REPORT

FORTIFICATION ASSESSMENT COVERAGE TOOLKIT (FACT) SURVEY IN PAKISTAN, 2017

AUGUST 2018[1]

DISCLAIMER

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[1] Correction note: An earlier version of this report contained an error in Figure 5 that has been corrected in the figure and all related text in this version of the report.

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Abbreviations

AME	Adult male equivalent
CAPI	Computer-assisted personal interviewing
DHS	Demographic Health Survey
EAR	Estimated average requirement
EAs	Enumeration areas
FACT	Fortification Assessment Coverage Toolkit
FAO	Food and Agriculture Organization
FFP	Food Fortification Programme
GAIN	Global Alliance for Improved Nutrition
HHS	Household Hunger Scale
HIES	Household Integrated Economic Survey
ICFI	Infant and Child Feeding Index
IYCF	Infant and young child feeding
KP	Khyber Pakhtunkhwa
MDD-W	Minimum dietary diversity for women of reproductive age
MPI	Multi-dimensional Poverty Index
MUAC	Mid-upper arm circumference
NOC	No Objections Certificate
OPM	Oxford Policy Management
PSU	Primary sampling unit
RDA	Recommended dietary allowance
RNI	Recommended nutrient intake
SES	Socioeconomic status
USAID	United States Agency for International Development
WHO	World Health Organization
WRA	Women of reproductive age

1. Summary

High levels of micronutrient deficiencies exist among young children and women of reproductive age in Pakistan, which may have long-term negative impact on individual health and well-being. Large-scale fortification of staple foods is proven to be a cost-effective and scalable intervention to tackle widespread micronutrient deficiencies. In Pakistan, national legislation mandating the fortification of oil/ghee with vitamin A and D has been in place since the early 1960s, and voluntarily salt iodization has been occurring in some provinces of the country since the 1980s. Wheat flour fortification with iron and folic acid has also been occurring voluntarily in Pakistan since 2007. Mandatory legislation for wheat flour fortification exists only in the province of Punjab since 2014 and which, in addition to iron and zinc, also requires zinc and vitamin B12 to be added. There is currently limited data on the coverage, and consumption of fortifiable and fortified foods, as well as the quality of fortified foods in the country. In 2017, a cross-sectional survey, comprised of a household assessment in three provinces (Balochistan, Punjab, and Sindh) and a market assessment in four provinces (Balochistan, Punjab, Sindh, and Khyber Pakhtunkhwa), was implemented using the Fortification Assessment Coverage Toolkit (FACT). The aim of the survey was to provide data on household coverage and consumption of fortifiable and fortified foods among children (under five years of age) and women of reproductive age, and availability and quality of fortified foods from markets.

The household component survey 704 households in Balochistan, 690 in Punjab, and 710 in Sindh and collected data on household sociodemographic characteristics, food security, dietary diversity, fortification logo awareness, and purchasing and consumption patterns of fortifiable salt, oil/ghee, and wheat flour. The market component assessed retail outlets in 10 purposively selected markets (three rural and seven urban) across the four provinces to identify available brands of salt, oil/ghee, and wheat flour. Up to 12 specimens of each food vehicle brand found in the marketplaces were collected and analyzed as composite samples to determine the micronutrient content of each brand (i.e. iodine in salt, vitamin A in oil/ghee, and iron in wheat flour).

According to the market survey results, 30 brands of salt, 149 brands of oil/ghee, and 67 brands of wheat flour were present in marketplaces across the four provinces. The brands were locally produced except for one salt brand and 11 oil/ghee brands. Overall, 26 brands (87%) of salt, 102 brands (69%) of oil/ghee, and 34 brands (51%) of wheat flour were confirmed to be fortified to some extent. However, the fortification content was inconsistent with only one brand (4%) of salt, 28 brands (19%) of oil/ghee, and 14 brands (21%) of wheat flour being fortified in compliance with the national standards. Additionally, 4 brands (13%) of salt were fortified above the national standard. Of the imported brands, the single salt brand was not fortified and only two brands (18%) of oil/ghee were fortified to some extent.

Household coverage of the food vehicles assessed in the survey was expressed as the proportion of total surveyed households that consumed a food vehicle (in any form), consumed a fortifiable food vehicle (i.e. industrially produced), and consumed a fortified food vehicle (i.e. confirmed by brand identification and laboratory analysis of samples collected from markets).

Salt and oil/ghee were universally consumed by all households (100%) in the three provinces. Coverage of fortifiable salt was relatively high (84% of households in Balochistan, 75% in Punjab, and 98% in Sindh) and coverage of fortifiable oil/ghee was nearly universal

(98-100%) in all provinces. Wheat flour was also universally consumed (100% of households) in Balochistan and Punjab, and by 92% of households in Sindh; however, coverage of fortifiable wheat flour was considerably lower among households in all three provinces: 52% in Balochistan, 31% in Punjab, and 63% in Sindh. Among households that reported consuming a fortifiable form of wheat flour, wheat flour produced by chakki mills accounted for 68% of the fortifiable flour consumed in Balochistan, 40% in Punjab, and 47% in Sindh[2].

Consumption of the fortified food vehicle was found to relatively low; however, it is important to note that many households were not able to report a brand name for certain food vehicles and as a result there was a high proportion of households with unknown fortification status when attempting to link the reported brand used in the household to the laboratory analysis of food specimens collected from markets. As a result, estimates of consumption of fortified food vehicles reported here are likely underestimated and should be interpreted with caution. In Balochistan, confirmed coverage of the fortified food vehicle in this survey was 11% for salt (71% unknown), 39% for oil/ghee (54% unknown), and 5% for wheat flour (45% unknown). In Punjab, confirmed coverage of the fortified food vehicle was 36% for salt (38% unknown), 31% for oil/ghee (65% unknown), and 1% for wheat flour (25% unknown). In Sindh, confirmed coverage of the fortified food vehicle in this was survey was 34% for salt (64% unknown), 20% for oil/ghee (59% unknown), and 10% for wheat flour (40% unknown).

Micronutrient contribution from fortified foods currently included in the fortification programme was expressed as a percentage of the EAR (for iodine and vitamin A) and RDA (for iron) among the target population groups. Estimates were made under the current conditions and modelled to assume the foods were fortified in compliance with the Pakistani fortification standards.

Fortified salt contributed on average 31% of the EAR for iodine among children 12-23 months, 39% among children 24-59 months, and 40% among WRA in Balochistan. In Punjab, these figures were: 45% among children 12-23 months, 54% among children 24-59 months, and 51% among WRA. In Sindh, these figures were: 32% among children 12-23 months, 43% among children 24-59 months, and 37% among WRA. When modelled assuming compliance with the standard, these estimates increased to more than 100% of the EAR for iodine (i.e. 120-224%) among all population groups in all three provinces.

Fortified oil/ghee contributed on average 35% of the EAR for vitamin A among children 12-23 months, 45% among children 24-59 months, and 33% among WRA in Balochistan. In Punjab, these figures were: 52% among children 12-23 months, 60% among children 24-59 months, and 42% among WRA. In Sindh, these figures were: 35% among children 12-23 months, 41% among children 24-59 months, and 28% among WRA. When modelled assuming compliance with the standard, these estimates increased to 64% of the EAR for vitamin A among children 12-23 months, 78% among children 24-59 months, and 56% among WRA in Balochistan. In Punjab, these figures were: 74% among children 12-23 months, 83% among children 24-59 months, and 60% among WRA. In Sindh, these figures were: 65% among children 12-23 months, 76% among children 24-59 months, and 52% among WRA.

[2] Correction note: An earlier version of this report contained an error that incorrectly reported the proportion of households consuming fortifiable chakki flour here that has been corrected in this version of the report.

Fortified wheat flour contributed on average 5% of the RDA for iron among children 6-11 months, 12% among children 12-23 months, 12% among children 24-59 months, and 15% among WRA in Balochistan. In Punjab, these figures were: 1% among children 6-11 months, 6% among children 12-23 and 24-59 months, and 8% among WRA. In Sindh, these figures were: 5% among children 6-11 months, 9% among children 12-23 and 24-59 months, and 13% among WRA. When modelled assuming compliance with the standard, these estimates increased to 5% of the RDA for iron among children 6-11 months, 14% among children 12-23 and 24-59 months, and 17% among WRA in Balochistan. In Punjab, these figures were: 2% among children 6-11 months, 11% among children 12-23 months, 10% among children 24-59 months, and 12% among WRA. In Sindh, these figures were: 9% among children 6-11 months, 15% among children 12-23 months, 16% among children 24-59 months, and 24% among WRA.

Mean monthly expenditure on fortifiable oil/ghee was PKR 930, PKR 970, and PKR 1061 in Sindh, Punjab, and Balochistan, respectively. This accounted for 92%, 107%, and 111% of monthly household expenditure on edible oils and fats, and 8%, 9%, and 9% of monthly household expenditure on food and non-alcoholic beverages, in Sindh, Punjab, and Balochistan, respectively, when compared to the provincial average expenditures from the HIES 2015-2016. Mean monthly expenditure on fortifiable wheat flour was PKR 1,540, PKR 1,558, and PKR 1,923 in Sindh, Punjab, and Balochistan, respectively. This accounted for 103%, 99%, and 86% of monthly household expenditure on edible oils and fats, and 13%, 14%, and 16% of monthly household expenditure on food and non-alcoholic beverages, in Sindh, Punjab, and Balochistan, respectively, when compared to the provincial average expenditures from the HIES 2015-2016.

In summary, the survey provided evidence that fortification of salt and oil/ghee could have a large impact on the intakes of iodine and vitamin A among young children and WRA in Balochistan, Punjab, and Sindh. However, for this to occur all products would need to be fortified in compliance with the fortification standard. Currently, most of these products are fortified but below standards underscoring the need to focus efforts on increasing compliance. To increase the availability of appropriately fortified foods, drivers of poor compliance at the production level must be ascertained and addressed through effective corrective actions. These can include, but may not be limited to, strengthening monitoring and enforcement efforts and the identification and implementation of effective incentives and penalties to drive compliance. A high priority should be placed on locally manufactured products as few brands are imported.

For wheat flour, the potential for impact from large-scale fortification is more limited considering its much lower coverage in a fortifiable form, a factor that is further compounded by the fact that a large proportion is produced by small-scale chakki mills. Consequently, it is estimated to provide only a minimal to moderate contribution to iron requirements among target populations, even if fortified according to the fortification standards. Furthermore, there are equity gaps in coverage with more vulnerable groups less likely to consume the fortifiable form thus limiting potential for impact in some population sub-groups. Additional analysis into the feasibility of this program considering the high proportion of small-scale millers and into the magnitude of the benefit of this program (by the supply of different micronutrients) in addition to other dietary sources among different populations groups is needed. Complementary targeted interventions may be required for specific population sub-groups that will not be reached by the large-scale wheat flour fortification program.

2. Introduction

Often referred to as the 'hidden hunger' because in most circumstances there are not physical signs, micronutrient deficiencies are known to negatively impact an individual's health and well-being, possibly leading to grave consequences such as mental impairment, chronic diseases and death if not prevented or treated (Black et al. 2013). In Pakistan, the 2011 National Nutrition Survey (NNS, 2011) revealed high rates of micronutrient deficiencies among pregnant women with 37% being deficient in iron, 46% in vitamin A, and 69% in vitamin D. Among children these figures were 44% being deficient in iron, 54% in vitamin A, and 40% in vitamin D.

Large-scale fortification of staple foods is a cost-effective, scalable and evidence-based strategy to help address widespread micronutrient inadequacies, when implemented under proper conditions and adequately enforced (World Health Organization (WHO) and Food and Agriculture Organization (FAO) 2006; Horton, Alderman, and Rivera 2008). In Pakistan, national legislation mandating the fortification of oil/ghee with vitamin A and D has been in place since the early 1960s. There is currently no national legislation mandating salt iodization in Pakistan; however, some provinces have implemented their own mandatory legislation, specifically Punjab and Gilgit Balistan in 2011, and Sindh in 2013. Wheat flour fortification with iron and folic acid has also been occurring voluntarily in Pakistan since 2007; however, mandatory legislation for wheat flour fortification exists only in the province of Punjab since 2014 and it includes the addition of not only iron and folic acid, but also zinc and vitamin B12.

To improve wheat flour fortification in Pakistan, the Food Fortification Programme (FFP) was created as a five-year investment by the United Kingdom government, running from 2016 to 2021. The program aims to fortify wheat flour produced at commercial roller mills with iron and folic acid, as well as edible oil/ghee with vitamins A and D. The FFP will support the government at federal, provincial, and district levels to establish the necessary legislative and regulatory frameworks. The program will also support the wheat flour and edible oil/ghee industries by providing technical assistance. FFP includes communications campaigns at district level to build consumer demand and generate evidence-based data through research studies to improve the implementation of food fortification in Pakistan.

It is expected that current consumption patterns of fortifiable and fortified foods are likely to be a reasonable proxy for future consumption; however, at this time there is little evidence on the coverage and consumption of fortifiable and fortified foods and only limited evidence on the compliance of some fortified foods with national standards. Understanding the current coverage, consumption and quality of fortifiable and fortified food vehicles is vital for estimating the potential for impact over time among different population sub-groups in Pakistan.

3. The FACT Survey

3.1 BACKGROUND

Between September and December 2017, GAIN and OPM conducted a cross-sectional survey in three provinces of Pakistan (Balochistan, Punjab, and Sindh) using the Fortification Assessment Coverage Toolkit (FACT) methodology to assess the program coverage of fortified staple foods and their potential micronutrient contributions.

FACT is a survey instrument that was developed by the Global Alliance for Improved Nutrition (GAIN) for carrying out coverage assessments of both population-based (i.e. staple foods and/or condiments) and targeted (e.g. infant and young child) fortification programmes (Friesen, VM et al. 2017). The toolkit was developed to help stakeholders achieve greater program impact by documenting successes, identifying potential barriers related to program coverage, and improving programmes based on evidence of program performance.

3.2 OBJECTIVES

The general objective of the survey was to determine the household coverage of fortified foods and their potential contribution to the micronutrient intake among children (under five years of age) and WRA (18 to 49 years of age) in three provinces (Balochistan, Punjab, and Sindh) of Pakistan.

The specific objectives of the survey were:

1. To assess the coverage of fortifiable and fortified salt, oil/ghee, and wheat flour among households;

2. To assess the availability of fortified brands of salt, oil/ghee, and wheat flour in purposively selected markets;

3. To measure amounts of select nutrients in specimens of salt (iodine), oil/ghee (vitamin A), and wheat flour (iron) collected from markets to determine the micronutrient content compared to the national fortification standards;

4. To estimate the consumption of fortifiable salt, oil/ghee, and wheat flour by children (under five years) and WRA;

5. To estimate the contribution of fortified salt, oil/ghee, and wheat flour to the intakes of select nutrients in the diets of children (under five years of age) and WRA;

6. To ascertain levels of awareness about fortified foods and their benefits among households;

7. To evaluate risk factors that may be predictive of inadequate micronutrient intake and determine their association with the coverage and consumption of fortified foods. These risk factors are:

    a. Household living in rural residence;
    b. Household at risk of poverty;
    c. Household with low socioeconomic status (SES);
    d. WRA not meeting minimum dietary diversity;
    e. Household with poor infant and young child feeding (IYCF) practices; and
    f. Household with food insecurity;

8. To estimate household expenditure on fortifiable oil/ghee and wheat flour in absolute terms (in Pakistani rupees (PKR)) and relative terms (as percentage of household expenditure on food using existing national survey household expenditure data).

4. Survey methodology

4.1 OVERVIEW

The FACT survey conducted in Pakistan was comprised of two components: a household survey and a market survey. This section presents key elements of the survey methodology for each component of the survey. This includes details on the target population (Section 4.2.1), sampling strategy (sections 4.2.2 and 4.3.1), sample size (sections 4.2.2 and 4.3.1), data collection (sections 4.2.3 and 4.3.2), and data quality assurance of each component (sections 4.2.4 and 4.3.3). This part concludes with definitions of key indicators (Section 4.5), and presentation of the ethical considerations (Section 4.6) and methodological limitations of the study (Section 4.7).

4.2 HOUSEHOLD COMPONENT

4.2.1 Target population and household definition

The target population of this survey was children (under five years of age) and WRA (18–49 years old) as these two groups are among those most at risk of micronutrient deficiencies.

The household component of the FACT survey was designed to be representative at the provincial level of all children under five years of age and households with a child under five. A household in this survey was defined as ‘a person or group of related or un-related persons that live together in the same dwelling and eat from the same pot of food, and acknowledge one adult male or female as the head of the household’. A household was eligible if at least one member was a child under five years of age.

4.2.2 Sampling strategy and sample size

This section summarises the core features of the sampling strategy and the sample size for the household component of the FACT survey. Further technical details can be found in Annex 1.

The survey used a stratified multi-stage sampling method. The sample aimed to be representative at the provincial level and to adhere to the minimal requirements for statistical precision. For the sample size determination, it was assumed that the survey would estimate proportions of 50% and assume a margin of error of seven percentage points at the statistical significance level of 5% (based on 95% confidence intervals). Annex 1 gives additional details on the sample size calculation.

Stage 1: Selection of enumeration areas (EAs)

In the first stage of sampling, a stratified systematic sampling method was used to select the EAs, which served as primary sampling units (PSUs) in each province. The list of EAs was obtained from the Pakistan Bureau of Statistics (PBS). EAs are statistical units of approximately the same size (number of households) and are embedded into administrative units such as Union Councils.

The three provinces of Balochistan, Punjab, and Sindh were defined as explicit strata and designated samples were drawn for each separately to ensure that statistics were representative at the province level. The survey is designed to be representative at the

provincial level of households with at least one child under five years of age. The sampling process yielded 57 EAs per province.

Replacement protocol and sample

After the selection of the 57 EAs in each province, 10 of those were randomly assigned to the replacement pool using the systematic sampling method. The remaining 47 EAs in each province were used as the main sample. If a selected EA could not be visited, it was replaced with another EA from the replacement pool in that province.

Stage 2: Selection of households within EAs

At the second stage, households were selected within the sampled EAs. A listing exercise was conducted to list all households within each EA and identify eligible households with a child under the age of five. Using a systematic random draw, 15 households were sampled within each of the 47 sampled EAs from the pool of eligible households. In each province, 705 households were randomly selected to be interviewed.

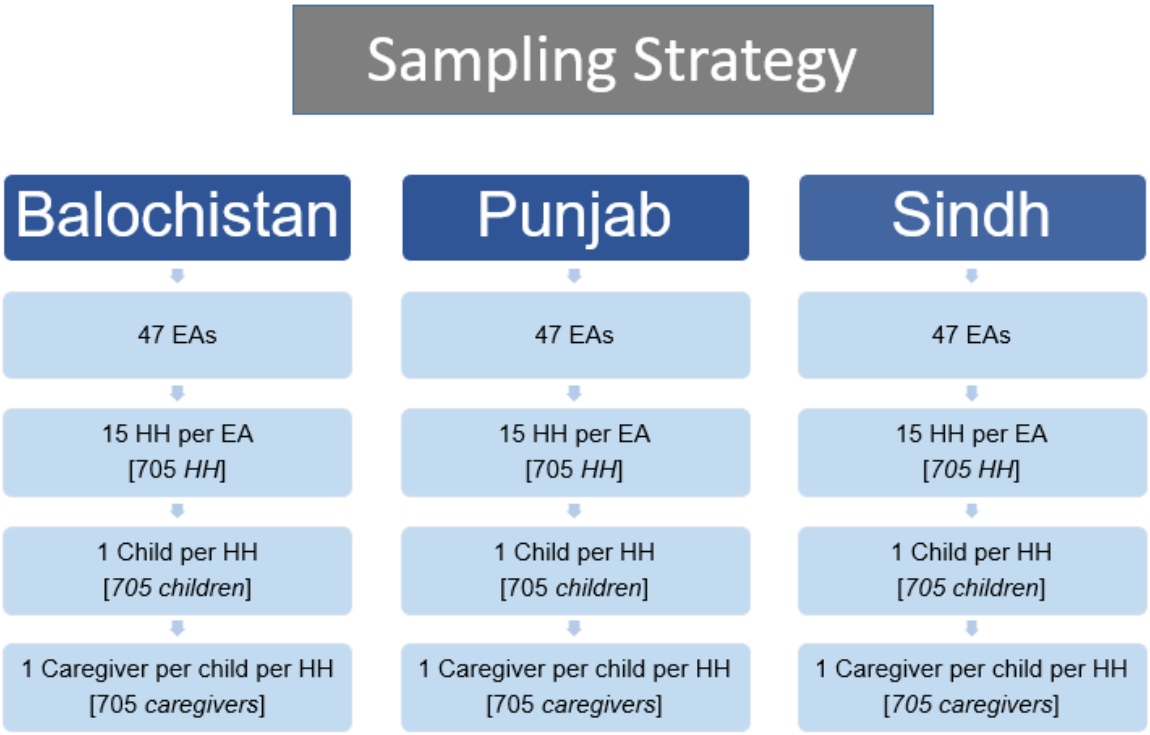
Within an EA, if a selected household could not be surveyed it was replaced with another household from the replacement pool in that EA. Similarly, a pool of 10 replacement households per EA was drawn simultaneously with the main household sample selection (15 households per EA). Therefore, a total of 141 EAs were sampled for the survey, with 47 in each province.

Stage 3: Selection of child under five and caregiver within households

The final stage of sampling involved randomly selecting one child under five within the sampled household. The selection was done at the time of the interview. The selection was based on the Kish grid method and was automatically generated within the computer-assisted household questionnaire after the successful completion of the household roster whereby the head of the household listed all household members. If the selected household did not have a child under five years of age, the interview was immediately terminated and the household was replaced according to the pre-defined replacement protocol. In all households, one child under five years of age was randomly selected and the primary caregiver of that child was asked to respond to the remainder of the household questionnaire collecting data on that child and caregiver.

Figure 1 below summarises the sampling strategy.

Figure 1 Summary of the sampling strategy for the Pakistan FACT survey 2017



4.2.3 Data collection

Data collection consisted of a listing survey followed by a household survey in each EA. Separate specialist teams were employed to implement each survey. The listing survey was implemented between July and August 2017 in all provinces and the household survey was implemented between September and November 2017 in Sindh and Balochistan and in December 2017 in Punjab.

Each province had a State Coordinator responsible for all data collection activities within his or her respective province. For the household survey, there were two data collection teams each in Sindh and Balochistan and three data collection teams in Punjab, with each team composed of one supervisor, one logistics coordinator, and three interviewers. Each team was assigned specific EAs in which they conducted the household survey. The supervisors were responsible for coordinating with community leaders and maintaining the quality of the data collection team. This was achieved through a combination of sitting in on interviews and getting feedback from the state coordinators. Data collection was conducted through CAPI software to maintain high standards of data quality (see Section 4.2.4 for further details).

One household questionnaire was administered per household. First, the household roster was administered to the household member most knowledgeable about the household (note that this person had to be at least 18 years of age). Then, the primary caregiver of the selected child under five was then asked to complete the remainder of the household questionnaire. If the primary caregiver was under the age of 18, then another household member (aged 18 or above) who was knowledgeable about household food preparation and purchasing was chosen to answer the questionnaire.

The main components of the household questionnaire are summarised in Table 1 and the full questionnaire can be found in Annex 2. All survey modules were taken or adapted from validated instruments where available. In cases where the respondent was not the primary caregiver, the following modules were skipped: child feeding practices; child dietary diversity; and child individual wheat flour consumption.

Table 1 Components of the household questionnaire

Component	Description
Household roster	Questions on the composition of the household and the gender, age, and education of all household members.
Household characteristics and assets	Questions on features of the household dwelling and ownership of assets.
Water, sanitation, and hygiene	Questions on access to drinking water and toilet facilities.
Birth history	Questions on live births and child mortality.
Household hunger scale	Questions on household hunger in the last 30 days.
Child feeding practices	Questions on breastfeeding and feeding frequency of the child.
Dietary diversity	Questions on food items consumed in the previous day by caregiver and child.
Coverage of food vehicles	Questions on the household usage, source, brand, quantity purchased, and cost of fortifiable salt, oil/ghee, and wheat flour.
Individual wheat flour consumption	Questions on frequency and amount of consumption of specific food items made from wheat flour by both caregiver and child.
Fortification knowledge	Questions on awareness of fortified foods and its benefits.
Health and nutrition for caregiver and child	Measurement of mid-upper arm circumference (MUAC) for both caregiver and child.

4.2.4 Training and data quality assurance

Before data collection commenced, separate training sessions for the listing survey and household survey were held. The listing training session was conducted on 11–13 July 2017. The household survey data collection was implemented in each province sequentially because of the time taken to obtain the appropriate permissions. The interview training for Sindh was conducted on 22-31 July 2017, followed by the trainings for Balochistan on 22-28 September 2017 and Punjab on 29 October-7 November 2017. The trainings were implemented by the same instructors immediately before data collection activities commenced in each province. The main objective of the training was to ensure that team members had mastered the instruments, could understand and correctly implement survey protocols, and could comfortably use CAPI.

The training sessions included classroom-based learning as well as community-based pilots that were monitored closely by the trainers. A central component of the quality assurance was the supervision that each interviewer received during the training, piloting, and roll-out of the survey. Interviewers were frequently assessed during the training and individual feedback was provided to identify and resolve any difficulties.

All supervisors participated in the main interviewer training and then received additional training on their additional tasks of coordination and quality assurance.

Several data quality assurance mechanisms were put in place throughout the survey implementation to ensure the collection of high-quality data. These are listed and summarised below:

1. Data was collected electronically through CAPI software, which enabled automated live data checks during the implementation of the household interview. Extensive validations and cross-checks were programmed into the CAPI software to reduce errors and inaccuracies during the household interview.

2. Sampling the child under five for interview was fully automated in the CAPI software, thus eliminating any possibility of interviewer error or influence on the random selection process.

3. Data were uploaded to the cloud daily, which enabled the central survey management team in Islamabad to carry out a range of consistency checks daily. Any issues identified at this stage were immediately communicated to the relevant province coordinator and team supervisors for action.

4. A data collection monitoring dashboard on PowerBi was used to monitor daily the progress of data collection as well as the performance of data collection teams and individual interviewers, allowing province coordinators and supervisors to give feedback to teams regularly and continuously improve the quality of data collection.

5. Quality assurance officers conducted back-check interviews, which involved revisiting a sample of households that had already been interviewed. The purpose of the back-check interview was to confirm that the interviews had indeed been conducted and to cross-check the accuracy of key information by means of a short questionnaire. The back-check questionnaire included questions that were unlikely to have changed since the initial interview, such as whether household uses salt, oil/ghee, and wheat flour at home. Comparisons between the back-check questionnaire and the main household questionnaire were conducted daily, with results being fed back to the team for continuous improvement. Furthermore, the quality assurance officers also randomly visited survey teams in selected EAs and sat in on some of the interviews to observe whether the interviewer was properly administering the interview.

4.3 MARKET COMPONENT

The market survey was designed to collect data on the availability and fortification quality of brands of salt, oil/ghee, and wheat flour in the four provinces of Pakistan, i.e. Balochistan, Khyber Pakhtunkhwa (KP), Punjab and Sindh.

4.3.1 Selection of market sites and sample size

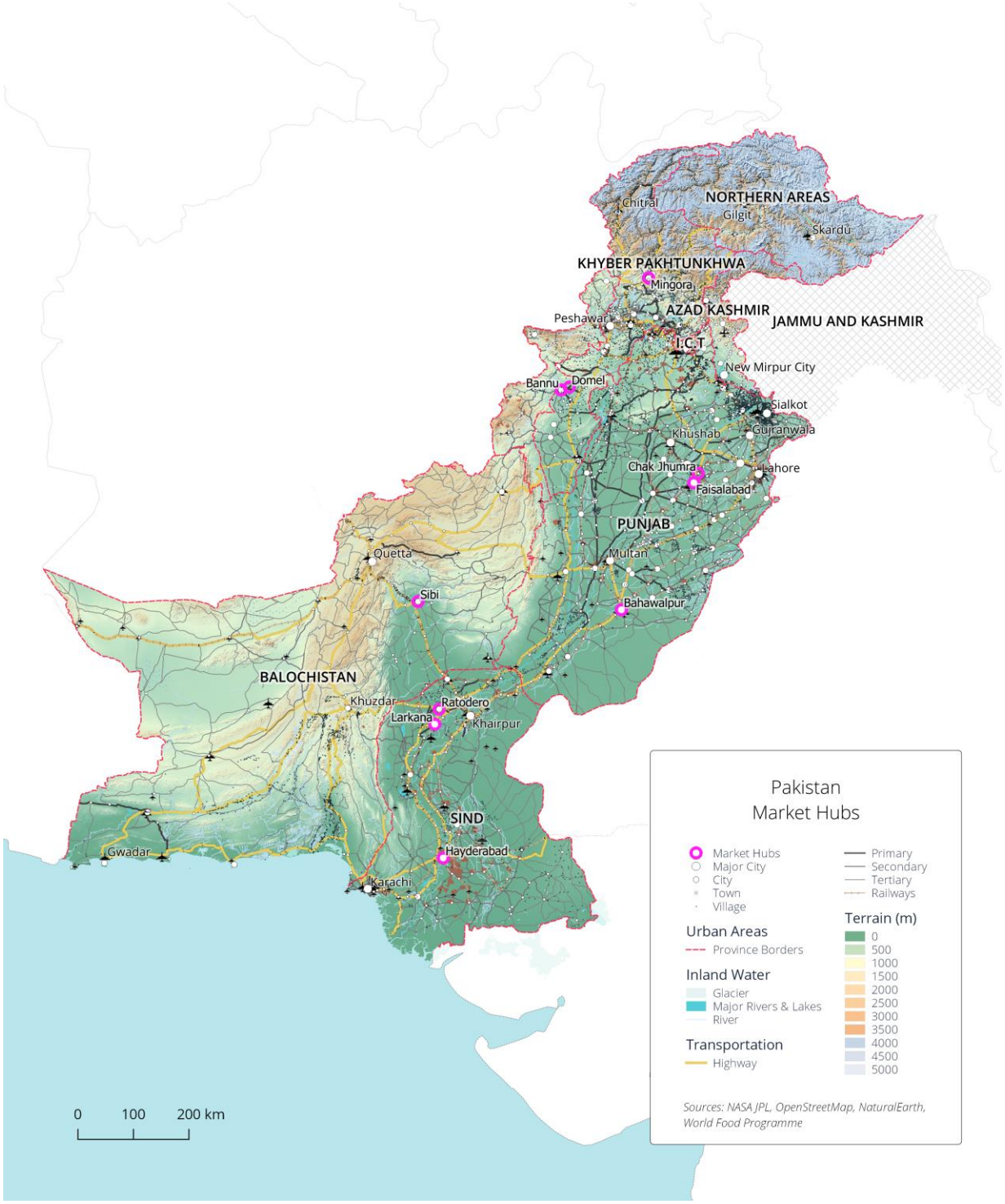
The market survey component of the FACT survey was designed to purposively sample retail outlets in each province. As a first stage of selection, market hubs were selected within each province. Market hubs are agglomerations (places of higher population density, e.g. cities, towns, and villages) where larger volumes of food products are sold or pass through and are dispatched to other places. Market hubs are located on the nodes of the main supply routes for different food vehicles, where one can expect to find a wider variety of products in these hubs than in the places they supply. Places supplied from these hubs are expected to have the same or a selection of the variety of brands available in the market hub from which they are supplied.

Two urban market hubs were selected in Punjab, KP, and Sindh each, and one urban market hub was selected in Balochistan. The selection of these urban market hubs was based on the following criteria: population size and density, geography, and road networks. Market hubs located in areas of high population density and at the intersection of roads used to dispatch the food vehicles from production or import sites toward populated areas were prioritised. Urban hubs that were not selected in a previously conducted market assessment in November 2016 by GAIN were prioritized. In addition to these seven urban hubs, three rural hubs were also chosen based on the following criteria: proximity of the urban hub to the nearest tehsil[3] headquarters and presence of a main bazaar or marketplace in the tehsil headquarter.

Within each market hub, up to five main marketplaces were selected, with a marketplace being defined as a large concentration of all types of retail outlets in a large geographic area within the market hub that allows buyers and sellers of the food vehicle to interact. The selection of the marketplaces was ensured that different types of vendor were represented: retail shops, wholesalers, and supermarkets. Finally, retail outlets within each marketplace were purposively selected.Figure 2 presents the map and list of selected market hubs in Pakistan.

[3] A tehsil is an administration division of Pakistan (also called a sub-district or Taluka). It is an area of land with a city or town that serves as its administrative center and may include adjoining towns or villages.

Figure 2 Location of selected market hubs



4.3.2 Data collection

The market survey took place during July and August 2017 and was implemented by four teams, one in each province. The market survey teams collected data from each market hub simultaneously in each province. Key informant interviews were first undertaken in each market hub to obtain a list of the total number and types of marketplace available in each hub. From this list, marketplaces that sold at least one of the three food vehicles of interest

were identified and then the selection of the marketplaces to be visited was carried out. Upon visiting each marketplace, a scoping exercise was conducted to understand the structure in terms of the arrangement and number of shops within the marketplace, and then retail outlets were selected to be visited. In each retail outlet visited, available brands of salt, oil/ghee, and wheat flour were registered.

To determine the fortification quality of the available brands, specimens of each registered brand were collected and sent to a laboratory for analysis of their micronutrient content. To ensure sufficient variability, the teams were asked to collect a total of 12 specimens per brand (ideally from different batches of production). The target number of specimens collected was achieved through specimen collection across multiple market hubs across all four provinces. A detailed protocol was prepared to ensure systematic collection, transport, and storage of food specimens. All specimens collected were purchased from retail outlets.

The main survey tool was a market questionnaire, which included registering brands available in the visited retail outlets and registering the food specimens that were collected from the retail outlets (see market questionnaires in Annex 4). Table 2 summarises the components of the market questionnaire.

Table 2 Components of the market questionnaire

Component	Description
Marketplace form	Listing all marketplaces and retail outlets visited within a market hub.
Brand registration form	Listing all brands that are found in the visited retail outlets for each food vehicle and registering information on the brands (e.g. producer and location of production site).
Specimen registration form	Registering all specimens collected for each food vehicle brand including the specimen identification information as well as information on the package from which the specimen was taken (i.e. production and expiration date, producer, and type, size, and cost of package).

