Understanding Infant and Young Child Feeding Measurement: A Comparative Analysis of Data Collection Methods for Dietary Data Webinar

Webinar Transcript

Yaritza Rodriguez

Thank you so much to everyone who's joined the webinar on Infant and Young Child Feeding Measurement. We're going to be covering a comparative analysis of data collection methods for dietary data. My name is Yaritza Rodriguez. I'm a communications officer with USAID Advancing Nutrition, and I'll be providing tech support today during this webinar. I'd first like to go over a couple of reminders about Zoom webinar. If at any point during today's webinar, you're unable to hear the speakers, please make sure you've connected your audio by selecting the headphones icon.

If you do disconnect, please rejoin and make sure your audio is connected. Please send a message to everyone again in the chat box to introduce yourself, send in your comments, or ask for tech support. During today's webinar, I again will be providing tech support, so please do shoot me a message if you need any support or help. Closed captioning in English has been enabled for this meeting or for this Webinar. To view the English subtitles on your screen, please click on the closed captioning icon and select Show subtitle.

Please also note that this webinar is being recorded and a recording of the webinar will be posted to the USAID Advancing Nutrition website shortly after the webinar. Today, we'll be using the question and answer box to collect your questions. Please submit your questions for all of our panelists in the Q&A box. Panelists may reply to your questions via text in the Q&A box, or will answer your questions live during the discussion portion of the webinar. Now, it's my pleasure to introduce you to the moderator of today's Webinar, Lidan Du-Skabrin. Over to you, Lidan.

Lidan Du-Skabrin

Thank you, Yaritza. Greetings everyone. Welcome to join our webinar from wherever you are. Next slide. First, let me introduce the key study team members. They are from SPK Research and Development in Cambodia, University of Zambia, located in Lusaka, and University of California, Davis, and USAID Advancing Nutrition and USAID The members with their names boated will be presenting today. There are too many good folks to be named here. Next slide. We have a lot to go over today.

First, I will provide you a brief background to set the stage for this study, and then Jennifer will introduce the study methodology. Next, Amry and Chiza will share with us their experiences and lessons learned from leading the teams collecting dietary data in Cambodia and Zambia's context. They will be followed by Elise, who will report on the statistical analysis and the key findings from both

countries. After that, Christine will offer us the interpretations of these results and the conclusions. Then I will open up the floor to hear your reactions, comments, and good questions.

Last but not least, Erin will round up our webinar by providing us her closing remarks. Next slide, please. As we are all very aware, good nutrition is essential for the survival, physical and mental growth and development, productivity health, and well beings across our entire lives. Complementary feeding is the critical transition period human babies go through, from being exclusively breastfed up to six months old to beginning to receive soft, semi-solid, and solid foods in addition to breastfeeding during 6 to 23 months of age.

There are multiple dimensions of good complementary foods, timely provided, adequate in quantity and quality, safe and properly fed. Next slide, please. In the 2021 updates of Indicators for Assessing Infant and Young Child Feeding Practices, the World Health Organization and UNICEF listed nine complementary feeding indicators. Three of them are related to the adequacy aspect of complementary feeding, and they are the outcome of interest of this particular study. The focus of our interest is the minimum dietary diversity for young children. Next slide, please. I will not read the whole definition, but to know that it is a dichotomous indicator presented in the form of percentage noting children consume foods and beverages from at least five out of the eight defined food groups during the previous day, 24 hours. Next let me introduce Jennifer, who will give us a brief introduction of the research methodology. Jennifer.

Jennifer Yourkavitch

Thank you. I'm going to talk about the study design and methodology starting with our motivations. Hanley-Cook and colleagues conducted a study in Ethiopia, Cambodia, and Zambia examining the accuracy of the minimum dietary diversity for women indicator from two recall methods, an open recall, and a list-based recall, compared to an observation. They found an overestimation of MDD-W by 10 points from the open recall and 16 points from the list-based. We wanted to know how these recall methods worked with children's dietary diversity.

The minimum dietary diversity, or MDD indicator. USAID supports Demographic Health Surveys and Feed the Future Zone of Influence surveys. These use slightly different methods to collect dietary data. DHS uses a method, more like a list-based recall, and Feed the Future uses a method, more like a multiple-pass recall. We're going to talk about those two methods in a moment, and so there's interest in looking at the accuracy and comparability for MDD estimates from these methods.

Next slide, please. Our primary objective was to compare estimations of MDD from two dietary recall data collection methods, the multiple-pass and a sentinel food list, specifically the Infant and Young Child Feeding Diet Quality questionnaire from the Global Diet Quality Project, comparing those to an observation. Secondary, to quantify the trade-off between the costs associated with collecting data with each recall method and the accuracy of the estimated MDD indicator compared to the observation reference.

This study also provides insights into proportions of children consuming individual food groups, as well as minimum meal frequency and minimum acceptable diet indicators for each method. Next slide, please. Here's how this worked. Before observations and interviews began, an enumerator visited prospective households to answer questions about the study and seek informed consent from the respondent. The respondent is the child's caregiver and the participant is the child. If consent was obtained, the enumerator scheduled the observation and interview days.

These are two consecutive days. The survey included data collection across all days of the week with weekdays and weekends proportionally represented to capture changes in dietary patterns across the week. However, periods of extended fasts or feasts such as special holidays were not included following

standard guidance. The enumerator arrives at the participant's home in the morning before any food is consumed and leaves when the participant goes to sleep.

The enumerator asks first whether the participant consumed any food during the previous night after going to sleep or before their arrival, and records that information. The enumerator then observes the participant during the entire day and records all food items the participant receives regardless of the consumed quantity. That is, there's no minimum quantity for consumed food to be considered according to WHO and UNICEF guidance. For mixed dishes, the enumerator recorded all main ingredients, usually the top two or three ingredients.

They were trained to probe for main ingredients for the guidance, and the enumerator also recorded who prepared the food and who fed the participant during each feeding episode. Next slide, please. Day two. This is the dietary recall data collection. The methods were assigned randomly and administered by different enumerators at different times of the day, one in the morning and one in the afternoon. First, multiple paths. This is following the standard guidance. Multiple paths is sometimes called open recall or hybrid recall.

For this, interviewers first assess the participant's liquid intake following a list, then proceeded with an open recall. This is the first pass. They used a script with probing questions for the respondent to recall the participant's dietary intake and then selected food groups from the reported foods in the survey CAPI, which is computer-assisted personal interview. It's our electronic data collection. In the second pass, they used a list to ascertain whether the participant consumed any foods from food groups not mentioned in the first pass.

