GROW GREAT

March 2021

COCARE MATERNAL SUPPORT STUDY

INVESTIGATING HUNGER AND MENTAL HEALTH AMONG PREGNANT WOMEN IN THE CAPE METRO AREA DURING THE 2020 COVID-19 PANDEMIC

in partnership with Stellenbosch University, Institute for Life Course Health Research; Embrace Movement for Mothers and Violence Protection Through Urban Upgrading

ILCHR Institute for Life Course Health Research

VPUU Violence Prevention Through Urban Upgrading

embrace

ACKNOWLEDGEMENTS

The Grow Great Campaign would like to thank Stellenbosch University who partnered with the campaign on this research, specifically Professor Mark Tomlinson, Dr Christina Laurenzi and Kelly Gemmell. In addition, thanks go to Violence Protection Through Urban Upgrading who made the intervention possible, DGMT who funded the research, and Embrace Movement for Mothers who supported the recruitment of study participants.

Matlwa Mabaso K, Laurenzi C, Menyatsoe M, Gemmell K, Manda S, Tomlinson, M. Impact of COVID-19 on wellbeing of pregnant women in 7 neighbourhoods in the Western Cape. Johannesburg, Grow Great Campaign, March 2021

ABBREVIATIONS

CI	Confidence Interval
DDS	Dietary Diversity Score
FAO	Food and Agricultural Organization
KfW	German Development Bank
NIDS CRAM	National Income Dynamics Study - Coronavirus Rapid Mobile Survey
OR	Odds Ratio
PHQ-9	Patient Health Questionnaire-9
SD	Standard Deviation
USSD	Unstructured Supplementary Service Data
WDDS	Women's Dietary Diversity Score

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EXECUTIVE SUMMARY

Pregnancy is a time of increased health and social protection needs for both mother and baby, and access to healthy, nutritious food is one of these core needs. Many pregnant women in South Africa, however, struggle to meet these basic nutritional needs, and the COVID-19 pandemic has exacerbated an already dire situation for pregnant women in the country.

INTRODUCTION

Social protection in the form of income or nutrition support has been shown to have a positive impact on maternal and child health outcomes. In South Africa, the Child Support Grant has provided critical support for meeting the basic needs of young children. However, there is no existing grant in the prenatal period despite the clear advantages that support during this time would provide.

In rapid response to the food insecurity crisis caused by the pandemic and the lockdown measures put into place to curb the spread of the virus, KfW German Development Bank provided a large grant to *Violence Protection Through Urban Upgrading** to provide food and nutrition support to families living in disadvantaged communities in the Western Cape. Through this initiative, known as CoCare, 2 775 pregnant women were selected to receive a R300 fortnightly digital food voucher for up to 16 weeks (to the total value of R2 400).

STUDY DESIGN AND FINDINGS

Women were eligible to participate if they were currently pregnant, and living in a designated area (although the area was later expanded so as to allow for more participants). They were recruited into the study at antenatal clinic appointments. Baseline surveys were conducted in two ways: through SMS surveys sent out to recruited women, and telephonic surveys conducted by a team of research assistants. The telephonic survey was conducted with a subset of the original SMS survey respondents, and was designed to gather more detail about specific indicators. In total, 2 618 SMS surveys were completed ahead of the rollout of the CoCare voucher, and 584 telephonic surveys were completed. Data were analysed using STATA version 16.0 and summarised descriptively.

We found that pregnant women living in disadvantaged communities in the Western Cape experienced high levels of hunger, poor mental health, and economic insecurity in the months following South Africa's national COVID-19

* *Violence Protection Through Urban Upgrading* is an NGO that works in disadvantaged communities in the City of Cape Town. It aims to co-create safe and sustainable neighbourhoods that improve the quality of life of the residents.

lockdown. Overall, findings were similar across SMS survey responses and telephonic responses. Almost 40% of participants were pregnant with their first child, and the majority (71%) did not have past-month employment or work-related income. Within the group of pregnant women living in households without any grant income (about 25% of all respondents), just over one third reported past-month employment. Hunger in the past week was reported by 39% of pregnant respondents, and an additional 22% reported that a child in their home had gone to bed hungry in the last seven days. Similarly, approximately 61% of women reported that they had felt down, depressed or hopeless to some degree in the past week, and 62% reported having little interest or pleasure in doing things over the same period. Among telephonic respondents, questions about dietary diversity were also asked; while past-day food groups reported represented various food groups, these findings were also mapped against high rates of hunger, indicating the potential limitations of this tool. In this telephonic group, mental health was ascertained in more detail; approximately 30%

of respondents scored at or above a threshold of 10, which is associated with high likelihood of a diagnosis of a mental health condition.