Specimens were stored in hotel rooms under the recommended temperature and secured from direct sunlight throughout the duration of the data collection. After all market hubs had been visited in each province, specimens were sent to the OPM office, where they continued to be stored in a temperature-controlled room until shipment to a laboratory in Lahore for analysis.

4.3.3 Training and data quality assurance

Training for the market survey took place on 20 and 21 July 2017. The main objective of the training was to ensure that team members had mastered the instruments, could understand and correctly implement survey protocols, and could comfortably use CAPI. Special emphasis was put on brand registration, specimen collection, and labelling protocols.

Several data quality assurance mechanisms were put in place throughout the survey implementation to ensure high-quality data:

1. The survey was implemented by a small team of senior interviewers, who were closely monitored by the survey manager.
2. The market survey team sent data and briefing notes to the central data management unit at the completion of the data collection at a market hub. Both data

and notes were reviewed by the central survey team to ensure survey protocols were being followed and challenges were appropriately addressed.

3. To ensure correct labelling of food specimens, adhesive labels printed with pre-filled information were used. Each label had its own unique ID and there was a set of IDs for each food vehicle.

4. Validations and consistency checks were built into the CAPI software for the market survey to maintain data quality.

5. Retail outlets were surveyed by two interviewers so that one interviewer could register the available brands while the other collected and labelled the specimen.

4.4 DATA MANAGEMENT AND ANALYSES

4.4.1 Data processing, cleaning, and storage

Data collected were transferred electronically from CAPI by the supervisors to the data processing staff at the OPM office daily. At the end of each day, supervisors uploaded the data and synchronised it with the main server. The OPM data management team was responsible for conducting a daily analysis of errors on the interviews completed to date, such as inconsistencies and gross outliers. Additionally, a dashboard for monitoring the progress of data collection and interviewer performance was developed using the PowerBi visualisation tool, which was updated and reviewed daily. Any errors or performance issues identified were communicated to the province coordinators and supervisors for immediate action.

The electronic data collection system allowed for a large proportion of the data cleaning to be carried out alongside the data collection, thereby increasing efficiency and enabling quick identification of any issues with the data so these could be remedied while the team was in the survey areas.

Additional cleaning took place at the end of data collection and included formatting the datasets, labelling the variables, assigning unique identification numbers to households, and adding any other necessary parameters. Three clean datasets were produced: a household roster dataset, a household questionnaire dataset, and a market survey dataset.

All data collected from the survey were stored on computers at OPM and backed up on a secure central database. At the end of data collection and before delivery to the data analysis team, the data manager anonymized the household and market data.

4.4.2 Data analyses

Data were analysed using STATA software (version 14.2). Descriptive statistics are presented as mean (95% confidence interval), percentage (95% confidence interval), or median (25^{th} percentile, 75^{th} percentile). Results are presented by province. All analyses were population weighted, where appropriate (see Annex 5 on how sampling weights were calculated). This was necessary to account for the sampling strategy because, although the units of analysis (households and children) were randomly sampled, they were not sampled with equal probability and so unweighted averages might have been misleading. For the disaggregation of household coverage indicators by risk factor, a t-test was used to assess significant differences between groups and significance below 5% level was reported for all

means/proportions over the disaggregating variable. For disaggregations that were statistically significantly different from zero, we presented asterisks that show the level of statistical significance of the difference: * = significant at the 5% level, ** = significant at the 1% level, and *** = significant at the 0.1% level. This means that the more asterisks that are shown, the more likely that the observed difference is due to a real difference between the two groups rather than being due to chance. Where results are not asterisked, this does not mean that there is no difference between the groups, but rather that any difference cannot be asserted with such a high degree of confidence (95% or more).

4.5 DEFINITIONS OF KEY INDICATORS

4.5.1 Indicators of risk

Six indicators of risk associated with poor micronutrient intakes were used to assess the relationship between coverage and consumption, and vulnerability. The risk indicators were:

- Rural residence – This is defined according to the data used to draw the survey sample in each province.
- At risk of poverty – This is defined according to the **Multi-dimensional Poverty Index (MPI)**. The MPI is a composite indicator constructed from indicators on living standards, education, and health and nutrition; a household is classified as at risk of poverty if the MPI score is greater than or equal to 0.33 (Alkire and Santos, 2014).
- Low socio-economic status (SES) (Demographic Health Survey (DHS) wealth quintiles) – This indicator is defined according to the DHS Wealth Index, which is a composite measure of a household's cumulative living standards and is constructed using principal component analysis. The index is calculated using data on a household's ownership of selected assets, materials used for housing construction, and types of water access and sanitation facilities. A household was classified as having low socio-economic status if the corresponding wealth index value was in the two lowest wealth quintiles. The wealth quintiles were based on the national wealth index cut-offs provided by the latest DHS survey conducted in Pakistan in 2012-13 (NIPS and ICF International, 2013).
- Household food insecurity – This is defined according to the **Household Hunger Scale (HHS)**. The HHS captures household reactions to the experience of food deprivation or insecurity in a score on a scale from 0 to 6. The HHS module and scoring were adapted from Deitchler et al. (2010) and Ballard et al. (2011). A household was classified as being food insecure if it had moderate or severe household hunger according to the HHS (i.e. its HHS was greater than one).
- Low women's dietary diversity – This is defined according to the **minimum dietary diversity for WRA** (MDD-W). A household is classified as having low dietary diversity if the selected caregiver is a WRA who did not meet the MDD-W, meaning she consumed foods from fewer than five food groups out of 10 the previous day (FAO and FHI 360, 2016). The 10 food groups include: grains (white roots and tubers and plantains); pulses (beans, peas, and lentils); nuts and seeds; dairy; meat, poultry and fish; eggs; dark green leafy vegetables; other vitamin A-rich fruits and vegetables; and other vegetables and other fruits.
- Poor infant and young child feeding (IYCF) practices – This is defined according to the **Infant and Child Feeding Index (ICFI)**, which is an age-specific score calculated

as a sum of the age-specific breastfeeding score, the age-specific meal frequency score, and the age-specific dietary diversity score (Guevarra et al., 2014). A household is classified as having poor IYCF practices if the selected child has an ICFI score less than 6.

4.5.2 Indicators of coverage

Three indicators of coverage were defined according to the Tanahashi coverage framework (Tanahashi, 1978; Aaron, GJ et al., 2017) and reported as the proportion of households meeting the criteria out of the total number of surveyed households:

1. **Consumption** of the food vehicle – the household consumes the food vehicle at home.

2. Consumption of the **fortifiable** food vehicle – the food vehicle used by the household is processed industrially (i.e. not made at home). (For wheat flour this indicator includes flour produced by small scale chakki mills; however, the proportion of fortifiable flour that is chakki vs. other industrially produced wheat flour is shown separately.)

3. Consumption of the **fortified** food vehicle – the food vehicle used by the household is fortified (i.e. it contains any content of added nutrients above the intrinsic levels). Households are classified as consuming a fortified or non-fortified food vehicle based on linking the reported brand consumed by the household to the results of the laboratory analyses of food specimens analysed from that brand.

4.5.3 Indicators of consumption and micronutrient contribution

The daily amount of fortifiable food vehicle consumed per individual was estimated and used in conjunction with the micronutrient content results to determine the micronutrient contribution (as a percentage of the estimated average requirements (EAR[4]) values for iodine and vitamin A, and of the recommended dietary allowance (RDA[5]) for iron) coming from consumption of fortified foods among children under five and WRA.

Consumption

For all food vehicles, the daily apparent food consumption per individual household member was determined using the adult male equivalent method (AME) (Weisell and Dop, 2012). At the household level, the daily quantity of the food vehicle consumed was estimated based on the reported quantity purchased and the duration it lasted in the household. Each member of the household was assigned an age- and sex-specific AME and the AMEs were summed together to calculate a household AME. Each individual AME was divided by the household AME and then multiplied by the quantity of food vehicle consumed by the household to calculate the quantity in grams of the food vehicle consumed per day per individual household member. Individuals from households that reported not consuming the fortifiable food vehicle were assigned zero for grams consumed per day.

[4] EAR is defined as the amount of a nutrient that satisfies the nutritional requirements of 50% of the population and it is used as a reference cut-point to determine inadequacies. The proportion of the population below the EAR values is interpreted as the proportion of individuals of that population at risk of inadequacy.

[5] RDA is the equivalent in the United States to the Recommended Nutrient Intake (RNI) used by WHO, FAO, and many countries, and is defined as the amount of nutrient that satisfies the needs of almost all individuals (97.5%) in a specific group of the population.

Micronutrient contribution

For all food vehicles, the quantity of food vehicle consumed (in grams/day per person) was used to estimate the micronutrient contributions by multiplying it by a fortification exposure content. For actual estimates, each household was allocated a micronutrient content using a hot deck imputation approach whereby one of the average nutrient values from all available brands found in the market in a particular province was randomly allocated to a household in that province to recreate in the household population the same distribution of fortification values as found in the market survey (see Annex 4). This approach was selected due to the high number of households in which a brand was unknown. For modelled estimates, all households were assigned the target average micronutrient content according to the fortification standards for food vehicles where the fortification standards are set as a range (i.e. vitamin A in oil) or a theoretical target average micronutrient content for food vehicles where the fortification standards are set as a minimum value (i.e. iodine in salt and iron in wheat flour), which was estimated assuming 20% coefficient of variation and 90% compliance with the minimum standard requirement.

The amount of micronutrient consumed daily from fortified foods was then expressed as a percentage of the EAR or RDA among the population groups. Percentage of EAR was used for iodine and vitamin A because it allows for comparison to the EAR cut-point method, which is recommended to be used when setting goals and evaluating the impact and safety of fortification for these nutrients (WHO and FAO, 2006). The EAR cut-point approach is not recommended for estimating prevalence of inadequate iron intakes among children and WRA because their requirements are not normally distributed; therefore, the percentage of RDA was estimated as an alternative for presenting the iron contribution coming from the fortified foods. EAR and RDA values were taken from the Institute of Medicine Dietary Reference Intakes (Food and Nutrition Board, 2001).

4.5.4 Analysis of micronutrients in food vehicles

Food specimens collected from markets were shipped to Qarshi Research International Ltd in Lahore for analyses. Fortification compliance was determined for each food vehicle brand by laboratory analyses of micronutrient content in the food specimens.

For salt and oil/ghee, brand-specific composite samples were created by pooling individual samples from the same brand and quantitative analyses were conducted using iodometric titration to determine the iodine content in salt and high-performance liquid chromatography (HPLC) to determine vitamin A content in oil/ghee. For wheat flour, qualitative analyses of individual samples were conducted using the iron spot test (AACC 4040) to determine the presence of added iron. Then brand-specific composite samples were created by pooling individual samples from the same brand that tested positive for added iron in the spot test and quantitative analyses were conducted using atomic absorption spectrometry to determine total iron content. An additional composite sample for each type of flour was created using all individual samples that tested negative in the iron spot test. Negative composite samples were similarly analysed to estimate total intrinsic iron content by type of flour. To determine the average added iron amount in each type of wheat flour, the intrinsic amount of iron found in the unfortified composite samples was subtracted from the total iron found in the fortified composite samples.

4.6 ETHICAL CONSIDERATIONS AND APPROVALS

Ethical approval

Ethical approval to conduct the survey was obtained from the National Bioethics Committee of Pakistan on 25 August 2017 (approval number 4-87/NBC-256/17/739). Verbal consent to carry out the survey was obtained from all respondents. Respondents were informed of the nature of the study and what would be required of them as study participants; they were also given an indication of the time that would be required to complete the survey and assured that their participation was voluntary and they had the right to withdraw participation at any point (see the second page of the household questionnaire in Annex 1).

All personal data collected as part of this survey are stored securely within the OPM office, are only available to authorised individuals for analytical purposes, and are handled in accordance with data protection best practices. Each respondent was assigned a unique identifier that was used to analyse the data. All anonymised data related to this survey will be made publicly available.

Government of Pakistan approvals

Additional approvals were obtained from two government authorities. Permissions were received from the Provincial Ministry of Planning and Development in Balochistan, Punjab, Sindh and Khyber Pakhtunkhwa (KP) for the market and household survey components. A 'No Objections Certificate' (NOC) was obtained from the Home Department in Balochistan, Punjab, and Sindh for the household survey component. The NOC was not obtained from the Home Department in KP during the funding period and therefore the household survey was conducted only in Balochistan, Punjab, and Sindh.

4.7 LIMITATIONS TO THE SURVEY

This section outlines the limitations to the survey design and implementation.

1. Household survey data are representative at the provincial level for each Balochistan, Punjab, and Sindh; therefore, the results from the survey data are not generalisable at the national level nor to the province of KP that was not surveyed.

2. Results are not representative of the entire population of households in each province or of WRA, but rather of households with at least one child under five and of children under five. This is due to the specific sampling strategy deployed for this survey. The sampling strategy aimed at randomly selecting children under five in the randomly selected households and then interviewing the child's caregiver.

3. Market hubs sampled were neither randomly selected nor selected in all PSUs in the household survey due to cost and time limitations and in the interest of using a standardised method that could be repeated independently from a household survey; therefore, results may not be representative of all available food vehicle brands available in each PSU and province.

4. Due to the nature of many of the retail marketplaces in the surveyed provinces, whereby these food vehicles (salt, oil/ghee, and wheat flour) are purchased in bulk containers by vendors to be repackaged and sold to consumers in smaller quantities, some of the brand specimens were collected from already opened containers and therefore may have been exposed to heat and sunlight before collection. By contrast,

other specimens, particularly for brands predominantly sold in supermarkets, were collected from sealed packages at the point of retail. Since some nutrients are sensitive to heat and light, the conditions under which some specimens were collected may have affected the results of laboratory analysis for vitamin A in oil/ghee.

5. The added iron contents for wheat flour were based on the nutrient content in samples confirmed to have added iron (via the iron spot test) less an estimate of intrinsic iron based on analysis of unfortified flours by type. However, the intrinsic iron content of wheat flour can change from growing season to growing season based on the crop variety grown, the soil it was grown in, fertiliser application, and other factors. Therefore, the intrinsic iron identified during this survey may vary from the intrinsic content measured at another time.

6. The coverage indicator for 'consumes fortified food' was based on the brand reported as most recently obtained in the household, which is subject to recall bias and thus may not be indicative of the usual brand used in the household. Furthermore, many households were not able to report a brand for certain food vehicles, resulting in a high proportion of households with unknown fortification status when attempting to link the reported brand used in the household to the results of the laboratory analyses of food specimens from that brand collected from markets; therefore, this indicator is likely underestimated. Food samples were not taken from households, and therefore the actual micronutrient content at this level is unknown.

7. The AME method used to estimate amount of food vehicles consumed daily is an indirect approach that assumes that intra-household food distribution is the same in all households based on the proportional energy expenditure of each person's age, sex, and physiological status and is subject to recall bias. Additionally, this method does not capture foods made from the food vehicles consumed outside the home; therefore, consumption indicators may be underestimated.

8. When calculating the actual micronutrient contribution from fortified foods, households were assigned a fortification exposure level using an imputation method. This method recreates the same distribution of nutrient values found in the market survey among households in each province but may not accurately reflect the actual micronutrient content in foods consumed in the household.

9. Iron requirements are highly variable, especially among WRA; therefore, EAR cut-offs are not recommended to be used to assess adequate intakes and instead a probability method that accounts for iron intake from all sources in the diet is required. Because assessing total dietary intake of iron was beyond the scope of the survey, the percentage of RDA was estimated as an alternative for presenting the iron contribution coming from the fortified foods. This procedure underestimates the contribution of iron, as the true value falls between the proportion of EAR and RDA values.

10. The household expenditure on fortifiable oil/ghee and wheat flour in relative terms (as a percentage of household expenditure on food) were estimated using separate data sources from different time periods, i.e. primary data from the current survey and secondary data from the Pakistan Household Integrated Economic Survey (HIES) from 2015-2016, which did not account for changes in inflation or expenditure over time and therefore do not accurately reflect the current household expenditure.

5. Results

This section presents the results from the FACT household and market survey components. It begins by presenting the survey response rates (Section 5.1), background characteristics of the survey population (Section 5.2), and fortification awareness among surveyed households (Section 5.3). It then presents results from the market survey on the presence of brands for each of the three fortified food vehicles (Section 5.4) and the brand micronutrient content (Section 5.5). Next, it presents the coverage indicators of these three food vehicles, by province and disaggregated by risk factor (Section 5.6). It then presents the consumption of fortifiable foods (Section 5.7) and corresponding micronutrient contribution indicators (Section 5.7.1). Finally, household expenditure on food vehicles is presented (Section 5.8).

5.1 HOUSEHOLD SURVEY RESPONSE RATES

Attainment of the target sample size was high in all provinces with a response rate of 99.9% in Balochistan, 97.9% in Punjab, and 100.7% in Sindh (Table 3). In Sindh, five extra households were interviewed as one team surveyed five extra households from the replacement list. All surveyed households were included in the analysis. There are no implications of these response rates on the analysis conducted in this report.

Table 3 Response rate for the survey, Pakistan, 2017

Households	Balochistan	Punjab	Sindh
Planned	705	705	705
Interviewed	704	690	710
Response rate, %	99.9	97.9	100.7[1]

[1] The response rate exceeds 100% as an additional five interviews were conducted.

The high response rate was achieved by making use of the randomly selected replacement households. In total, 620 (29.3%) out of the originally sampled 2,115 households were replaced according to the survey protocol. This was mainly due to the household being unavailable or because there was no child under five in the household, making it ineligible for inclusion in the survey. The survey team was unable to locate 392 households either because the dwelling was temporarily unavailable or the houses were locked. There were 43 cases where a household either refused to participate or refused to continue once the survey had started (Table 4).

Table 4 Reasons for replacement of households, Pakistan, 2017

Reason for replacement	Number of households	Share of replaced households (%)
Household temporarily absent/locked	392	63.2
Seasonal migration	99	16.0
Household ineligible (i.e. no child under five)	53	8.5
Household refused to participate	43	6.9
Dwelling not found	30	4.8
Other reason	3	0.5
Total	**620**	**100**

5.2 SURVEY POPULATION CHARACTERISTICS

5.2.1 Demographics

Table 5 presents the demographic characteristics of the sampled households. The median household size was eight in Balochistan, seven in Punjab, and seven in Sindh. Most households were headed by a male: less than 1% of households in Balochistan, 8% in Punjab, and 9% in Sindh were female-headed. The mean age of children included in the survey was between 29 and 31 months. The mean age of caregivers was between 30 and 32 years. Caregivers in Balochistan tended to have fewer years of education, with only 18% of caregivers having five or more years of education, compared to 42% and 33% of caregivers in Punjab and Sindh, respectively.

Table 5 Household and demographic characteristics of the survey sample, Pakistan, 2017[1]

Variable	Balochistan N = 704	Punjab N = 690	Sindh N= 710
Household			
Household size (n), median	8.0 (6.0, 10.0)	7.0 (5.0, 9.0)	7.0 (5.0, 9.0)
Household dependency ratio, median[2]	0.8 (1.3, 1.8)	1.3 (0.7, 2.0)	1.2 (0.7, 2.0)
Female-headed household, %	0.8 (0.5, 1.1)	7.7 (7.1, 8.3)	8.5 (7.8, 9.2)
Age of household head (years), mean	43.6 (43.3, 44.0)	43.5 (43.2, 43.8)	42.1 (41.8, 42.4)
Caregiver			
Age (years), mean	31.5 (31.2, 31.7)	30.0 (29.8, 30.1)	29.5 (29.3, 29.6)
≥ Five years education, %	17.7 (16.7, 18.7)	41.5 (40.3, 42.7)	33.2 (32.1, 34.4)
Child			
Age (months), mean	30.8 (30.2, 31.3)	29.8 (29.4, 30.3)	30.6 (30.2, 31.0)
Sex female, %	49.5 (47.9, 51.1)	48.2 (47.0, 49.4)	47.7 (46.4, 48.9)

[1] All values are mean/percentage (95% confidence interval) or median (25th, 75th percentile) as indicated, and are weighted to correct for unequal probability of selection.
[2] Household dependency ratio = number of household members below 15 years of age and above 64 years of age/number of household members between 15 and 64 years of age.

5.2.2 Indicators of risk

Region of residence

Table 6 presents the regional distribution of households included in the survey. Rural households represented the majority of the surveyed households in Balochistan (81%) and Punjab (70%), while only 44% in Sindh.

Table 6 Regional distribution of households, Pakistan, 2017[1]

Variable	Balochistan	Punjab	Sindh
Urban	136 (19%)	210 (30%)	395 (56%)
Rural	568 (81%)	480 (70%)	315 (44%)
Total	**704**	**690**	**710**

Poverty

Table 7 shows the number of households at risk of acute poverty with the different components of the MPI. The risk of poverty was highest in Balochistan (55%), followed by Sindh (44%), and then Punjab (24%). Households had low levels of access to key living standard components, with noteworthy percentages experiencing such issues as unimproved sanitation (72% in Balochistan, 44% in Punjab, and 55% in Sindh), unsafe drinking water sources (48% in Balochistan, 31% in Punjab, and 54% in Sindh), inadequate flooring (46% in Balochistan, 24% in Punjab, and 41% in Sindh) and inadequate cooking fuel source, i.e. dung, wood, coal, or charcoal, (67% in Balochistan, 38% in Punjab, and 37% in Sindh).

The level of deprivation along the education component was more severe in Balochistan, followed by Sindh, and then Punjab. While only 17% of households in Punjab had at least one child of school age not attending school, the figure was 55% of households in Balochistan, and 39% in Sindh. Similarly, only 23% of households in Punjab had no members of the household with more than five years of education, while in Sindh and Balochistan the figure was 29% and 35% of households, respectively.

In Balochistan and Punjab the MUAC measurements showed that around 15% of children or caregivers were malnourished, while this was higher at 31% in Sindh. Contrary to this, only 5% of households in Sindh had lost at least one child under five years of age in the last five years, compared to 10% and 12% of households in Punjab and Balochistan, respectively.

Table 7 Multidimensional poverty index (MPI) and its component indicators, Pakistan, 2017[1]

Variable	Balochistan N = 704	Punjab N = 690	Sindh N= 710
At risk of poverty[2]	55.0 (53.8, 56.2)	23.6 (22.7, 24.5)	43.9 (42.9, 44.8)
Living standard component			
No electricity	9.0 (8.4, 9.7)	1.8 (1.6, 2.1)	9.8 (9.3, 10.2)
Unimproved sanitation[3]	71.6 (70.6, 72.6)	43.6 (42.6, 44.6)	55.0 (54.1, 55.8)
Unsafe drinking water source[4]	47.4 (46.2, 48.6)	30.6 (29.8, 31.4)	54.2 (53.3, 55.1)
Inadequate flooring[5]	46.4 (45.1, 47.8)	23.8 (23, 24.6)	41.3 (40.5, 42.1)
Inadequate cooking fuel source[6]	66.9 (65.8, 67.9)	37.8 (37, 38.7)	37.2 (36.6, 37.8)
Fewer than two key assets and no car/truck[7]	0.0 (0.0, 0.0)	13.0 (12.3, 13.7)	0.0 (0.0, 0.0)
Education component			
At least one child (5–14 years old) not currently attending school	55.3 (54, 56.6)	17.2 (16.4, 18)	38.9 (37.9, 40)
No member aged 10 years or older has completed five years of school	35.4 (34.2, 36.6)	22.5 (21.6, 23.4)	28.9 (28, 29.8)
Health and nutrition component			
At least one child born in the last five years has died	11.7 (10.8, 12.6)	9.9 (9.2, 10.5)	5.3 (4.8, 5.8)
Caregiver or child is malnourished[8]	15.3 (14.4, 16.3)	15.5 (14.7, 16.3)	30.6 (29.6, 31.6)

[1] All values are percentages (95% confidence interval) and weighted to correct for unequal probability of selection.
[2] Households with MPI ≥ 0.33.
[3] The household does not have access to an improved sanitation facility, i.e. a flush toilet or latrine, a ventilated improved pit, or composting toilet, or it is improved but shared with other households.
[4] The household does not have access to safe drinking water, i.e. piped water, public tap, borehole, pump or tube well, protected well, protected spring, or safe drinking water is more than a 30-minute round-trip walk from home.
[5] The household has an earth, sand, or dung floor.
[6] The household cooks with dung, wood, coal, or charcoal.
[7] From an asset list including: radio, television, mobile/non-mobile phone, bicycle, motorcycle, refrigerator, and/or car or truck.
[8] Mid-upper arm circumference of female caregiver <230 mm or of child under six months <115 mm or child six months or older <125 mm.

Socio-economic status

Table 8 presents the distribution of households by SES and wealth quintile, as defined by the DHS Wealth Index. 68% of households from Balochistan were classified as low SES. 46% of households in Sindh were classified as low SES. While, only 24% of the households in Punjab were classified as low SES.

Table 8 Demographic Health Survey (DHS) Wealth Index, Pakistan, 2017[1]

Variable	Balochistan N = 704	Punjab N = 690	Sindh N= 710
Low SES[2] %	68.0 (66.9, 68.9)	24.2 (23.3, 25)	46.3 (45.6, 47.1)
Distribution of households by wealth quintile			
Lowest, %	22.9 (21.7, 24.1)	3.5 (3.1, 3.8)	19.9 (19.2, 20.6)
Second, %	45.1 (43.7, 46.4)	20.7 (19.9, 21.5)	26.5 (25.6, 27.3)
Middle, %	19.4 (18.4, 20.3)	28.1 (27.1, 29.1)	23.7 (22.8, 24.7)
Fourth, %	7.1 (6.5, 7.8)	31.4 (30.5, 32.4)	25.1 (24.2, 25.9)
Highest, %	5.6 (5, 6.2)	16.3 (15.7, 17)	4.9 (4.5, 5.4)

[1] All values are percentages (95% confidence interval) and weighted to correct for unequal probability of selection.
[2] Lowest two wealth quintiles.

Women's dietary diversity

As shown in Table 9, the median dietary diversity score for WRA based on foods consumed the previous day was four out of 10 in Balochistan and Punjab, and three out of 10 in Sindh. Overall, 59% of WRA in Balochistan, 64% in Punjab and 87% in Sindh did not meet the minimum dietary diversity score of five.

The consumption of vitamin A-rich animal-source foods (dairy, organ meat, or eggs) was high in all the provinces (75% in Balochistan, 68% in Punjab, and 59% in Sindh) while consumption of vitamin A-rich plant-based foods (dark leafy greens and other vitamin A-rich fruits and vegetables) was lower (32% in Balochistan, 57% in Punjab, and 20% in Sindh. Consumption of iron-rich foods (meat, fish, or poultry) was highest in Balochistan (63%), followed by Sindh (43%), and then Punjab (35%). The proportion of WRA consuming zinc-rich foods (flesh or organ meat) was highest in Balochistan (57%), followed by Sindh (36%) and then Punjab (33%).

Table 9 Minimum dietary diversity score for women of reproductive age (MDD-W) and its components, Pakistan, 2017[1]

Variable	Balochistan N= 683	Punjab N= 686	Sindh N= 702
Dietary diversity score,[2] median	4.0 (3.0, 6.0)	4.0 (3.0, 5.0)	3.0 (2.0, 4.0)
Did not meet MDD-W,[3] %	59.2 (57.8, 60.5)	64.2 (63.2, 65.2)	86.7 (85.9, 87.5)
Plant sources of vitamin A,[4] %	31.5 (30.2, 32.8)	56.6 (55.5, 57.7)	20.3 (19.5, 21.2)
Animal sources of vitamin A,[5] %	75.3 (74.1, 76.4)	68.1 (67.0, 69.0)	58.5 (57.4, 59.6)
Iron-rich foods,[6] %	63.2 (61.9, 64.5)	35.4 (34.4, 36.4)	42.9 (41.9, 43.9)
Zinc-rich foods,[7] %	57.4 (56, 58.7)	33.2 (32.2, 34.2)	35.5 (34.5, 36.4)

[1] All values are median (25th, 75th percentiles) or percentage (95% confidence interval) as indicated and weighted to correct for unequal probability of selection.
[2] Median score based on a score of 10 food groups consumed the previous day: 1) grains, white roots and tubers, and plantains; 2) pulses (beans, peas, and lentils); 3) nuts and seeds; 4) dairy; 5) meat, poultry, and fish; 6) eggs; 7) dark green leafy vegetables; 8) other vitamin A-rich fruits and vegetables; 9) other vegetables; and 10) other fruits.
[3] Consumed less than five out of 10 food groups the previous day.
[4] Consumed dark green leafy vegetables or other vitamin A-rich fruits and vegetables.
[5] Consumed dairy, organ meat, or eggs.
[6] Consumed flesh meat, organ meat, or fish.
[7] Consumed flesh meat or organ meat.

Infant and young child feeding practices

As shown in Table 10, IYCF practices were poor for 76% of children under five years of age in Balochistan, 90% in Punjab, and 70% in Sindh. For children less than six months of age, this indicator is derived from exclusive breastfeeding rates, which were 14%, 16%, and 22% in Balochistan, Punjab, and Sindh respectively. For children aged 6-23 months and 24-59 months, this indicator is derived from an ICFI score based on age-appropriate continued breastfeeding and/or dietary diversity and meal frequency. According to the ICFI, 23%, 25%, and 15% of children 6-23 months of age and 34%, 25%, and 7% of children 24-59 months of age were appropriately fed in Balochistan, Punjab, and Sindh, respectively.

Table 10 Infant and young child feeding (IYCF) practices and components, Pakistan, 2017[1]

Variable	Balochistan	Punjab	Sindh
All children 0-59 months	**N = 704**	**N = 690**	**N = 710**
Poor IYCF,[2] %	76.2 (76.1, 76.3)	90.1 (90, 90.2)	70.1 (69.9, 70.4)
Children <6 months	**N = 41**	**N = 71**	**N = 62**
Exclusively breastfed, %	13.7 (13.1, 14.3)	15.5 (15.3, 15.7)	21.5 (21.2, 21.8)
Children 6-23 months	**N = 178**	**N = 189**	**N = 203**
ICFI score, median	5.0 (4.0, 5.0)	4.0 (3.0, 5.0)	4.0 (3.0, 5.0)
ICFI score[3] = 6, %	22.7 (22.4, 23.1)	24.7 (24.6, 24.8)	14.8 (14.7, 15)
Currently breastfed, %	31.0 (29.5, 32.5)	24.9 (23.8, 25.9)	29.6 (28.5, 30.8)
Dietary diversity component score[4] ≥ 2, %	45.0 (44.7, 45.4)	48.7 (48.5, 48.8)	35.6 (35.4, 35.8)
Meal frequency component score[5] ≥ 3, %	74.8 (74.4, 75.2)	76.5 (76.4, 76.6)	73.4 (73.2, 73.6)
Children 24-59 months	**N = 485**	**N = 430**	**N = 445**
ICFI score, median	5.0 (5.0, 6.0)	5.0 (4.0, 6.0)	3.0 (4.0, 5.0)
ICFI score = 6, %	33.8 (33.4, 34.2)	24.8 (24.7, 24.9)	6.5 (6.4, 6.6)
Dietary diversity component score = 3, %	36.6 (36.2, 37)	32.6 (32.5, 32.7)	12.9 (12.8, 13)
Meal frequency component score ≥ 4 %	96.8 (96.7, 96.9)	90.3 (90.3, 90.4)	91.1 (91, 91.2)

[1] All values are either median (25th, 75th percentile) or percentage (95% confidence interval) as indicated, and are weighted to correct for unequal probability of selection.
[2] Defined as non-exclusive breastfeeding for children under six months and an ICFI score of <6 for children aged 6–59 months.
[3] ICFI score = 6 is equivalent to good practice based on continued breastfeeding, increased dietary diversity and increased meal frequency based on child's age range.
[4] Good dietary diversity score based on child's age range (≥ 2 food groups for 6–8 months, ≥ 3 food groups for 9–11 months, ≥ 4 food groups for 12–23 months, and ≥ 5 food groups for 24–59 months).
[5] Good meal frequency score based on child's age range (≥ 2 times for 6–8 months, ≥ 3 times for 9–11 months, and ≥ 4 times for 12–59 months).

Household food insecurity

As shown in Table 11, 4% of households in Balochistan and Punjab, and 1% of households in Sindh experienced moderate or severe hunger as defined by the household hunger score.

Table 11 Household food insecurity, Pakistan, 2017[1]

Variable	Balochistan N = 704	Punjab N = 690	Sindh N= 710
Moderate or severe household hunger,[2] %	3.5 (3.1, 3.9)	4.1 (3.6, 4.5)	1.3 (1.1, 1.6)

[1] All values are percentages (95% confidence interval) and weighted to correct for unequal probability of selection.
[2] Household hunger score >1.

5.3 FORTIFICATION AWARENESS AND KNOWLEDGE

As shown in Table 12, 9% of households in Balochistan, 11% of households in Punjab, and 8% in Sindh reported hearing about fortified foods. Out of these households that reported hearing about fortified foods, most of them reported positive attributes of fortified foods (92% of households in Balochistan, 98% in Punjab, and 97% in Sindh).

Table 12 Fortification awareness and knowledge, Pakistan, 2017[1]

Variable	Balochistan	Punjab	Sindh
Reported hearing about fortified foods, %	8.9 (8.7, 9.1)	11.0 (11.0, 11.1)	7.8 (7.7, 7.8)
	N = 704	**N = 690**	**N = 710**
Reported positive attributes of fortified foods[2], %	91.5 (90.9, 92.1)	98.4 (98.3, 98.4)	96.6 (96.5, 96.8)
	N = 59	**N = 81**	**N = 68**

[1] All values are percentages (95% confidence interval) and weighted to correct for unequal probability of selection.
[2] Among households that reported hearing about fortified foods. Positive attributes reported by households include 'enriched/added micronutrients', 'good for health', 'better quality', 'the food tastes good', and/or 'the food is good for the growth and development of children'.