Then those food groups from the second pass were recorded in the CAPI. Finally, they were asked about any other solid, semi-solid, or soft foods consumed. In case none of the food groups were marked as yes during this recall, the interviewer asked the follow-up question regarding intake of any solid, semi-solid, or soft food during the previous day or night. Next slide. The next method was the list-based dietary recall using sentinel food list from the IYCF diet quality questionnaire.

The enumerator asked the respondent to indicate which foods the participant consumed during the previous day and night by reading out items from a questionnaire, and those responses were marked in the CAPI. The question about the number of meals was also asked, in addition to questions about breastfeeding and milk feeds, to calculate those indicators, minimum meal frequency, and minimum acceptable diet. This adapted questionnaire contains 30 sub-food groups.

The sub-food groups were then collapsed into the eight food groups used to assess the MDD indicator for children following that guidance. Next slide. Our sample size and sampling approach. These samples are representative of the USAID Feed the Future Phase I zones of influence in Cambodia and Zambia. They count for country-specific estimations of attrition. The sample sizes provide more than 80% power to conclude that two methods are equivalent within 10 percentage points.

Assuming a reference minimum dietary diversity indicator prevalence of 30% and those other parameters listed there. That gave us a sample size of 636 in Cambodia and 608 in Zambia. There are two stages of sampling. In the first stage, we selected 30 enumeration areas or clusters within the zones using probability proportional to size. In the second stage, we randomly selected 20 or 21 households in each cluster based on a complete listing of all eligible households. That means there was at least one infant, each 6 to 23 months in the household. All right.

Now we'll hear more about data collection from Amry Ok. Next slide.

Amry Ok

Thank you so much. Next slide, please. In my presentation, I'm going to cover the field data collection in Cambodia. For those who were not familiar with Cambodia, Cambodia is one of the country in Southeast Asia bordering the Thailand, Laos, Vietnam, with a total population of 16 millions and total land areas of 181,035 square kilometers. Administratively, Cambodia is divided into 24 provinces and Phnom Penh municipality. GDP per capita is 3,200, estimated in 2021.

Target sites for the study are for provinces around Tonlé Sap Lake like, including Kampong Thom, Siem Reap, Battambang, and Pursat. Next slide, please. For the complementary feeding practices, according to the CDHS 2021, minimum dietary diversity is 48.6, minimum meal frequency 81.7, minimum acceptable diet 42. According to the Feed the Future Zone of Influence baseline 2017, the two minimum dietary diversity and minimum meal frequency is not available, but minimum acceptable diet is 35.5%. Next slide, please.

Okay, in this slide, I'm going to present about the questionnaire development and CAPI preparation. For the adaptation of the questionnaire, first, we receive original questionnaire shared by the USAID Advancing Nutrition team, and then we used this as a basis for adaptation based on the local foods. Data collection from the three methods, namely household observation, hybrid, and list-based sentinel questionnaire verse developed and revised through series of discussion and meetings between USAID Advancing Nutrition team and SBK Research and Development consultant.

The three tools were designed in Kobo Collect format based on the finalized paper versions of the final questionnaires and submitted to USAID Advancing Nutrition team for command feedback before training and institution in the field. Several rounds of feedback were provided by USAID Advancing Nutrition colleges and revision was made to improve the tool for ease of data entry and analysis. The questionnaires were translated into Khmer by national expert of SBK and back translation was made to make sure that the translation is accurate.

Pilot was conducted in a commune in Kandal province, which is outside of the actual study site. A total of 50 household with children aged 6 to 25 months old were randomly selected for this pile of data collection. Next slide, please. Okay, this slide, I'm going to talk about the recruitment of enumerators and supervisors and training of the data collection team. Expert and gender balance data collection team, including enumerator and supervisor who used to work for the previous similar studies for the project of GIZ ,Plan International, Save the Children in Cambodia were recruited to join the team.

Clear role and responsibilities of all data collectors, of field supervisor, enumerators were clearly described in the implementation manual and elaborated during the training. Training of the enumerator and supervisor. Several capacity-meeting activities were conducted to make sure enumerators and supervisors are capable to collect quality data. This activity includes number one, orientation workshop. The orientation workshops were conducted for two days in May on the 2nd and 3rd 2022 to four supervisors and enumerators who had previous experience in conducting nutrition surveys.

Upon the workshop, modifications were proposed to improve overall flow, clarity types of information captures, and alignment of the meaning of the text between English and Khmer. Second, main training of the data collector. Main training of the data collectors with a total of 34 researchers, including 4 supervisors and 30 enumerators was successfully held for five days from 9 to 13 May, 2022, including three days in-house training at SBK office in Phnom Penh and two-day pilot study. The training was organized with support from the IT specialists and SBK technical support staff.

Third, pilot testing. As mentioned already, the pilot test was conducted in Kandal Province from 12 to 13 May 2022. This commune was outside of the actual study site but has similar characteristic to the simple cluster. The total of 50 household with children aged 6 to 33 months old were randomly selected for this pilot data collection. Lastly, refresher training. Because of some changes in CAPI structures of the questionnaires, there was a suggestion from GSI team that a free refresher training was conducted to pay particular attention on the changes made.

All field staff, 4 supervisor and 34 enumerators were invited to participate in one full-day refresher training on Monday 6th June, 2022, to focus on the updates of the tool and protocol and refresh and provide the opportunity to practice the updated final CAPI tool. Next slide, please. Okay, in this slide, we'll continue to cover the organization of the field data collection. Field data collection. Data collection started on 8 June 2022, and ended on 15 July 2022, a total of 641 home visits were approached with 638 household observation, 636 hybrid interviews and 636 sentinel interviews were conducted in the 30 sample villages in the four provinces.

Four teams were responsible for this study in which one team comprising one supervisor and between 7 to 8 enumerators who are responsible for collecting data in assigned province. Five household were replaced from the random selected household list after three round of attempt. Recruitment of the participant between this study in each village. Supervisor first contacted the village chief to get the list of household with children 6 to 23 months old.

Then randomly sampled between 21 to 22 depending on the size of the village, children aged 6 to 23 months old plus reserved list, one day before starting the data collection at that particular village. This supervisor also ask the village chief to make an appointment with the selected household and draw the map for enumerators so that the enumerator are able to reach the household early in the morning. Next slide, please? For the two last slide, I will cover the challenges. First, the challenges and responses during the data collection.