From the SMS data, pregnant women who had gone to bed hungry in the past seven days were over three times more likely to report feeling down, depressed or hopeless, and nearly twice as likely to have little interest or pleasure in doing things. Women who were hungry were also three times more likely to respond with a 'yes' to both of these questions about mental health. Furthermore, these odds increased when pregnant women reported that a child in their household had gone to bed hungry. Of the telephonic group, pregnant women reporting past-week hunger were also found to be twice as likely to have high mental health symptomatology. Furthermore, respondents who reported receiving no direct grant income were 63% more likely to report high symptomatology on the mental health scale used, compared to those women receiving grant income.

CONCLUSION

These findings emphasise an urgent and critical need for nutrition and mental health support strategies for vulnerable pregnant women whose needs have become increasingly more apparent during the pandemic. They build on evidence revealing worsening hunger levels and poor mental health as a result of the ongoing COVID-19 pandemic, and can also be understood in the context of the large body of evidence attesting to the long-term adverse consequences of poor maternal nutrition and poor mental health on the physical and cognitive development of the unborn fetus.

While women have access to Child Support Grants in the period following the birth of their child, there is an urgent need to expand the grant into the pre-natal period, which would allow for the provision of increased food and income security during pregnancy and immediately following birth. This support would enable vulnerable pregnant women to access the nutritious food they require for a healthy pregnancy and likely improve their mental wellbeing. The effects of COVID-19 on the livelihoods of South Africans has made it more pressing than ever for this policy to move from aspiration to action.

1. INTRODUCTION

Pregnancy is a time of increased health and social protection needs – for both mother and baby. Access to healthy, nutritious food is one of these core needs.

Optimal physical and brain development of the fetus depends in part on sustained access to safe, diverse and healthy foods that provide the micro and macronutrients necessary to support healthy growth and development of the unborn child.[1] However, for many women in South Africa, meeting basic nutritional requirements to ensure a healthy pregnancy and to support infants after birth is a challenge. One third of pregnant women live in households that have reported running out of money for food in the past year;[2] over 60% of mothers of young children live below the upper-bound poverty line;[3] and more than 40% of pregnant women suffer from antenatal depression, which has been found to increase the risk of food insecurity.[4]

South Africa has long been faced with the challenge of rising unemployment, and the uneven participation of men and women in the labour market. According to Statistics South Africa, 31% of women were unemployed in fourth quarter of 2019 (pre-pandemic) compared to 27% of men.[5] The informal economy – officially comprising 34% of the South African workforce – offers additional challenges for all workers, and for women in particular, as most informal employment lacks social and legal protections that may prove critical during pregnancy.[6,7] Pregnant women especially are more vulnerable to unemployment than non-pregnant women, whilst facing additional financial pressures as a result of increased pregnancy-related healthcare, transport and nutrition costs.[2] These challenges, which make pregnant women vulnerable to poverty and income instability, have clear and significant effects on maternal and child health.[8,9] Resultant inadequate maternal nutrition and dietary intake, as well as poor maternal mental health, may affect infant outcomes,[10,11] particularly by increasing the risk of infants being born with low birth weight and having poor growth trajectories. Current data from South Africa indicates that 15% of infants are born with low birth weight, and over a quarter of children aged under five years suffer from stunting.[12] Low birth weight puts children at risk of stunted growth and development;[13] and stunting has detrimental long-term consequences for children's health, education and economic prospects across the life course.[14]