5.4 BRAND PRESENCE IN THE MARKET

Table 13 presents the number of brands found per market hub for each food vehicle in the four provinces of Pakistan. Overall, a total of 30 salt, 149 oil/ghee, and 67 wheat flour brands were present in retail outlets in the market hubs surveyed.

Table 13 Number of available brands by food vehicle and market hub, Pakistan, 2017

Province	Market hub	Urban/Rural	Number of available brands		
			Salt	Oil/Ghee	Wheat flour
Balochistan	Sibi	Urban	5	18	14
Khyber Pakhtunkhwa	Mingora	Urban	2	5	5
	Bannu	Urban	8	14	7
	Domel	Rural	0	4	4
Punjab	Bahawalpur	Urban	1	18	3
	Faisalabad	Urban	5	70	9
	Chak Jhumra	Rural	8	25	13
Sindh	Hayderabad	Urban	2	22	0
	Rato dero	Rural	8	13	13
	Larkana	Urban	4	32	5
Total number of brands			**43**	**221**	**73**
Total number of unique brands[1]			**30**	**149**	**67**

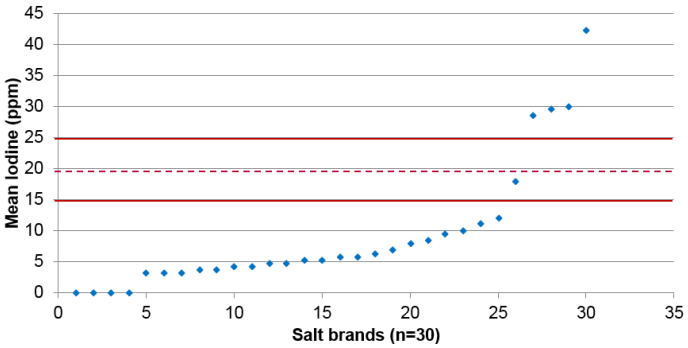
[1] The total number of brands across market hubs does not equal the total number of unique brands because some brands were found across multiple market hubs.

5.5 MICRONUTRIENT CONTENT OF FOODS SPECIMENS

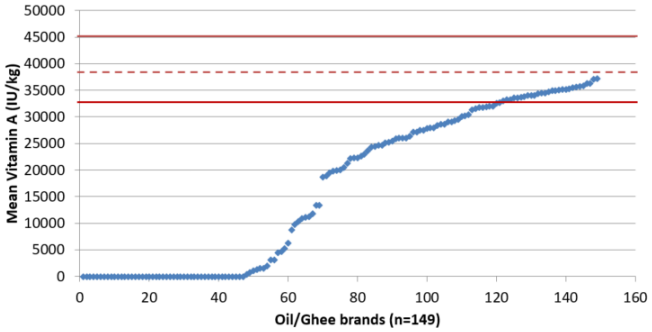
In this section, the results of the micronutrient content of food vehicles by brand based on laboratory analyses of food specimens collected from markets are presented. Figure 3 shows, for each food vehicle, the average nutrient content compared to the required nutrient content according to the standards in Pakistan for salt (PS: 1669-2008; at retail level), oil/ghee (PS:2858-2012 2nd Revision/PS:221-2010 4th Revision), and wheat flour (PS:4872-2017(R)). Details on the number of specimens analysed and measured micronutrient content per brand are presented in Annex 6.

Figure 3 Micronutrient content of foods vehicles by brand compared to Pakistan national standards, 2017

a. Salt



b. Oil/Ghee

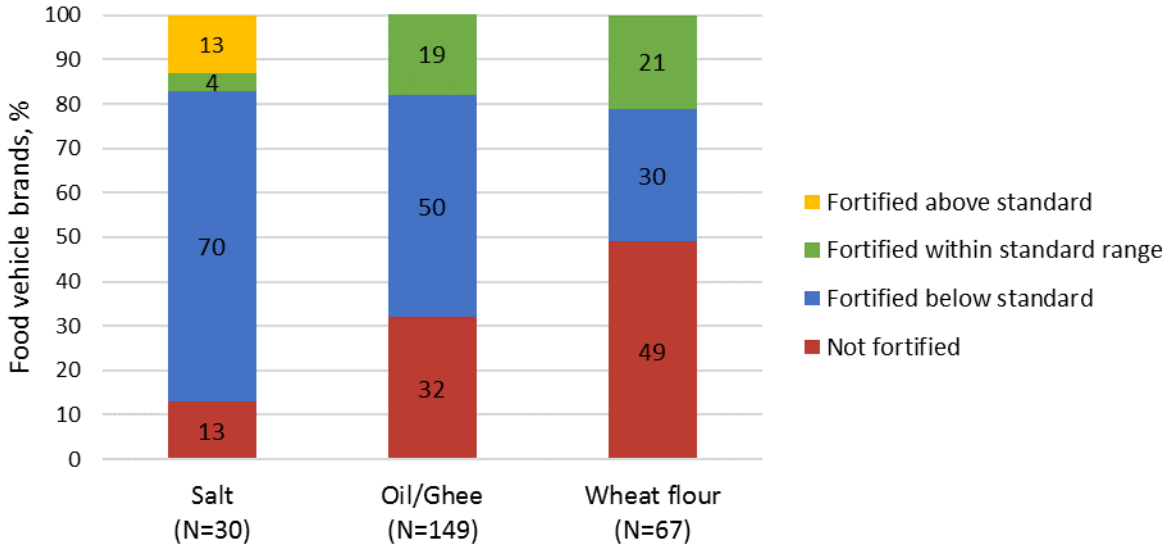


c. Wheat flour

The red solid lines indicate the mandatory micronutrient content according to the most recent Pakistani national standards: 15-25 ppm iodine in salt; 33,000-45,000 IU/kg vitamin A in oil/ghee; and ≥15 ppm added iron in wheat flour. The dotted red line indicates target average for salt and oil/ghee. The blue dashed and solid lines indicate the theoretical average and maximum micronutrient content, respectively, assuming 20% coefficient of variance and 90% compliance based on the standard minimum for wheat flour.

Figure 4 summarises the results of the micronutrient content by brand classified into categories based on compliance with national standards for each food vehicle. The results showed that 26 brands (87%) of salt, 102 brands (69%) of oil/ghee, and 34 brands (51%) of wheat flour were confirmed to be fortified to some extent. However, only one brand (4%) of salt, 28 brands (19%) of oil/ghee, and 14 brands (21%) of wheat flour were fortified in compliance with the national standards. Additionally, 4 brands (13%) of salt were fortified above the national standard.

Figure 4 Fortification compliance of brands by food vehicle compared to Pakistan national fortification standards, 2017



Fortification compliance was defined as follows: iodine in salt: not fortified (<3 ppm), fortified below standard (3 to <15 ppm), fortified within standard range (15 to 25 ppm), fortified above standard (≥25 ppm); vitamin A in oil/ghee: not fortified (0 IU/kg), fortified below standard (>0 to <33,000 IU/kg), fortified within standard range (≥33,000 to 45,000 IU/kg), fortified above standard (>45,000 IU/kg); and added iron in wheat flour: not fortified (negative iron spot test), fortified below standard (>0 to <15 mg/kg), fortified within standard range (≥15 mg/kg), fortified above standard (not applicable).

As shown in Table 14, the fortification compliance also varied by place of production (imported versus local). One brand of salt and 11 brands of oil/ghee were imported, while no brands of wheat flour were imported. Of the imported brands, none of the salt brand (0%) and only two brands (18%) of oil/ghee were fortified to some extent. All the salt, oil/ghee, and wheat flour brands that were found to be fortified within the standard range were locally produced.

Table 14 Fortification compliance of brands by source of production, Pakistan, 2017[1]

Imported Brands					
Food Vehicle	**Not fortified**	**Fortified below standard**	**Fortified within standard range**	**Fortified above standard**	**Total imported**
Salt	1	0	0	N/A	1
Oil/ghee	9	2	0	0	11
Wheat flour	0	0	0	N/A	0
Local Brands					
Food Vehicle	**Not fortified**	**Fortified below standard**	**Fortified within standard range**	**Fortified above standard**	**Total imported**
Salt	3	21	1	4	29
Oil/ghee	38	72	28	0	138
Wheat flour	33	20	14	N/A	67

[1] Fortification compliance was defined as follows: iodine in salt: not fortified (<3 ppm), fortified below standard (3 to <15 ppm), fortified within standard range (15 to 25 ppm), fortified above standard (≥25 ppm); vitamin A in oil/ghee: not fortified (0 IU/kg), fortified below standard (>0 to <33,000 IU/kg), fortified within standard range (≥33,000 to 45,000 IU/kg), fortified above standard (>45,000 IU/kg); and added iron in wheat flour: not fortified (negative iron spot test), fortified below standard (>0 to <15 mg/kg), fortified within standard range (≥15 mg/kg), fortified above standard (not applicable).

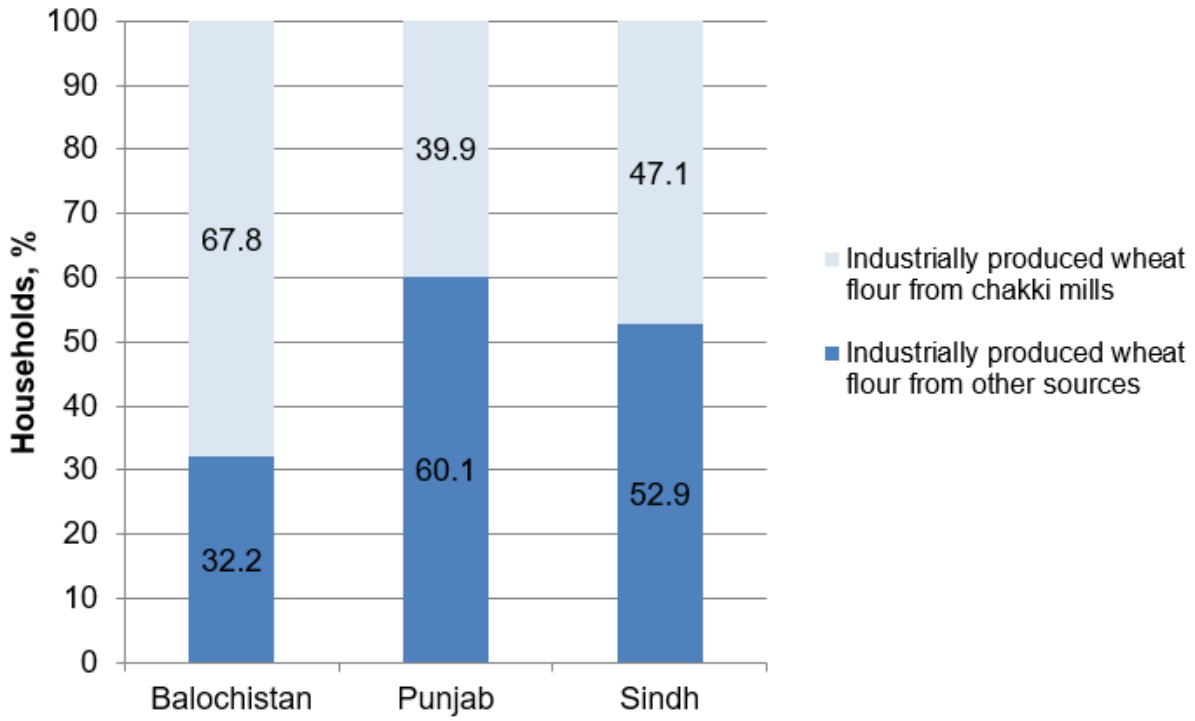
5.6 HOUSEHOLD COVERAGE OF FOODS

5.6.1 Household coverage of foods by province

Figure 6 shows the household coverage of salt, oil/ghee, and wheat flour, i.e. the proportion of households that consume a food vehicle, the proportion of households that consume a fortifiable form of that food vehicle (i.e. industrially produced), and the proportion of households that consume a fortified food vehicle.

Salt and oil/ghee were universally consumed by all households (100%) in the three provinces. Wheat flour was also universally consumed by households in Balochistan and Punjab (100%) and by 91% of households in Sindh. For salt and oil/ghee, 75-100% of households in the three provinces consumed these foods in a fortifiable form; however, fewer households consumed wheat flour in a fortifiable form, i.e. 52% in Balochistan, 31% in Punjab, and 63% in Sindh. Among households that reported consuming a fortifiable form of wheat flour, chakki mill flour accounted for 68% of the fortifiable flour consumed in Balochistan, 40% in Punjab, and 47% in Sindh (Figure 5).

Figure 5 Type of wheat flour used among households consuming fortifiable wheat flour, Pakistan, 2017[6]



Balochistan, N=348; Punjab, N=200; Sindh, N=495

As described in the survey limitations, many households were not able to report a brand for certain food vehicles or in some cases the brand reported by the household was not found in the market survey. As a result, there was in a high proportion of households with unknown fortification status for many food vehicles when attempting to link the reported brand used in

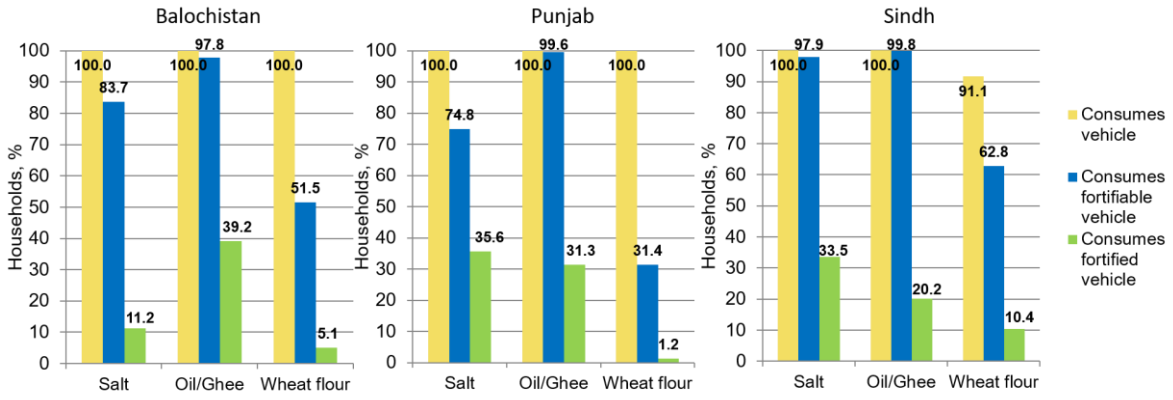
[6] Correction note: An earlier version of this report contained an error that incorrectly switched the labels for industrially produced wheat flour from chakki mills and from other sources as well as the labels for Punjab and Sindh in Figure 5. This has been corrected in this version of the report and all related text.

the household to the results of the laboratory analyses of food specimens from that brand collected from markets; therefore, the consumes fortified food vehicle indicators reported here may be underestimated and should be interpreted with caution. Food samples were not taken from households, and therefore the actual micronutrient content at this level is unknown.

In Balochistan, 11% of households were confirmed to consume fortified salt (71% classified as unknown), 39% were confirmed to consume fortified oil/ghee (53.5% classified as unknown), and 5% were confirmed to consume fortified wheat flour (44.7% classified as unknown). In Punjab, household coverage of the fortified food vehicle was: 36% for salt (37.8% unknown), 31% for oil/ghee (64.7% unknown), and 1% for wheat flour (25.1% unknown). In Sindh, household coverage of the fortified food vehicle was: 34% for salt (64.1% unknown), 20% for oil/ghee (58.9% unknown), and 10% for wheat flour (40.3% unknown).

Annex 7 presents these results in a tabular format.

Figure 6 Household coverage of foods, Pakistan, 2017



Balochistan, N=704; Punjab, N=690; Sindh, N=710.The proportion of households for which fortification status was unknown because no brand was reported or the brand reported was not found in the market survey was: 71.0% for salt, 53.5% for oil/ghee, and 44.7% for wheat flour in Balochistan; 37.8% for salt, 64.7% for oil/ghee, and 25.1% for wheat flour in Punjab; and 64.1% for salt, 58.9% for oil/ghee, and 40.3% for wheat flour in Sindh.

5.6.2 Household coverage by risk factors

The following section presents the household coverage of fortifiable food vehicles disaggregated by risk factors in Balochistan, Punjab, and Sindh. Throughout the text, statements of significant differences between the groups account for the probability that such observed discrepancies could have occurred by chance in 5%, 1%, or 0.1% of the cases. It is important to distinguish the concept of a statistically significant difference between two groups and the size or magnitude of that difference. It may be the case that a difference between two groups is statistically significant, but the magnitude of that difference is small and therefore not practically or operationally relevant. For further details on statistical analyses refer to section 4.4.2.

Coverage of foods in general is not presented disaggregated by risk factors because it was universal for all vehicles in all provinces, except for wheat flour in Sindh, where the coverage was comparatively high (92%). Coverage of fortified foods is also not presented

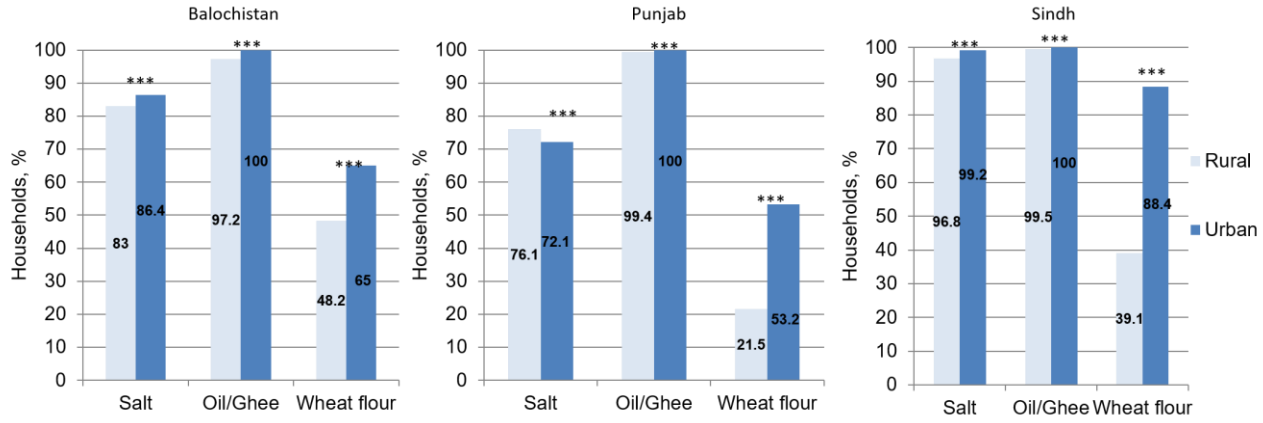
disaggregated by risk factors due to small sample sizes resulting from the high proportion of households classified as unknown in the analyses. Annex 7 presents these results in a tabular format.

Region of residence

Figure 7 presents the household coverage of fortifiable foods disaggregated by region of residence.

For all food vehicles, apart from salt in Punjab, fewer rural households consumed the fortifiable food vehicle compared to urban households. The differences were relatively small (<4 percentage points) except for wheat flour where 48% of rural households consumed fortifiable wheat flour compared to 65% of urban households in Balochistan; in Punjab these figures were 22% of rural households compared to 53% of urban households; and in Sindh these figures were 39% of rural households compared to 88% of urban households.

Figure 7 Household coverage of fortifiable foods by region, Pakistan, 2017



Balochistan (Urban, N=136; Rural, N=568); Punjab (Urban, N=210; Rural, N=480); Sindh (Urban, N=395; Rural, N=315).
*P<0.05, **P<0.01, ***P<0.001.

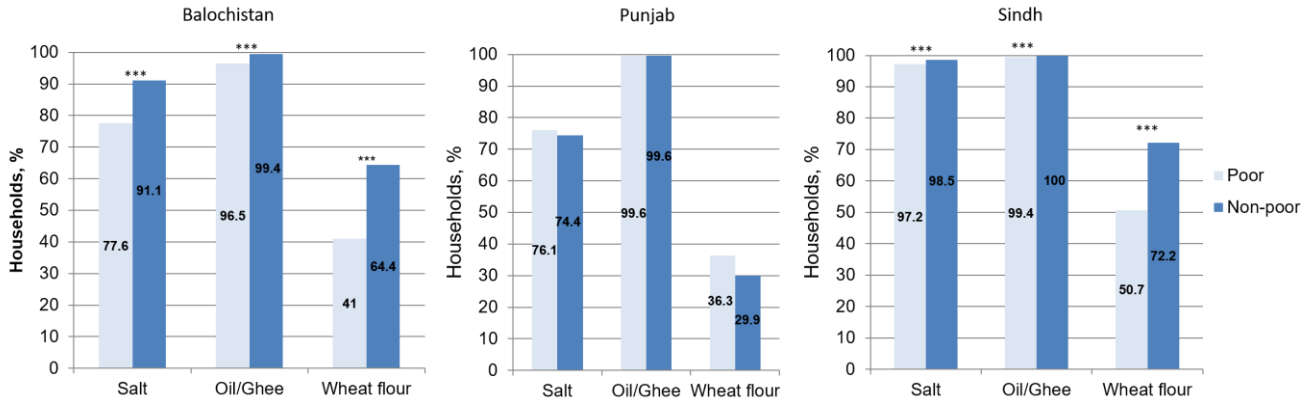
Poverty status

Figure 8 presents the household coverage of fortifiable foods disaggregated by household poverty status as defined by the MPI.

There were statistically significant differences in consumption of fortifiable foods between poor and non-poor households for all food vehicles in Balochistan and Sindh. For all food vehicles in both provinces, fewer poor households consumed the fortifiable food vehicle compared to non-poor households. The greatest difference was observed for wheat flour where 41% of poor households consumed fortifiable wheat flour compared to 64% of non-poor households in Balochistan and 51% of poor households compared to 72% of non-poor households in Sindh.

In Punjab, the differences in the consumption of all the fortifiable food vehicles between poor and non-poor households were not statistically significant.

Figure 8 Household coverage of fortifiable foods by poverty status, Pakistan, 2017



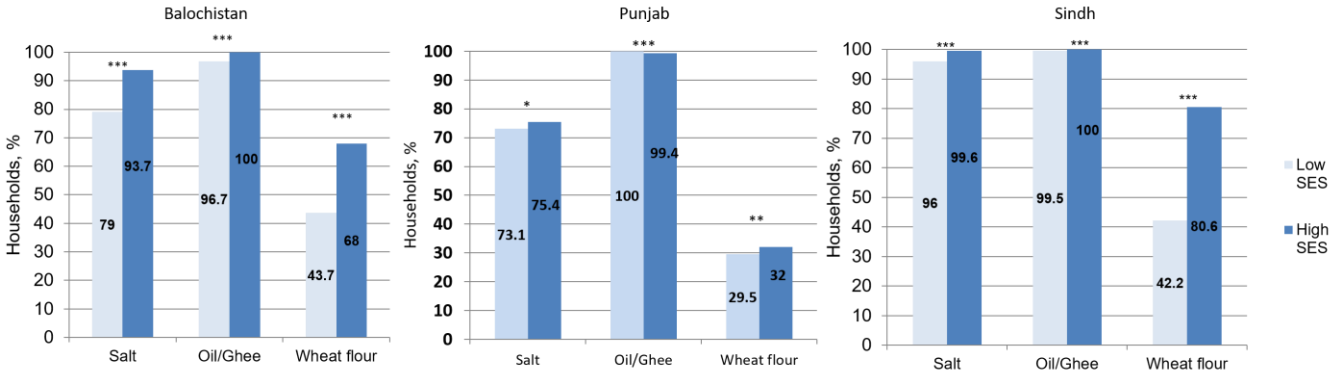
Poor = multi-dimensional poverty index ≥ 0.33. Balochistan (Poor, N=406; Non-poor, N=298). Punjab (Poor, N=154; Non-poor, N=536). Sindh (Poor, N=290; Non-poor, N=420).
*P<0.05, **P<0.01, ***P<0.001.

Socio-economic status

Figure 9 presents the household coverage of fortifiable foods disaggregated by household SES as defined by the DHS wealth index.

In Balochistan and Sindh, fewer households with low SES consumed all fortifiable food vehicles compared to households with high SES. The difference was statistically significant. The greatest difference was observed for wheat flour where 44% of households with low SES consumed fortifiable wheat flour compared to 68% of households with high SES in Balochistan, 30% of households with low SES compared to 32% of households with high SES in Punjab and 42% of households with low SES compared to 81% of households with high SES in Sindh.

Figure 9 Household coverage of fortifiable foods by socio-economic statues (SES), Pakistan, 2017



Low SES = lowest two wealth quintiles. Balochistan (High SES, N=208; Low SES, N=496). Punjab (High SES, N=524; Low SES, N=166). Sindh (High SES, N=410; Low SES, N=300).
*P<0.05, **P<0.01, ***P<0.001.

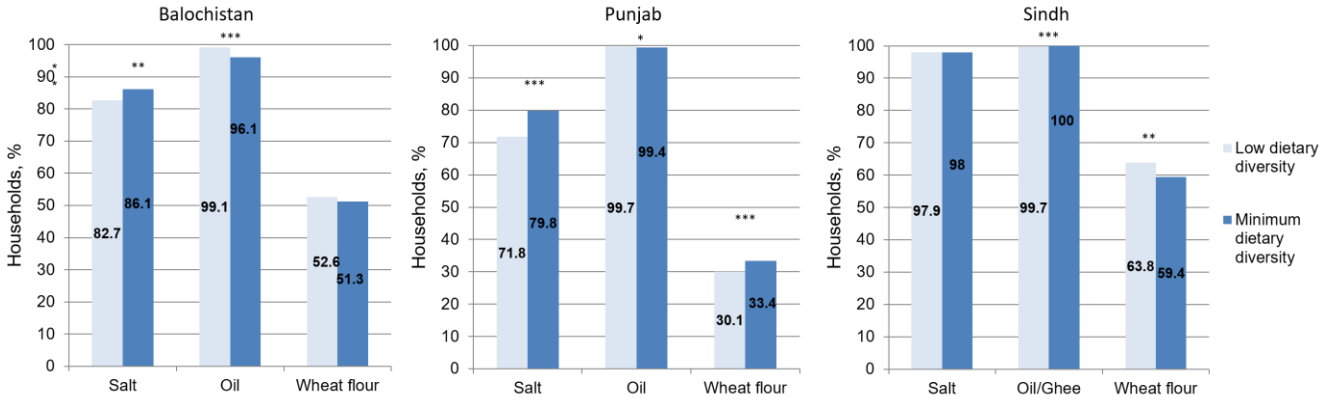
Women's dietary diversity

Figure 10 presents the household coverage of fortifiable foods disaggregated by women's dietary diversity as defined by the MDD-W.

Fortifiable salt was consumed by significantly fewer households with low dietary diversity compared to households with minimum dietary diversity in Balochistan and Punjab. Similarly, fortifiable wheat flour was consumed by significantly fewer households with low dietary diversity compared to household with minimum dietary diversity in Punjab. The differences were relatively small for both food vehicles (<4 percentage points).

Conversely, fortifiable oil was consumed by significantly more households with low dietary diversity compared to household with minimum dietary diversity in all three provinces. A similar trend was apparent in the consumption of fortifiable wheat flour in Sindh where it was consumed by significantly more households with low dietary diversity compared to household with minimum dietary diversity. The differences were relatively small for both food vehicles (<3 percentage points).

Figure 10 Household coverage of fortifiable foods by women's dietary diversity, Pakistan, 2017



Low dietary diversity = women's dietary diversity score < 5. Balochistan (Minimum dietary diversity, N=242; Low dietary diversity, N=441). Punjab (Minimum dietary diversity, N=253; Low dietary diversity, N=433). Sindh (Minimum dietary diversity, N=96; Low dietary diversity, N=606).
*P < 0.05, **P < 0.01, ***P < 0.001.

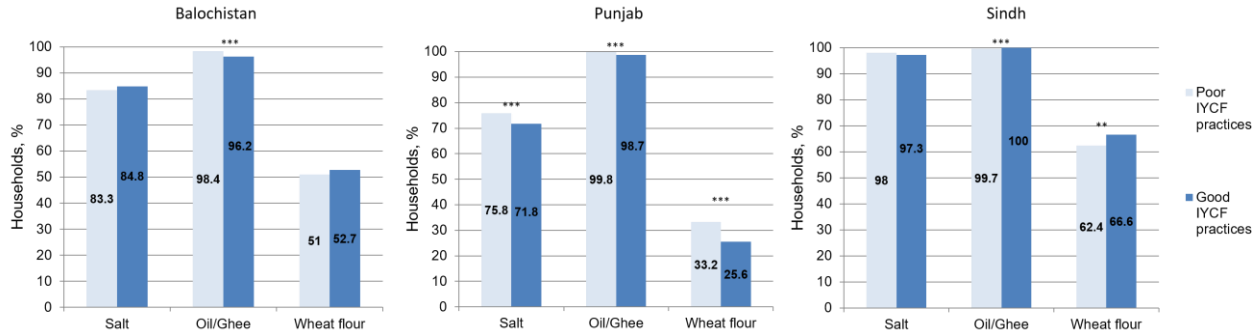
Infant and young child feeding practices

Figure 11 presents the household coverage of fortifiable foods disaggregated by IYCF practices.

Significantly more households with poor IYCF practices consumed fortifiable oil/ghee in Balochistan and Punjab, and salt and wheat flour in Punjab compared to households with good IYCF practices, though the differences were small (1-8 percentage points).

Conversely, fewer households with poor IYCF practices consumed fortifiable oil/ghee in Punjab and Sindh; however again the differences were small (1 percentage point).

Figure 11 Household coverage of fortifiable foods by infant and young child feeding (IYCF) practices, Pakistan, 2017



Poor IYCF practices = infant and child feeding index score < 6. Balochistan (Poor IYCF, N=505; Good IYCF, N=199). Punjab (Poor IYCF, N=531; Good IYCF, N=159). Sindh (Poor, N=648; Good IYCF, N=62).
*P < 0.05, **P < 0.01, ***P < 0.001.

Household food security

The household coverage of fortifiable foods was disaggregated by household food security is not presented due to the small proportion of households that were classified as food insecure in each province (<5%) (as shown in Table 11).

Annex 7 presents all results of coverage indicators disaggregated by risk factors in a tabular format.

5.7 CONSUMPTION OF FORTIFIABLE FOODS

Table 15 presents the daily apparent consumption of fortifiable food vehicles among children in four age groups (6-8 months, 9-11 months, 12-23 months, and 24-59 months) and WRA in each province.

In Balochistan, daily apparent consumption of fortifiable salt ranged from 1.2 g/day to 2.6 g/day among children, increasing by age group, and was 5.2 g/day among WRA. For fortifiable oil/ghee, daily apparent consumption ranged from 7.7 ml/day to 17.2 ml/day among children, increasing by age group, and was 33.5 ml/day among WRA. For fortifiable wheat flour, daily apparent consumption ranged from 30.1 g/day to 52.3 g/day among children, and 105.2 g/day among WRA.

In Punjab, daily apparent consumption of fortifiable salt ranged from 1.3 g/day to 2.1 g/day among children and was 4.2 g/day among WRA. For fortifiable oil/ghee, daily apparent consumption ranged from 8.9 ml/day to 18.3 ml/day among children and was 36.6 ml/day among WRA. For fortifiable wheat flour, daily apparent consumption ranged from 13.0 g/day to 33.2 g/day among children, and for WRA it was 66.7 g/day. Consumption for all three food vehicles was higher among children 6-8 months compared to children 9-11 months.

In Sindh, daily apparent consumption of fortifiable salt ranged from 1.5 g/day to 3.3 g/day among children, increasing by age group, and was 6.4 g/day among WRA. For fortifiable oil/ghee, daily apparent consumption ranged from 8.4 g/day to 16.4 g/day among children, increasing by age group, and was 33.0 ml/day among WRA. For fortifiable wheat flour, daily apparent consumption ranged from 40.8 g/day to 59.6 g/day among children, increasing by age group, and was126.0 g/day among WRA.

Table 15 Daily apparent consumption of fortifiable foods by population group and province, Pakistan 2017[1]

Fortifiable food vehicle[2]	Children				Women
	6-8 months	9-11 months	12-23 months	24-59 months	18-49 years
Balochistan					
Salt, g/day	1.2 (1.2, 1.3)	1.2 (1.1, 1.2)	2.1 (2.1, 2.1)	2.6 (2.6, 2.6)	5.2 (5.2, 5.3)
N	24	28	121	474	670
Oil/ghee ml/day	7.7 (7.6, 7.8)	8.4 (8.3, 8.5)	12.7 (12.6, 12.8)	17.2 (17.2, 17.3)	33.5 (33.4, 33.6)
N	26	29	123	478	674
Wheat flour, g/day	33.3 (32.5, 34.1)	30.1 (29.3, 30.9)	44.3 (43.5, 45.1)	52.3 (51.7, 52.8)	105.2 (104.1, 106.3)
N	26	29	123	483	681
Punjab					
Salt, g/day	1.4 (1.4, 1.4)	1.3 (1.3, 1.3)	1.7 (1.7, 1.7)	2.1 (2.1, 2.1)	4.2 (4.2, 4.2)
N	31	30	126	426	673
Oil/ghee ml/day	10.8 (10.8, 10.9)	8.9 (8.8, 8.9)	14.6 (14.5, 14.6)	18.3 (18.3, 18.4)	36.6 (36.6, 36.6)
N	31	29	125	425	674
Wheat flour, g/day	14.0 (13.7, 14.4)	13.0 (12.8, 13.2)	29.6 (29.4, 29.8)	33.2 (33.1, 33.3)	66.7 (66.4, 66.9)
N	31	30	128	429	684
Sindh					
Salt, g/day	1.5 (1.5, 1.5)	1.8 (1.8, 1.8)	2.3 (2.3, 2.3)	3.3 (3.3, 3.3)	6.4 (6.3, 6.4)
N	22	35	144	430	685
Oil/ghee ml/day	8.4 (8.4, 8.5)	9.4 (9.4, 9.5)	13 (12.9, 13)	16.4 (16.3, 16.4)	33.0 (33, 33.1)
N	23	35	143	437	691
Wheat flour, g/day	40.8 (40.4, 41.1)	43.2 (42.8, 43.6)	47.7 (47.4, 48)	59.6 (59.2, 59.9)	126.0 (125.4, 126.6)
N	23	36	144	444	701

[1] All values are mean (95% confidence interval) unless otherwise indicated and are weighted to correct for unequal probability of selection.
[2] Fortifiable refers to a food vehicle that is industrially processed (i.e. not made at home).