There are several but I captured here the keys challenges. First of all, while the data collection was taken during the rainy season, some roads and paths were broken and slippery, so it was difficult for the car to enter the area. In such cases, the survey team sometimes had to walk from 10 to 15 minutes to take motorcycle or to take motorcycle to reach the sampled household. In some villages, some of the sampled households were a bit far from each other, especially in the mountainous area like Pursat province.

This took longer time to the survey team to travel from one household to the next. Some village chiefs were at first reluctant to cooperate with the team as the commune election in 2022 had just been finished, but after sharing ethical approval from the National Ethic Committee and with clear explanation of the objective of the survey, full support were received from the household head. Another challenge was, as expected, all visited village has not updated the list of children between 6 to 23 months old.

Therefore, the team had to spend time with the village chief to construct the list together. That was the solution we did. Another challenge was, as I mentioned in the previous slide, five household were replaced from the random selected household, list after three round of attempt. We got three household decided not to join. They did not give consent even after three attempts to meet by the enumerator because they were too busy with other work. Two household allowed enumerator to conduct household observation until the end but during the hybrid and sentinel interview, they could not participate because of some personal issue like a traffic accident.

Six additional neighboring villages were randomly selected and added to the existing village to complete the required number. Majority of the household respondents feel uneasy while being observed because they would be embarrassed. Supervisor needed to spend long hour in the evening to review the filled-in questionnaire before submitting to server but this happen a few days. Sometimes, they spend until midnight but after a few days, this time has been reduced. Next slide, please? Last slide, sorry. This will cover the challenges and responses in food classifications.

Three points. Some enumerators had difficulty in asking all the ingredient in mixed dishes and foods purchased from outside or from the market. For household observation, a classification of food group that was consumed day one was not done during the data collection and CAPI design did not allow for such classification at the field. The field enumerator observed the food and child and then recorded food name and food ingredient in the chart and in the food line on the CAPI.

Later as a statistician as that **[unintelligible 00:25:25]** reaches made food clarification by herself in evident with age food group. It was suggested that the CAPI design to allow-- for the observation form should record all three age food group that would reduce time to do the classification later by the data managers. Last points, classification of the food prepared in the market with different ingredient was difficult, such as pizza and other type of soup, or something like this. They share and discuss if sometimes they cannot find a solution, they share on the telegram in the team member.

Then took for the lead consultant to provide a final thought on the ingredient. Thank you so much, and that's all from me. Now. I would like to pass the mic to my colleague, Chiza.

Chiza Kumwenda

Thank you so much, Ok, for that information on Cambodia. Now I have the Zambian side of the story. I'd like to ask that you pay particular attention, especially around the differences between these two countries. Next slide. In terms of Zambia, looking at the few demographics we see, and I think this has also been published elsewhere that this is one of the youngest countries in the world, which means that as I speak now, it would have been a teenager speaking, the median age of 17.6 years, which is quite a young country, indeed.

Unlikely Cambodia, there are quite a number of Zambians, 19.6 millions, this is the very recent data that we have gotten. The census was just finished last year, and the results were published still last year, so quite a big operation in terms of numbers. Majority of the Zambians are staying in the rural areas, so up to about 60% of the population is in the rural areas. Administratively, Zambia is divided into 10 provinces. In the case of the current research or study, we were in the Eastern province.

The Eastern province, is one of the most populous provinces in the country, and the province largely depends on rainfed agriculture. We can imagine that, unlike the other provinces of the country, the Eastern province is quite agrarian indeed. With regards to landmass, the country in total has about 743,390 square kilometers, which is quite bigger than Cambodia, which had almost just 100,000 square kilometers. For GDP, the figures are boring, but between $65 and $110 billion US dollars as the economist side of the things.

Next slide, please. With respect to the nutritional and complementary feeding practices, we see that Zambia has had quite very poor indicators. For infant and young child feeding indicators, these are for the kids between 6 and 23 months, minimum data diversity was 23%, so 23% of the children were able to meet the data and diversity criteria. Also 41%, and unfortunately, quite very sad in that time 12% of the little ones, were able to meet the minimum acceptable diet, so quite, quite, very, very low figures indeed.

That is the data that's coming from the demographics and the health care survey 2018. Moving on, you see from the Feed the Future Zone of Influence in terms of the minimum data diversity, there has been an improvement in that particular section. Minimum new frequency to also improve including a minimum acceptable diet, this was as of 2019. After the implementation of the different interventions, we can see that things seem to be moving to the right direction in that section. Just to take you back a bit to say that our study was conducted in all the five districts where the Feed the Future Zone of Influence has been operating.

Basically, showing an improvement in those feeding indicators. Next slide, please. I will take you through some of the operational activities we undertook in order to start using the

questionnaires for capturing the data. Unlike our friends in Cambodia, we conducted the research a bit late, but nonetheless, you'll see that we did similar things. For example, for the multiple past dietary recall, we had adapted the questionnaire using the local food groups. That was very much based on some of the experiences that we have gathered, because previously we have worked a lot with dietary assessment tools.

Of course, we were one of the countries that assessed maternal nutritional intake. We had the quite handy examples of local food, so to adapt what was shared by the JSI. The questionnaire was also translated like our friends in Cambodia, we had two major languages, Nyanja and Tumbuka. These were back-translated into English to ensure that the translation was correct and also to a certain accuracy of our tool. Unlike the multiple-pass questionnaire, the least based we used the diet quality questionnaire. This one we did not adapt at all.

The reason was, it was the recommendation from the developers that we should not tamper, including even the way the questions flow. The way the questionnaire was designed by the developers of the diet quality questionnaire, that's how it was absolutely administered except for the language, which as is an ethical related issues, we need to translate them. That is the only thing that we did, but we used the May 2022 version of the same. If you see a different one today, please don't be surprised because by the time, we're using it was not updated.

That's why there will be variations. Next slide, please. On the organization of the field data production, the first thing we did was to embark on recruitment. Our recruitment strategy was to ensure that we only first of all give priority to those who have prior experience in it assessing dietary intake. The good news was that we had a pool of individuals who had spent some time with us assessing dietary assessment in a number of surveys, but much more importantly, those who participated in the MDD-W, we also had them.

Over half of them were previously involved in the MDD-W. We were very lucky on that plant. However, we didn't want to take it for granted, but we wanted to ensure that each one of the people who are coming to be trained, they should know that either they're going to be an enumerator or they would be supervisor. That decision was made after the training which also involved pre and post-test for the trainees. The idea was to ensure that people pay particular attention considering the seriousness of their assignment.