The COVID-19 pandemic has exacerbated an already dire situation for pregnant women in South Africa. Women have been particularly hard hit by the COVID-19 pandemic and its related economic effects.[15,16] Nearly two-thirds of the three million people who lost their jobs during South Africa's early lockdown in April-May 2020 were women, and women working in the informal sector had no access to a safety net to buffer this loss.[17] Even before

the pandemic, pregnant women not living with the father of their children tended to receive sporadic and unpredictable financial support; the most significant expenses they reported were for food, accommodation and transport – costs that were often not met.[18] Sharp increases in unemployment, poverty and food insecurity have significant implications for women's ability to access necessary care and nutrition, and prepare for the birth of their child, especially during this vulnerable period.[19] The pandemic is likely to have significant, ongoing effects on the development of young children, through increased food insecurity, loss of caregivers, worsening mental health, increased stress, and poorer physical health outcomes.[20] Furthermore, these challenges have repercussions that will influence individual child development, with long term-consequences for future generations, and for human capital and economic development.[20]

THE IMPORTANCE OF SOCIAL PROTECTION DURING PREGNANCY

Research has identified the positive effects that income support provided during pregnancy can have on maternal and child outcomes. A recent global review found that pregnancy income

support was linked with increased number of antenatal visits; reductions in neonatal, infant, and child mortality rates; improvement in birth weight; and declines in wasting and severe malnutrition.[21] In the South African context, although the Child Support Grant provides essential income support to mothers of young children up until the age of 18, this benefit is only granted once infants are born. In addition, the barriers to uptake of this grant result in only 65% of poor children benefitting from this cash transfer in the first year of life.[22] Extending the Child Support Grant into pregnancy could be transformative, allowing expectant mothers to cater for their nutritional needs early in pregnancy, when the developing fetus requires these nutrients the most.[23] However, this approach has not been widely tested in South Africa. The economic and health circumstances brought about by the COVID-19 pandemic has made this imperative even greater. Health and social protection systems must respond to these mounting challenges, and evidence is needed to motivate for the integration of new interventions into the health system, taking equity and sustainability into account.[19]

THE INTERVENTION

In rapid response to the food insecurity crisis as a result of the pandemic, KfW German Development Bank granted approximately R98 million to Violence Protection Through Urban Upgrading to provide food and nutritional support to families living in disadvantaged communities. Part of this fund was directed to pregnant women specifically, in the form of a R300 fortnightly digital food voucher, over a period of 16 weeks (to the total value of R2 400), with an explicit intention to support poor and vulnerable pregnant women in the Western Cape. Vouchers were redeemable at local spaza shops and general dealers, with the aim of simultaneously stimulating the local economy.

This report shares baseline findings from a rapid study of recipient women, with the aim of:

a. *providing localised evidence of what pregnancy income support can do for vulnerable pregnant women; and*

b. *using this evidence to support the call for greater social protection for poor pregnant women across South Africa.*

2. METHODOLOGY

DESIGN

This study used a pre-post quantitative survey design, conducted by self-administered SMS survey and for a sub-set of participants, by telephonic interview. Ethical approval was granted by the Health Research Ethics Committee at Stellenbosch University (N20/09/056_COVID-19).

SAMPLE AND SETTING

All pregnant women aged 18 or older, living in select vulnerable communities in the Cape Town area of the Western Cape, were eligible. The original selected communities were Hanover Park, Manenberg, Gugulethu, Nyanga, Harare, Kuyasa and Monwabisi Park. Collectively, these areas are amongst the poorest peri-urban areas surrounding Cape Town, with high levels of unemployment, exposure to chronic stressors related to poverty, and limited access to healthy nutritional options – all of which pose cumulative risks for prenatal and maternal wellbeing.

During the recruitment phase, the number of communities selected were expanded to include a larger set of areas (catchment areas for selected clinics) in order to reach the target number of pregnant women in a given timeframe (before the rollout of digital food vouchers in November 2020).

RECRUITMENT

a. SMS-BASED SURVEY

For the brief SMS-based questionnaire, 5 000 pregnant women over the age of 18 from the seven areas noted above were targeted for recruitment into the programme.

Thirty-two fieldworkers were recruited from eligible communities to assist in recruitment efforts. Fieldworkers were trained on data collection and establishing rapport with pregnant women at a one-day workshop held in the first week of October 2020. Refresher training was held with team leaders, who were the representative fieldworkers for each site, on Tuesday 12 October 2020.