5.7.1 MICRONUTRIENT CONTRIBUTION FROM FORTIFIED FOODS

This section presents the micronutrient contribution from the consumption of fortified foods as a percentage of the EAR (for iodine and vitamin A) or RDA (for iron). The results are presented as histograms where the prevalence on the y-axis refers to the percentage of the specific target population who fall into each range of % EAR or RDA for a specific micronutrient shown on the x-axis. These are based on actual consumption estimates of the three food vehicles assessed (see Table 15) and a fortification exposure level, both actual (i.e. using measured micronutrient content for each food vehicle found in the market assessment) and modelled (i.e. using the target average micronutrient content according to the fortification standards for food vehicles where the fortification standards are set as a range (i.e. vitamin A in oil) or a theoretical target average micronutrient content for food vehicles where the fortification standards are set as a minimum value (i.e. iodine in salt and iron in wheat flour), which was estimated from the minimum national standard requirement at production level assuming 20% variation and 90% compliance).

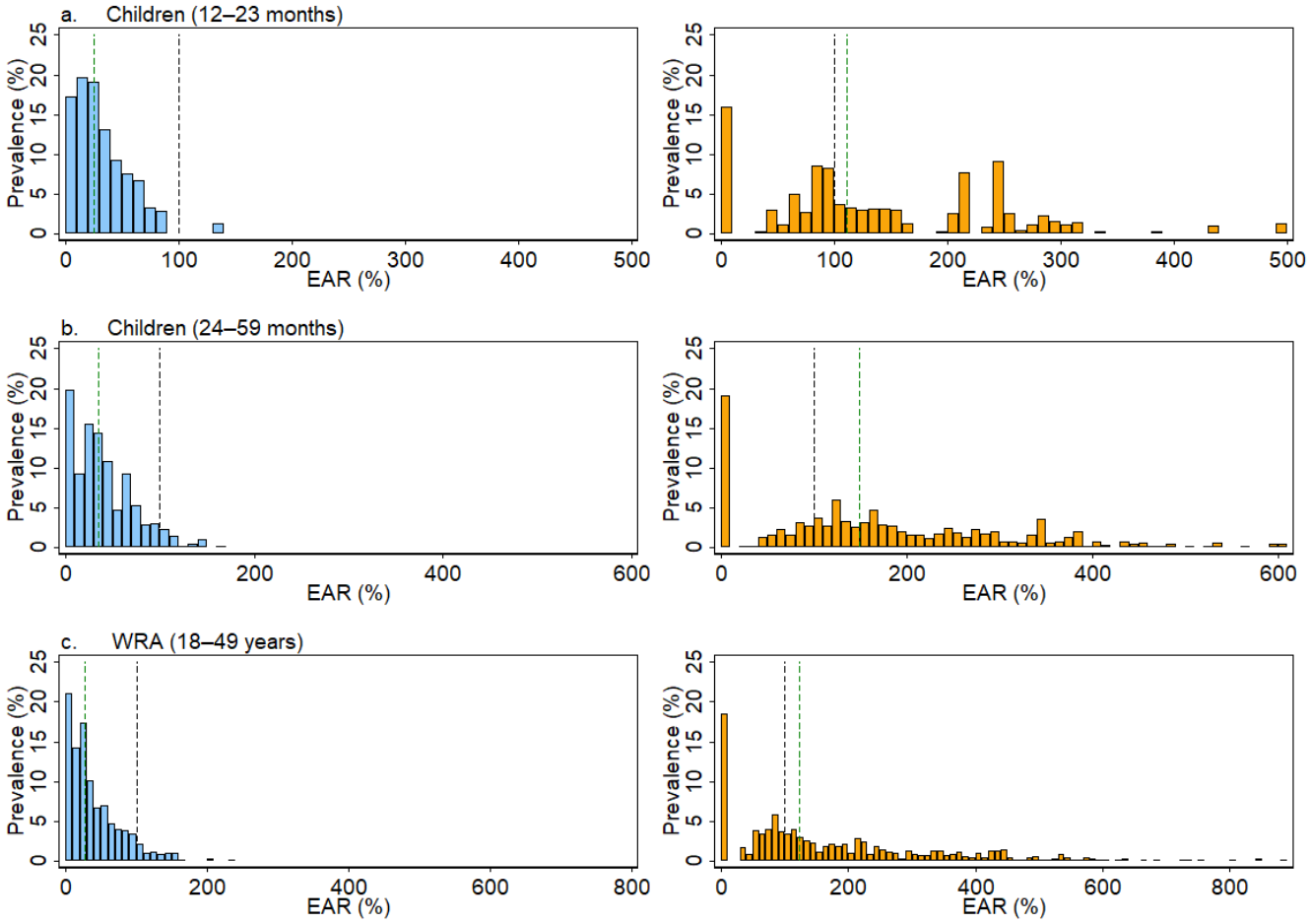
Tables with detailed results can be found in Annex 8. Figure 12, Figure 13, and Figure 14 present the current and modelled iodine contribution from the consumption of fortified salt as a percentage of the EAR in Balochistan, Punjab, and Sindh, respectively. The actual and modelled contributions from fortified salt to dietary iodine requirements were below 35% for all target populations

In Balochistan, fortified salt was estimated to contribute on average 25% of the EAR for iodine among children aged 12–23 months, 34% among children 24–59 months, and 28% among WRA. When modelled assuming compliance with the fortification standard, the estimates were similar across all child age groups and for WRA: 111% among children 12–23 months, 149% among children 24–59 months, and 123% among WRA.

In Punjab, fortified salt was estimated to contribute on average 24% of the EAR for iodine among children aged 12–23 months, 29% among children aged 24–59 months, and 24% among WRA. When modelled assuming compliance with the fortification standard, the estimates were similar across all age groups and for WRA: 109% among children aged 12–23 months, 150% among children aged 24–59 months, and 113% among WRA.

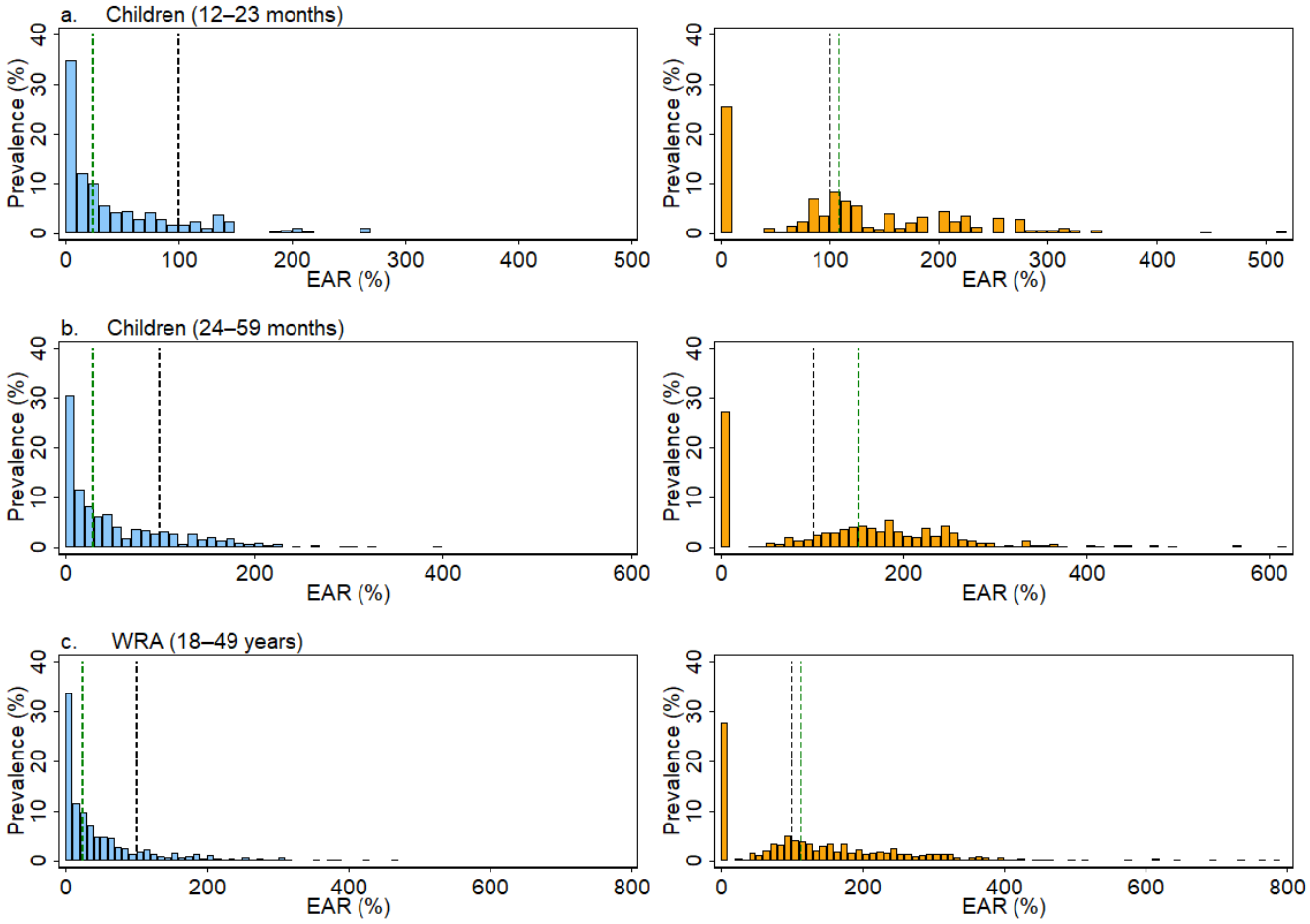
In Sindh, fortified salt was estimated to contribute on average 23% of the EAR for iodine among children aged 12–23 months, 29% among children aged 24–59 months, and 23% among WRA. When modelled assuming compliance with the fortification standard, the estimates were similar across all age groups and for WRA: 149% among children aged 12–23 months, 209% among children aged 24–59 months, and 167% among WRA.

Figure 12 Actual and modelled iodine contribution from consumption of fortified salt as a percentage of estimated average requirements (EAR), Balochistan, 2017



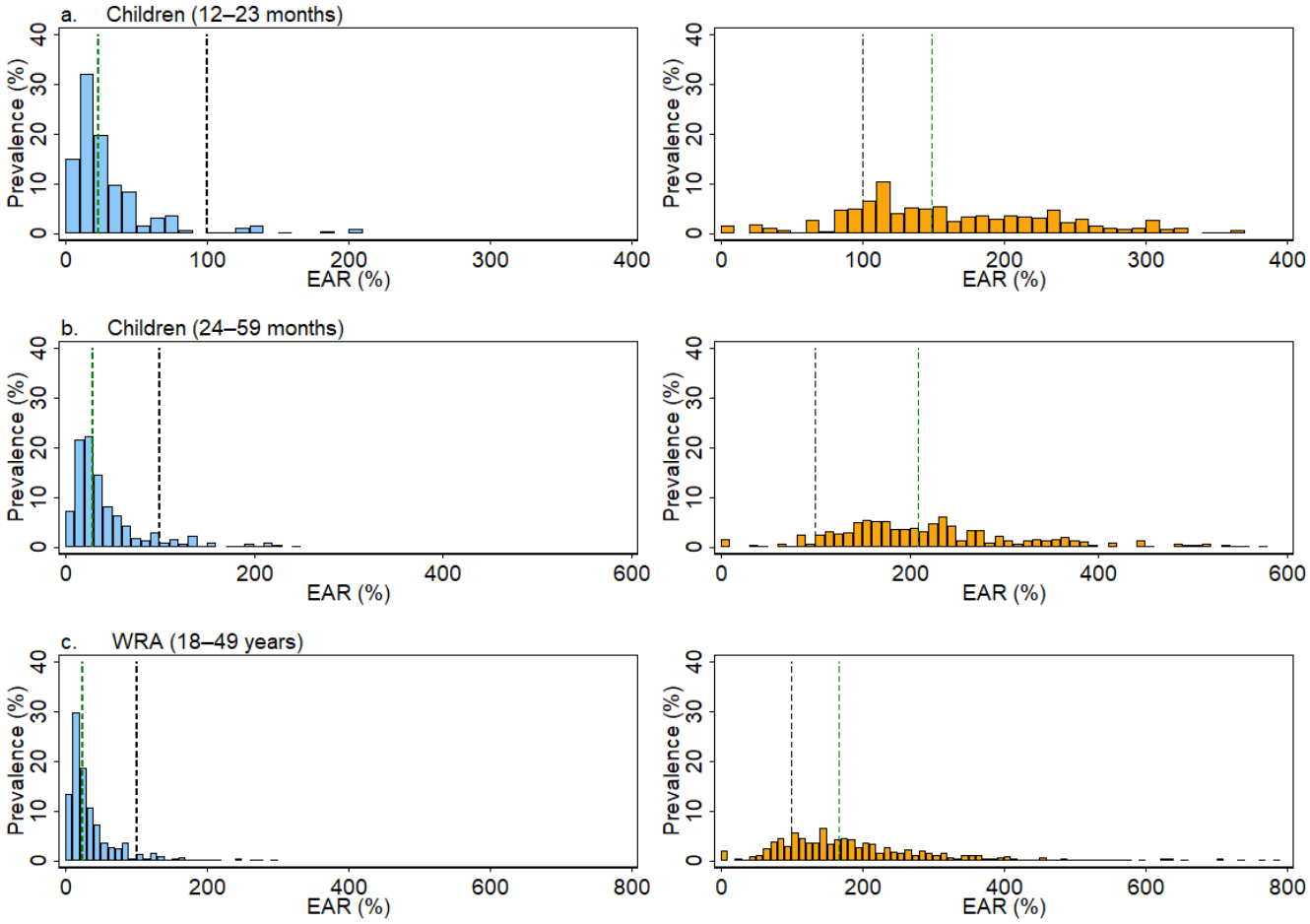
WRA, women of reproductive age. Blue and orange bars indicate actual and modelled estimates, respectively. Dotted black line is at 100%; dotted green line is at the median %.

Figure 13 Actual and modelled iodine contribution from consumption of fortified salt as a percentage of estimated average requirements (EAR), Punjab, 2017



WRA, women of reproductive age. Blue and orange bars indicate actual and modelled estimates, respectively. Dotted black line is at 100%; dotted green line is at the median %.

Figure 14 Actual and modelled iodine contribution from consumption of fortified salt as a percentage of estimated average requirements (EAR), Sindh, 2017



WRA, women of reproductive age. Blue and orange bars indicate actual and modelled estimates, respectively. Dotted black line is at 100%; dotted green line is at the median %.

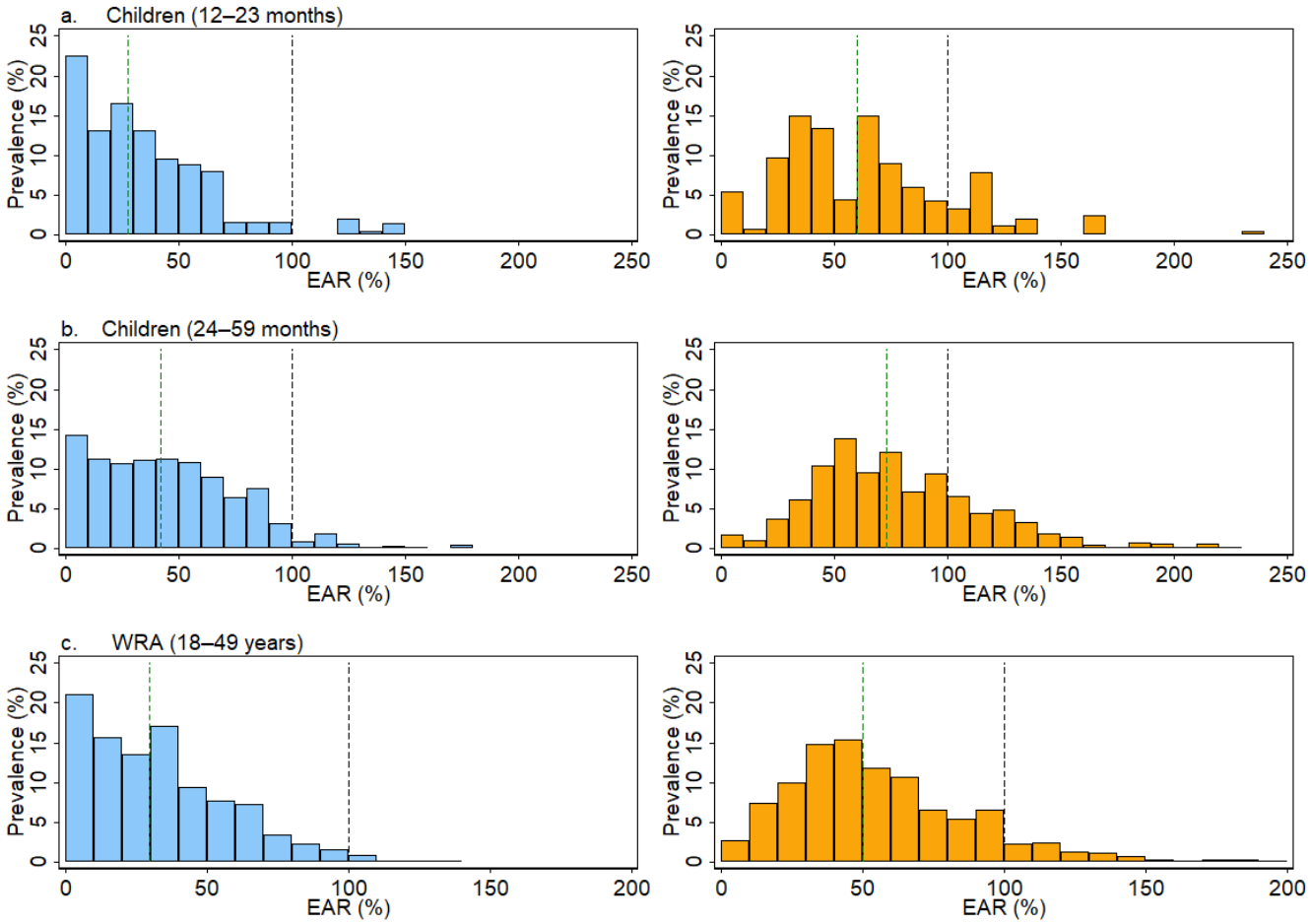
Figure 15, Figure 16, and Figure 17 present the actual and modelled vitamin A contribution from the consumption of fortified oil/ghee as a percentage of the EAR in Balochistan, Punjab, and Sindh, respectively. The current contribution from fortified foods to dietary vitamin A requirements was generally low across all target populations (<60%).

In Balochistan, fortified oil/ghee was estimated to contribute on average 28% of the EAR for vitamin A among children aged 12–23 months, 42% among children aged 24–59 months, and 30% among WRA. When modelled assuming compliance with the fortification standard, the estimates were similar across all age groups and for WRA: 60% among children aged 12–23 months, 73% among children aged 24–59 months, and 50% among WRA.

In Punjab, fortified oil/ghee was estimated to contribute on average 52% of the EAR for vitamin A among children aged 12–23 months, 58% among children aged 24–59 months, and 38% among WRA. When modelled assuming compliance with the fortification standard, the estimates were similar across all age groups and for WRA: 71% among children aged 12–23 months, 79% among children aged 24–59 months, and 55% among WRA.

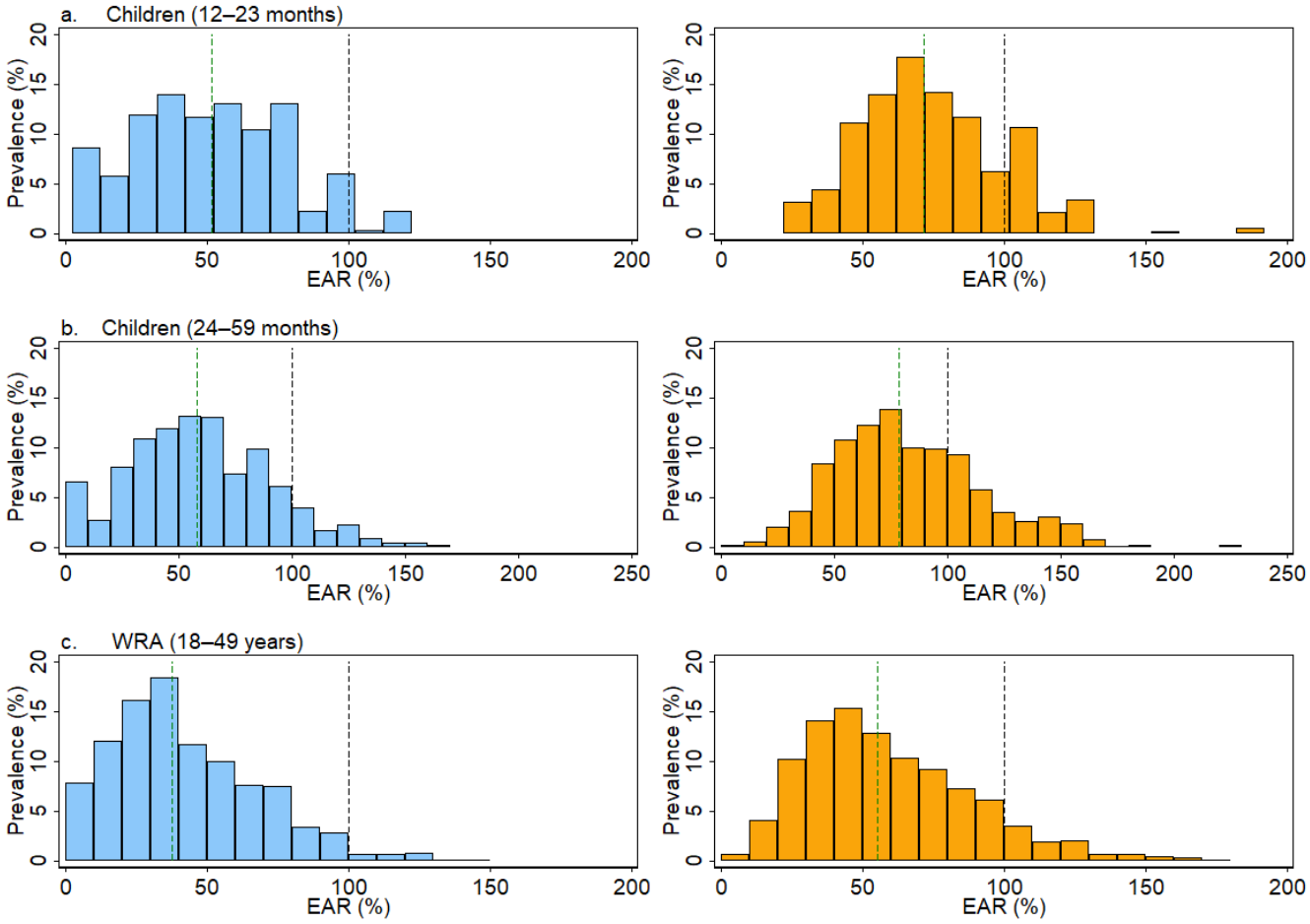
In Sindh, fortified oil/ghee was estimated to contribute on average 33% of the EAR for vitamin A among children aged 12–23 months, 35% among children aged 24–59 months, and 22% among WRA. When modelled assuming compliance with the fortification standard, the estimates were similar across all age groups and for WRA: 59% among children aged 12–23 months, 70% among children aged 24–59 months, and 45% among WRA.

Figure 15 Actual and modelled vitamin A contribution from consumption of fortified oil/ghee as a percentage of estimated average requirements (EAR), Balochistan, 2017



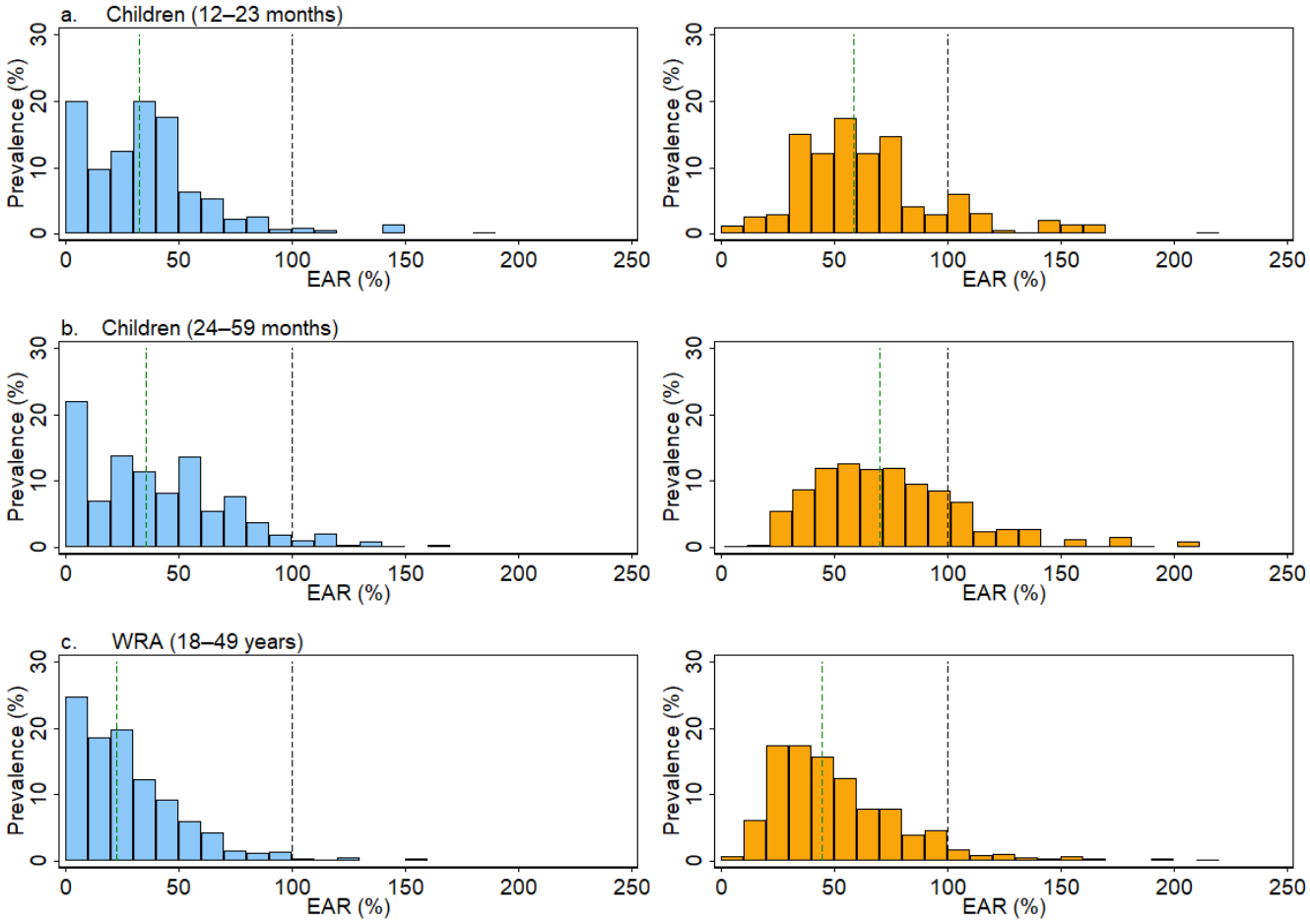
WRA, women of reproductive age. Blue and orange bars indicate actual and modelled estimates, respectively. Dotted black line is at 100%; dotted green line is at the median %.

Figure 16 Actual and modelled vitamin A contribution from consumption of fortified oil/ghee as a percentage of estimated average requirements (EAR), Punjab, 2017



WRA, women of reproductive age. Blue and orange bars indicate actual and modelled estimates, respectively. Dotted black line is at 100%; dotted green line is at the median %.

Figure 17 Actual and modelled vitamin A contribution from consumption of fortified oil/ghee as a percentage of estimated average requirements (EAR), Sindh, 2017



WRA, women of reproductive age. Blue and orange bars indicate actual and modelled estimates, respectively. Dotted black line is at 100%; dotted green line is at the median %.

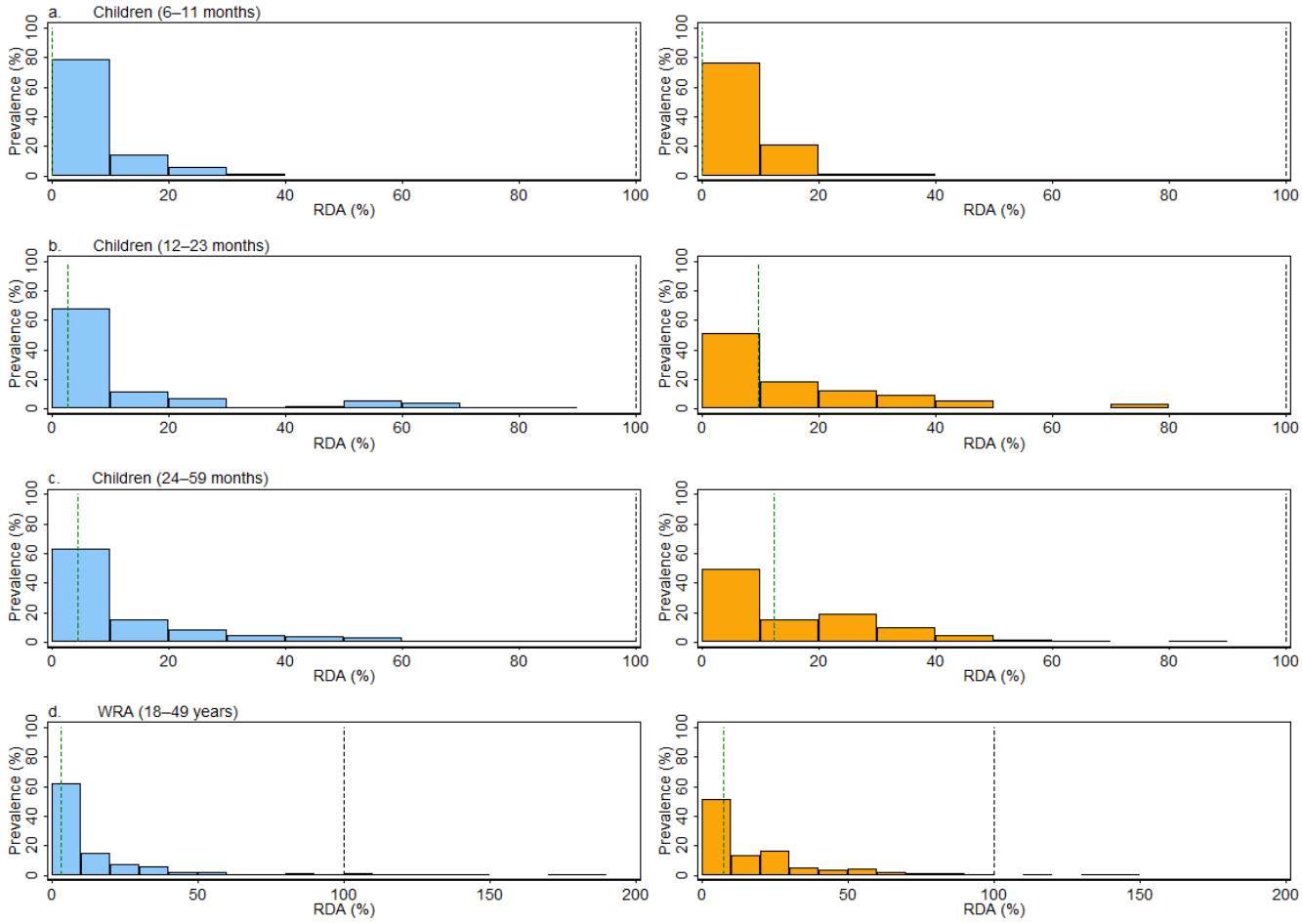
Figure 18, Figure 19, and Figure 20 present the current and modelled iron contribution from the consumption of fortified wheat flour as a percentage of the RDA in Balochistan, Punjab, and Sindh, respectively. The current contribution from fortified wheat flour to dietary iron requirements was generally low across all target populations but the modelled estimates demonstrate that there is potential for fortified foods to make an important contribution to iron intakes among most population groups (except children aged 6–11 months) if producers are compliant with the standard.

In Balochistan, fortified wheat flour was estimated to contribute on average less than 1% of the RDA for iron among children aged 6–11 months, 3% among 12–23 months, 4% among children aged 24–59 months, and 3% among WRA. If the fortification standard were complied with, the fortified foods could potentially provide 10% of the RDA for iron among children aged 12-23 months, 12% among 24–59 months and 7% among WRA.

In Punjab, fortified wheat flour was estimated to contribute on average less than 1% of the RDA for iron for all population groups for both current and modelled iron contribution from the consumption of fortified wheat flour.