With regards to fieldwork, we conducted our study between March and April. Mostly it was done in March. The idea was to do it in December last year, or even November, but because of logistical reasons, we ended up being in 2023. However, we were most guided by the Feed the Future Advancing Nutrition USAID JSI individuals. They gave us quite very impressive support. We ended up also getting support from the Zambia Statistics Agency, where we wanted to ensure that our sampling was going to be as representative as possible, even if it is a methodological study.

We did want to stick to all the protocol-related guidance. Next slide. Next is the looking at the lessons length and experiences. Like I said, initially we have had some experience on using the MDD-W and of course, as individuals, but we noted that there could be very key lessons that we can share even today. The first one was related to team composition and leadership. From our experience, we have noted that the choice of a supervisor for a team is very critical in ensuring that one dedication and two quality assurance. No one has to lower the standard.

The team supervisors were identified during the course. No one was going to think that they are there already. We try to ensure that they are all at the same level, except after we have assessed for a number of things, including technical knowledge, also general field experience as well as leadership skills. We are very very lucky indeed to have such a pool of people from whom we chose leaders. The other thing was the structure of the training. We also from our experience have noted that quite all right, people would like to know new things in the form of theory, but role plays were one of the things we saw as being very critical in ensuring that we reinforce the basics.

Role-plays should form a very big component of what you are doing If you were to assess data intake. Also, internalizing training materials is one of the things which can also be promoted. I know that some of you have done this much more better, but please, as much as possible, allow the participants to lead, to take lead all the time in real-life examples. In terms of field data collection, we would like to propose here and also recommend that it's very critical to go to the field just immediately after the training because once you take a bit more time, some enumerators who have been trained, they may fall off.

Also others start forgetting stuff. In that case, you increase more on the aspect of attrition of the people that you have trained, but also you need much more time to do the refresher. Preferably less than a week, that would be fine in terms of ensuring retention of the knowledge that people learned. The next slide, please. One of the key lessons we have learned, and it's very good to share with the team here, is that of supervision. Supervision not just living to the supervisors of the immediate supervisors, but the research team.

In our case, we were lucky we had almost seven researchers from the University of Zambia. We were taking turns to go into the field and provide support and that was very critical. We have seen that it's very important because it also reinforces cordial relationship between our team and the community. Because we are going to communities where we have never been, there are some suspicions and also mistrust. Going there to cement that relationship is very critical. It's not quite enough to just let the supervisors run the show.

The senior supervisors also should be in the field to not among other things, not just to check the way the data is collected, but also to enhance that relationship between the data collection team and the research teams. The other thing is related to the community engagement, especially using the community volunteers. We have now and again seen from our experience and of course during this study, that community volunteers are doing quite a lot. Also on top of that, we do have frontline community workers.

This would be from the Ministry of Health, Ministry of Community Development, or Agriculture and such. Those take quite a lot of bigger role plays in terms of explaining some of the things which the community may not have. However, we also noted from our experience that it's very important and critical to sensitize the community of what they can do and what they cannot do. A good example was noted when it was time for sampling because the protocol is stipulating that you have to sample so randomly sampling as opposed to choosing individuals aligned, maybe friends or a child who looks like they can benefit.

It's very important in the first place during community sensitization to also include these details so that we don't end up seeing antagonizing each other. Next slide, please. This slide is just also showing some technical issues in terms of challenges, especially on the transportation part of

things. In our case here in Zambia we also conducted the survey during some rainy season and apart from the rains you see the picture down there, it's a number of people just lined up, that vehicle is stuck.

That is a very practical challenge indeed because the roads are quite bad in the fields. It's very important also to recognize that communities can also be a source of help as well on the same. From the point of transportation, it's quite a big challenge to move the study team, especially when you have to shift one enumerator from one household to go to the other because during the observation you use one enumerator. Then during the following day, the recourse, you need two numerators, so they have to be jungled around. Quite challenging was the logistical part of things.

However, we were very lucky that our teams had quite a number of vehicles which were able to move from one place to the other. In the case of getting stuck like that, the community also helped us without being asked for anything else, so quite very important also to remember the importance of community. In terms of taking for part of things, the classification of other vegetables. In our team, some of the data collectors, like I said, we had half those with experience with MDD-W as we didn't have. For some, it was the first time to understand these food groupings.

For example, during the training and the pretest, we noted that there was need for us to even explain in detail, what do we mean by a vegetable and what are the groups or the foods which belong to which vegetable group. We know that there are other vegetables which are grouped as vitamin A-rich while others are put in other vegetables. One of the most challenging one was for green maize because it was during the times when people had access to maize. The data collectors would sometimes ask, so if a woman has eaten or if I individually eat.

If you see on the lower portion there, there is a blazer where we are roasting the green maize. If someone has eaten just a cob, we will count that they have eaten a vegetable. That was something which we realized was something we needed to emphasize, "Yes, in this current affairs do that," and make sure that you allocate that to the other vegetables. The other challenge was ifisashi. This is a dish which is mixed with ground nuts and several other kinds of foods. In the DQQ, the diet quality questionnaire that we use for list-based, ifisashi was as an example of other vegetables.

That brought a bit of confusion. However, now we know that they have updated that version. Is not us who did, but I think the developers have updated the version. In terms of solution, like I've indicated, refresher training was also included to just ensure that those who were misclassifying the green maize started doing the correct things. Also, we had so much feedback from the supervisors, which was even enhanced through WhatsApp platform. At this stage, let me not take too much of your time. I would like to submit to my colleague Elise, who now come to give us the actual results. Thanks and over to you Elise.

Elise Reynolds

Thank you, Chisa. I'll now present our methods and main results. Next slide, please. For our main analysis that we use an equivalence testing approach to compare each of the proxy methods' performance to the in-home observation. Typical statistical testing assesses whether

estimates are different from each other, however, here instead, our primary objective was to test whether the proxy methods could perform equally as well as the in-home observation.

Therefore, significant results using this testing framework indicate that the methods are equivalent to each other, not different from each other. In order to test equivalence, we first estimated the prevalence of consumption of each food group, minimum dietary diversity, minimum meal frequency, and minimum acceptable diet for each population using the data from the in-home observation and each of the proxy methods. From there, we then compared the estimates from each of the methods to the observation estimates using a two-one-sided test equivalence approach.