Fieldworkers then distributed care packs, containing basic maternal and newborn toiletries and information leaflets, to all pregnant women attending 13 primary health care facilities in the stipulated areas between

September and November 2020. Fieldworkers were situated at primary health care facilities on antenatal appointment clinic days. Upon receiving care packs, all pregnant women were invited to participate in an SMS survey; basic contact details (name, surname, ID number, area of residence) were collected for those who opted in at this point. Women were told that they would be invited via SMS to participate in a free survey. Participation in the research had no bearing on whether or not recruited women received a digital voucher.

All eligible participants received an introductory SMS, inviting them to take part in a USSD-format (Unstructured Supplementary Service Data) survey, which is referred to in this report as the SMS survey. There was a brief opt-in consent message to ensure that participants agreed to their responses being recorded.

b. TELEPHONIC SURVEY

For a subset of these participants who indicated their willingness to participate further, a telephonic survey was administered. At the end of the SMS-based survey, participants indicated whether or not they were willing to be contacted to participate in a phone-based survey. Participants' cell phone numbers were then selected from the database in the order of participation. While these numbers were not able to be fully randomly selected, they represented a distribution across all areas of participation.

BASELINE DATA COLLECTION PROCEDURES

a. SMS-BASED SURVEY

Participants who responded affirmatively to the invitation message (recruited successfully) were taken through a brief, self-administered survey comprising 14 questions. Participants received SMSes in succession with response options clearly laid out, and were prompted to select the most appropriate response. After each question was answered, the participant's response was sent back to the server where it was securely stored. Participants used their own cell phones to respond to the survey. Although all data collection for this SMS-based survey was automated, requiring no data collection staff, participants were given a contact number for national helplines if additional psychosocial support was required.

b. TELEPHONIC SURVEY

Selected women participated further in a telephonic survey, containing 43 questions. Telephonic surveys were administered by a team of six trained, experienced research assistants. Interviews were conducted in either English, isiXhosa or Afrikaans, depending on the preference of the participants. Drawing on a list of cell phone

numbers, all of whom belonged to women who had participated in the SMS survey and who were registered to receive a voucher, research assistants called potential participants to confirm availability and interest, preferred language preference, and to set a time for an interview, which was expected to take approximately 30 minutes.

At the start of the telephonic interview, research assistants read a brief information and voluntary informed consent form over the phone in the language of the participants' choosing. All calls were audio-recorded, and all responses were recorded using Airtable data management software; they were submitted to a secure cloud-based platform afterwards.

MEASURES

a. SMS-BASED SURVEY

Demographic questions asked participants about household members, number of children, education, employment, and government grant income *(see Appendix 1)*. Questions related to hunger asked how often participants and a child in their household went to bed hungry. Participants were asked two questions about their past-week mental health, scored on a Likert scale.

b. TELEPHONIC SURVEY

The telephonic survey included general questions about participant demographics, and provided more detail on hunger and mental health by including the Dietary Diversity Questionnaire and the Participant Health Questionnaire-9 (PHQ-9). *All questions are in Appendix 2.*

The Dietary Diversity Questionnaire, developed by the Food and Agricultural Organisation (FAO), is a questionnaire used to assess the nutrient adequacy of the diets of women and households.[24] The measure includes 16 items encompassing standard and universal food groups, for example: dark leafy vegetables, fish and cereals. Participants are asked to recall consumption over the past 24 hours. Food groups consumed are totalled for a dietary diversity total score, which may be tailored to individuals (such as the Women's Dietary Diversity Score) as well as households (Household Dietary Diversity Score). This questionnaire has been used with pregnant women in sub-Saharan Africa[25] and with South African women.[26] The Women's Dietary Diversity Score (WDDS) was used to analyse participants' responses to these questions. To calculate the WDDS, 14 of the 16 food groups in the Dietary Diversity Questionnaire are combined into nine food groups.[24] These aggregate groups include: 1 = starchy staples (combination of cereals and white roots and tubers); 2 = dark, green leafy

vegetables; 3 = other vitamin A rich fruits and vegetables (vitamin A rich vegetables and tubers and vitamin A rich fruit); 4 = other fruits and vegetables (combination of other fruit and other vegetables); 5 = organ meat; 6 = meat and fish; 7 = eggs; 8 = legumes, nuts and seeds; and 9 = milk and milk products.