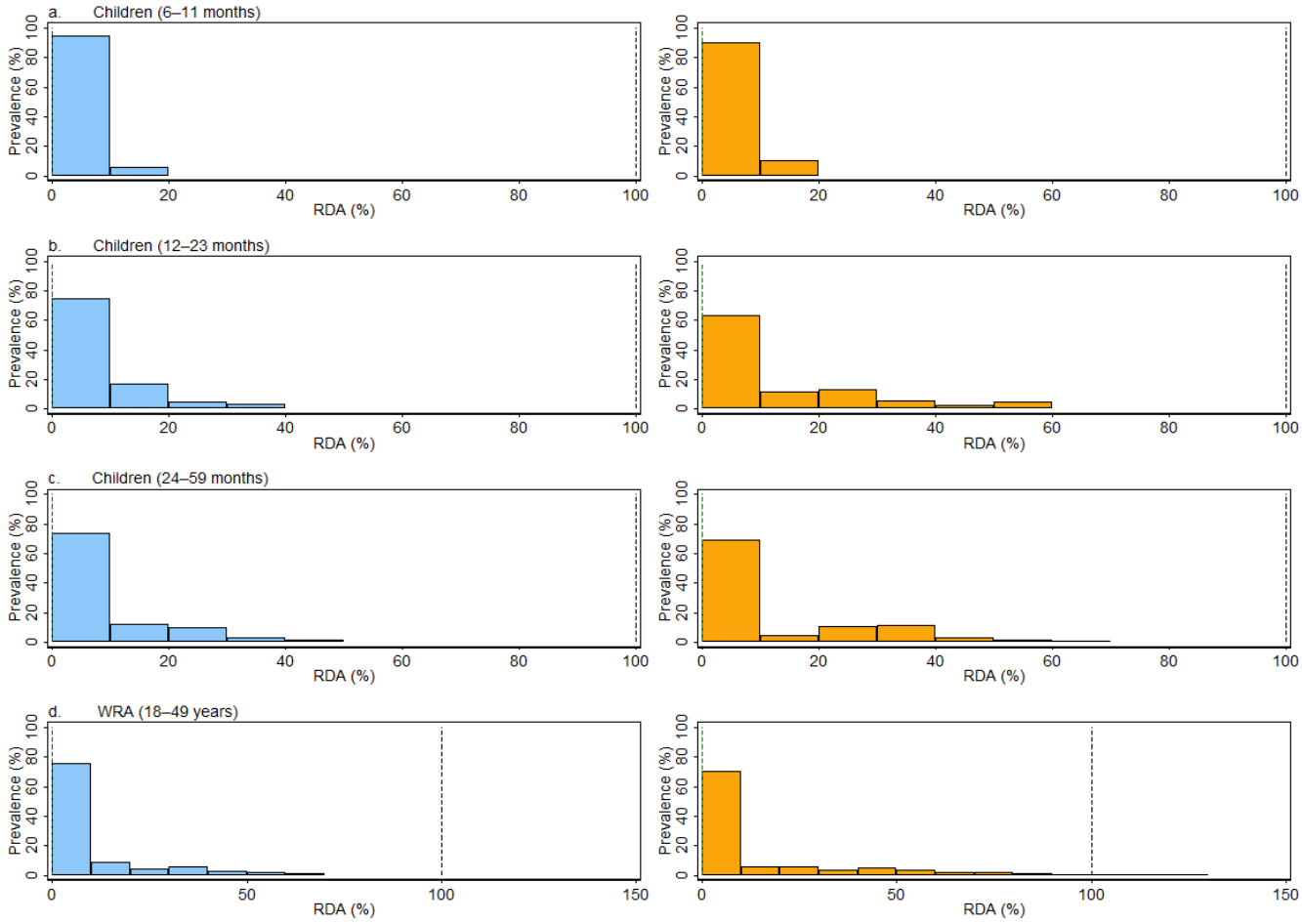
In Sindh, fortified wheat flour was estimated to contribute on average 4% of the RDA for iron among children aged 6–11 months, 8% among children aged 12–23 months, 7% among children aged 24–59 months, and 9% among WRA. If wheat flour was fortified in compliance with the standard, it could potentially provide 8% of the RDA for iron among children aged 6–11 months, 15% among children aged 12–23 months, 12% among children aged 24–59 months, and 17% among WRA.

Figure 18 Actual and modelled iron contribution from consumption of fortified wheat flour as a percentage of the recommended dietary allowance (RDA), Balochistan, 2017



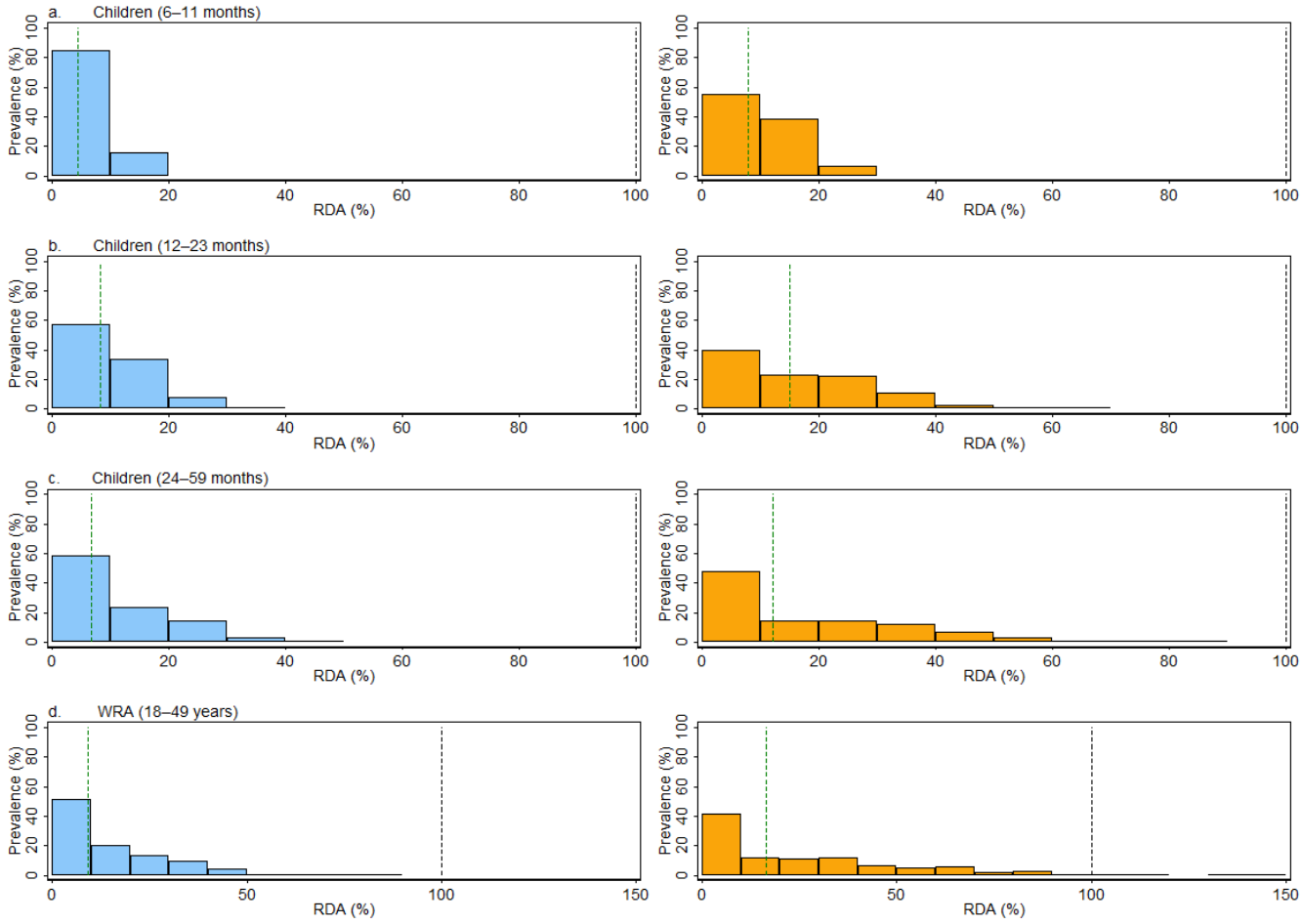
WRA, women of reproductive age. Blue and orange bars indicate actual and modelled estimates, respectively. Dotted black line is at 100%; dotted green line is at the median %.

Figure 19 Actual and modelled iron contribution from consumption of fortified wheat flour as a percentage of the recommended dietary allowance (RDA), Punjab, 2017



WRA, women of reproductive age. Blue and orange bars indicate actual and modelled estimates, respectively. Dotted black line is at 100%; dotted green line is at the median %.

Figure 20 Actual and modelled iron contribution from consumption of fortified wheat flour as a percentage of the recommended dietary allowance (RDA), Sindh, 2017



WRA, women of reproductive age. Blue and orange bars indicate actual and modelled estimates, respectively. Dotted black line is at 100%; dotted green line is at the median %.

5.8 HOUSEHOLD EXPENDITURE ON FORTIFIABLE FOOD VEHICLES

Table 16 presents the monthly expenditure on fortifiable edible oil/ghee and wheat flour among households that reported using the fortifiable food vehicle across the three provinces in absolute terms (Pakistani Rupees, PKR) and in relative terms (as a percentage of the average household expenditure on 'Edible Oils and Fats' or 'Wheat and Wheat Flour' and of the average household expenditure on 'Food and Non-Alcoholic Beverages' by province using pre-existing data from the Household Integrated Economic Survey (HIES) 2015-2016).

Mean monthly expenditure on fortifiable oil/ghee was PKR 930, PKR 970, and PKR 1061 in Sindh, Punjab, and Balochistan, respectively. This accounted for 92%, 107%, and 111% of monthly household expenditure on edible oils and fats, and 8%, 9%, and 9% of monthly household expenditure on food and non-alcoholic beverages, in Sindh, Punjab, and Balochistan, respectively, when compared to the provincial average expenditures from the HIES 2015-2016.

Mean monthly expenditure on fortifiable wheat flour was PKR 1,540, PKR 1,558, and PKR 1,923 in Sindh, Punjab, and Balochistan, respectively. This accounted for 103%, 99%, and 86% of monthly household expenditure on edible oils and fats, and 8%, 9%, and 9% of monthly household expenditure on food and non-alcoholic beverages, in Sindh, Punjab, and Balochistan, respectively, when compared to the provincial average expenditures from the HIES 2015-2016.

Table 16 Monthly expenditure on fortifiable wheat flour and oil/ghee among households that reported using the fortifiable food vehicle, Pakistan, 2017[1]

Variable	Balochistan	Punjab	Sindh
Oil/Ghee			
	N=685	N=706	N=684
Monthly expenditure on fortifiable oil/ghee (PKR), mean[2]	1060.6 (1056.6, 1064.5)	970.9 (970.1, 971.8)	930.2 (917.7, 942.8)
Monthly expenditure on fortifiable oil/ghee as a percentage of total monthly expenditure on 'Edible Oils and Fats', %[3]	111.3 (110.9, 111.7)	107.4 (107.3, 107.5)	92.3 (91.1, 93.6)
Monthly expenditure on fortifiable oil/ghee as a percentage of total monthly expenditure on 'Food and Non-Alcoholic Beverages', %[4]	8.8 (8.8, 8.8)	8.5 (8.5, 8.5)	7.6 (7.5, 7.7)
Wheat flour			
	N=348	N=198	N=495
Monthly expenditure on fortifiable wheat flour (PKR), mean[2]	1923.1 (1914.1, 1932)	1557.8 (1553.3, 1562.2)	1540.2 (1536.2, 1544.1)
Monthly expenditure on fortifiable wheat flour as a percentage of total monthly expenditure on 'Wheat and Wheat Flours', %[3]	86.0 (85.6, 86.4)	99.2 (98.9, 99.5)	103.2 (102.9, 103.4)
Monthly expenditure on fortifiable wheat flour as a percentage of total monthly expenditure on 'Food and Non-Alcoholic Beverages', %[4]	16.0 (15.9, 16)	13.6 (13.6, 13.7)	12.6 (12.6, 12.7)

[1] All values are mean (95% confidence interval) or percentage (95% confidence interval) as indicated and weighted to correct for unequal probability of selection.
[2] Provincial average for household expenditure on food vehicles from Fortification Assessment Coverage Toolkit (FACT) survey 2017.
[3] Monthly expenditure by province from FACT survey 2017 and average household expenditure on 'Edible Oils and Fats' and 'Wheat and Wheat Flours' by province from Household Integrated Economic Survey (HIES) 2015-2016.
[4] Monthly expenditure by province from FACT survey 2017 and average household expenditure on 'Food and Non-Alcoholic Beverages' by province from HIES 2015-2016.

6. Key findings and recommendations

6.1 Survey context

The survey results revealed that the likelihood of a household being at risk of poverty and the likelihood of a household being in the lowest two wealth quintiles were higher in Balochistan compared to Sindh and Punjab. The higher rate of poverty measured by MPI in Balochistan was driven by lower levels of access to key living standard components and education. Conversely, households in Sindh had the highest prevalence of a caregiver or child being malnourished (based on MUAC measurements) compared to Balochistan and Punjab. Prevalence of not meeting dietary diversity among WRA was higher in Sindh compared to Balochistan and Punjab; while WRA in Balochistan, the most rural of the provinces, tended to consume more iron- and zinc-rich foods compared to Punjab and Sindh. Prevalence of other risk factors (poor infant and child feeding practices and food insecurity) were not found to be significantly different between states.

6.2 Key findings

The survey provided evidence that fortification of salt and oil/ghee could have a large impact on the intakes of iodine and vitamin A among young children and WRA in Balochistan, Punjab, and Sindh. However, for this to occur all products would need to be fortified in compliance with the fortification standard. Currently, most of these products are fortified but below standards underscoring the need to focus efforts on increasing compliance. Furthermore, the fortification standards for wheat flour was found to be set as a minimum value without a target or maximum value, which should be corrected as it does not provide regulatory guidance to address the potential plausible (low but non-zero) risk of over fortification, which may have adverse effects depending on the nutrients being added, nor does it account for the natural variation of the nutrient being added. To increase the availability of appropriately fortified foods, drivers of poor compliance at the production level must be ascertained and addressed through effective corrective actions. These can include, but may not be limited to, strengthening monitoring and enforcement efforts and the identification and implementation of effective incentives and penalties to drive compliance. A high priority should be placed on locally manufactured products as few brands are imported.

Alternatively, the potential for impact from the wheat flour fortification program is more limited given that its coverage in a fortifiable form is considerably lower. Furthermore, a large proportion is produced by small-scale chakki mills, and it is estimated to provide only a minimal to moderate contribution to iron requirements among target populations, even if fortified according to the fortification standards. There are also equity gaps in coverage with more vulnerable groups (such as those that from poor and low SES households) being less likely to consume the fortifiable form thus limiting potential for impact in some population sub-groups. Additional analysis into the feasibility of this program considering the high proportion of small-scale millers and into the magnitude of the benefit of this program (by the supply of different micronutrients) in addition to other dietary sources among different populations groups is needed. Provincial strategies and approaches may need to be tailored to derive maximum impact. Complementary targeted interventions may also be required for specific population sub-groups that will not be reached by the large-scale wheat flour fortification program.

Finally, it was not possible to accurately estimate the household coverage of fortified food vehicles in the current survey because a large proportion of households were not able to report the brand of the food vehicle they used. This resulted in a high proportion of households with unknown fortification status for many food vehicles because the survey was designed to link the reported brand used in the household to a fortification status based on the laboratory analyses of food specimens collected by brand from markets. These results revealed that collecting and analysing food samples at market-level cannot fully replace collecting and analysing food samples at household-level. Future surveys should be designed according to the primary objectives they wish to achieve (i.e. household-level coverage or market-level availability and quality of fortified foods) keeping in mind the trade-offs of each methodology.

6.3 Recommendations

Based on the findings of the survey described above, the following priority recommendations can be made:

1. Drivers of poor compliance with fortification standards at production level need to be ascertained and addressed through effective corrective actions to increase the availability of appropriately fortified foods. These can include, but may not be limited to, strengthening monitoring and enforcement efforts and the identification and implementation of effective incentives and penalties to drive compliance;

2. The wheat flour fortification standard should be revised to include a target and maximum limit to avoid over fortification while ensuring an appropriate range that considers the natural variation in the food vehicle;

3. Further investigation into the feasibility and potential impact of the wheat flour fortification program, including exploration into chakki mills, is needed to determine the benefit of this program in the population; and

4. The total intake of micronutrients (in particular iron) from all dietary sources, in addition to fortified foods, among target populations needs to be assessed in future surveys to determine the extent to which the nutrient gap in the diet could be filled through the current fortification program or if complementary interventions and/or food vehicles are needed for certain nutrients.

These results will be shared with nutrition stakeholders in the country to further guide programming efforts and nutrition policy recommendations. Additionally, the findings will inform subsequent phases of GAIN-led fortification programming.

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8. Annexes

1. SAMPLE SIZE CALCULATIONS

Sampling design for the FACT household survey in Pakistan is based on assumptions of statistical precision and on analytical assumption of provincial level survey estimates.

The survey was carried out in three Pakistani provinces: Punjab, Sindh, and Balochistan. However, the sample size determination was done assuming that the survey would be carried out in all four provinces of Pakistan including KP. The sample aimed to be representative at the provincial level and to adhere to the minimal requirements for statistical precision. For the sample size determination, it was assumed that the survey will estimate proportions of 50% and assume a margin of error of seven percentage points at the statistical significance level of 5% (based on 95% confidence intervals). Hence the sample will yield survey sample estimates of proportions in the range of 45%-55%.

Due to the three-stage sampling design, the statistical power will be affected by the clustering effects inflating the variance. For the sampling size determination, historic information about clustering effects were used. The 2012-13 Pakistan Demographic and Health Survey (PDHS) was used as the source of the historic information. Three key variables from the PDHS with available design effect estimates were used to act as proxies for the two key populations of interest – children under five and women of reproductive age:

- Vaccination card seen;
- Had diarrhoea in the past 2 weeks;
- Proportion of women attending at least 1 ANC visit during their last pregnancy (ANC).

PDHS reports the ‘design factor’ (DEFT) which is the ‘design effect’ (DEFF) in its reduced form as the Standard Error multiplier instead of the Variance multiplier. Therefore, the reported DEFT had to be adjusted into a standard DEFF measure to be used in sample size calculations.

The statistics for the selected indicators were reported at the national level as well as for each province. To approximate to the actual situation in each of the selected provinces, the zone estimates were used in the calculation. To transfer the sampling design effect estimates from a reference sample design (PDHS 2012-13) to a new sampling design used for FACT surveys, a standardised measure of sampling design effects, the Intra Class Correlation (ICC), was calculated for each indicator.

Table 17 summarises these calculations.

Table 17: Design effect estimates from PDHS 2012-13

Geographical zone	Indicator	DEFT	DEFF	ICC
National	Vaccination card seen	1.5	2.25	4.6%
	Had diarrhoea in past 2 weeks	1.7	2.89	7.0%
	ANC	2.1	4.41	12.6%
Punjab	Vaccination card seen	1.2	1.44	1.6%
	Had diarrhoea in past 2 weeks	1.4	1.96	3.6%
	ANC	1.6	2.56	5.8%
Sindh	Vaccination card seen	1.2	1.44	1.6%
	Had diarrhoea in past 2 weeks	1.2	1.44	1.6%
	ANC	1.7	2.89	7.0%
KP	Vaccination card seen	1.3	1.69	2.6%
	Had diarrhoea in past 2 weeks	1.7	2.89	7.0%
	ANC	2.9	8.41	27.4%
Balochistan	Vaccination card seen	1.5	2.25	4.6%
	Had diarrhoea in past 2 weeks	1.6	2.56	5.8%
	ANC	2.3	5.29	15.9%

Table 17 shows considerable variation in DEFFs among the indicators as well as between the four provinces of interest. To produce a more conservative estimate of the required sample size for the FACT survey, the mean of the indicators in the KP province were used in calculations, which yields an average ICC of 12.3%.

The minimum sample size was calculated using the following formula:

$$n = \frac{z^2 \times p(1-p)}{\propto^2} \times deff$$

where:
$n =$ net sample size
$z =$ z-score
$p =$ proportion of children with a given trait
$\propto =$ margin of error
$deff =$ design effect

The value of the design effect is a direct function of the proposed size of the survey cluster (m) – i.e. the number of households sampled in each EA.

$$deff = 1 + (m-1) \times ICC$$

For the FACT survey in Pakistan, 15 households were sampled in each EA. Based on the selected historic value of ICC, the DEFF was thus assumed to be 2.7.

The calculation based on statistical precision thus yielded a recommended sample of 540 households and 36 EAs in each province. The total size of the sample nationwide would thus be 2,160 households sampled from 144 EAs. However, during the early stakeholder engagements, the proposed provincial sample sizes were challenged and strong case made for their increase due to the importance of provincial level policy discourse. Therefore, a balance was struck between the increase in the sample size beyond the minimum required for the initial statistical precisions and the budget availability resulting in 47 EAs to be sampled per province which resulted in a provincial sample of 705 households and a total sample of 188 EAs and 2,820 households nationwide. This sample would yield a six percentage point margin of error for provincial estimates.

2. HOUSEHOLD QUESTIONNAIRE

PAKISTAN FACT COVERAGE SURVEY 2017 **HOUSEHOLD QUESTIONNAIRE**					
Date_of_interviewint	Date of interview انٹرویو کی تاریخ ***CAPI Programmer:*** Take time stamp to signal beginning and end of interview	DD / MM / YY ☐☐/☐☐/☐☐			
	Team identifier ٹیم کا کوڈ	☐☐	intid	interviewer_id انٹرویور کا کوڈ	☐☐
State_id	Province identifier صوبہ کا کوڈ	01. Punjab پنجاب 02. Sindh سندھ 03. Khyber Pakhtunkhwa خیبر پختونخواہ 04. Baluchistan بلوچستان			☐☐
Dist_id	District identifier ڈسٹرکٹ کا کوڈ	☐☐			
Ea_id	Enumeration area سروے کا علاقہ	☐☐			
	Area/village/town name علاقہ / گاؤں/ ٹاؤن کا نام	_____			
	Structure identifier	☐☐			
Household_id	Household identifier گھرانہ نمبر	☐☐			

Good morning / Good evening Madam / Sir,

My name is [NAME OF INTERVIEWER] and I work for Oxford Policy Management (OPM). We are currently conducting a survey on the coverage of fortified foods and your household was randomly selected to participate in the survey.

For this purpose, we are collecting information on the coverage of fortified foods, as well as on the nutritional status of mothers and children across the country. The information we will collect will help policymakers and implementers to improve the way in which nutritional programmes in Pakistan are structured and delivered to households, and might therefore be used to improve the nutritional programmes in your areas. We are not recording your voice using this tablet, the tablet is only used to aid with the interview.

The first part of the interview will be about the composition of the household, including all its members. Then, based on this information, I would like to interview the mother or caregiver of the child less than 5 years of age. If there is more than one child less than 5 years of age then I will select one at random. I will then ask the mother/caregiver of the child some questions about what she and the child ate yesterday and foods purchased and prepared in the household, like salt, oil, and wheat flour. At the end I will measure the mid-upper arm circumference of the woman and the child to assess their nutritional status.

The questions to you will take about 1 hour.

Do you agree to start with the first part of the interview?

اسلامُ علیکم۔

میرانام ---------- ہے۔ میرا تعلق آکسفورڈ پالیسی مینجمنٹ سے ہے-- یہ ایک تحقیقاتی ادارہ ہیں جو کہ اس وقت پاکستان میں ماں اور بچے کی غذائی صورتحال کو بہتر کرنے کےلیے تحقیق کر رہا ہے۔ ہم غذائیت سے بھرپور خوراک کے بارے میں ایک سروے کر رہے ہیں اور آپ کا گھرانہ قرعہ اندازی کے ذریعے چنا گیا ہے۔

ان معلومات کی بناء پر حکومت آپکے علاقے میں غذائی ضروریات کے بارے میں جو پروگرام ہیں ان کوبہتر بنانے کے لیے منصوبہ بندی کرے گی۔ ہم اس ٹیبلٹ پہ آپ کی آواز نہیں ریکارڈ کر رہے ہیں۔ اس ٹیبلٹ پر صرف آپ کا انٹرویو کیا جائے گا۔

اس سوالنامے کے پہلے حصے میں ہم گھر اور گھرانے کے افراد کے بارے میں کچھ سوالات پوچھیں گے۔ ان معلومات کی بناء پر ہم 5 سال سے کم عمر بچے کی ماں یا دیکھ بھال کرنے والی خاتون سے انٹرویو کرینگے۔

اگر گھرانے میں 5 سال سے کم عمر کے ایک سے زیادہ بچے ہیں تو ہم اُن میں سے کسی ایک کو چُنیں گے ۔ میں بچے کی ماں یا دیکھ بھال کرنے والی خاتون سے کچھ سوالات پوچھوں گی کہ انھوں نے اور اُن کے بچے نے کل کیا کھایا اور کون کون سی غذائیں گھرانے میں تیار کی گئی اور خریدی گئی مثلا نمک، گندم کا آٹا اور آئل/ گھی وغیرہ۔

آخر میں ماں اور بچے کی غذائی صورت حال کا اندازہ لگانے کے لئے ان کے بازو کا ناپ بھی لیں گے۔

کیا آپ اس سروے میں حصہ لینے کے لئے تیار ہیں؟ 1.....ہاں |_____|

نہیں 2

Please make sure the respondent is at least 18 years of age

Available_key_household	Most knowledgeable household member is available .....1 گھرانے کے بارے میں سب سے زیادہ معلومات رکھنے والا فرد موجود ہے۔ Another member of the household is around.....2 کوئی دوسرا گھرکا فرد موجود ہو۔ No one is around for the interview.....3 کوئی موجود نہیں ہے۔		If **2 or 3**, stop here.

h_01	Oral consent to fill in the household roster obtained? گھرانے کی معلومات لینے سے پہلے زبانی اجازت لے لی گئی ہے؟	Yes .....1 No.....2 ہاں.....1 نہیں 2	If **yes**, start. If **no**, stop here.

HOUSEHOLD ROSTER

We would like some information about the people who usually live in your household. Please include all family and non-family members (such as domestic servants, lodgers, or friends) who usually live together in the same dwelling and eat from the same pot of food. A member of the household must have lived in the household for at least 6 of the past 12 months. Start with the head of the household.

اب ہم کچھ معلومات لیں گے کہ اس گھرانے میں عموماً کونسے افراد رہتے ہیں۔ برائے مہربانی تمام فیملی کے اور فیملی کے باہر کے افراد کو شامل کریں (جیسا کہ نوکر، لرجر یا دوست) جو عموماً اسی گھر میں رہتے ہیں اور یہ افراد ایک ہی چولہے سے کھا تے پیتے ہیں۔ گھرانے کا فرد جو پچھلے 12 مہینوں میں کم از کم 6 مہینے یہاں رہا ہو، اس فرد کو بھی شامل کریں۔ گھرانے کے سربراہ سے شروع کریں۔

گھرانے کے سربراہ سے شروع کریں۔ پھر سربراہ کی بیوی (اگر موجود ہے)، اس کے بچے، دوسرے افراد اور پھر باقی تمام بچوں کے بارے میں لکھیں۔

Start by listing the head of the household, the spouse to the head of the household (if applicable), their children, all other adults, and then all other children.

					ONLY if person<5 years صرف 5 سال سے کم عمر افراد کے کیلئے	ONLY for persons aged ≥ 5 AND <31	ONLY for persons aged ≥ 5 5 سال اور 5 سال سے زیادہ عمر کے افراد کے کیلئے		Only for persons aged<5 years صرف 5 سال سے کم عمر افراد کے کیلئے
Line no. (hh_pid)	A. Name (hh_a) نام	B. What is [name]'s relationship to the head? (hh_rel) [نام] کا سربراہ کےساتھ کیارشتہ ہے؟	C. What is [name]'s gender? (hh_b) [نام] کی جنس	Da. How old is [name] in completed years *Please indicate age in years* (age [نام] کی عمر سالوں میں کتنی ہے؟	Db. How old is [name] in completed months *Please indicate age in months (hh_cb)* [نام] کی عمر مہینوں میں کتنی ہے؟	E. Is [name] currently attending school? (hh_d) کیا [نام] آج کل سکول جاتا/جاتی ہے؟	F. Has [name] completed middle level education (grade 8)? (hh_e) کیا [نام]نے آٹھویں جماعت تک تعلیم مکمل کی ہے؟ If hh_e=1then skip to H	Only if hh_e = 2 G. What is the highest level of schooling [name] has completed? (hh_f) [نام]نے زیادہ سے زیادہ کتنی کلاسیں پاس کی ہیں؟	H. Who is [name]'s caregiver? (hh_carg) (*CAPI will automatically link to line number of caregiver*) [نام] کی دیکھ بھال کون کرتا ہے؟
01	Head of household	Head ..... 1 Spouse..... 2 Son/daughter 3	Male..... 1 Female. 2 مرد.....1 عورت. 2	☐☐	☐☐	Yes .....1 No.....2 ہاں .....1 نہیں.....2	Yes..... 1 No..... 2 ہاں..... 1 نہیں.....2	No formal education..1 Pre-primary/kindergarten..2 Grade1……3	

	گھراندے کے سربراہ کا نام لکھیں ؟	Son/daughter in-law. 4 Grandchild ..... 5 Parent..... 6 Parent in-law ..... 7 Brother / sister ..... 8 Brother / sister in-law ..... 9 Auntie / uncle ..... 10 Nephew / niece ..... 11 Grandparent..... 12 Domestic help or related to domestic help..... 13 Other relative of the household head or spouse of head..... 14 Not related to the household head or spouse of the head..... 15 1.....سربراہ 2بیوی/ شریک حیات 3.....بیٹا / بیٹی 4.....داماد / بہو 5..... پوتا / پوتی 6.....والدین 7..... ساس / سسر 8.....بہن / بھائی						Grade 2.....4 Grade 3.....5 Grade 4.....6 Grade 5.....7 Grade 6.....8 Grade 7.....9 Don't know.....88	

		9.....بہنوئی / بھابھی 10..... آنٹی / انکل 11..... بھتیجا / بھتیجی دادا / دادی / نانا / نانی .....12 13.....گھریلو نوکر سربراہ / شریک حیات 14کے دیگر رشتہ دار گھر کے سربراہ / شریک حیات سے متعلق نہیں 15							
02		[see above options]	Male..... 1 Female. 2 .....مرد 1 عورت . 2	☐☐	☐☐	Yes .....1 No.....2 .....ہاں1 .....نہیں2	Yes .....1 No.....2 .....ہاں 1 .....نہیں 2	[see above options]	
03		[see above options]	Male..... 1 Female. 2 .....مرد 1 عورت . 2	☐☐	☐☐	Yes .....1 No.....2 .....ہاں1 .....نہیں2	Yes .....1 No.....2 .....ہاں 1 .....نہیں 2	[see above options]	
04		[see above options]	Male..... 1 Female. 2 .....مرد 1 عورت . 2	☐☐	☐☐	Yes .....1 No.....2 .....ہاں1 .....نہیں2	Yes .....1 No.....2 .....ہاں 1 .....نہیں 2	[see above options]	
05		[see above options]	Male..... 1 Female. 2 .....مرد 1 عورت . 2	☐☐	☐☐	Yes .....1 No.....2 .....ہاں1 .....نہیں2	Yes .....1 No.....2 .....ہاں 1 .....نہیں 2	[see above options]	

06		[see above options]	Male..... 1 Female. 2 مرد..... 1 عورت . 2	☐☐	☐☐	Yes .....1 No.....2 ہاں .....1 نہیں.....2	Yes .....1 No.....2 ہاں.....1 نہیں..... 2	[see above options]	
07		[see above options]	Male..... 1 Female. 2 مرد..... 1 عورت . 2	☐☐	☐☐	Yes .....1 No.....2 ہاں .....1 نہیں.....2	Yes .....1 No.....2 ہاں.....1 نہیں..... 2	[see above options]	
08		[see above options]	Male..... 1 Female. 2 مرد..... 1 عورت . 2	☐☐	☐☐	Yes .....1 No.....2 ہاں .....1 نہیں.....2	Yes .....1 No.....2 ہاں.....1 نہیں..... 2	[see above options]	
09		[see above options]	Male..... 1 Female. 2 مرد..... 1 عورت . 2	☐☐	☐☐	Yes .....1 No.....2 ہاں .....1 نہیں.....2	Yes .....1 No.....2 ہاں.....1 نہیں..... 2	[see above options]	
10		[see above options]	Male..... 1 Female. 2 مرد..... 1 عورت . 2	☐☐	☐☐	Yes .....1 No.....2 ہاں .....1 نہیں.....2	Yes .....1 No.....2 ہاں.....1 نہیں..... 2	[see above options]	
11		[see above options]	Male..... 1 Female. 2 مرد..... 1 عورت . 2	☐☐	☐☐	Yes .....1 No.....2 ہاں .....1 نہیں.....2	Yes .....1 No.....2 ہاں.....1 نہیں..... 2	[see above options]	
				Note: Add a new page if more people in the household					

HCR	*Please select the key respondent who answered the household roster* برائے مہربانی، جوابدہندہ کو منتخب کریں جس نے روسٹر کے جوابات دیئے۔ *(A LIST OF HOUSEHOLD MEMBERS WILL APPEAR IN **CAPI.**)* *(SELECT ONLY ONE.)* (کسی ایک کو منتخب کریں)	

under5	Total number of children under 5 years old in the household گھر انے میں 5 سال سے کم عمر بچوں کی کل تعداد	*(**CAPI** WILL AUTOMATICALLY COMPLETE THESE 3 ITEMS. FOR THE SELECTION OF THE CHILD, **CAPI** WILL USE THE KISH TABLE PRINCIPLES)* *If selected caregiver is <18 years of age, skip to respondent.*
RAND1	Line number of the randomly selected child منتخب کئے گئے بچے کا لائن نمبر لکھیں	
RAND2	Line number of the mother/caregiver of the randomly selected child منتخب کئے گئے بچے کی ماں / دیکھ بھال کرنے والی خاتون کا لائن نمبر لکھیں	

avail2	Is the mother/caregiver available? ماں / دیکھ بھال کرنے والی خاتون گھر پر موجود ہے؟	Yes .....1 No.....2 ہاں.....1 نہیں..... 2	If **yes**, proceed. If **no**, stop here and revisit household. اگر جواب "ہاں" ہے تو انٹرویو کریں۔ اگر جواب "نہیں" ہے تو انٹرویو کو ختم کردیں اور دوبارہ گھرانہ وزٹ کریں۔
cons2	Oral consent of the <u>mother/caregiver</u> obtained? کیا ماں / دیکھ بھال کرنے والی خاتون سے زبانی رضامندی حاصل کی گئی ہے؟	Yes .....1 No.....2 ہاں.....1 نہیں..... 2	If **yes**, skip to hc1. If **no**, stop here. اگر جواب "ہاں" ہے تو انٹرویو کریں۔ اگر جواب "نہیں" ہے تو انٹرویو کو ختم کردیں

respondent	*The selected caregiver is less than 18 years of age. As a result, the caregiver cannot be interviewed. Please select another household member who is 18 years or older to answer the remaining questions. The household member should be someone who is knowledgeable about the household characteristics and food purchases. Please explain to the respondent that the caregiver of the selected child is under 18 years of age and as a result we don't have approval to interview the caregiver. Therefore, we would like to interview someone else.* اگر منتخب دیکھ بھال کرنے والی عورت کی عمر 18 سال سے کم ہے تو منتخب دیکھ بھال کرنے والی عورت کو انٹرویو نہیں کیا جا ئے گا۔ برا ئے مہربانی گھرانے کے 18 سال سے بڑے افراد میں سے کسی ایک کو منتخب کریں جو گھرانے کے بارے میں اور گھرانے میں خوراک کے بارے میں خریداری کے بارے میں جانتا ہو۔ برا ئے مہربانی جواب دہندہ کو یہ بتائیں کہ بچے کی دیکھ بھال کرنے والی خاتون 18 سال سے کم ہے اس لئے ہم ان سے انٹرویو نہیں کر سکتے۔ اس لئے ہم آپ سے انٹرویو لیں گے۔	*(CAPI will automatically list all the household members from the roster who are 18 years and older*)	Only if the selected caregiver < 18 years old.
avail3	*Is [respondent] available?* کیا جوابدہندہ گھر پر موجود ہے؟	Yes .....1 No 2	If yes, proceed. If no, stop here and revisit household.
cons3	*Oral consent of [respondent] obtained?* کیا جوابدہندہ سے زبانی اجازت لی گئی ہے؟	Yes .....1 No 2	If yes, proceed. If no, stop here.