In which we controlled for the sequence of method collection, meaning controlling for which proxy method was administered first on May 2. We used a 10% equivalence margin. If the estimated difference between the in-home observation estimate and the proxy method estimate were less than 10 percentage points above or below, then the proxy method could be considered equivalent to the observation. For each indicator, we also calculated the sensitivity and specificity for each indicator.

Sensitivity, meaning the proxy method's ability to classify someone, for example, who met MDD, minimum dietary diversity via the observation as meeting minimum dietary diversity using the proxy method. The same is true for each of the indicators and food group consumption. The specificity is just the opposite, meaning the method's ability to classify, for example, someone who did not meet minimum dietary diversity via the observation as not meeting minimum dietary diversity using the proxy method.

Again, the same is true for each of the food group consumption and indicators as well. Next slide. In each country, we also estimated the total cost for collecting, cleaning, and analyzing the data using each proxy method. From there, we can then calculate cost accuracy. We estimated cost accuracy of each proxy method by first calculating the percentage points of deviation of each method's MDD prevalence estimate from the in-home observation Minimum Dietary Diversity prevalence estimate. We then subtracted this number from 100 and divided the total cost by this value. Thus, the method that deviated less from the in-home observation would have a lower cost per unit of accuracy. The purpose of the cost accuracy measure is primarily to enable us to compare the two proxy methods to each other in terms of cost versus accuracy.

Next slide, please. Now, here we have some of our results. Here are the baseline characteristics for both countries. Some key differences I want to highlight between the two countries. For our respondents, a higher percentage attended secondary school in Cambodia than in Zambia. In Zambia, a greater percentage had farming related occupations than in Cambodia. For household characteristics, a higher percentage of households in Cambodia had an improved sanitation source, an improved water source, used a clean cook stove and had improved roofing materials. In Zambia, a higher percentage had improved flooring and improved walls than in Cambodia.

Next slide, please. Here we can see the indicator estimates from the in-home observation in both Cambodia and Zambia. Zambia had a higher percentage of children meeting Minimum Dietary Diversity and consuming most food groups, with a few exceptions. Dairy consumption and flesh food consumption were both much higher in Cambodia than in Zambia, as was egg

consumption, but egg consumption was low in both countries, and this difference was smaller than for other food groups.

Grain consumption in both countries was nearly universal, as was meeting minimum meal frequency, and because minimum meal frequency was nearly universal, estimates of minimum acceptable diet mirror those of Minimum Dietary Diversity. I'll primarily present results for Minimum Dietary Diversity and food group consumption in the following slides. Next slide, please. These next two slides show our primary equivalence results.

First, here are the results from Cambodia. Here, the red diamond represents the indicator estimate produced from the in-home observation data. The blue circle represents the estimate produced from the list method, and the black circle, the multiple pass method. Each indicator has short black horizontal bars above and below the estimates, and these indicate the 10% equivalence margin for the indicator. Here in Cambodia, we see the estimates for all indicators fall within the equivalence margin for both methods, except in one case. Please click. Thank you.

The multiple pass method overestimated the breast milk consumption beyond the 10% equivalence threshold, which you can see here highlighted in the red box. If we take in Cambodia MDD, for example, both methods were equivalent to the observation within our 10% equivalence margin, but the list estimate was only 1.4 percentage points higher compared to the observation, whereas the hybrid was 7.3 percentage points higher than the observation, but both falling within this threshold. Thus, the list was a closer estimate, which will be important later when we discuss the cost accuracy.

However, overall in Cambodia, we can consider both methods to be equivalent to the in home observation for assessing all indicators except for the multiple pass method's ability to estimate breast milk consumption. Next slide, please. Here are the results for Zambia, and here the story is slightly different. Both methods are equivalent to the observation in estimating breast milk consumption in grain, legume and other fruit and vegetable consumption.

However- click for the animation, please. Both methods estimates exceed the 10% threshold for Minimum Dietary Diversity estimation flesh, food, vitamin A rich fruits and vegetables and egg consumption only for the list method. While the methods here did not perform as well as they did in Cambodia, they're both performing about the same as each other. They're both making consistent non-equivalent overestimates in the same food groups. That is, except for the case of eggs, where the multiple pass method is considered equivalent but falls right on the P value threshold of 0.05.

Next slide, please. We can further look here at the sensitivity and specificity for these methods, particularly for Minimum Dietary Diversity. These give us some insight into why the performance may not have been equivalent in Zambia. In Cambodia, the top two charts, we can see that both methods are highly sensitive. They're nearly at 80% or above and they're also highly specific at above 80%. Even though the list is slightly less sensitive, it's slightly more specific. Both list and multiple paths are doing a good job at accurately predicting cases.

However, in Zambia, both are at 80% or above for sensitivity, but below 65% or at 65% or below for specificity, meaning that neither we're doing a particularly good job at identifying the true negative cases, those people that did not meet Minimum Dietary Diversity. This is because as can be seen in our previous slide, the proxy methods were over-reporting intake for a number of key food groups including flesh foods, vitamin A rich fruits and vegetables and eggs.

Next slide, please. For cost accuracy, we found that the multiple pass method was more expensive in both countries, primarily due to the higher costs from personnel time, preparing for data collection, and administering the survey.

The multiple pass method took 8 minutes longer than the list in Cambodia and 11 minutes longer than the list in Zambia. Thus, the list method had better cost accuracy. As we saw previously, it provided a more accurate estimate of Minimum Dietary Diversity, meaning it was closer to the in-home observation estimate, and it also cost less, as we see here. This translates into a lower cost per unit of agreement overall being $79 lower in Cambodia and $69 lower in Zambia. Next slide, please. Overall in Cambodia, both methods were equivalent to the in-home observation for all of our indicators except for breast milk consumption using the multiple pass method. Both methods were highly sensitive and specific for most indicators.

Next slide, please. However, in Zambia, both methods were equivalent for breast milk, grain, bean, dairy, and other fruit and vegetable consumption, but neither was equivalent for Minimum Dietary Diversity, flesh food, vitamin A rich fruit and vegetable consumption. The multiple pass but not the list method was equivalent for egg consumption. However, in cases of non-equivalence, both methods were overestimates. Finally, both methods had generally high sensitivity greater than 80% and a generally low specificity less than 65%, one estimating Minimum Dietary Diversity in particular. Finally, in both countries, the list-based method was more cost accurate. I will now turn it over to Christine Stewart for a discussion of the results.