The PHQ-9 is a multi-purpose instrument for screening, monitoring and measuring the severity of depression. The PHQ-9 survey contains nine items, scored on a 4-point Likert-type scale from not at all (0) to nearly every day (3), total scores range from 0 to 27, with higher scores reflecting more severe depressive symptomatology. This scale has been used extensively,[27] and has been validated in South Africa and used with South African expectant mothers.[28]

DATA ANALYSIS

Data were captured in Microsoft Excel and analysed in STATA version 16.0. Continuous data were described by means (SD). Discrete or categorical data were summarised using frequencies and percentages.

a. SMS-BASED SURVEY

For the SMS -based survey, the primary outcome was binary, which was 1 = Yes to experiencing mental health problems if the mother answered '*yes, for a few days*' or '*yes, for most days*' to '*felt down, depressed, or hopeless*' in the past week; otherwise it was set to 0 = No. A secondary outcome was also binary, which categorised mothers into the 1 = Yes category if they had the outcome of 1 = Yes on both mental health questions; otherwise, they were categorised as 0 = No. Associations between dependent variables such as poor mental health and potential predictors were quantified by odds ratios (ORs) with 95% confidence intervals (CI) and p-values (5% level).

b. TELEPHONIC SURVEY

For the telephone survey data there was only one outcome, which again was binary, generated categorising the PHQ-9 test score. Women with a PHQ-9 test score of 10 or higher were categorised as 1 = Yes, otherwise they assigned a value of 0 = No. Potential predictors were quantified by ORs with 95% CI and p-values (5% level).

Summary statistics included describing continuous data using means (SD) and 95% CIs, while discrete or categorical data were summarised using frequencies and percentages, with 95% CIs. Associations between dependent variables such as poor mental health and potential predictors were quantified by ORs with 95% CIs and p-values (5% level).

3. RESULTS: SMS SURVEY

A total of 5 012 pregnant women had access to the SMS survey (USSD string-format). In total, 2 747 women completed the survey, with 2 618 surveys completed by 17 November 2020 – before the first round of voucher distribution. The results of these 2 618 responses are included in this section.

3.1. SOCIO-DEMOGRAPHIC INFORMATION

3.1.1. AREA

32% (n=823) of study participants were from Khayelitsha, followed by Nyanga (n=437, 17%), Gugulethu (n=294, 11%) and Manenberg (n=260, 10%). *Figure 1 illustrates this breakdown.*

3.1.2. AGE DISTRIBUTION OF STUDY PARTICIPANTS

The mean age of pregnant women included in the study was 29.1 years, with the youngest pregnant woman aged 19 and the eldest aged 53 years. The majority of study participants were between the ages of 25 and 34 years, *as illustrated in Figure 2.*

