1. Fuel stacking and comparing energy use for different fuels to cook the same foods

Where people are using more than one fuel to cook a meal (fuel stacking), you need to be careful that you are measuring energy use in sufficient detail to enable meaningful comparisons between different phases. For example, if in the baseline phase a stew was cooked on charcoal and served with a chapati cooked on kerosene, you would need to measure the energy use for these two food items separately and then add them together to get the total energy use per meal. Similarly, if in the transition phase, the stew was cooked in an EPC and the chapati on LPG, you would also need to measure the energy use for these two food items separately and then add them together to get the total energy use per meal.

So, if you want to analyse and compare the energy used for different fuels to cook the same meals when fuel stacking is a factor, you will need to be able to measure energy use at the food item level. This is just something to bear in mind in terms of how you filter the data when people are stacking fuels.

2. How do you deal with the usually very small sample sizes, especially when disaggregating? How can we show how statistically confident we are with the trends indicated in the data?

There's two ways of thinking about sample size: 1) number of participants and 2) number of cooking events.

Number of participants. Before ECO, cooking diaries studies have been with relatively small numbers of participants, typically, 20, 25) which is not enough to meaningfully disaggregate for example by urban/rural, gender of the main cook, socio economic status of a household, etc. As ECO projects have typically larger sample sizes, there may be some scope for disaggregation. Although with a large sample size, there is likely to be a trade-off between the number of households in your study and the amount of data your budget enables you to collate.

However, another way of looking at the sampling is to consider the **number of cooking events** that we're gathering data on. If you class each cooking event as an individual data point, then we're potentially looking at 4000-6000 data records, which is a large enough sample to then be able to do some kind of statistical analysis to show the level of statistically confidence.

With number of cooking events, have to be careful when you're looking at more specific food items – e.g. comparing the energy used to cook leafy vegetables with electricity and LPG as you will most likely have fewer data records of leafy vegetable cooking compared to the cooking events in general. In this case, you would need to use your judgment to know when the sample size is still large enough to try and do some kind of statistical test on to show the level of statistical confidence. If you can do this, it lends a lot of weight and value to the analysis you're doing.

3. How is disaggregated gender information gathered and analysed during cooking diaries?

Previous MECS cooking diary studies have not carried out much disaggregation of the data by gender due to smaller sample sizes and the participants all being women meaning there was little opportunity to explore gender dynamics. The much larger sample sizes in ECO open up interesting opportunities to try and make comparisons across gender provided there are differences in the gender of cook. In most places where we've been working so far, the principal cook is almost exclusively female, which makes any kind of gender analysis difficult because it's very difficult to get a big enough sample size. However, focussing on gender is very much worth bearing in mind if your sampling enables you to capture some male cooks.

The **exit surveys** might also be a good opportunity to try and capture disaggregated gender data related to changes in cultural cooking practices. For example, have men become more involved in cooking since the introduction of electric cooking appliances. Some of the surveys we've used in previous MECS studies have explored who takes responsibility for purchasing stoves and who has responsibility for purchasing energy related equipment. We made this distinction because we found there's a clear trend for women to be responsible for purchasing cooking equipment, while men like to be responsible for purchasing major household purchases and energy related equipment. But when it came to an electric cooking stove, it was still regarded as the responsibility of the women.

Further anecdotal evidence from previous MECS work highlights that when you have an electric cooking device which is not smoky (and therefore smelly), men are much more inclined to actually engage in sharing some of the cooking responsibilities. Related to this, it's also possible to have gender disaggregation on the perception of taste (including preference of a smoky flavour) in the exit survey as well.

So, all of the above would be really interesting research questions if methodologies can be adapted to capture these aspects.

Ideally, the exit survey would be carried out with male and female heads of household separated. However, practically this is difficult as households tend to sit in the same room when discussing the enumerator's questions and the enumerator has to record whatever the dominant answer is. So practically difficult but methodologically it would be a really interesting exercise to do.

4. When cooking diaries studies are carried out by non-researchers – such as sales agents – do you have any advice on how to best ensure that qualitative survey information is captured consistently and rigorously especially with qualitative questions that may require follow up questions?

Two keys: 1) question design and 2) enumerator training.

With qualitative research, it is really important to design your questions very carefully, simply to try and avoid opportunity for misinterpretation or alternative ways of interpretation. So, it's well worth actually putting a lot of effort into designing your questions.

The other key is training of enumerators (also covered in ECO webinars 2 and 3). If the enumerators have done enough piloting training, they'll be aware of possible ways that questions may be misinterpreted when they go into households. In addition, if enumerators have all been trained together so they understand fully what the question is trying to explore, then they'll be in a much better position to be able to ask follow-up questions, and prompt and encourage in a consistent manner.

4. How much time is required to carry out a baseline?

In a cooking diaries study, a baseline is carried out before introducing the new electric cooking appliances in order to find out what is the existing menu and what are the existing fuels and appliances that people in the target community use to cook this menu. For ECO projects, we are suggesting a baseline phase of at least three weeks. A full overview of the different phases and their suggested lengths can be found in ECO webinar 3.

However, how long it takes you to capture the variety of foods in the menu during the baseline phase may depend on the cooking culture and how complex the menu is. Cooks often tend to use a fixed menu (or menu plan) where they cook the same meals regularly. In some locations, cooks might have a one week menu which they repeat every week. In other places, there may be a more diverse menu which last two or more weeks before it repeats. Some places have much simpler menus, where the menu is repeated every day.

Therefore, if the menu is very varied, you might want to extend your baseline a bit longer to try and capture all the detail of that menu. Whereas with a very simple short menu, you might be able to capture the menu in two weeks or possibly even less.