Christine Stewart

Thank you, Elise. Okay, we can go to the next slide. All right. I would like to summarize our key findings from this analysis and provide some conclusions and recommendations. Overall, our primary finding is that we found that the list-based recall method provided estimates of the Minimum Dietary Diversity prevalence that were closer to the true value, as measured by the in-home observation. In addition, this method was slightly less costly to administer. Taking together, therefore the list-based recall method offered the greatest cost accuracy ratio.

In other words, the lowest cost per unit of accuracy. There were some slight differences between the two countries that we would like to highlight. In Cambodia, we found that the prevalence estimate from the list-based recall method was statistically equivalent to the in-home observation with a difference of only 1.4 percentage points. The prevalence estimate from the multiple pass method was within our equivalence margin, but it was a larger difference with a difference of 7.3 percentage points difference between the two estimates.

While this magnitude of difference fell within our equivalence margin, it's a magnitude that could potentially be of importance to programs or tracking population trends over time. The reason for the overestimate was primarily due to over reports of breast milk consumption than were actually observed during the in-home visit. Now in Zambia, the list-based recall produced a prevalence estimate that was four percentage points higher than observed, whereas the multiple past recall also produced estimates that were higher than observed.

In this case by 8.3 percentage points, and this was primarily due to over-reporting of key food groups in specifically flesh foods, vitamin A rich fruits and vegetables and eggs. These are often some of the same food groups that are emphasized in complimentary feeding behavior change communication programs. We think that this over reporting may be indicative of reporting bias.

Next slide, please. Now, we have not placed very much emphasis on the analysis of minimum meal frequency and minimum acceptable diet indicators or MMF and MAD. This is because the MMF prevalence was nearly 100% in both settings.

There was very little variability and in prevalence. There was also very little of variability between either of the proxy methods and the observation. With the exception of Zambia, the list-based recall did produce prevalence estimates that were slightly lower than observed. Because the MMF prevalence was 100%, and the MAD indicator is a composite of MDD and MMF, the results for MAD were nearly identical to what we've shown for MDD, so we haven't presented much here today. Next slide. Now the study has a few important strengths and limitations.

We had reasonably large sample sizes of more than 600 participants per country and so we could look at it, analyze data separately by country. This enables us to look at both similarity and differences across sites. The sampling method was representative within defined regions that represent the feed **[unintelligible 00:57:18]** future zones of influence in both countries. The results are therefore generalizable to other similar settings. A unique strength of this study is that we have collected comprehensive data on cost from the study teams, as well as from the analysis teams administering the surveys using both methods, and therefore this enables us to evaluate and compare which method allows for the greatest degree of accuracy at lowest cost.

The study does have some limitations, though. We used a 10 percentage point equivalence margin, which may be considered too large. However, greater precision would've required much larger sample sizes than were likely feasible. Second, this validation study does not mimic real world circumstances. Specifically, we would not typically administer these surveys together with an in-home observation. During an in-home observation, people may change their diets as a reaction to knowing that they are being observed. However, in our particular case for this study, we are not so concerned about that potential bias per se, because we were most interested in evaluating how the recalls the subsequent day reflected to what actually happened in the home.

Nevertheless, the in-home observation may have primed participants to better recall foods on the subsequent day than they would under normal circumstances. For this reason, there may be less random error, in other words forgetfulness, than would be expected under normal circumstances when the dietary recall may have been administered unannounced. Finally, for the costing data, it's somewhat difficult to disentangle time and costs incurred under normal survey conditions versus those that are incurred within a validation research study such as this. Also, there was some time tracking that was done retrospectively rather than in real time which presents some limitations as well. Next slide.

Our key conclusion from this study is that for large scale multi-topic surveys, the list-based recall produced slightly more accurate estimates of the MDD at the population level. It took less time to administer and was less costly to implement. However, there are some caveats. We saw evidence of reporting bias in our analysis, and this is a well-known limitation of dietary recall assessments. Social desirability bias refers to the tendency to respond in such a way to avoid criticism, and social approval bias refers to the tendency to seek praise.

Both of these forms of bias may lead respondents to over-report foods perceived to be "healthy" or under-report foods perceived to be "unhealthy" based on what they perceive the

surveyor or the observer to believe. This type of bias may be particularly problematic in the context of interventions promoting consumption of particular food groups. We do urge some caution in how these indicators are interpreted in such contexts. Lastly, we would like to remind everyone that single day recalls from dietary assessment instruments such as these are really only intended to be interpreted at the population level.

They're not recommended for use in estimating individual level usual dietary patterns, due to random within-person error from day-to-day variability and intake. These forms of random error will reduce both the sensitivity and specificity of the assessment instrument. However, the instrument can still be good at estimating population level prevalence. Next slide. I'd like to now turn it back over to Lidan for her acknowledgements. Thank you.

Lidan Du-Skabrin

Thank you all. Thank you, Christine, for offering us your interpretation and conclusions. We have a lot of people to acknowledge, and we have the privilege of working with a number of subject matter experts, and some of them I really do hope that they are in the audience. I've seen Giles and Sorrel. In addition to these subject matter experts we benefited from designing our study protocols, we also worked with a number of other technical experts in various institutions, and particularly in USAID, University of California, Davis, and UNICEF, and the other agencies and also our own colleagues on USAID Advancing Nutritions.

In the remaining 20 minutes I would like to open up the floor to address some of the questions. My colleagues particularly Jennifer has been working tirelessly answering questions on the site in the chat in the Q&A boxes. Where do we start? While they are still addressing the questions in the text, I would like to bring my colleagues in Cambodia and Zambia back to the presentation room, and to ask you one question that I was intrigued by one of our audience's question there.

If the data collection was conducted at a different season, as we recall both data collection happened in the rainy seasons, how would that affect the field work? Meaning will there be more foods or fewer foods to go through in the recall, and will that pose any more difficulties in classification or recording? Would that be introducing any errors? Chiza and Amry, which one of you would like to go first? Chiza, here you go.

Chiza Kumwenda

Thanks Lidan, and thanks to my **[unintelligible 01:03:58]** in terms of the effect of seasonality. Certainly yes, the season variability as result of going to the study sites when there's let's say for example plenty to eat is going to literally reflect the actual diversity mostly. From the Zambian perspective, in terms of minimum meal frequency for example, we have conducted these studies in communities maybe problematic surveys, not research based but using programs to assist infant and **[unintelligible 01:04:35]** feeding practices.