HOUSEHOLD CHARACTERISTICS AND ASSETS			
N°	**QUESTIONS**	**ANSWERS**	**SKIPS**
hc1	Does your household have electricity? کیا آپ کے گھر میں بجلی ہے ؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Yes .....1 No .....2 ہاں.....1 نہیں.....2	
hc2	What fuel does your household mainly use for cooking? آپ کھانا کس پر(ایندھن) پکا تے ہیں ؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Electricity.....1 LPG/cylinder.....2 Natural Gas .....3 Biogas .....4 Kerosene stove .....5 Coal / Lignite .....6 Charcoal .....7 Wood .....8 Straw / Shrubs / Grass .....9 Animal dung .....10 No food cooked in household.....11 Don't know.....88 Other (specify):.....99 بجلی----------1 سلنڈر والا چولہا----------2 قدرتی گیس /سوئی گیس----------3 با ئیو گیس----------4 مٹی کا تیل----------5 قدرتی کوئلہ----------6 کوئلہ (لکڑی سے تیار کردہ)----------7 لکڑی----------8 گھاس پھوس/ جھاڑیاں----------9 گوبر/ گوبر کے اپلے ---------- 10 گھر میں کھانا نہیں پکاتے----------11 معلوم نہیں----------88 دیگر (وضاحت کریں)----------99	
hc3	What is the main material of the floor of the dwelling? مکان کا فرش کس چیز سے بنا ہوا ہے؟ *(OBSERVATION)* *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Earth / Sand / Mud ..... 1 Dung..... 2 Wood Planks..... 3 Bamboo ..... 4 Parquet / Polished Wood ..... 5 Vinyl / Asphalt Strips ..... 6 Ceramic Tiles ..... 7 Cement..... 8 Carpet ..... 9 Chips / Terrazzo..... 10 Bricks ..... 11 Mats ..... 12 Marble ..... 13 Other (Specify): ..... 99 مٹی /کچا فرش----------1 گوبر سے بنا ہوا فرش----------2	

		لکڑی کے پھٹے----------3 بانس کی لکڑی کا فرش----------4 پالش لکڑی کا فرش----------5 پلاسٹک/ لک،سیمنٹ اور بجری کا بنا ہوا فرش----------6 چینی مٹی کی ٹالز سے بنا ہوا فرش----------7 سیمنٹ کا فرش----------8 قالین بچھا ہوا ہے----------9 چپس کا فرش----------10 اینٹوں کا فرش----------11 چپٹائی بچھی ہو ئی ہے----------12 سنگ مر مر کا فرش----------13 دیگر (وضاحت کریں)----------99	
hc4	What is the main material of the roof of the dwelling? مکان کی چھت کس چیز سے بنی ہوئی ہے؟ *(OBSERVATION)* *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	No roofing.....1 Thatch .....2 Sod/grass .....3 Bamboo .....4 Wood planks.....5 Cardboard .....6 Wood/T iron/mud.....7 Ceramic tiles.....8 Cement/RCC .....9 Reinforced brick cement/RBC.....10 Roofing shingles.....11 Iron sheets/Asbestos.....12 Other (Specify) .....99 کوئی چھت نہیں ہے ----------1 جھاڑیوں اور پتوں کی چھت----------2 با نس کی لکڑی----------3 قدرتی گھاس کی چھت ----------4 لکڑی کے پھٹوں کی بنی ہو ئی چھت ----------5 کارڈ بورڈ(موٹا گتہ) کی بنی ہوئی چھت----------6 ٹی آر گاڈر والی چھت----------7 چینی مٹی کی ٹالز سے بنی ہو ئی چھت----------8 لینٹر کی چھت ----------9 اینٹوں اور سیمنٹ کی چھت----------10 روفنگ شنگلز کی چھت----------11 ٹین کی چھت/ اسبیٹوس----------12 دیگر (وضاحت کریں)----------99	

hc5	What is the main material of the exterior walls of the dwelling? مکان کی بیرونی دیوار کس چیز سے بنی ہوئی ہے؟ *(OBSERVATION.)* *(SELECT ONLY **ONE** ANSWER.)* (ایک جواب منتخب کریں)	No walls……1 Cane/trunks……2 Mud……3 Stones……4 Stone with mud……5 Bamboo with mud……6 Bamboo/Sticks……7 Unbaked bricks……8 Baked bricks……9 Carton/Plastic……10 Plywood……11 Cardboard……12 Wood planks/shingles……13 Any Other wood……14 Tent……15 Cement……16 Stone with cement……17 Cement blocks……18 Marble/Ceramic Tiles……19 Other (specify)_____.....99 کوئی دیوار نہیں ہے----------1 کین/ درخت کے تنوں کی بنی ہوئی دیوار----------2 کچی دیوار----------3 پتھروں کی دیوار----------4 پتھر اور مٹی کی دیوار----------5 بانس اور مٹی کی دیوار----------6 بانس/جھاڑیوں کی دیوار----------7 کچی اینٹوں کی دیوار----------8 پکی اینٹوں کی دیوار----------9 گنے/پلاسٹ کی دیوار----------10 پلا ئے وڈ کی دیوار ----------11 کارڈ بورڈ(موٹا گتہ) کی دیوار----------12 لکڑی کے پھٹوں کی بنی ہو ئی دیوار----------13 لکڑی کی دیوار(پھٹوں کے علاوہ)----------14 ٹینٹ----------15 سیمنٹ کی دیوار ----------16 پتھر اور سیمنٹ کی دیوار ----------17 سیمنٹ بلاک کی دیوار----------18 سنگ مرمر/ سیرا مک ٹائلز کی دیوار----------19 دیگر (وضاحت کریں)----------99	
hc6	Now I'm going to ask if you or anyone in your household currently owns any of the following items اب میں آپ سے پوچھوں گی کہ آپ یا آپ کے گھرانے کے کسی فرد کی ملکیت میں مندرجہ ذیل اشیاء ہیں۔ Does your household or anyone in the household own a functional …..? کیا آپ یا آپ کے گھرانے کے کسی فرد کی	A. Radio ریڈیو	Yes .....1 No.....2 1.....ہاں 2.....نہیں	
		B. Television ٹیلی ویزن	Yes .....1 No.....2 1.....ہاں 2.....نہیں	
		C. Cable TV/Dish کیبل ٹی وی/ڈش	Yes .....1 No.....2	

	ملکیت میں ------ہے؟ ***(PROMPT FOR EACH ITEM**; RECORD ALL ITEMS OWNED BY HOUSEHOLD OR A MEMBER...)* (ہر چیز کا نام لے کر پوچھیں)		1.....ہاں 2.....نہیں	
		D. Mobile Telephone موبائل فون	Yes .....1 No.....2 1.....ہاں 2.....نہیں	
		E. Non-mobile telephone لینڈ لائن	Yes .....1 No.....2 1.....ہاں 2.....نہیں	
		F. Watch ہاتھ والی گھڑی	Yes .....1 No.....2 1.....ہاں 2.....نہیں	
		G. Bicycle سائیکل	Yes .....1 No.....2 1.....ہاں 2.....نہیں	
		H. Motorcycle or scooter موٹرسائیکل، سکوٹر	Yes .....1 No.....2 1.....ہاں 2.....نہیں	
		I. Refrigerator فریج	Yes .....1 No.....2 1.....ہاں 2.....نہیں	
		J. Fan پنکھا	Yes .....1 No.....2 1.....ہاں 2.....نہیں	
		K. Iron استری	Yes .....1 No.....2 1.....ہاں 2.....نہیں	
		L. Computer/laptop کمپیوٹر/لیب ٹاب	Yes .....1 No.....2 1.....ہاں 2.....نہیں	

		M. Car or truck or bus کار / ٹرک /بس	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		N. Animal-drawn cart گدھا گاڑی/ بیل گاڑی	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		O. Boat with a motor موٹر والی کشتی	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		P. Boat without motor موٹر کے بغیرکشتی	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		Q. Air conditioner ائیر کنڈیشنر	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		R. Generating set جنریٹر	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		S. Almirah/Cabinet الماری	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		T. Chair کرسی	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		U. Room cooler روم کولر	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		V. Internet connection انٹرنیٹ کنکشن	Yes .....1 No.....2 ہاں.....1 نہیں.....2	

		W. Sewing machine سلائی مشین	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		X. Camera کیمرہ	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		Y. Sofa صوفہ	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		Z. Bed بیڈ/ پلنگ	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		AA. Water pump نلکا / پمپ	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		BB. Clock دیوار والی گھڑی	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		CC. Tractor ٹریکٹر	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
		DD. Dish washer/washing machine برتن دھونے والی / کپڑے دھونے والی مشین	Yes .....1 No.....2 ہاں.....1 نہیں.....2	
hc7	Does any member of your household own any agricultural land? کیا اس گھرانے کی ملکیت میں کوئی زرعی زمین ہے؟	Yes ..... 1 No ..... 2 ہاں..... 1 نہیں 2		
Hc9	Does this household own any livestock, herds, other farm animals, or poultry? کیا آپکے گھرانے کی ملکیت میں کوئی مال مویشی یا مر غیاں ہیں؟	Yes ..... 1 No ..... 2 ہاں..... 1 نہیں 2		If **2**, skip to **hc11**
	How many of the following animals does the household own?			

	آپکے گھرانے کی ملکیت میں مندرجہ ذیل (جانور) ------کتنے / کتنی ہیں؟ ***(PROMPT FOR EACH ANIMAL**; IF NONE, RECORD '00'; IF MORE THAN '95', ENTER '95'; IF UNKNOWN, ENTER '98')* *(IF THE HOUSEHOLD CAN'T SPECIFY THE NUMBER OF CHICKEN/ OTHER POULTRY, THEN ENTER 99, AND SELECT THE RANGE IN hc10)*			
hc10a	Cows/Bulls	گائے / بیل	|____|____|	If < '99' for chicken/ other poultry, skip to **hc11**.
hc10b	Horses/Donkeys/Mules	گھو ڑے / گدھے / خچر	|____|____|	
hc10c	Goats	بکریاں	|____|____|	
hc10d	Sheep	بھیڑ یں	|____|____|	
hc10e	Chickens	مرغیاں	|____|____|	
hc10i1	Buffalos	بھینس	|____|____|	
hc10i2	Camels	اونٹ	|____|____|	
hc10g	Other (specify) _____	دیگر (وضاحت کریں) _____	_____	
hc10	Select the range of chicken/poultry that the household owns. گھرانے کی ملکیت میں مرغیاں / پولٹری کی تعداد بتائیں۔ *(ONLY COMPLETE IF HOUSEHOLD CAN'T SPECIFY EXACT NUMBER OF CHICKEN/ OTHER POULTRY)* (صرف اس صورت میں لکھیں جب گھرانہ مرغیوں کی تعداد نہیں بتا سکتا)	1-9……1 10-29……2 30 or more……...3		
hc11	Does any member of this household have a bank account? کیا آپ کے گھرانے کے کسی فرد کا بینک اکاؤنٹ ہے؟	Yes .....1 No……2 Don't know……88 ہاں.....1 نہیں.....2 معلوم نہیں.....3		
hc12	What is the ownership status of your house? یہ گھر آپ کا اپنا ہے، کرا ئے پر ہے یا کرا ئے کے بغیر ہے؟	Owned by any member of the household ……1 Rented ……2 Living without paying rent ……3 Other (Specify)……99 ذاتی ہے .....1 کرایے پر ہے .....2 کرایہ کے بغیر .....3 دیگر (وضاحت کریں).....99		

WATER, SANITATION, AND HYGIENE (WASH)			
N°	QUESTIONS	ANSWERS	SKIPS
w1	What is the main source of drinking water for the members of your household? آپ کے گھرانے کا پینے کے پانی کا بڑا ذریعہ کون سا ہے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Water piped into dwelling.....1 Water piped to yard / plot.....2 Water piped into neighbour's dwelling/yard/plot.....3 Public tap / standpipe.....4 Tube well.....5 Protected dug well.....6 Unprotected dug well.....7 Protected spring.....8 Unprotected spring.....9 Rainwater.....10 Tanker truck.....11 Cart with small tank/drum.....12 Surface water (river / dam / lake / pond / stream / canal / irrigation channels).....13 Bottled water.....14 Hand pump.....15 Motorized Pump.....16 Filtration plant.....17 Don't know.....88 Other (specify): _____.....99 گھر کے اندر پائپ کے ذریعے----------1 ا حاطے میں پائپ کے ذریعے----------2 ہمسا ئیوں کے گھر پائپ سے (گھر کے اندر/احاطے میں)----------3 پبلک ٹیب----------4 ٹیوب ویل----------5 ڈھکا ہوا کنواں / محفوظ کنواں----------6 غیر محفوظ کنواں----------7 محفوظ چشمہ ----------8 غیر محفوظ چشمہ----------9 بارش کا پانی----------10 ٹینکرٹرک ----------11 چھوٹے ٹینک/ ڈرم کا ریڑھا ----------12 سطحی پانی (دریا، ڈیم، جھیل، تالاب، ندی، نہر ،دوسرے آ بپاشی کے ذرائع) ----------13 بوتل کا پانی / منرل واٹر----------14 ہینڈ پمپ ----------15 مو ٹر پمپ----------16 فلٹریشن پلانٹ----------17 معلوم نہیں----------88 دیگر (وضاحت کریں)----------99	If **1 or 2**, skip to **w4** **If 3 , skip to w3**
w2	Where is that water source located? پینے کے پانی کا یہ ذریعہ کہاں پر ہے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	In own dwelling.....1 In own yard/plot.....2 Elsewhere.....3 اپنے گھرمیں .....1 اپنے پلاٹ میں .....2 کہیں اور.....3	If **1 or 2**, skip to **w4**

w3	How long does it take to go there, get water and come back? اس ذریعے سے پانی لانے کے لئے کتنا وقت لگتا ہے؟ (آنے اور جانے کا وقت شامل کریں) *(WRITE IN THE NUMBER.)* *(IF 'DON'T KNOW', RECORD 888)* *(PLEASE INCLUDE WAITING TIME ALSO IF ANY)* *(IF WATER IS DELIVERED AT HOME, RECORD '000')*	Minutes منٹ ..... ☐☐☐	
w4	What kind of toilet facility do members of your household usually use? آپ کے گھرانے کے افراد کس قسم کی لیٹرین استعمال کرتے ہیں؟ *(DO **NOT** PROMPT)* (خود سے نہ بتائیں) *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Flush to septic tank .....1 Flush to piped sewer .....2 Flush to pit latrine .....3 Flush to somewhere else .....4 Flush, don't know where .....5 Ventilated improved pit latrine .....6 Pit latrine with slab .....7 Pit latrine without slab / open pit .....8 Bucket toilet .....10 Hanging toilet / hanging latrine .....11 No facilities / bush / field .....12 Don't know .....88 Other (specify): .....99 فلش سیپٹک ٹینک سے منسلک----------1 فلش سیوریج سسٹم سے منسلک----------2 فلش کھڈے / گڑھے سے منسلک ----------3 فلش کہیں اور جاتا ہے ----------4 فلش، معلوم نہیں کہاں جاتا ہے ----------5 ہوا دار اور پانی جذب کرنے والی لیٹرین ----------6 کھڈے / گڑھے والی لیٹر ین سلیب کے ساتھ ----------7 کھڈے / گڑھے والی لیٹر ین سلیب کےبغیر----------8 بالٹی والی لیٹرین ----------9 ہینگینگ لیٹر ین----------10 کوئی لیٹرین نہیں ، کھیتوں / جھاڑیوں میں----------11 معلوم نہیں----------88 دیگر (وضاحت کریں)----------99	If 12, skip to **Short Birth History Module**
w5	Do you share this toilet facility with other households? کیا اس لیٹرین کو دوسرے گھرانے بھی استعمال کرتے ہیں؟ *(CIRCLE ONLY **ONE** ANSWER.)* (ایک جواب منتخب کریں)	Yes .....1 No .....2 ہاں.....1 نہیں.....2	

SHORT BIRTH HISTORY			
N°	QUESTIONS	ANSWERS	SKIPS
bh1	Altogether, how many live births have there been in your household in the last 5 years? Please include any baby who cried or showed other signs of life at birth/delivery. گزشتہ 5 سال میں مجموعی طور پر آپ کے گھرانے میں کتنے زندہ بچوں کی پیدائش ہوئی؟ پیدائش کے وقت بچے کا رونا / زندگی کی دیگر علامات جو بچے نے ظاہر کی ہوں ان کو بھی شامل کریں۔ *Include all the live births in this household in the last 5 years whether they are from the same mother or from different mothers.* گھرانے کے پچھلے 5 سال میں زندہ پیدا ہونے والے بچوں کو شامل کریں۔ بیشک وہ ایک ماں کے ہوں یا گھرانے کی مختلف ماؤں کے ہوں۔ *(WRITE IN THE NUMBER)* *(IF 'NONE', RECORD 00.* *IF 'DON'T KNOW', RECORD 88)*	Number of live births زندہ بچوں تعداد لکھیں ☐☐	If **00** or **88**, skip to **household hunger scale** module.
bh2	Is this child / are these children still alive? کیا یہ بچہ / بچے ابھی بھی زندہ ہیں؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	All alive……1 One or more has died in the past 5 years ..2 Don't know …… .88 سب بچے زندہ ہیں.....1 1 یا 1 سے زیادہ پچھلے 5 سال میں فوت ہوئے.....2 معلوم نہیں 3	

HOUSEHOLD HUNGER SCALE			
N°	QUESTIONS	ANSWERS	SKIPS
hh1	How many times in the last 30 days was there ever no food to eat of any kind in your house because of lack of resources to get food? پچھلے تیس دن (30 دنوں) میں کتنی بار ایسا ہوا کہ آپ کے گھرانے میں وسائل کی کمی کی وجہ سے کھانے کو کچھ بھی موجود نہ ہو؟ *(WRITE IN THE NUMBER)* *(IF 'NONE,' RECORD 00.)*	Number of times تعداد لکھیں ☐☐	
hh2	How many times in the last 30 days did you or any household member go to sleep at night hungry because there was not enough food? پچھلے تیس دن (30 دنوں) میں کتنی بار آپ یا آپکے گھرانے کا کوئی بھی فرد خوراک کی کمی وجہ سے بھوکا سویا؟ *(WRITE IN THE NUMBER)* *(IF 'NONE,' RECORD 00.)*	Number of times تعداد لکھیں ☐☐	
hh3	How many times in the last 30 days did you or any household member go a whole day and night without eating anything at all because there was not enough food? پچھلے تیس دن (30 دنوں) میں کتنی بار آپ یا آپکے گھرانے کا کوئی بھی فرد پورا دن اور رات خوراک کی کمی کی وجہ سے بھوکا رہا؟ *(WRITE IN THE NUMBER)* *(IF 'NONE,' RECORD 00.)*	Number of times تعداد لکھیں ☐☐	

CHILD FEEDING PRACTICES			
N°	QUESTIONS	ANSWERS	SKIPS
			If **selected** caregiver < 18 years of age and alternative respondent is being interviewed, skip to **dietary diversity** module.
			If **child is > 24 months**, skip to **cf3**
cf1	Is [NAME OF CHILD] currently breastfed? کیا [نام] اب بھی اپنی ماں کا دُودھ پی رہا ہے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Yes .....1 No .....2 ہاں..... 1 نہیں 2	If **2**, skip to **cf3**.
cf2	Does [NAME OF CHILD] take any food or drink other than breast milk, including water? کیا [نام] کو ماں کے دُودھ کے علاوہ کچھ اورکھانے یا پینے کو دیا جاتا ہے بشمول پانی کے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Yes .....1 No .....2 ہاں..... 1 نہیں 2	If **2**, skip to **dietary diversity** module.
cf3	How many times was [NAME OF CHILD] fed mashed or pureed food or solid or semisolid foods other than liquids from when [NAME OF CHILD] woke up yesterday to when [NAME OF CHILD] woke up today? [نام] نے کل صبح سو کر اٹھنے کے بعد سے آج صبح اٹھنے تک کتنی بار ٹھوس، نیم ٹھوس یا نرم غذائیں کھائیں ، پینے کی چیزوں کو نکال کر ؟ *(WRITE IN THE NUMBER)* *(IF 'NONE,' RECORD 00.)* *(IF 'DON'T KNOW', RECORD 88)*	Number of times تعداد لکھیں ☐☐	

DIETARY DIVERSITY

From when you woke up yesterday to when you woke up today, did you and [NAME OF CHILD] have any of the following things to eat or drink?

کل صبح اٹھنے کے بعدسے آج صبح اٹھنے تک آپ نے یا آپ کے بچے نے مندرجہ ذیل غذائیں کھائیں یا پیئیں ہیں؟

اگر دیکھ بھا ل کرنے والی خاتون کی عمر 18 سال سے کم ہے تو سوال اس طرح پو چھیں۔

کل صبح اٹھنے کے بعدسے آج صبح اٹھنے تک آپ نے مندرجہ ذیل غذائیں کھائیں یا پیئیں ہیں؟

I am interested in whether you had the item I mention, even if it was combined with other foods. For example, if you ate porridge made with a mixed vegetable sauce, you should reply yes to any food I ask about that was an ingredient in the porridge or sauce. Please do not include any food used in a small amount for seasoning or condiments (like chilies, spices, herbs, or fish powder), I will ask you about those foods separately.

اگر آپ نے کوئی مکس غذا استعمال کی ہے مثلاً اگر آپ نے آ لو گوشت کھایا ہے تو جواب میں آ لو اور گو شت دونوں میں ہاں لکھیں۔ جہاں اجزاء ہیں۔ ان تمام فوڈ کیٹیگری کو ہاں میں کوڈ کریں۔
مہربانی فرما کر یہاں وہ تمام مصالحے جو کم مقدار میں استعمال ہوں ان کو شامل نہ کریں۔ ان کے بارے میں الگ سے پوچھوں گی جیسے کہ (مرچیں، مصالحے، جڑی بوٹیاں یا فش پاؤڈر وغیرہ)

*(READ **ALL** QUESTIONS. CIRCLE ONLY **ONE** ANSWER FOR EACH.)*

(تمام سوالات پڑھیں – ہر سوال کے لیےایک جواب منتخب کریں)

N°	ITEMS اشیاء	A. Caregiver دیکھ بھال کرنے والی خاتون	B. Child بچہ If **selected** caregiver < 18 years of age and alternative respondent is being interviewed, skip to **salt** module.
dd01	Water? پانی /آب زم زم		Yes ..... 1 No ..... 2 ہاں.....1 نہیں 2 .....
dd01 b	***For children < 6 months only:*** Any other food or drink? کیا بچے نے کو ئی اور غذا کھائی یا پی ہے؟		Yes……1 No……...2 ہاں.....1 نہیں.....2 If **1**, confirm that response to **cf2 is 2** then skip to **salt** module. If **2**, skip to **salt** module.
dd02	Tinned, powdered or fresh milk, or any other milk? ٹن ، پاوڈر ملک ،تازہ دودھ یا کو ئی اور دودھ	Yes.....1 No ..... 2 ہاں.....1 نہیں.....2	

dd02	Tinned or powdered or fresh milk, Tinned or powdered infant formula such as Nido, Lactogen, or any other milk (excluding breast milk)? ٹن ، پاوڈر ملک یاتازہ دودھ، ٹن یا بچوں کا ڈبے کا دودھ جیسے کہ نیڈو، لیکٹوجن، اور کوئی اور دودھ (ماں کے دودھ کے علاوہ)		Yes .....1 No .....2 ہاں.....1 نہیں 2
dd03	Any foods made from wheat, maize, rice or other flours such as bread, roti, rice, noodles, spaghetti, biscuits, or kichrei, daliya, sewaian or sagudana? گندم، چاول یا مکئی سے بنی ہوئی اشیاء جیسے روٹی ،ڈبل روٹی، چاول ، سپیگٹی، نوڈلز بسکٹ یا کھچڑی، دلیہ، سویاں، ساگودانہ	Yes.....1 No ..... 2 ہاں.....1 نہیں.....2	Yes .....1 No .....2 ہاں.....1 نہیں 2
dd04	White potatoes, white yams, cassava, arvi, kachalu, or any other foods made from roots? آلو، اروی، کچالو اور دوسری جڑوں سے حاصل ہونے والی غذائیں۔	Yes.....1 No ..... 2 ہاں.....1 نہیں.....2	Yes .....1 No .....2 ہاں.....1 نہیں 2
dd05	Any food made from vegetables or root crops with yellow or orange flesh such as carrots, squash, pumpkin, sweet potatoes? گاجر، پیٹھا اور شکر قندی وغیرہ۔ (وہ تمام غذائیں جو جڑوں والی سبزیاں جن کا پیلا یا نارنجی گودا ہو)	Yes.....1 No ..... 2 ہاں.....1 نہیں.....2	Yes .....1 No .....2 ہاں.....1 نہیں 2
dd06	Any food made from dark green leafy vegetables such as spinach, kale, palik, sarsoon, bathu, chulai,kechanar, chana ka sag, phalian and other locally available dark green leafy vegetables? گاڑھے سبز رنگ کے پتوں والی سبزیوں سے بنی ہوئی غذائیں جیسے پالک، سرسوں، باتھو،میتھی،کلفا سا گ، چلائی، کچنار، چنے کا ساگ اور دوسری گاڑھے سبز رنگ کی سبزیاں وغیرہ۔	Yes.....1 No ..... 2 ہاں.....1 نہیں.....2	Yes .....1 No .....2 ہاں.....1 نہیں 2
dd07	Any other vegetables? ا ن کے علاوہ کو ئی اور سبزی (بھنڈی ،پھول گوبھی، بینگن، مولی، شلجم، چقندر)	Yes.....1 No ..... 2 ہاں.....1 نہیں.....2	Yes .....1 No .....2 ہاں.....1 نہیں 2
dd08	Any food made from fruits with yellow or orange flesh such as ripe mango, ripe papaya, peach, apricot or persimmon? پکے ہوئے آم، پکا ہوا پپیتا، آڑو، خوبانی یا جاپانی پھل وغیرہ۔(اور وہ تمام غذائیں جو پیلے اور نارنجی گودےوالےپھلو ں سے بنی ہوں ۔)	Yes.....1 No ..... 2 ہاں.....1 نہیں.....2	Yes .....1 No .....2 ہاں.....1 نہیں 2
dd09	Any other fruits? ا ن کے علاوہ کو ئی اور پھل (تر بوز، خربوزہ، کیلا،انگور، سیب، ناشپاتی، جامن)	Yes.....1 No ..... 2 ہاں.....1 نہیں.....2	Yes .....1 No .....2 ہاں.....1 نہیں 2
dd10	Any beef, lamb, goat, chicken, turkey, duck, or other birds? بڑا گوشت، چھوٹا گوشت ، مرغی، بطخ اور دوسرے پرندوں کا گوشت وغیرہ ؟	Yes.....1 No ..... 2 ہاں.....1 نہیں.....2	Yes .....1 No .....2 ہاں.....1 نہیں 2
dd11	Any liver, kidney, heart, or other organ meats? دل، کلیجی، گردے، سری پا ئے ، یا دوسرے اعضاء ؟	Yes.....1 No ..... 2 ہاں.....1 نہیں.....2	Yes .....1 No .....2 ہاں.....1 نہیں 2

dd12	Any eggs? انڈے؟	Yes.....1 No.....2 ہاں.....1 نہیں.....2	Yes.....1 No.....2 ہاں.....1 نہیں.....2
dd13	Any fresh or dried fish or shellfish or seafood? مچھلی (تازہ یا خشک) ، جھینگے ،کیکڑے وغیرہ-	Yes.....1 No.....2 ہاں.....1 نہیں.....2	Yes.....1 No.....2 ہاں.....1 نہیں.....2
dd14	Any cowpea, soya bean, or other foods made from beans, peas, lentils, or legumes? لوبیا، چنے،دالیں، مٹراور ان سے بنی ہوئی غذائیں ۔	Yes.....1 No.....2 ہاں.....1 نہیں.....2	Yes.....1 No.....2 ہاں.....1 نہیں.....2
dd15	Any groundnut, cashew, walnut, kola nut, sesame, shea nut, almond or other foods made from nuts or seeds, including nut/seed butters or pastes? مونگ پھلی، کاجو، بادام، اخروٹ،پستہ ، چلغوزہ اور تل یا ان سے بنی ہوئی غذائیں ؟	Yes.....1 No.....2 ہاں.....1 نہیں.....2	Yes.....1 No.....2 ہاں.....1 نہیں.....2
dd16	Any cheese, yoghurt or other foods made from milk or other milk products? دودھ سے بنی ہوئی دوسری غذائیں جیسے دہی ، پنیراورلسی وغیرہ -	Yes.....1 No.....2 ہاں.....1 نہیں.....2	Yes.....1 No.....2 ہاں.....1 نہیں.....2
dd17	Any foods made with oil, fat, or butter? گھی، تیل، چربی، یا مکھن سے تیار کردہ غذائیں-	Yes.....1 No.....2 ہاں.....1 نہیں.....2	Yes.....1 No.....2 ہاں.....1 نہیں.....2
dd18	Any condiments and seasonings, such as, spices, herbs, fish powder, chilies or any other ingredients used in small quantities for flavour? ایسی غذائیں جیسے کہ مصالحہ جات، جڑی بوٹیاں ، فش پاوڈر ، مرچیں اور اس کے علاوہ وہ تمام غذائیں جو تھوڑی مقدار میں صرف ذائقہ اور خوشبو کےلئے استعمال ہوتی ہیں	Yes.....1 No.....2 ہاں.....1 نہیں.....2	Yes.....1 No.....2 ہاں.....1 نہیں.....2
dd19	Any other beverage and foods, such as coffee, tea, soft drinks, sweetened juice drinks, sweets, candies, chocolate, crisps/chips, or others? چائے، کافی ، مشروبات (پیپسی، سیون اپ،جام شیریں اور روح افزا)، میٹھے جوس، مٹھائیاں، ٹوفیاں، چاکلیٹ، چپس وغیرہ -	Yes.....1 No.....2 ہاں.....1 نہیں.....2	Yes.....1 No.....2 ہاں.....1 نہیں.....2

SALT IODIZATION COVERAGE			
N°	QUESTIONS	ANSWERS	SKIPS
si1	Now, I would like to talk with you about salt. اب میں آپ سے نمک کے بارے میں بات کرنا چاہوں گی۔ Does your household use salt? کیا آپ کا گھرانہ نمک استعمال کرتا ہے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Yes ..... 1 No ..... 2 ہاں.....1 نہیں 2	If **2**, skip to **oil** module.
si2	The **last time** your household got salt, where did you get it from? آخری مرتبہ آپ کے گھرانے نے نمک با زار سےخریدا تھا/ مفت لیا تھا / یا گھر پر بنایا تھا؟ *(READ **ALL** RESPONSES)* *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	From Market.....1 Home Produced .....2 Don't know / Don't remember.....88 Other (specify): _____.....99 با زار سے خر یدا تھا-----1 گھر پر بنایا تھا-----2 معلوم نہیں / یاد نہیں -----88 دیگر (وضاحت کریں)-----99	If **2,** skip to **oil** module.
si3	The **last time** your household got salt, did you get it in its original packaging or not? آخری مرتبہ جب آپ کے گھرانے نے نمک خریدا/ لیا،کیا یہ اس کی اصلی پیکنگ میں تھا یا اصلی پیکنگ میں نہیں تھا؟ *(READ **ALL** RESPONSES)* *(CIRCLE ONLY **ONE** ANSWER)* (تمام جوابات پڑھیں) (ایک جواب منتخب کریں)	Original package ..... 1 Not in original Package..... 2 Don't know / Don't remember..... 88 Other (Specify): ..... 99 اصلی پیکنگ میں تھا-----1 اصلی پیکنگ میں نہیں تھا-----2 معلوم نہیں / یاد نہیں -----88 دیگر (وضاحت کریں)-----99	
si4	The **last time** your household got salt, what was the brand? آخری مرتبہ جب آپ کے گھرانے نے نمک لیا تو وہ کس کمپنی / برانڈ کا تھا؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	China Salt..... 1 Dalda Namak ..... 2 Damond Salt ..... 3 Dewan Salt..... 4 Dolfun Natural Salt..... 5 Faiz Khan Iodized Salt ..... 6 Fine Salt..... 7 Food Maker..... 8 Hamaliya Salt..... 9 Handi..... 10 Hub Iodized Salt..... 11 Hub Refined Grain Salt ..... 12 Hub Salt ..... 13 Khas Natural Salt ..... 14 Khawara Namak..... 15 Kinza ..... 16 Lahori Salt..... 17 Local Chakki..... 18 Mehran Salt..... 19 National China Salt ..... 20 National Iodized Salt ..... 21 National Refined Salt 22	

