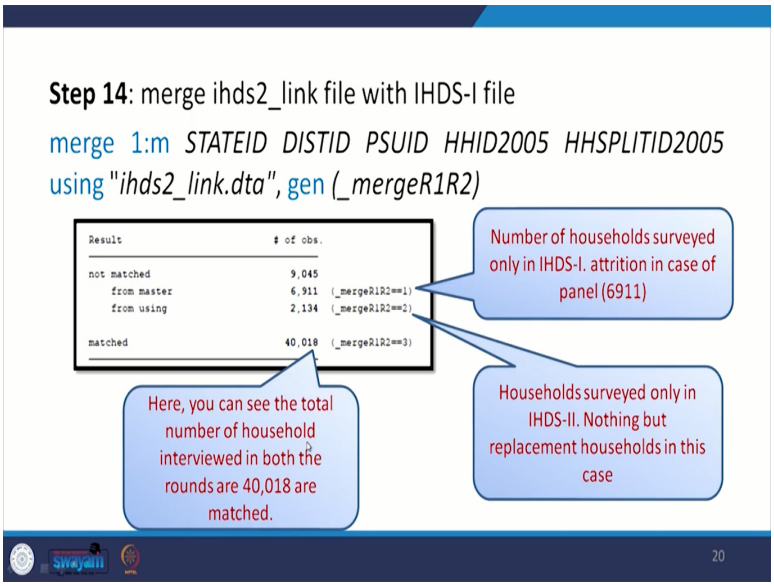

And we will clarify further. So, basically when we have three indicators, that one code one, 1, 2 and 3 are there. So, what we are interested, only for 3, because three are the common IDs, common information in both round. So, we can draw for one and two because these are no longer important for the analysis. So far as panel is concerned, we can draw and can proceed accordingly.

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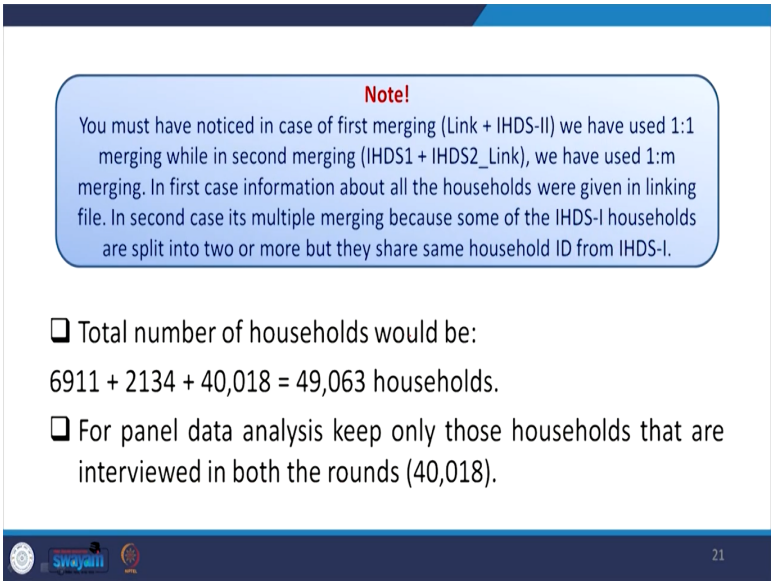

So, you must have noticed in the case of first merging, that is the link with IHDS-2. We have used with one is to one merging dividing while in the second one, we merge the IHDS-1 with the

combined link file. So, we applied one to one multiple file. That is merging technique. In first case, information about all the households were given in linking file. In the second case, it's multiple merging because we know some of the IHDS-1 households are split into two or more. And they share same household ID from IHDS-1.

Since there are more numbers and because of split we applied one to m as the merging technique. so the 2 common the total number of household would be in this case is 6911, 2134, 40018 that is of 49063 households so far as the total number is concerned. But out of that 40018 is the final number and they are interpreting both the rounds. Alright.