Through and through even in the Eastern province as an example where we were, the minimum meal frequency has quite substantially increased mainly due to the times when we assess. There are a number of NGOs working in communities and certainly we know that certain things have improved, like we were showing you the results from the DHS in 2018 demonstrating quite

low prevalences of the appropriate feeding practices. That trend seems to be changing substantially, and we are very much hoping it is very much linked to what was concluded by Christine to say, are there possibilities of certain intervention? Yes, indeed.

In our feed, the future zone where we were, there has been some form of what are called scaling up nutrition interventions. The government is working quite very much on the areas of infant and young **[unintelligible 01:05:33]** feeding in the context of **[unintelligible 01:05:38]**. Yes, the minimum meal frequency is increasing and this is not just for the research-related or observation bias, but it could be, yes, there is some aspect of bias that can come and obviously that is the case, but the magnitude is not as a result of bias. However, in terms of diversity, yes, season can influence and for the sake of misclassification, we hope that when there is less food they couldn't be much issues with misclassification.

Of course, as my colleague, Ok, is coming on, we had trained our enumerators and we do have some substantial experience also doing home surveys. We even are observing intake of, for example, now we have these lipid-based nutrient supplements we are actively observing in homes to establish the actual intake. There is a little bit of some bias we are not very much worried about it because from what we have seen so far, it seems like indeed things are moving in the right direction. Otherwise, I don't have much to say. I hope that my colleague Ok, can share from his experience. Over.

Lidan Du-Skabrin

Thank you. Amry, would you like to follow up? Thank you.

Amry Ok

Yes, thank you so much. My answers that, yes, of course, there's a possible sessional unpack in the feeding practices. In our case in Cambodia we conducted this study in the middle of the rainy season, in May and June especially among the poor and **[unintelligible 01:07:29]** household, they might be not enough food available at household level. Also some impact on the availability of the green vegetable. There would be maybe some more green vegetable during the rainy season than the dry season. Also seasonal fruit like watermelons and mango, banana, papaya, something like this. That can be found.

If this study conducted during the harvesting session like in November, December they may have better opportunity to have more diverse food in and more frequent interval, because during the harvesting season there will be more food in terms of rice and also they also can grow some fruit and some vegetable as well. Yes, that's what we observe, and that's my thought about that. It's not only that, but a feeding pattern also affect--

Including the living condition of the family also can affect because we observe that in urban one area, for instance, in **[unintelligible 01:09:00]** that we conducted in a **[unintelligible 01:09:03]** which is close to the **[unintelligible 01:09:05]** town which is the living condition of the households better than the rural area. Children generally eat more nutrient and diverse food than the rural area. Yes, that what I can provide at the moment. Thank you so much for the patience.

Lidan Du-Skabrin

Okay. Thank you. Amry, please don't leave yet. I would like to follow up with a related question, and one of the audience was asking, do you have any reflections on the two different data collection methods, given your findings, particularly on the potential of misclassifying foods when using an open-ended approach in a multiple path, versus identifying classifying food when using a closed-ended Chiza, I saw your hand is up, but let's give Amry the floor first since he has already. Thank you. Amry.

Amry Ok

[unintelligible 01:10:12] the question is a little bit mixed up for me, can you clarify a little bit more?

Lidan Du-Skabrin

Sure. The question was about your reflection on the ability of the method, classifying accurately the food into the designated food group when you use the open-ended approach versus the close-ended approach. The close-ended approach meaning the list based and the open-ended meaning the open recall.

Amry Ok

Yes, the close-ended approach. Our reflection was that it was easier for the enumerator to administer and also shorter time and would be less cost-effective- or less cost in terms of spending. For the open recall it take a longer time. It's around 20 minutes for each to administer it.

Lidan Du-Skabrin

Thank you, Amry. Chiza.

Chiza Kumwenda

Thanks, Lidan. What I'm taking out of this is that in terms of our experience and our results, we have seen that the categorization issues might be mostly for the vegetables, because, for example, if it is fresh and eggs and breast milk or breastfeeding and even grains and **[unintelligible 01:11:47]** and in that order, it is not quite very difficult for people to allocate which food group does what the person has said belong to? Basically what we have noted is that it seems to be mostly to do with certain foods.

What was Elise's presentation we saw that for example Zambia we had fresh foods and eggs and vitamin A rich foods, so for that it's more likely to be cramped within the list based. However, even if the DQQ was validated at some point and that from our experience you

could see if somebody is asking the woman did the child eat from the following food groups? They will have a yes and no and that form of questioning, which I think was validated, even the cognitive processes which I'm told they were conducting in different research settings, meaning that it wasn't just a mere yes and no, because obviously there is a limit to how much a person can lie.

From our experience we have noted that it's not quite a big variation in terms of whether someone miscategorizes more in list based or miscategorizes more in open recall. Basically, maybe from our end, we might not be explicit here the miscategorization was mostly on the other vegetables, especially because we had newer people who came on board and even others who have been in nutrition cycles to be told that our green maize, which we normally eat from this end, is not part of the grains, as some people call them, as cereals, but it's a vegetable.

That is in both cases, however, who decided what food to belong to a group? In the list based, it is list based. In the open based with extensive training and the **[unintelligible 01:13:48]** and pretesting-- In fact, as of now, as I speak, we have very full confidence that the categorization was as we would have done, or as if anybody else would have done. Yes, that's what we can respond to. Otherwise, thanks for that question. Over.

Lidan Du-Skabrin

Okay, thank you very much. I would like to bring everybody's attention to the Q&A box that we have on the platform. There are many good questions being fielded over there, and our panelists are providing quick answers over there as well. My next question will be directed to Elise and Christine. I know we didn't rehearse this.

Would you like to comment on the potential speculations, let's say, on what might be the cause on the specificity, the differences of- particularly the specificities of the two methods in Zambia versus the specificities in Cambodia? Because they demonstrated pretty different characteristics in the two contexts. Elise and Christine, would you like to answer that question? Thank you.

Christine Stewart

Sure. I can maybe start and Elise please chime in if I miss anything. Specificity is a measure of how accurately the instrument classifies people who did not meet the MDD criteria. It's a reflection of how well the instrument classifies the low-food group consumers. In Zambia in particular, there was some evidence of over-reporting of a few key food groups, so what this led to is an overestimate of the MDD, and because of that there was lower specificity in particular with the multiple pass recall method.

However, sensitivity was quite good in both settings and sensitivity is a reflection of how well the instrument classifies people who did meet the criteria. In other words, people who had high MDD. I think that the main difference that is being illustrated by the specificity differences between Zambia and Cambodia, is that there was a little bit more over-reporting of food group consumption in Zambia than there was in Cambodia.