		Noble Salt Iodized ..... 23 Nutra Plus Iodine Fortified Salt ..... 24 Pure Salt ..... 25 Pure Ultra Refined Iodized Salt..... 26 Raza..... 27 Roosmoor Salt ..... 28 Saadi..... 29 Sani Iodized ..... 30 Shan Nutra Plus Oil ..... 31 Shan Salt..... 32 Shangrilla China Salt ..... 33 Shezan Iodized Salt ..... 34 Shezan Salt..... 35 Super Gold Salt..... 36 Superfine Salt..... 37 Supreme Iodized Salt..... 38 Supreme Refined Salt..... 39 Utility Salt ..... 40 Zain Chinese Salt..... 41 Don't know…….....88 Other (specify) …….....99	
si5	The **last time** your household got salt, what quantity did you get? آخری مرتبہ جب آپ کے گھرانے نے نمک خریدا/ لیا تو نمک کتنی مقدار میں خریدا /لیا گیا تھا؟ *(A. WRITE IN THE NUMBER)* *(B. CIRCLE THE UNIT)*	A. Quantity ☐☐☐☐.☐☐ B. Kilogram.....1 grams ……2 Other (specify): _____.....99	
si6	The **last time** your household got that amount of salt, how much did it cost? آخری مرتبہ جب آپ کے گھرانے نے نمک خریدا /لیا تو کتنے میں خریدا تھا ؟ *(IF RECEIVED AS GIFT / FOOD AID, RECORD 77777)* *(IF 'DON'T KNOW', RECORD 88888)*	RUPEES روپے ☐☐☐☐☐	
si7	How long does this amount usually last in your household? نمک کی یہ مقدار آپ کے گھرانے میں کتنےعرصہ تک چلتی ہے؟ *(A. WRITE IN THE NUMBER)* *(B. CIRCLE THE UNIT)*	A. Duration ☐☐ B. Day(s).....1 Week(s)……2 Month(s).....3	
si8	In total, how much did your household spend on salt **in the last 30 days**? گزشتہ 30 دنوں میں آپ کے گھرانے نے نمک پر کتنا خرچ کیا؟ *(IF 'DON'T KNOW', RECORD 88888)*	RUPEES روپے ☐☐☐☐☐	If **si3 = 2, 88 or 99** skip to **oil** module.

si9	Do you have the salt package you purchased/got last time in your home now? کیا آپ کے گھر میں نمک کا پیکٹ جو آخری مرتبہ خریدا/لیا ، اس وقت موجود ہے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	ہاں..... 1 نہیں ..... 2 Yes .....1 No 2	If **2**, skip to **oil** module.
si10	***ASK TO SEE THE SALT PACKAGE AND LOOK FOR FORTIFICATION LOGO OR WORDS SUCH AS IODIZED OR FORTIFIED*** نمک کے پیکٹ کو دیکھیں کہ کہیں آئیوڈائزڈ کا لفظ یا لوگو موجود ہے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Salt is in its original package and Logo or words were observed……...1 Salt is in its original package and Logo or words were NOT observed….... نمک اس کی اصل پیکٹ / پیکنگ میں ہے اور آئیوڈائزڈ کا لفظ یا لوگو موجود ہے؟----------1 نمک اس کی اصل پیکٹ / پیکنگ میں ہے اور آئیوڈائزڈ کا لفظ یا لوگو موجود نہیں ہے؟ ----------2	

OIL/GHEE FORTIFICATION COVERAGE			
N°	QUESTIONS	ANSWERS	SKIPS
of1	Now, I would like to talk with you about cooking oil and ghee. اب میں آپ سے کھانا پکانے کے تیل / گھی کے بارے میں بات کرنا چاہوں گی۔ Does your household use cooking oil / ghee to prepare food or add to food at home? کیا آپ کا گھرانہ کھانا پکانے کے لئے تیل / گھی کا استعمال کرتا ہے؟ *(CIRCLE ONLY **ONE** ANSWER.)* (ایک جواب منتخب کریں)	Yes .....1 No .....2 ہاں.....1 نہیں.....2	If **2**, skip to **wheat flour** module.
of2-1	Do you use cooking oil or ghee more often to prepare food or add to food at home? آپ اپنےگھر میں کھانا پکانے کے لئے زیادو تر تیل استعمال کرتے ہیں یا گھی ؟	Cooking Oil……1 Ghee……2	
of2	What is the **main** type of (cooking oil / ghee) that your household uses on most days? آپ کا گھرانہ کھانا پکانے کے لئے زیادہ تر کونسا تیل / گھی استعمال کرتا ہے؟ *(CIRCLE ONLY **ONE** ANSWER.)* (ایک جواب منتخب کریں)	Groundnut oil……1 Red palm oil……2 Sunflower oil ……3 Coconut oil……4 Palmolein oil……5 Soya bean oil ……6 Rape seed (canola)/ Mustard oil ……7 Cottonseed oil ……8 Corn/Maize oil ……9 Sesame seed oil ……10 Safflower oil ……11 Olive Oil ……12 Vegetable oil ……13 Vegetable Ghee……14 Pure Ghee(Desi Ghee)……15 Don't know / Don't remember……88 Other (Specify):……99 مونگ پھلی کا آئل----------1 سرخ پام آئل----------2 سورج مکھی کا آئل----------3 کوکونٹ آئل----------4 پامولین آئل----------5 سویا بین آئل----------6 سرسوں/کنولہ آئل----------7 کپاس کے بیجوں کا آئل----------8 مکئی کا آئل----------9 تلوں کا تیل----------10 سفلور کا آئل----------11 زیتون کا تیل----------12 ویجیٹیبل آئل----------13 ویجیٹیبل گھی----------14 دیسی گھی----------15 معلوم نہیں / یاد نہیں ----------88 دیگر (وضاحت کریں)----------99	

of3	The **last time** your household got [MAIN TYPE OF OIL/GHEE], where did you get it from? آخری مرتبہ آپ کے گھرانے نے یہ تیل / گھی با زار سے خریدا تھا/ مفت لیا تھا/ گھر پر بنایا تھا؟ *(READ **ALL** RESPONSES)* *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	From Market .....1 Home Produced.....2 Don't know / Don't remember.....88 Other (specify): _____.....99 با زار سے خر یدا تھا----------1 گھر پر بنایا تھا----------2 معلوم نہیں / یاد نہیں ----------88 دیگر (وضاحت کریں)----------99	If **2,** skip to **wheat flour** module.
of4	The **last time** your household got [MAIN TYPE OF OIL/GHEE], did you get it in its original packaging or not? آخری مرتبہ جب آپ کے گھرانے نے یہ تیل / گھی خریدا / لیا تو ، کیا یہ اس کی اصلی پیکنگ میں تھا یا اصلی پیکنگ میں نہیں تھا؟ *(READ **ALL** RESPONSES)* *(CIRCLE ONLY **ONE** ANSWER)* (تمام جوابات پڑھیں) (ایک جواب منتخب کریں)	Original package .....1 Not in original Package.....2 Don't know / Don't remember .....88 Other (Specify):.....99 اصلی پیکنگ میں تھا----------1 اصلی پیکنگ میں نہیں تھا----------2 معلوم نہیں / یاد نہیں ----------88 دیگر (وضاحت کریں)----------99	
of5	The **last time** your household got [MAIN TYPE OF OIL/GHEE], what was the brand? آخری مرتبہ جب آپ کے گھرانے نے یہ تیل / گھی خریدا / لیا تویہ کس کمپنی / برانڈ کاتھا؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Aagaz Oil .....1 Afia Oil .....2 Arfa Oil.....3 Ashiyana Cooking Oil .....4 Avian Oil .....5 Barkat Oil.....6 Canolive Oil .....7 Care Cooking Oil Duble Refind .....8 Chand Oil.....9 Coroli Oil.....10 Dalda Canola Oil .....11 Dalda Oil.....12 Dalda Sunflower Oil.....13 Dastarkhwan Oil .....14 Dil Dil Oil.....15 Eva Cooking Oil.....16 Eva Oil .....17 Family Oil.....18 Fauji Oil .....19 Ghani Canola Oil .....20 Ghousia Oil.....21 Golden Sun Oil .....22 Golden Sun Sunflower Oil .....23 Gul Oil.....24 Habib Oil.....25 Handi Cooking Oil .....26 Hoor Oil .....27 Inam Cooking Oil.....28 Islamabad Oil.....29 Italia Olive Oil .....30 Kashmir Cooking Oil.....31 Kausar Oil.....32 Khalis Oil .....33 Khushboo Oil.....34 Kisan Oil 35	

		Kisan Sunflower Oil ..... 36 Maan Oil ..... 37 Malta Oil ..... 38 Manpasand Cooking Oil ..... 39 Mezan Canola Oil ..... 40 Mezan Oil ..... 41 Moulvi Oil ..... 42 Multan Oil ..... 43 Mundial Extra Virgin Olive Oil ..... 44 Mundial Pomace Olive Oil ..... 45 National Oil ..... 46 Nayab Cooking Oil ..... 47 Pakwan Oil ..... 48 Phool Oil ..... 49 Planta Oil ..... 50 Premium Cooking Oil ..... 51 Prime Cooking Oil ..... 52 Punjab Oil ..... 53 Rafhan Corn Oil ..... 54 Ravi Premium Cooking Oil ..... 55 Ravi Pure Oil ..... 56 Rite Oil ..... 57 Salva Oil ..... 58 Samar Cooking Oil ..... 59 Sasso Olive Oil ..... 60 Sawera Cooking Oil ..... 61 Seasons Canola Oil ..... 62 Seasons Cooking Oil ..... 63 Seasons Corn Oil ..... 64 Seasons Rice Bran Oil ..... 65 Shama Oil ..... 66 Smart Oil ..... 67 Soya Supreme Oil ..... 68 Sufi Canola Oil ..... 69 Sufi Oil ..... 70 Sufi Soyabean Cooking Oil ..... 71 Sufi Sunflower Cooking Oil ..... 72 Sultan Oil ..... 73 Sunflower Oil ..... 74 Sunrise Cooking Oil ..... 75 Tandrust Oil ..... 76 Tullo Oil ..... 77 Utility Oil ..... 78 Zaiqa Oil 79	
		Aagaz Ghee ..... 80 Adam's Desi Ghee ..... 81 Aghaz Banaspati ..... 82 Al-Shifa Ghee ..... 83 Amber Banaspati ..... 84 Anis Ghee ..... 85 Anmol Ghee ..... 86 Aseel ..... 87 Awaz Ghee ..... 88 Barkat Banaspati ..... 89 Borges ..... 90 Dalda Banaspati ..... 91 Dalda Ghee ..... 92 Dastarkhwan Ghee ..... 93 Deewan Banaspati Ghee ..... 94 Dil Dil Banaspati ..... 95 Dil Dil Ghee ..... 96 Dilpasandh Gold Banaspati 97	

		Sohna Ghee .....161 Soya Supreme Ghee.....162 Sufi Banaspati .....163 Sufi Ghee.....164 Sultan Ghee.....165 Supreme Ghee .....166 Swera Banaspati .....167 Talo Banaspati.....168 Tandrust Ghee.....169 Tiger Ghee.....170 Tohfa Ghee.....171 Tullo Ghee .....172 Umda Ghee .....173 Utility Ghee .....174 Zakia Ghee .....175 Zargoon Ghee .....176 Don't know.....888 Other (specify) 999	
of6	The **last time** your household got [MAIN TYPE OF OIL/GHEE], what quantity did you get? آخری مرتبہ جب آپ کے گھرانے نے یہ تیل / گھی خریدا/ لیا تو کتنی مقدار میں خریدا/ لیا تھا؟ *(A. WRITE IN THE NUMBER)* *(B. CIRCLE THE UNIT)*	A. Quantity ☐☐☐☐.☐☐ B. Litre.....1 Mililitres……2 Kilogram……3 gram……4 Other (specify): _____.....99	
of7	The **last time** your household got that amount of [MAIN TYPE OF OIL/GHEE], how much did it cost? آخری مرتبہ جب آپ کے گھرانے نے اس مقدار میں تیل / گھی خریدا/ لیا تو یہ کتنے کا خریدا تھا؟ *(IF RECEIVED AS GIFT / FOOD AID, RECORD 77777)* *(IF 'DON'T KNOW', RECORD 88888)*	RUPEES روپے ☐☐☐☐☐	
of8	How long does this amount usually last in your household? تیل / گھی کی یہ مقدار آپ کے گھرانے میں کتنے عرصہ تک چلتی ہے؟ *(A. WRITE IN THE NUMBER.)* *(B. CIRCLE THE UNIT)*	A. Duration ☐☐ B. Day(s).....1 Week(s)……..2 Month(s).....3	
of9	In total, how much did your household spend on [MAIN TYPE OF OIL/GHEE] **in the last 30 days**? گزشتہ 30 دنوں میں آپ کے گھرانے نے اس تیل / گھی پرکتنا خرچ کیا؟ *(IF 'DON'T KNOW', RECORD 88888)*	RUPEES روپے ☐☐☐☐☐	If **of4 = 2, 88 or 99** skip to **wheat flour** module.
of10	Do you have the [MAIN TYPE OF OIL/GHEE] container, you purchased/got last time in your home now? کیا آپ کے گھر میں تیل / گھی کا ڈبہ جوآخری مرتبہ	Yes .....1 No .....2 ہاں.....1 نہیں.....2	If **2**, skip to **wheat flour** module.

	خریدہ/لیا، اس وقت موجود ہے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)		
of11	***ASK TO SEE [MAIN TYPE OF OIL/GHEE] CONTAINER AND LOOK FOR FORTIFICATION LOGO OR WORDS SUCH AS FORTIFIED*** تیل / گھی کے ڈبے کے اوپر دیکھیں کہ کہیں بھی فورٹیفیکیشن یا فورٹیفائیڈ کا لفظ یا لوگو موجود ہے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	OIL/GHEE is in its original package and Logo or words were observed…….....1 OIL/GHEE is in its original package and Logo or words were NOT observed…….....2 تیل / گھی اس کی اصل پیکنگ میں ہے او ر جیسے کہ فورٹیفائیڈ کا لفظ یا لوگو موجود ہے---------- 1 تیل / گھی اس کی اصل پیکنگ میں ہے او ر جیسے کہ فورٹیفائیڈ کا لفظ یا لوگو موجود نہیں ہے----------2	

WHEAT FLOUR FORTIFICATION COVERAGE			
N°	QUESTIONS	ANSWERS	SKIPS
wf1	Now, I would like to talk with you about wheat flour. اب میں آپ سے گندم کے آٹے کے بارے میں بات کرنا چاہوں گی۔ Does your household prepare foods using wheat flour? کیا آپ کا گھرانہ عام طور پر گندم کا آ ٹا استعمال کرتا ہے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Yes .....1 No .....2 ہاں..... 1 نہیں 2	If **2**, skip to **individual wheat flour** module.
wf3_c	The last time your household got wheat flour, where did you get it from? آخری مر تبہ آپکے گھرانے نے آٹا کہاں سے لیا؟ *(READ **ALL** RESPONSES)* *(CIRCLE ONLY **ONE** ANSWER)* (تمام جوابات پڑھیں) (ایک جواب منتخب کریں)	From a chakki mill (unbranded / branded) .....1 From the market and it was a chakki flour brand (branded) .....2 From the market and it was OTHER than chakki flour.....3 Home produced.....4 Don't know.....88 Other (specify)_____.....99 آٹاچکی سے لیا (کو ئی بر ا نڈ تھا/کو ئی بر ا نڈ نہیں)--------1 بازار سے چکی کا آٹا خر یدا (جس کا کو ئی بر ا نڈ ہے)-------2 بازار سے آٹا خر یدا (چکی کے علاوہ کو ئی اورآٹا)---------3 اپنے دانے پسوائے----------4 معلوم نہیں / یاد نہیں---------- 88 دیگر (وضاحت کریں)___----------99	
wf3_d	Is this your usual source to get this wheat flour for at least last 6 months of the year? کیا آپ سال کے پچھلے 6 مہینے عموما اسی قسم کا آٹا ستعمال کرتے ہیں؟	Yes.....1 No.....2 Don't know.....88 ہا ں نہیں معلوم نہیں	If **wf3-c=4** Skip to **Individual wheat flour consumption** module.
wf4	The **last time** your household got wheat flour, did you get it in its original packaging or not? آخری مرتبہ آپ کے گھرانے نےگندم کا آٹا خریدا/لیا تو کیا یہ اس کی اصلی پیکنگ میں تھا یا اصلی پیکنگ میں نہیں تھا؟ *(READ **ALL** RESPONSES)* *(CIRCLE ONLY **ONE** ANSWER)* (تمام جوابات پڑھیں) (ایک جواب منتخب کریں)	Original package.....1 Not in original package .....2 Don't know / Don't remember.....88 Other (specify): _____.....99 اصلی پیکنگ میں تھا----------1 اصلی پیکنگ میں نہیں تھا----------2 معلوم نہیں / یاد نہیں ----------88 دیگر (وضاحت کریں)----------99	

wf5	The **last time** your household got wheat flour, what was the brand? آخری مرتبہ آپ کے گھرانے نے جو گندم کا آٹا خریدا/ لیا کس کمپنی/ برانڈ کا تھا؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	11 Star Special Atta ..... 1 7 Star ..... 2 Anmol Atta ..... 3 Bake Parlor Super Fine Atta ..... 4 Bran Wheat ..... 5 Chakki Atta ..... 6 Chakki Maida ..... 7 Chiwada Atta ..... 8 Chiwana Suji ..... 9 Classic Fine Atta ..... 10 Do-Talwar ..... 11 Faisal Atta ..... 12 Farina Atta ..... 13 Farooq Atta ..... 14 Fil Atta ..... 15 Fine Atta ..... 16 Gaznavi Atta ..... 17 Ghulab ..... 18 Golden Atta ..... 19 Grains Atta ..... 20 Healthy Living Atta ..... 21 Inqalab Atta ..... 22 Itemad Atta ..... 23 Khajoor Atta ..... 24 Khyber ..... 25 Kohinoor Maida ..... 26 Kohinoor Suji ..... 27 Lasani ..... 28 Latif ..... 29 Maida Chotti Chakki ..... 30 Memon Pure Chakki Atta ..... 31 Mezail ..... 32 Nafees Atta ..... 33 Nagina ..... 34 Naushahi ..... 35 Nayab Wheat Flour Atta ..... 36 Open Suji ..... 37 Pakistan Atta ..... 38 Par Marka Suji ..... 39 Premier Maida ..... 40 Pure Atta ..... 41 Qurshi Flour ..... 42 Sehat Fine Atta ..... 43 Shahi Atta ..... 44 Shan Maida ..... 45 Shan Special Maida ..... 46 Sher-Marka ..... 47 Soraj Brand Atta ..... 48 Special Maida ..... 49 Special Suji ..... 50 Sunny Super Atta ..... 51 Super Atta ..... 52 Super Chakki Atta ..... 53 Super Maida ..... 54 Super Diet Atta ..... 55 Super Fine Atta ..... 56 Syed Diet Gold Atta ..... 57 Syed Diet Platinum Atta ..... 58 Tayyaba Flour Mills ..... 59 Unaaj Atta ..... 60 V.I.P Atta ..... 61 White Atta ..... 62 Yadgar Atta 63	

		Yadgar Fine Atta ..... 64 Yadgar Maida ..... 65 Zaitoon Atta..... 66 Zam Zam Atta ..... 67 Zameendar Atta ..... 68 Don't know ..... 88 Other (Specify).....	
wf6	The **last time** your household got wheat flour, what quantity did you get? آخری بار آپ کے گھرانے نے گندم کا آٹا خریدا/ لیا ، تو وہ کتنی مقدار میں تھا؟ *(A. WRITE IN THE NUMBER)* *(B. CIRCLE THE UNIT)*	A. Quantity ☐☐☐☐ ☐☐ B. Kilogram.....1 Other (specify): _____.....99	
wf7	The **last time** your household got that amount of wheat flour, how much did it cost? آخری مرتبہ جب آپ کے گھرانے نے اتنی مقدار میں گندم کا آٹا خریدا/ ا لیا تو یہ آٹا کتنے میں خریدا؟ *(IF RECEIVED AS GIFT / FOOD AID, RECORD 77777)* *(IF 'DON'T KNOW', RECORD 88888)*	RUPEES روپے ☐☐☐☐☐	
wf8	How long does this amount usually last in your household? گندم کے آٹے کی یہ مقدار آپ کے گھرانے میں کتنا عرصہ چلتی ہے؟ *(A. WRITE IN THE NUMBER.)* *(B. CIRCLE THE UNIT)*	A. Duration ☐☐ B. Day(s).....1 Week(s).....2 Month(s).....3	
wf9	In total, how much did your household spend on wheat flour **in the last 30 days**? گزشتہ 30 دنوں میں آپ کے گھرانے نے گندم کا آٹا لینے پر کتنا خرچ کیا؟ *(IF 'DON'T KNOW', RECORD 88888)*	RUPEES روپے ☐☐☐☐☐	If **wf4 = 2, 88 or 99** skip to **individual wheat flour** module.
wf10	Do you have the wheat flour package, you purchased/got last time in your home now? کیا آپ کے گھر میں گندم کا آٹا/تھیلا جو آخری مرتبہ خریدا/لیا، اس وقت موجود ہے؟ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Yes .....1 No .....2 ہاں..... 1 نہیں 2	If **2**, skip to **individual wheat flour** module.
wf11	***ASK TO SEE WHEAT FLOUR PACKAGE AND***	Wheat flour is in its original package and	

	LOOK FOR FORTIFICATION LOGO OR WORDS SUCH AS FORTIFIED گندم کے آٹے کی پیکنگ کو دیکھیں اور چیک کریں کہ کہیں فورٹیفیکیشن یا فورٹیفائیڈ کا لفظ یا لوگو موجود ہے۔ *(CIRCLE ONLY **ONE** ANSWER)* (ایک جواب منتخب کریں)	Logo or words were observed……..1 Wheat flour is in its original package and Logo or words were NOT observed…….2 گندم کا آٹا اس کی اصل پیکنگ میں ہے اور جیسےکہ فورٹیفیکیشن یا فورٹیفائیڈ کا لفظ یا لوگو موجود ہے----------1 گندم کا آٹا اس کی اصل پیکنگ میں ہے اور جیسےکہ فورٹیفیکیشن یا فورٹیفائیڈ کا لفظ یا لوگو موجود نہیں ہے----------2	

INDIVIDUAL WHEAT FLOUR CONSUMPTION

Now I would like to ask about how often and how much you and [NAME OF CHILD] consume specific foods made from wheat flour.

اب میں آپ سے پوچھنا چوہونگی کہ آ پ اور آپ کے بچے نے گندم کے آٹے سے بنی ہو ئی غذاؤں کو کب کب اور کتنا کھایا/ استعمال کیا۔

اگر دیکھ بھا ل کرنے والی خاتون کی عمر 18 سال سے کم ہے تو سوال اس طرح پو چھیں۔

اب میں آپ سے پوچھنا چوہونگی کہ آ پ نے گندم کے آٹے سے بنی ہو ئی غذاؤں کو کب کب اور کتناکھایا / استعمال کیا۔

1. **In the last 7 days**, did you and [NAME OF CHILD] eat [FOOD ITEM]?

پچھلے 7 دنوں میں آپ اور آپ کے بچے نے یہ غذا کھائی / استعمال کی؟

ا گر دیکھ بھا ل کرنے والی خاتون کی عمر 18 سال سے کم ہے تو سوال اس طرح پو چھیں۔

پچھلے 7 دنوں میں آپ نے یہ غذا کھائی / استعمال کی؟

(REPEAT QUESTION FOR EACH FOOD ITEM LISTED BELOW)

2. **In the last 7 days**, how many times did you and [NAME OF CHILD] eat [FOOD ITEM]?

پچھلے 7 دنوں میں آپ اور آپ کے بچے نے یہ غذا کتنی بار کھائی / استعمال کی؟

ا گر دیکھ بھا ل کرنے والی خاتون کی عمر 18 سال سے کم ہے تو سوال اس طرح پو چھیں۔

پچھلے 7 دنوں میں آپ نے یہ غذا کتنی بارکھائی / استعمال کی؟

(REPEAT QUESTION FOR EACH FOOD ITEM LISTED BELOW. IF THEY DID NOT HAVE THE FOOD ITEM, DO NOT ASK FOR FREQUENCY)

3. Usually how much of [FOOD ITEM] did you and [NAME OF CHILD] eat at **one sitting**?

عموما آپ اور آپ کا بچہ یہ غذا ایک دفعہ میں کتنی کھاتے/ استعمال ہیں؟

ا گر دیکھ بھا ل کرنے والی خاتون کی عمر 18 سال سے کم ہے تو سوال اس طرح پو چھیں۔

عموما آپ یہ غذا ایک دفعہ میں کتنی کھا تی / استعمال کرتی ہیں؟

(SHOW PICTURES OF PORTIONS AND REPEAT QUESTION FOR EACH FOOD ITEM LISTED BELOW. IF THEY DID NOT HAVE THE FOOD ITEM, DO NOT ASK FOR PORTION SIZE)

N°	ITEMS	A. Caregiver دیکھ بھال کرنے والی			B. Child بچہ If **selected** caregiver < 18 years of age and alternative respondent is being interviewed, OR child is exclusively breastfed (cf2=2) skip to **fortification knowledge** module.		
	غذائیں	(iwfc2_comsum_a*) 1. Had the food item کیا یہ غذا کھائی؟	2(iwfc2_freq_a*) Frequency (# times) کتنی دفعہ کھائی	3 (iwfc2_port_a*). Portion Size عموما ایک دفعہ میں آپ یہ چیزکتنی کھاتی ہیں؟	1. (iwfc1_comsum_b*) Had the food item کیا یہ غذا کھائی؟	(iwfc1_freq_b*) 2. Frequency (# times) کتنی دفعہ کھائی	3. (iwfc1_port_b*) Portion Size عموما ایک دفعہ میں بچہ یہ چیزکتنی کھا تا ہیں؟
1	Chicken and vegetable Roll مرغی اور سبزی والے رول	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
2	Potato stuffed Samosa آلو والے سموسے	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐

3	Chicken stuffed Samosa مرغی والے سموسے	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
4	Kachori کچوری	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
5	Sheer Mall شیر مال	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
6	Buns/ Fruit Buns بن/ فروٹ بن	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
7	Chapati/Roti/Homemade roti چپاتی/روٹی/گھر پر بنی ہوئی روٹی	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
8	Roghni Naan/ Other similar Naan روغنی نان/ اسی طرح کا کوئی اور نان	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
9	Potato stuffed Naan/ Other similar Naan آلو والا نان/ اسی طرح کا کوئی اور نان	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
10	Paratha پراٹھا	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
11	Afghani naan افغا نی نان	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
12	Sliced Bread (Plain, Garlicky, milky, etc.) ڑبل روٹی (سادی، لہسن والی یا دودھ والی)	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
13	Bran Bread براؤن بریڈ	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐

14	Pizza پیزا	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
15	Pasta (Macaroni or noodles etc.) پاستہ(میکرونی، نوڈلز وغیرہ)	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
16	Butter Cake بٹر کیک(سادہ کیک)	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 2 نہیں	☐☐	☐
17	Rusk رس	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
18	Cake Rusk کیک رس	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
19	Biscuits (Any kind) بسکٹ(ہر طرح کے)	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
20	Jalebi جلیبی	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
21	Gulab Jamun گلاب جامن	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
22	Cream Roll کریم ر ول	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
23	Cream Puffs کریم پف	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
24	Butter Fruit Puffs فروٹ پف	Yes.....1 No .....2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐

25	Bakar Khaani باکر خانی	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
26	Doughnuts ڈونٹس	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
27	Cake کیک	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
28	Vermicelli میدے کی سویاں	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
29	Halwa حلوہ (آٹے، معدےیا سوجی کا بنا ہوا)	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐
30	Wheat Porridge (Any kind) گندم کا دلیہ(ہرطرح کا) جو پکا کر کھا تے ہیں۔	Yes.....1 No ..... 2 ہاں.....1 نہیں 2	☐☐	☐	Yes.....1 No.....2 ہاں.....1 نہیں 2	☐☐	☐

FORTIFICATION KNOWLEDGE			
fk1	Have you ever heard about fortified foods? کیاآپ نے ایسی غذاؤں کے بارے میں سنا ہے جس میں اضافی غذائی اجزا شامل کیے گئے ہوں ؟ *(CIRCLE ONLY **ONE** ANSWER.)* (ایک جواب منتخب کریں)	Yes .....1 No .....2 ہاں.....1 نہیں.....2	If **2**, skip to **health and nutrition** module.
fk2	Where did you hear about it? آپ کو اس کے بارے میں کہاں سے پتا چلا ؟ *(DO NOT READ RESPONSES TO RESPONDENT.)* *(CIRCLE **ALL** RESPONSES THAT APPLY.)* (کوئی جواب نہ پڑھیں) (ایک سے زیادہ جوابات آ سکتے ہیں)	Television .....1 Radio .....2 Campaign of Department of Health.....3 Health facility / clinic .....4 Newspaper / magazine.....5 Community workers.....6 Friends/Family/ Relatives.....7 Other (Specify) .....99 ٹیلی ویزن / ٹی وی.....1 ریڈیو.....2 محکمہ صحت کی مہم.....3 مرکز صحت / کلینک.....4 اخبار / میگزین.....5 کمیو نٹی ورکرز.....6 دوست/خاندان/رشتے دار.....7 دیگر (وضاحت کریں).....99	
fk3	What does fortified mean? ایسی غذا ئیں جن میں اضافی غذائی اجزا شامل کیے گئے ہوں ا س سےکیا مطلب ہے؟ *(DO NOT READ RESPONSES TO RESPONDENT.)* *(CIRCLE **ALL** RESPONSES THAT APPLY.)* (کوئی جواب نہ پڑھیں) (ایک سے زیادہ جوابات آ سکتے ہیں)	Enriched / added micronutrients .....1 Good for health.....2 Better quality .....3 Bad quality.....4 More expensive .....5 The food tastes good.....6 The food is good for growth and development of children.....7 No meaning .....8 Don't know.....88 Other (Specify): .....99 اضافی غذائی اجزا شامل ہوتے ہیں۔.....1 صحت کیلئے اچھی / اچھا ہے.....2 اچھا معیار.....3 برا معیار.....4 کافی مہنگی.....5 خوراک کا ذائقہ اچھا ہے.....6 ایسی خوراک بچوں کی پرورش کیلئے اچھی ہوتی ہے.....7 کوئی معنی نہیں.....8 معلوم نہیں.....88 دیگر (وضاحت کریں).....99	

HEALTH AND NUTRITION DATA			
N°	QUESTIONS	ANSWERS	SKIPS
			If **selected** cargiver is male, skip to **muacc**. If **selected** caregiver is ≥51 years of age OR **selected** caregiver < 18 years of age and an alternative respondent is being interviewed, skip to **muacm**.
MOTHER / CAREGIVER			
hnd0	What is your marital status? (CIRCLE ONLY ***ONE*** ASNWER)	Single……1 Currently married……2 Widowed……3 Separated……4 Divorced……5 Nikkah solemnised but Rukhsati not taken place……6 Refused……97 کبھی بھی شادی نہیں ہوئی شادی شدہ بیوہ علیحدگی طلاق یافتہ نکاح ہوا لیکن رخصتی نہیں ہوئی انکار کر دیا	If **1** or **6**, skip to **muacm**.
hnd1	Are you currently pregnant? کیا آپ ابھی حاملہ ہیں؟ *(CIRCLE ONLY **ONE** ANSWER.)* (ایک جواب منتخب کریں)	Yes ..... 1 No ..... 2 Don't know..... 88 ہاں.....1 نہیں.....2 معلوم نہیں.....3	
hnd2	Are you currently breastfeeding? کیا آپ بچے کو ابھی اپنا دُودھ پلارہی ہیں؟ *(CIRCLE ONLY **ONE** ANSWER.)* (ایک جواب منتخب کریں)	Yes..... 1 No ..... 2 ہاں.....1 نہیں.....2	
muacm	Now I would like to check your and [NAME OF CHILD]'s nutritional status. اب میں آپ کی اور [نام] کی غذائیت کی صورت حال کو چیک کرونگی۔ May I measure your arm circumference? کیا میں آپ کی بازو کا ناپ لے سکتی ہوں؟ *TAKE THE MUAC OF THE **MOTHER / CAREGIVER** ON HER LEFT ARM*	ملی میٹر mm ☐☐☐	If MUAC **< 185mm** → **Refer to health services!**

	ماں / دیکھ بھال کرنے والی خاتون کے بائیں بازو کا ناپ لیں۔ *(IF 'REFUSED,' RECORD 666.)* *(IF ARM IS TOO BIG, RECORD 777.)*		
CHILD			
muacc	May I measure [NAME OF CHILD]'s arm circumference? کیا میں [نام] کی بازو کا ناپ لے سکتی ہوں؟ *TAKE THE MUAC OF THE **CHILD** ON HIS / HER LEFT ARM* بچے کے بائیں بازو کا ناپ لیں۔ *(IF 'REFUSED,' RECORD 666.)* *(IF CHILD IS NOT AVAILABLE, 'RECORD 777.)*	☐☐☐ mm ملی میٹر	If <6 months and MUAC **< 110 mm** OR ≥6 months and MUAC **< 115 mm** → **Refer to health services!**

Recall survey	I would like to thank you very much for the time you have given us today. This will help us a lot in our research and hopefully this will help the government make better informed decisions about food fortification. We are conducting another survey that is related to this one in couple of weeks. We will be interviewing households in Pakistan and asking them about their food consumption over the last 24 hours and 7 days. There is a chance that your household might be randomly selected again to participate in that study. If your household is selected, would you like to participate in that study? آج جو وقت آپ نے ہمیں دیا میں اُس کا بہت شکریہ ادا کرتی / کرتا ہوں۔ یہ ہمیں ہماری تحقیق میں بہت مدد کرے گا اور ہماری گورنمنٹ کو بھی تقویت والی غذاؤں کے بارے میں فیصلہ کرنے کے لئے مددگار ثابت ہوگا۔ ہم اس طرح کا ایک سروے آگے آنے والےکچھ ہفتوں میں کریں گے۔ جس میں پاکستان کے چند گھرانوں کا انٹرویو کریں گے جس میں اُن سے پچھلے 24 گھنٹوں اور گزشتہ 7 دنوں کے دوران جو خوراک استعمال کی اس کے بارے میں پوچھیں گے۔ عین ممکن ہے کہ آپ کا گھرانہ قرعہ اندازی کے ذریعے پھر سے اُس تحقیق میں شامل ہو۔ اگر آپ کا گھرانہ منتخب ہوتا ہے تو کیا آپ اس تحقیق میں حصہ لینا چاہیں گے؟	Yes ……..1 No ……..2 Currently undecided ……..3 ہاں----------1 نہیں----------2 ابھی فیصلہ نہیں کیا----------3

FILL IN AFTER COMPLETING QUESTIONNAIRE		
outhh	Outcome of the visit انٹرویو کا نتیجہ	Completed .....1 انٹرویو مکمل ہو گیا۔ Partially completed (revisit) .....2 انٹرویو جزوی طور پر مکمل ہوا ۔ [دوبارہ انٹرویو کریں] Partially completed (refused after starting the interview) .....3 انٹرویو جزوی طور پر مکمل ہوا ۔ [شروع میں ہی انکار کر دیا] Permission refused.....4 اجازت لینے پر انکار کر دیا۔ Household ineligible .....5 گھرانہ اہل نہیں ہے۔ No eligible respondent available at time of visit (revisit) .....6 کوئی جواب دہندہ موجود نہیں جب انٹرویو کے لئے گئے [دوبارہ انٹرویو کریں] Temporarily unable to be interviewed, e.g. illness or incapacitation (revisit).....7 عارضی طور پر انٹرویو نہیں دے سکتے [دوبارہ انٹرویو کریں] Long term unavailable.....8 طویل مدت کے لئے موجود نہیں Dwelling not found.....9 مکان نہیں ملا Dwelling not inhabited .....10 مکان میں کوئی نہیں رہتا Other (specify): .....99 دیگر وضاحت _____

3. EXAMPLE SHOWCARDS

Example 1: Showcard for the food frequency questionnaire

Chicken & Vegetable Roll

1. ¼ roll

2. ½ roll

3. 1 roll

4. 1 ½ rolls

5. 2 rolls

6. 3 rolls

7. 4 rolls

8. 5 rolls

4. MARKET QUESTIONNAIRES

MARKETPLACES & RETAIL OUTLETS by market hub	Date of market visit (dd/mm/yyyy) مارکیٹ وزٹ کی تاریخ	_____ / _____ / 2017	1

Instructions: Complete 1 sheet in a given market hub. There can be up to 5 marketplaces identified, or as few as 1. All retail outlets visited should be listed.