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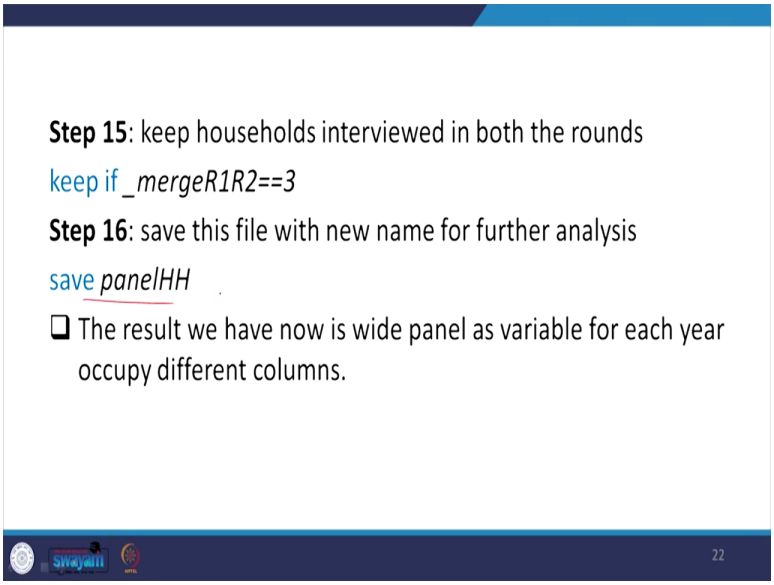

So, we can keep that 3. You can do this experiment on your own. We are not repeating. And next, you can simply save with the panel HHID, and that has been already guided and will show while we are using that data for further analysis. So, coming to the dataset which we have already shown for your analysis to make a panel version. You can also click on this link to get for those datasets directly.

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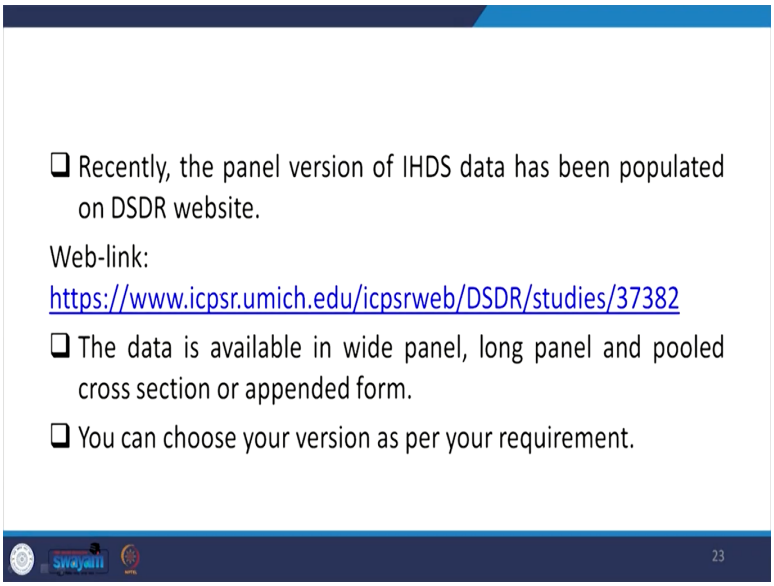

And readily available provided by the ICPSR and they are providing in wide panel, long panel, pooled cross section and appended form as well.

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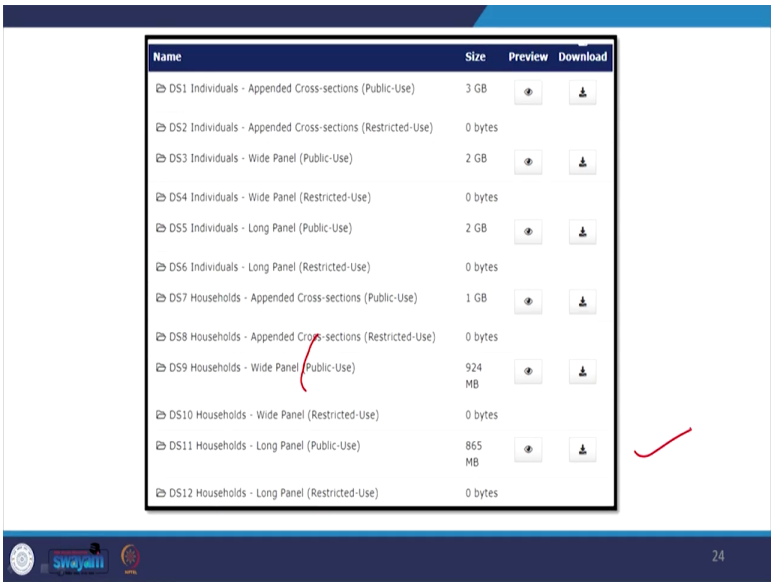

For whichever the requirement you have you can download and start using it. So, these are all information given for clarity. You can use it for better explanation further alright. So, I think we need to proceed for the use of all those data that we have already converted, we have made panel and in the next class we will be suggesting you the exact technique of deriving result based on

the panel. So, that is all for today's lecture. Next lecture will be purely understanding and analysis of the panel data. Thank you so much.