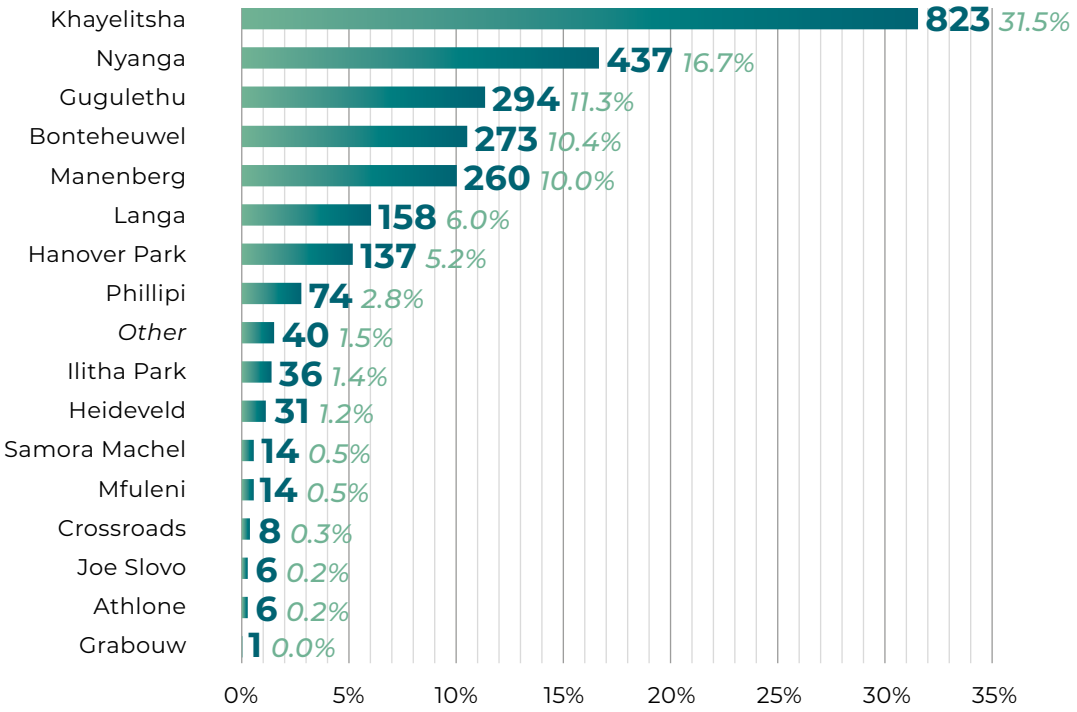
3.1.3. PARITY

Almost 40% (n=1 039) of participants reported that they had no other children, with a third reporting that they had one other child. *See Figure 3.*

3.1.4. EMPLOYMENT STATUS

The majority of participants (n=1 858, 71%) reported that in the month prior to the survey, they did not have any kind of job or earn any income *as illustrated in Figure 4.*

Figure 1
STUDY PARTICIPANT AREA OF RESIDENCE



3.1.5. PROSPECT OF FUTURE EMPLOYMENT

The majority of participants (n=2 132, 83%) reported not having a paid job to return to in the four weeks following the survey *as illustrated in Figure 5.*

3.1.6. NUMBER OF GRANTS RECEIVED

Forty-one percent (n=1 077) of participants were living in households that were benefitting from only one government grant. Twenty-five percent (25%) of study participants were living in households that received no government grants at all, and only 34% of these women were employed. Sixty percent (n=392) of pregnant women who were living in households with no grants at all were first-time moms. *Figure 6 provides greater detail.*