Lidan Du-Skabrin

Thank you, Christine. Elise, do you have anything to add?

Elise Reynolds

No, I think **[inaudible 01:16:51]** Christine.

Lidan Du-Skabrin

Okay, thank you. Chiza and Amry, I'm returning one question back to you again on the practical execution of such a data collection study in the context of on the ground. Could you please try to help one of the audience to answer this question, when you have a mixed dish that's not necessarily homemade, could that be one of the reasons explain some differences between the observed versus the reporting methods? In that situation, who decide what the main ingredients are in those dishes and therefore record in the **[unintelligible 01:17:45]**? I know you both encountered those situation, probably more so in Cambodia. Amry, would you like to give a first step at this question?

Amry Ok

Chiza, would you like to go first?

Lidan Du-Skabrin

We're talking about foods not homemade and brought or bought from outside. Amry, you can go—

Amry Ok

Okay. Yes, I think that also could be possible, that could be a difference between observation and the interview open recall because during that observation, we have a specific food that the enumerator could see. Then **[unintelligible 01:18:52]** some food that can be separated, but for the food that cannot be separated, for example, the **[unintelligible 01:19:04]**, the porridge that is so mixed like- bought from the market. The enumerator could then if I was to go back to where they bought from the store to ask for which ingredient they put in so that could decide which ingredient they put in.

If they bought from somewhere which was not possible to go back to the place where they made it that we share, as I mentioned during my presentation on the Telegram, so that the enumerator, the supervisor in the group can share from experience. For example, some households, some family, they ate the food from far away from, for example, Pnom Pen to Battambang, because children living in Pnom Pen and the parent eat fancy food from Pnom Pen- so they could not identify. We can ask- those who made the decision, the final decision for-- This is so difficult food we share among ourselves, but the lead consultants made the decision in this case. Thank you.

Lidan Du-Skabrin

That's very helpful. Thank you very much. Chiza, would you like to share your experiences collecting data in Zambia's context?

Chiza Kumwenda

Yes. **[inaudible 01:20:53]**

Lidan Du-Skabrin

We don't hear you very well.

Chiza Kumwenda

Thanks, **[inaudible 01:21:05]** we are even following these mothers. We did have enumeration area. These are places where we are sampling our participants, even in towns, if we are to call them as towns. However, we did not have much issues with mixed dishes away from home because most of the foods that people were eating are the ones which we even used during the training and the pretest and also during the pilot.

Majority of the foods eaten away from home were most these processed foods which would not have already given us trouble because we were using the guidelines from the IYCF, guidelines from the UNICEF and WHO where the decision as to whether the main ingredients should count as main is said to be if we look at the amount. If we are preparing a meal that will involve a number of ingredients, so we look at the main ingredients which will go into the dish. One, two, three in terms of size.

It's actually the enumerator who has been quite, very well trained to say, okay, if they will prepare, maybe if it's a she, in our case we will have ground nuts and maybe any vegetable and if they add other vegetables, maybe onions, then substantially if it is maybe the third ingredient- if they have three so obviously it's two up to three. The decision as to whether one ingredient counts is in terms of the amount. That's why we would not have issues most of the time. We decided to as much as possible stick to the guideline. Unfortunately on the children, the foods- we didn't have too many mixed dishes, which we hope that should be the case, but otherwise, we didn't have much issues. Over.

Lidan Du-Skabrin

Great, thank you. It sounds like training and pilot testing and field pilot testing and roleplay really helped to improve the clarity of how foods should be classified into their rightful place. In the next one minute, Jennifer, I want to bring you back to one of the questions we received. Unfortunately, we couldn't post on the Q&A. In this study, is the multiple pass method used exactly the same as the approach used by the mixed survey, because that should have helped reduce the cost difference and may also impact differences in the estimates against the in-home observation. What's your take on that? One minute, please.

Jennifer Yourkavitch

Thanks, Lidan. We constructed the questionnaire and used the method as advised in the WHO UNICEF Guidance 2021. I believe the next approach is just slightly different, but I can't speak to that definitively. Perhaps our colleagues from UNICEF want to chime in on that.

Lidan Du-Skabrin

Can we give the mic to our colleagues in UNICEF? If not, whoever is in the audience, please provide a written comment in the chat box. We're rapidly approaching time. Before I pass the mic to Erin to give us her closing remarks, I would like to send a teaser that we are preparing a manuscript with a lot more information included on this study to be submitted very soon. Please stay tuned. Erin, you have the floor.

Erin Milner

Great, thank you. Thanks for the presentations and the discussions. I think moving to the next slide or two-- Taking a step back while we progress the slides, taking a step back, we at USAID commissioned this study because we invest in and use a variety of sources of dietary data with children, of course, being a key population of interest for our nutrition programs. Such dietary data are critical for understanding how programs and policies are working, as well as the future of interventions.

We know there are a variety of methods used to collect dietary data for children, as has been described. It is important to understand the nuances of these methods in addition to which methods are most accurate and feasible in different settings so that we can rigorously design, monitor, and evaluate policies and programs to ultimately improve children's dietary intake and nutrition. This study is important because results not only inform the accuracy of methods, but also provide some cost and feasibility implications for practical use of the methods in household surveys as well as program assessments.

It's helpful to learn that the list-based recall method yielded slightly more accurate estimates of Minimum Dietary Diversity prevalence in both study sites, and was slightly less costly to administer making it the more cost-accurate method, particularly for large-scale multi-topic surveys. Although we saw some of the findings were a bit nuanced. The results also hint at the importance of understanding the context in terms of existing interventions to improve diets, for instance, by promoting specific foods or food groups when interpreting results.

That said, the findings imply that harmonized methods to estimate children's dietary diversity could be useful to ensure measurements can be compared, especially when thinking about large-scale population-based household surveys. Overall, these findings are a key contribution to the evidence-based to inform decisions about the measurement of children's diets, and importantly about how to most effectively collect and interpret data to monitor, evaluate, and design policies and programs to improve children's dietary intake and nutrition. With that, thanks for joining and we look forward to continuing the discussion.

Lidan Du-Skabrin

Thank you very much, Erin for giving this fabulous roundup. Thank you for everyone attending this webinar, and we will be sharing our resources soon after this and with all the slide decks. Please continue to send us your good questions following the email down in the lower left corner on this slide. Thank you very much.

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