Team ID: ٹیم کا نمبر		Data Collector Name: ڈیٹا کولیکٹر کا نام:		Retail Outlet Code: ریٹیل آنوٹ کا کوڈ Wholesaler = W Retail shop = R Supermarket = S Bakey = B

Region code ریجن کا کوڈ (see below)	Market Hub Code مارکیٹ حب کا کوڈ (see below)	Marketplace visited مارکیٹ کا وزٹ	Marketplace Name مارکیٹ کی جگہ کا نام	Marketplace location (address if possible) مارکیٹ کا پتہ	Retail outlet visited	Retail Outlet Name ریٹیل آنوٹ لٹ کا نام	Retail outlet type code ریٹیل آنوٹ کا کوڈ (see above)
		1			1		
Region ریجن Sindh= SD Balochistan =BS Punjab = PJ Khyber Pakhtunkhwa = KP	Market Hub مارکیٹ حب TBD				2		
					3		
					4		
					5		
					6		
					...		
		2			1		
					2		
					3		
					4		
					5		
					6		
					...		
		3			1		
					2		
					3		
					4		
					5		
					6		
					...		
		4			1		

BRAND REGISTRATION by market hub, retail outlet type, and food vehicle

Date of visit وزٹ کی تاریخ (dd/mm/yyyy)	_____ / _____ / 2017

2

Instructions: Complete 1 sheet per food vehicle per retail outlet type in a given market hub (i.e. 1 salt sheet, 1 WF sheet, 1 oil sheet per retail outlet type, except in the case of bakeries, which will only have 1 WF sheet). Per market hub, you should have 10 sheets.

Team ID: ٹیم کا نمبر	Data Collector Name: ڈیٹا کولیکٹر کا نام:	Region code ریجن کا کوڈ	Market Hub Code مارکیٹ حب کا کوڈ	Retail outlet type code ریٹیل آنوٹ کا کوڈ	Retail Outlet Code: ریٹیل آنوٹ کا کوڈ Wholesaler = W Retail shop = R Supermarket = S Bakey = B

No	Food Vehicle فوڈ Salt = S Oil = O Wheat Flour = WF	Food Vehicle Type فوڈ کی قسم (For oil and wheat flour - see codes)	Brand Name برانڈ کا نام	Producer	Production site country	Production Site address (if available)	local vs. imported مقامی / درآمد Local = L Imported = I	Region ریجن Sindh= SD Balochistan =BS Punjab = PJ Khyber Pakhtunkhwa = KP	Market Hub مارکیٹ حب TBD	Food Vehicle Type فوڈ کی قسم Palm Oil = OP Red Palm Oil = ORP Sunflower Oil = OS Soybean Oil = OSB Corn Oil = OC Canola Oil = OA Olive Oil = OO Groundnut/Peanut Oil = OG Vegetable Oil = OV Date Oil = OD Ghee = GH Other = OOT Wheat flour = WE White Flour = WI Whole Wheat Meal = WW
1										
2										
3										
4										
5										
6										
7										
8										
9										
etc.										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										

SPECIMEN REGISTRATION FORM	Date of visit (dd/mm/yyyy)	____ / ____ / 2017	Team ID: ٹیم کا نمبر		Data Collector Name: ڈیٹا کولیکٹر کا نام		3

Instructions: Complete one sheet per food vehicle in a given market hub (i.e. 1 salt sheet, 1 WF sheet and 1 oil sheet). Per market hub, you should have 3 sheets. Unique number sequencing should change depending on the food vehicle.

Specimen Label																
Unique Number	Region code ریجن کا کوڈ	Market Hub Code مارکیٹ حب کا کوڈ	Food vehicle Salt = S Oil = O Wheat Flour = WF	Brand Name برانڈ کا نام	Specimen number نمونہ نمبر	Production date (dd/mm/yyyy)	Expiry date (dd/mm/yyyy)	Producer	Production site country	Production Site address (if available)	Package type پیکج کی قسم	Package Size پیکج کا سائز	Package size unit پیکج سائز کا یونٹ (ml, l, g, kg)	labeled as fortified? فورٹیفائیڈ کا لوگو موجود ہے (Statement only = FS Logo only = FL Statement & Logo = FSL Not labeled = N	Price قیمت (CFA)
1000															
1001															
1002															
1003															
1004															
1005															
1006															
1007															
1008															
etc.															

5. SAMPLING WEIGHTS

Due to the complex sampling design, sample adjustment weights need to be estimated for the analysis. The sampling weights aim to correct for unequal probabilities of selection as imposed by the complex design. The sampling weights have been estimated for both of the analytical levels: population of children under five years of age and the population of households with children under the age of five. The sampling weights are the inverses of the sampling probabilities, where the sampling probabilities form a conditional probability across different sampling stages. In the case of the FACT survey in Pakistan selection probability of clusters in each province, selection probability of the households within the cluster and finally probability selection of children within households need to be taken into account. The weights in their final form are normalized (rescaled) to the level of the analytical sample (the sum of weights need to equate to the analytical sample size) taking into account any explicit sampling strata – in the case of FACT survey in Pakistan, the provinces.

No weights were calculated for WRA because they were not sampled at the household level. Instead the primary caregiver of the randomly sampled child, who may or may not have been a WRA, was selected to be interviewed. As a result, child-level weights were applied to WRA estimates found in this report.

Cluster weights

In the first stage of sampling the clusters were selected in each province with the probability proportional to the size (PPS) of each cluster. As the PPS at the first stage was combined with the equal number of households selected within each cluster at the second stage, the sample becomes approximately self-weighted, meaning that in the ideal situation no weights would be required. However, the information on the size of the cluster available in the sampling frame is often not accurate and is outdated, so the newly obtained cluster sizes through listing are used to estimate the sampling weights.

In order to illustrate the probability of selection of each cluster we employ a single unit probability approach[7] and the probability can be operationalised as follows:

$$p_i^{cl} = \frac{\widehat{M}_i}{K}$$

where p_i^{cl} is the probability for a single cluster i to be selected, $\widehat{M}_i$ is the estimated size of the cluster and K is the total size of the frame.

Household weights

As mentioned earlier, households were selected from the list of eligible households in an EA using a systematic random approach. Eligible households were identified from the listing exercise as those households with at least one child under 5. The probability of selection of each household was given as follows:

$$p_i^h = p_i^{cl} \times \frac{m}{M_i}$$

where p_i^h is the probability of household in cluster i to be selected into the sample, m is the number of households selected per EA (15 in the present case), and M_i is the total number of eligible households in an EA identified from the listing exercise. Household-level weights were

[7] An alternative approach mentioned in the literature is also the average unit size approach where the numerator is the multiplication of the average size of the clusters and the number of clusters sampled.

appropriately normalised inverses of these probabilities. Normalisation is operationalised as follows:

$$w_i^h = \frac{1}{p_i^h} \times \frac{n}{\sum_{i=1}^{n^{cl}} \frac{1}{p_i^h}}$$

where w_i^h is the normalised weight, p_i^h is the probability of selecting a household in cluster i and n is the total number of households in the sample.

Child weights

Within each visited household, one child under 5 was randomly sampled using the Kish grid method. The probability of selection of each child was given as follows:

$$p_j^c = p_i^h \times \frac{b}{B_j}$$

where p_i^c is the probability of each child in household j to be selected, p_i^h is defined as above, b is the number of children selected per household (1 in the present case), and B_i is the total number of children under 5 in household j. Similarly, child-level weights were appropriately normalised inverses of these probabilities.

Estimation set-up

The survey weights were applied within a survey set up in Stata that takes into account clustered sampling, stratification and finite population corrections. EAs were the PSUs within each state; therefore, for household and child estimates, clustering was set at the EA level. Stratification during sampling was used at the primary sampling level, i.e., at the EA level. For the estimation set-up, strata for EAs were defined by state and urban/rural terciles based on population density. Finally, as large proportions of the total eligible population were sampled in many EAs, the estimation set-up also accounted for the finite population correction (FPC) factor. This factor was defined as follows:

$$FPC = \sqrt{\frac{N-n}{N-1}}$$

where N is the size of the population from which the sample is drawn and n is the size of the sample.

6. FOOD SPECIMEN LABORATORY ANALYSIS RESULTS BY BRAND

Table 18 Results of laboratory analysis of salt samples by brand

Food vehicle	Brand	Number of specimens collected	Nutrient analysed	Mean iodine (ppm)	Pakistan national fortification standard (ppm)	Mean added iodine (ppm)
Salt	1	12	**Iodine**	0.0	**15-25**	NA
	2	8		0.0		
	3	12		0.0		
	4	28		0.0		
	5	1		3.2		
	6	12		3.2		
	7	1		3.2		
	8	12		3.7		
	9	12		3.7		
	10	11		4.2		
	11	12		4.2		
	12	1		4.8		
	13	12		4.8		
	14	2		5.3		
	15	6		5.3		
	16	12		5.8		
	17	1		5.8		
	18	7		6.3		
	19	1		6.9		
	20	12		7.9		
	21	13		8.5		
	22	12		9.5		
	23	6		10.0		
	24	12		11.1		
	25	12		12.0		
	26	1		18.0		
	27	25		28.6		
	28	4		29.6		
	29	11		30.0		
	30	1		42.3		

Table 19 Results of laboratory analysis of oil/ghee samples by brand

Food vehicle	Brand	Number of specimens collected	Nutrient analysed	Mean vitamin A (IU/kg)	Pakistan national fortification standard (IU/kg)	Mean added vitamin A (ppm)
Oil/ghee	1	13	**Vitamin A**	0.0	**33,000-45,000**	NA
	2	1		0.0		
	3	11		0.0		
	4	12		0.0		
	5	12		0.0		
	6	12		0.0		
	7	13		0.0		
	8	2		0.0		
	9	12		0.0		
	10	8		0.0		
	11	12		0.0		
	12	12		0.0		
	13	12		0.0		
	14	11		0.0		
	15	12		0.0		
	16	1		0.0		
	17	7		0.0		
	18	1		0.0		
	19	11		0.0		
	20	1		0.0		
	21	12		0.0		
	22	12		0.0		
	23	6		0.0		
	24	12		0.0		
	25	2		0.0		
	26	10		0.0		
	27	7		0.0		
	28	2		0.0		
	29	1		0.0		
	30	2		0.0		
	31	1		0.0		
	32	5		0.0		
	33	12		0.0		
	34	2		0.0		
	35	1		0.0		
	36	13		0.0		
	37	10		0.0		
	38	11		0.0		
	39	13		0.0		
	40	10		0.0		

41	12		0.0		
42	10		0.0		
43	12		0.0		
44	11		0.0		
45	1		0.0		
46	11		0.0		
47	12		0.0		
48	4		0.0		
49	12		0.0		
50	12		359.0		
51	12		1023.0		
52	8		1351.0		
53	11		1471.0		
54	3		1559.0		
55	12		1952.0		
56	1		3108.0		
57	12		3169.0		
58	12		4402.0		
59	25		4607.0		
60	1		5272.0		
61	11		6270.0		
62	12		7219.0		
63	1		8721.0		
64	1		9746.0		
65	2		10345.0		
66	11		10884.0		
67	17		11131.0		
68	12		11198.0		
69	6		11792.0		
70	8		13340.0		
71	11		13348.0		
72	14		18693.0		
73	1		18938.0		
74	5		19444.0		
75	12		19858.0		
76	4		19949.0		
77	1		20441.0		
78	22		21252.0		
79	13		22155.0		
80	12		22294.0		
81	12		22330.0		
82	24		22643.0		
83	1		23000.0		
84	1		23695.0		

	85	9		24318.0		
	86	1		24447.0		
	87	1		24642.0		
	88	12		24691.0		
	89	7		25131.0		
	90	9		25271.0		
	91	24		25389.0		
	92	3		25940.0		
	93	1		25986.0		
	94	13		26001.0		
	95	12		26032.0		
	96	12		26310.0		
	97	3		27102.0		
	98	5		27153.0		
	99	8		27463.0		
	100	1		27548.0		
	101	15		27780.0		
	102	13		27865.0		
	103	10		27894.0		
	104	8		28359.0		
	105	1		28671.0		
	106	12		29074.0		
	107	12		29103.0		
	108	7		29256.0		
	109	15		29550.0		
	110	12		30080.0		
	111	13		30167.0		
	112	11		30348.0		
	113	12		31311.0		
	114	1		31572.0		
	115	1		31765.0		
	116	12		31841.0		
	117	5		31844.0		
	118	11		31957.0		
	119	11		32067.0		
	120	11		32535.0		
	121	14		32621.0		
	122	3		33004.0		
	123	8		33198.0		
	124	10		33269.0		
	125	18		33546.0		
	126	1		33582.0		
	127	15		33706.0		
	128	14		33760.0		
	129	11		34008.0		

	130	12		34032.0		
	131	13		34087.0		
	132	15		34382.0		
	133	10		34408.0		
	134	8		34453.0		
	135	20		34657.0		
	136	12		34897.0		
	137	4		34936.0		
	138	12		35059.0		
	139	10		35082.0		
	140	12		35223.0		
	141	12		35232.0		
	142	2		35494.0		
	143	1		35677.0		
	144	12		35709.0		
	145	12		35776.0		
	146	15		36275.0		
	147	12		36278.0		
	148	2		37104.0		
	149	14		37174.0		

Table 20 Results of laboratory analysis of wheat flour samples by brand

Food vehicle	Brand	Number of specimen collected	Nutrient analysed	Mean total iron (ppm)	Pakistan national fortification standard (ppm)	Spot test	Intrinsic iron estimate	Mean added iron (ppm)
Wheat flour	1	1	**Iron**	0.0	**≥15**	Negative	6.5	0.0
	2	1		0.0		Negative	6.5	0.0
	3	1		0.0		Negative	6.5	0.0
	4	12		0.0		Negative	6.5	0.0
	5	1		0.0		Negative	6.5	0.0
	6	7		0.0		Positive	6.5	0.0
	7	1		0.0		Negative	6.5	0.0
	8	1		0.0		Negative	6.5	0.0
	9	1		0.0		Negative	6.5	0.0
	10	2		0.0		Negative	6.5	0.0
	11	2		0.0		Negative	6.5	0.0
	12	2		0.0		Negative	6.5	0.0
	13	1		0.0		Negative	6.5	0.0
	14	12		0.0		Negative	6.5	0.0
	15	12		0.0		Negative	6.5	0.0
	16	3		0.0		Negative	6.5	0.0
	17	1		0.0		Negative	6.5	0.0
	18	12		0.0		Negative	6.5	0.0
	19	12		0.0		Negative	6.5	0.0
	20	12		0.0		Negative	6.5	0.0
	21	12		0.0		Negative	6.5	0.0
	22	1		0.0		Negative	6.5	0.0
	23	1		0.0		Negative	6.5	0.0
	24	12		0.0		Negative	6.5	0.0
	25	12		0.0		Negative	6.5	0.0
	26	1		0.0		Negative	6.5	0.0
	27	1		0.0		Negative	6.5	0.0
	28	1		0.0		Negative	6.5	0.0
	29	1		0.0		Negative	6.5	0.0
	30	2		0.0		Negative	6.5	0.0
	31	1		0.0		Negative	6.5	0.0
	32	1		0.0		Negative	6.5	0.0
	33	1		0.0		Negative	6.5	0.0
	34	11		0.0		Negative	6.5	0.0
	35	1		0.0		Negative	6.5	0.0
	36	1		12.0		Positive	6.5	5.5
	37	1		12.0		Positive	6.5	5.5
	38	12		12.0		Positive	6.5	5.5
	39	11		13.0		Positive	6.5	6.5
	40	12		14.0		Positive	6.5	7.5

	41	3		14.0		Positive	6.5	7.5
	42	1		16.0		Positive	6.5	9.5
	43	12		16.0		Positive	6.5	9.5
	44	12		16.0		Positive	6.5	9.5
	45	1		17.0		Positive	6.5	10.5
	46	1		17.0		Positive	6.5	10.5
	47	4		17.0		Positive	6.5	10.5
	48	12		18.0		Positive	6.5	11.5
	49	1		18.0		Positive	6.5	11.5
	50	12		19.0		Positive	6.5	12.5
	51	6		19.0		Positive	6.5	12.5
	52	1		20.0		Positive	6.5	13.5
	53	12		20.0		Positive	6.5	13.5
	54	1		20.0		Positive	6.5	13.5
	55	7		22.0		Positive	6.5	15.5
	56	1		23.0		Positive	6.5	16.5
	57	8		23.0		Positive	6.5	16.5
	58	1		23.0		Positive	6.5	16.5
	59	7		24.0		Positive	6.5	17.5
	60	1		24.0		Positive	6.5	17.5
	61	12		25.0		Positive	6.5	18.5
	62	6		26.0		Positive	6.5	19.5
	63	4		27.0		Positive	6.5	20.5
	64	6		28.0		Positive	6.5	21.5
	65	1		28.0		Positive	6.5	21.5
	66	12		37.0		Positive	6.5	30.5
	67	12		48.0		Positive	6.5	41.5

7. HOUSEHOLD COVERAGE RESULTS (FIGURE 6 TO FIGURE 11 IN TABLE FORMAT)

Table 21 Household coverage of foods, Pakistan, 2017

Indicator name	Balochistan					Punjab					Sindh				
	Estimate	Lower CI	Upper CI	s.e	N	Estimate	Lower CI	Upper CI	s.e	N	Estimate	Lower CI	Upper CI	s.e	N
Household consumes salt	100	100	100	0	704	100	100	100	0	690	100	100	100	0	710
Household consumes oil/ghee	100	100	100	0	704	100	100	100	0	690	100	100	100	0	710
Household consumes wheat flour	100	100	100	0	704	100	100	100	0	690	91.1	90.6	91.6	0.3	710
Household consumes fortifiable salt	83.7	82.9	84.5	0.4	704	74.8	74	75.6	0.4	690	97.9	97.7	98.2	0.1	710
Household consumes fortifiable oil/ghee	97.8	97.2	98.2	0.3	704	99.6	99.4	99.7	0.1	690	99.8	99.6	99.9	0.1	710
Household consumes fortifiable wheat flour	51.5	50.3	52.7	0.6	704	31.4	30.5	32.3	0.5	690	62.8	62	63.6	0.4	710
Household consumes fortified salt	11.2	10.5	12	0.4	704	35.6	34.6	36.6	0.5	690	33.5	32.5	34.5	0.5	710
Household consumes fortified oil/ghee	39.2	37.9	40.6	0.7	704	31.3	30.4	32.2	0.5	690	20.2	19.3	21	0.4	710
Household consumes fortified wheat flour	5.1	4.6	5.6	0.3	704	1.2	1	1.4	0.1	690	10.4	9.7	11	0.3	710

Table 22 Household coverage of fortifiable foods by region, Pakistan, 2017

Indicator name	Balochistan									Punjab									Sindh								
	Rural				Urban				Difference	Rural				Urban				Difference	Rural				Urban				Difference
	Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N	
Household consumes fortifiable salt	83	82.5	83.6	568	86.4	85.7	87.1	136	-3.4***	76.1	75.9	76.2	480	72.1	71.8	72.5	210	3.9***	96.8	96.7	96.9	315	99.2	99.2	99.2	395	-2.4***
Household consumes fortifiable oil/ghee	97.2	97.1	97.3	568	100	100	100	136	-2.8***	99.4	99.3	99.4	480	100	100	100	210	-0.6***	99.5	99.5	99.5	315	100	100	100	395	-0.5***
Household consumes fortifiable wheat flour	48.2	47.7	48.8	568	65	64	66	136	-16.8***	21.5	21.4	21.7	480	53.2	53	53.5	210	-31.7***	39.1	38.7	39.4	315	88.4	88.2	88.6	395	-49.3***

Table 23 Household coverage of fortifiable foods by poverty status, Pakistan, 2017

Indicator name	Balochistan									Punjab									Sindh								
	Poor				Non-poor				Difference	Poor				Non-poor				Difference	Poor				Non-poor				Difference
	Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N	
Household consumes fortifiable salt	77.6	77	78.3	406	91.1	90.8	91.4	298	-13.5***	76.1	76	76.3	154	74.4	74.3	74.6	536	1.7***	97.2	97.1	97.3	290	98.5	98.5	98.6	420	-1.4***
Household consumes fortifiable oil/ghee	96.5	96.3	96.6	406	99.4	99.3	99.4	298	-2.9***	99.6	99.6	99.6	154	99.6	99.5	99.6	536	0***	99.4	99.4	99.5	290	100	100	100	420	-0.6***
Household consumes fortifiable wheat flour	41	40.5	41.5	406	64.4	63.7	65	298	-23.4***	36.3	36.1	36.5	154	29.9	29.8	30	536	6.31***	50.7	50.5	51	290	72.2	71.9	72.6	420	-21.5***

Table 24 Household coverage of fortifiable foods by socio-economic statues (SES), Pakistan, 2017

Indicator name	Balochistan									Punjab									Sindh								
	Low SES				High SES				Difference	Low SES				High SES				Difference	Low SES				High SES				Difference
	Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N	
Household consumes fortifiable salt	79	78.3	79.6	496	93.7	93.5	94	208	-14.8***	73.1	73	73.3	166	75.4	75.2	75.5	524	-2.2***	96	95.9	96.1	300	99.6	99.6	99.6	410	-3.5***
Household consumes fortifiable oil/ghee	96.7	96.6	96.8	496	100	100	100	208	-3.3***	100	100	100	166	99.4	99.4	99.4	524	0.6***	99.5	99.4	99.5	300	100	100	100	410	-0.5***
Household consumes fortifiable wheat flour	43.7	43.2	44.2	496	68	67.4	68.7	208	-24.3***	29.5	29.3	29.7	166	32	31.9	32.2	524	-2.5***	42.2	41.9	42.4	300	80.6	80.4	80.9	410	-38.5***

Table 25 Household coverage of fortifiable foods by women's dietary diversity, Pakistan, 2017

Indicator name	Balochistan									Punjab									Sindh								
	Low MDDW				High MDDW				Difference	Low MDDW				High MDDW				Difference	Low MDDW				High MDDW				Difference
	Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N	
Household consumes fortifiable salt	82.7	82.3	83.1	441	86.1	85.4	86.7	242	-3.4***	71.8	71.6	71.9	433	79.8	79.6	80	253	-8***	97.9	97.9	98	606	98	97.9	98.1	96	-.1***
Household consumes fortifiable oil/ghee	99.1	99	99.1	441	96.1	95.9	96.2	242	3***	99.7	99.7	99.7	433	99.4	99.3	99.4	253	0.3***	99.7	99.7	99.7	606	100	100	100	96	-.3***
Household consumes fortifiable wheat flour	52.6	52	53.1	441	51.3	50.7	51.9	242	1.3***	30.1	30	30.3	433	33.4	33.2	33.6	253	-3.2***	63.8	63.5	64	606	59.4	58.9	59.8	96	4.4***

Table 26 Household coverage of fortifiable foods by infant and young child feeding (IYCF) practices, Pakistan, 2017

Indicator name	Balochistan									Punjab									Sindh								
	Poor IYCF practices				Good IYCF practices				Difference	Poor IYCF practices				Good IYCF practices				Difference	Poor IYCF practices				Good IYCF practices				Difference
	Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N	
Household consumes fortifiable salt	83.3	82.8	83.7	505	84.8	84.2	85.3	199	-1.5***	75.8	75.6	75.9	531	71.8	71.6	72	159	4***	98	98	98	648	97.3	97.2	97.5	62	0.7***
Household consumes fortifiable oil/ghee	98.4	98.3	98.5	505	96.2	96.1	96.4	199	2.2***	99.8	99.8	99.8	531	98.7	98.7	98.7	159	1.1***	99.7	99.7	99.7	648	100	100	100	62	-.3***
Household consumes fortifiable wheat flour	51	50.5	51.6	505	52.7	52.1	53.3	199	-1.7***	33.2	33.1	33.4	531	25.6	25.4	25.8	159	7.6***	62.4	62.1	62.7	648	66.6	66.2	67	62	-4.2***

Table 27 Household coverage of fortifiable foods by household food security, Pakistan, 2017

Indicator name	Balochistan									Punjab									Sindh								
	Food insecure				Food secure				Difference	Food insecure				Food secure				Difference	Food insecure				Food secure				Difference
	Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N		Estimate	Lower CI	Upper CI	N	Estimate	Lower CI	Upper CI	N	
Household consumes fortifiable salt	71.4	65.3	76.7	34	84.2	83.3	85	670	-12.8***	69.4	63.8	74.5	27	75.1	74.2	75.9	663	-5.7**	100	100	100	10	97.9	97.6	98.2	700	2.1***
Household consumes fortifiable oil/ghee	100	100	100	34	97.7	97.1	98.2	670	2.3***	100	100	100	27	99.5	99.3	99.7	663	.5***	100	100	100	10	99.8	99.6	99.9	700	.2***
Household consumes fortifiable wheat flour	52.2	46.2	58.2	34	51.5	50.2	52.8	670	0.7	31.9	27	37.3	27	31.4	30.5	32.3	663	0.5	78.6	70.4	85.1	10	62.6	61.8	63.4	700	16***

8. MICRONUTRIENT CONTRIBUTION RESULTS (FIGURE 12 TO FIGURE 20 IN TABLE FORMAT)

Table 28 Actual and modelled iodine contribution from consumption of fortified salt as a percentage of estimated average requirements (EAR), Pakistan, 2017

Indicator name	Balochistan								Punjab								Sindh							
	Estimate	Lower CI	Upper CI	s.e	p25	p50	p75	N	Estimate	Lower CI	Upper CI	s.e	p25	p50	p75	N	Estimate	Lower CI	Upper CI	s.e	p25	p50	p75	N
Children 12-23 months																								
Actual iodine contribution from salt as a % of EAR	31.3	NA	NA	NA	15.1	25.3	43.4	121	45.2	NA	NA	NA	0	23.8	71.1	126	31.9	NA	NA	NA	12.3	23	36.7	144
Modelled iodine contribution from salt as a % of EAR	139.9	NA	NA	NA	64.9	110.8	218.4	121	120.3	NA	NA	NA	0	108.5	187.3	126	161.9	NA	NA	NA	105.4	148.6	218.4	144
Children 24-59 months																								
Actual iodine contribution from salt as a % of EAR	39.1	38	40.3	0.6	15.9	34.1	60.4	474	53.7	52	55.4	0.9	0	29	86.8	426	43.3	41.9	44.6	0.7	19	29.2	51.6	430
Modelled iodine contribution from salt as a % of EAR	169.1	164.4	173.7	2.4	76.3	149.2	254.9	474	141.4	138.4	144.4	1.5	0	149.5	219	426	223.7	220.7	226.7	1.5	155	209	274.3	430
WRA																								
Actual iodine contribution from salt as a % of EAR	39.8	38.7	41	0.6	14.3	27.6	59.2	670	51	49.5	52.6	0.8	0	24	67	673	36.7	35.8	37.7	0.5	14.3	23.2	42.5	685
Modelled iodine contribution from salt as a % of EAR	172.6	168	177.3	2.4	61.9	122.9	249.3	670	135.3	132.6	138	1.4	0	112.8	208.2	673	194.9	191.9	197.8	1.5	111.7	167	247.9	685

Table 29 Actual and modelled vitamin-A contribution from consumption of fortified oil/ghee as a percentage of estimated average requirements (EAR), Pakistan, 2017

Indicator name	Balochistan								Punjab								Sindh							
	Estimate	Lower CI	Upper CI	s.e	p25	p50	p75	N	Estimate	Lower CI	Upper CI	s.e	p25	p50	p75	N	Estimate	Lower CI	Upper CI	s.e	p25	p50	p75	N
Children 12-23 months																								
Actual Vit-A contribution from oil/ghee as a % of EAR	34.7	NA	NA	NA	12.7	27.6	51.1	123	51.6	NA	NA	NA	30	51.6	69.4	125	35.4	NA	NA	NA	15.4	32.5	47	143
Modelled Vit-A contribution from oil/ghee as a % of EAR	63.8	NA	NA	NA	35.4	60.2	84.4	123	74.3	NA	NA	NA	56	71.4	90.1	125	64.9	NA	NA	NA	43.3	58.7	76.7	143
Children 24-59 months																								
Actual Vit-A contribution from oil/ghee as a % of EAR	45.3	44	46.6	0.7	17.2	42	67.6	478	59.3	58.4	60.3	0.5	37	58.1	81.6	425	40.9	39.8	41.9	0.5	15.1	35.4	58.4	437
Modelled Vit-A contribution from oil/ghee as a % of EAR	78.3	76.8	79.8	0.7	51.3	73.2	100.2	478	83.2	82.2	84.2	0.5	60	78.7	104.3	425	75.9	74.8	76.9	0.5	50.4	70	95.4	437
WRA																								
Actual Vit-A contribution from oil/ghee as a % of EAR	32.9	32.1	33.8	0.4	12.2	29.7	45.9	672	42.3	41.7	43	0.3	24	37.8	58.8	673	28	27.3	28.6	0.3	10.2	22.3	39.6	689
Modelled Vit-A contribution from oil/ghee as a % of EAR	56	55	57.1	0.5	32.7	49.8	73.6	672	59.7	59	60.4	0.4	38	55.3	77.9	673	51.6	50.8	52.3	0.4	30.7	44.7	65.5	689

Table 30 Actual and modelled iron contribution from consumption of fortified wheat flour as a percentage of recommended dietary allowance (RDA), Pakistan, 2017

Indicator name	Balochistan								Punjab								Sindh							
	Estimate	Lower CI	Upper CI	s.e	p25	p50	p75	N	Estimate	Lower CI	Upper CI	s.e	p25	p50	p75	N	Estimate	Lower CI	Upper CI	s.e	p25	p50	p75	N
Children 6-11 months																								
Actual iron contribution from wheat flour as a % of RDA	5.2	NA	NA	NA	0	0	8.9	55	1.4	NA	NA	NA	0	0	0	61	4.7	NA	NA	NA	0	4.3	8.3	59
Modelled iron contribution from wheat flour as a % of RDA	5.3	NA	NA	NA	0	0	9.3	55	2.2	NA	NA	NA	0	0	0	61	8.5	NA	NA	NA	0	7.8	14.9	59
Children 12-23 months																								
Actual iron contribution from wheat flour as a % of RDA	12.3	NA	NA	NA	0	2.6	15.7	123	5.8	NA	NA	NA	0	0	10.4	128	8.5	NA	NA	NA	0	8.3	13.5	144
Modelled iron contribution from wheat flour as a % of RDA	14.2	NA	NA	NA	0	9.6	25.2	123	10.5	NA	NA	NA	0	0	20.2	128	15.2	NA	NA	NA	0	14.9	24.3	144
Children 24-59 months																								
Actual iron contribution from wheat flour as a % of RDA	11.8	11.2	12.4	0.3	0	4.4	16.6	483	6.3	5.9	6.6	0.2	0	0	11.2	429	9.1	8.8	9.3	0.1	0	6.7	16	444
Modelled iron contribution from wheat flour as a % of RDA	14.1	13.6	14.6	0.2	0	12.3	26.4	483	9.5	9.1	9.9	0.2	0	0	22.8	429	16.3	15.9	16.8	0.2	0	12.1	28.7	444
WRA																								
Actual iron contribution from wheat flour as a % of RDA	14.6	13.9	15.3	0.4	0	2.8	17.5	681	7.6	7.3	7.9	0.2	0	0	9.8	684	13.1	12.8	13.4	0.2	0	9.2	21.5	701
Modelled iron contribution from wheat flour as a % of RDA	17.3	16.5	18	0.4	0	7.4	24.8	681	12.4	11.8	12.9	0.3	0	0	19.2	684	23.6	23	24.2	0.3	0	16.5	38.7	701