Figure 2

AGE DISTRIBUTION OF STUDY PARTICIPANTS *(n=2 264)*

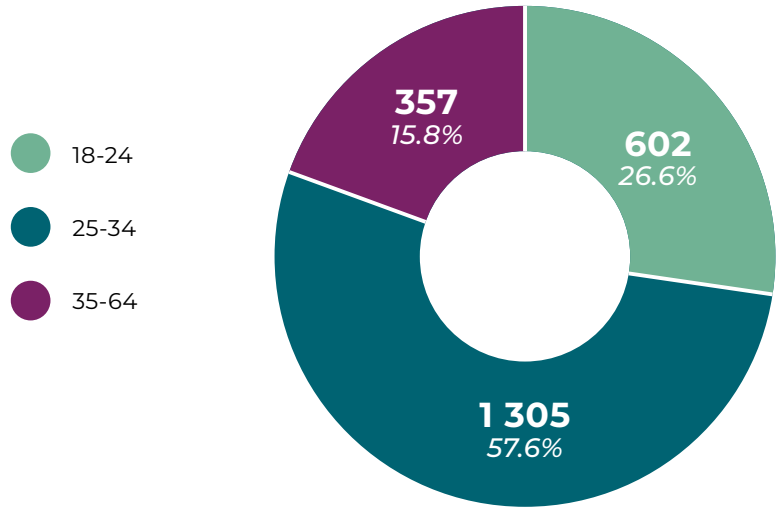


Figure 3

PARITY

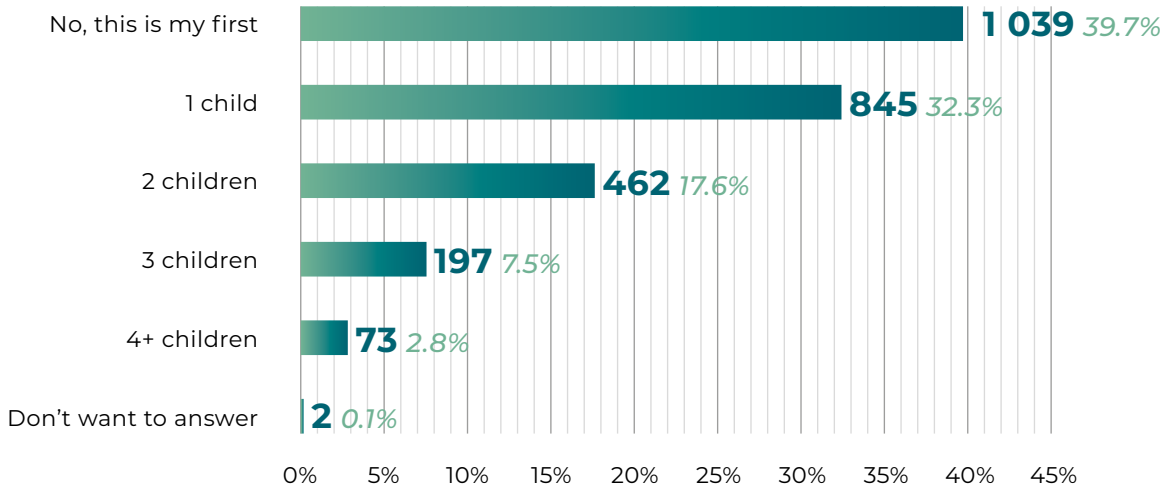


Figure 4

EMPLOYMENT STATUS *(n=2 618)*

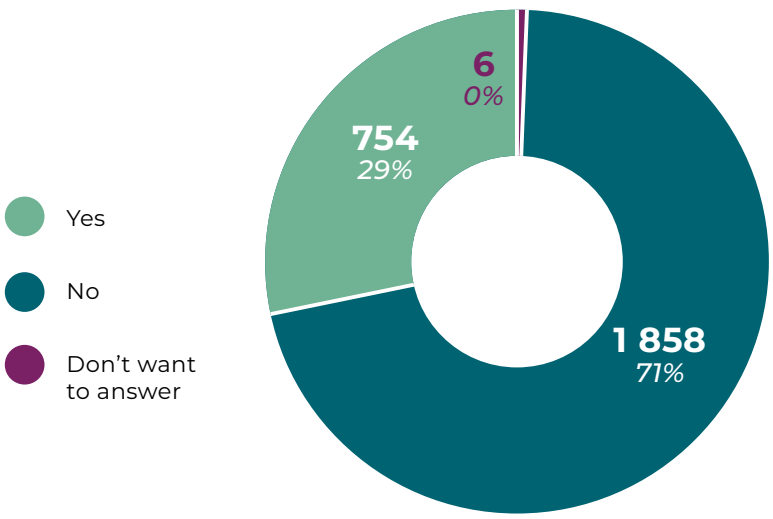


Figure 5

PAID JOB TO RETURN TO *(n=2 618)*

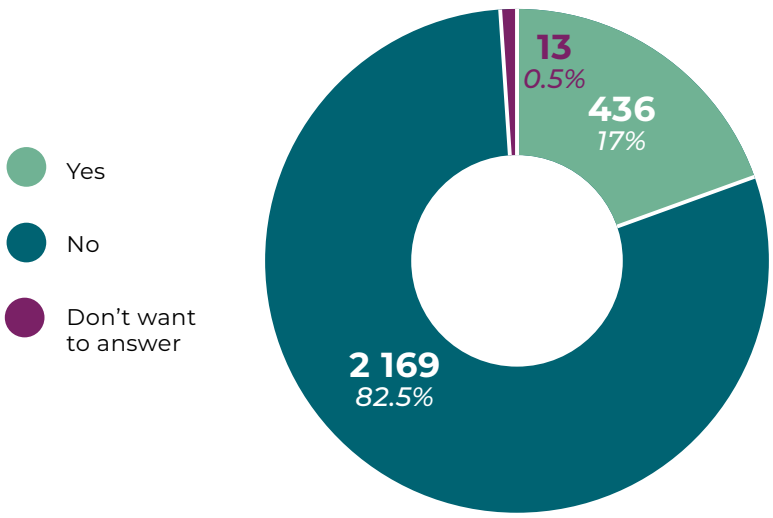
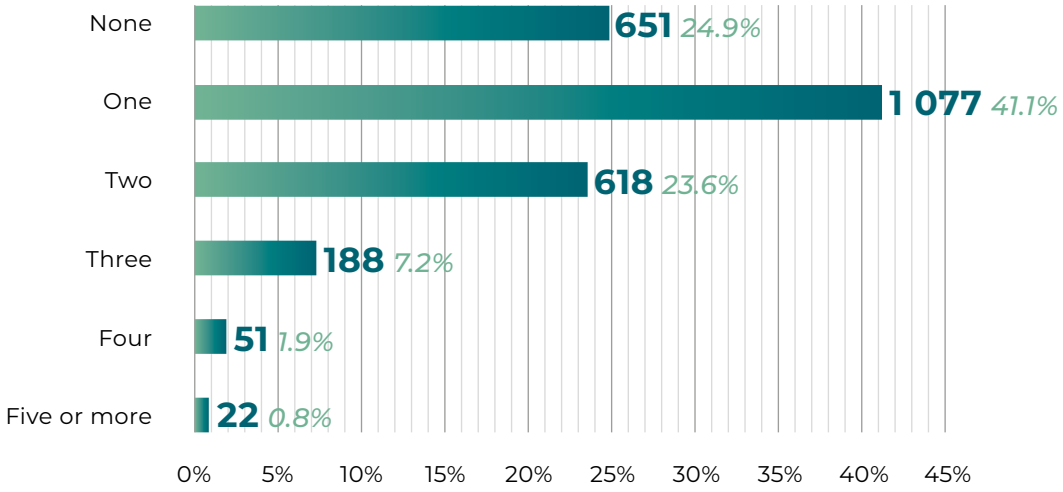


Figure 6

GRANTS FOR RESPONDENT'S HOUSEHOLD



3.2. HUNGER

3.2.1. MATERNAL HUNGER

Almost 40% (n=1 015, 39%) of participants reported that they had gone to bed hungry at least once in the seven nights preceding the survey. Of those who went to bed hungry in the preceding seven nights, 12.9% went to bed hungry once that week, 34% on two occasions, and 22.5% on three occasions *(see Figure 7).*

3.2.2. CHILD HUNGER

Of the participants who had a child living with them in their home, 24% (n=577) reported that a child in their home had gone to bed hungry in the preceeding seven nights. Of the children who went to bed hungry, 23.5% went to bed hungry for a single night in the previous week, 33% for two nights and 17.6% for three nights. *Figure 8 illustrates this further.*

Figure 7

MATERNAL HUNGER

How many nights did you go to bed hungry?

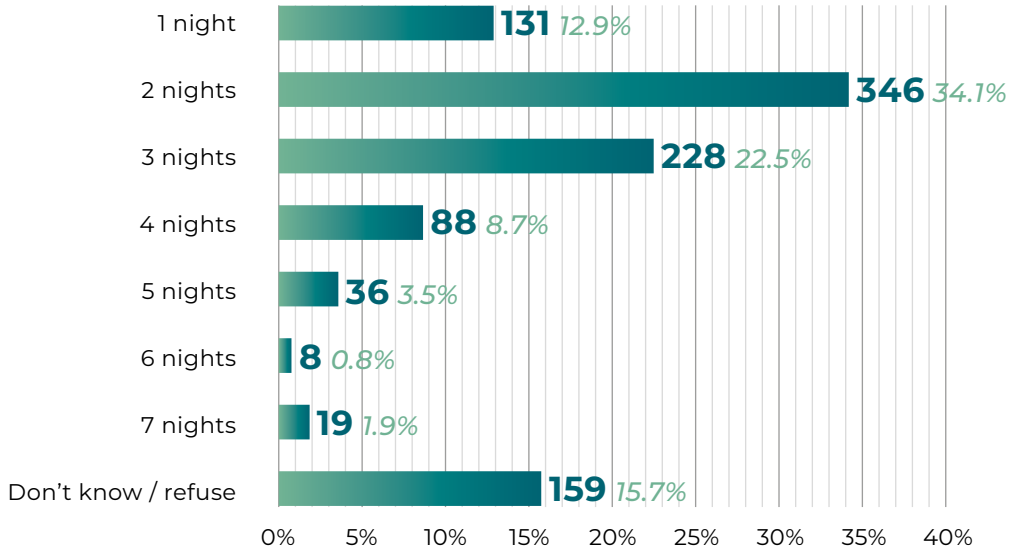
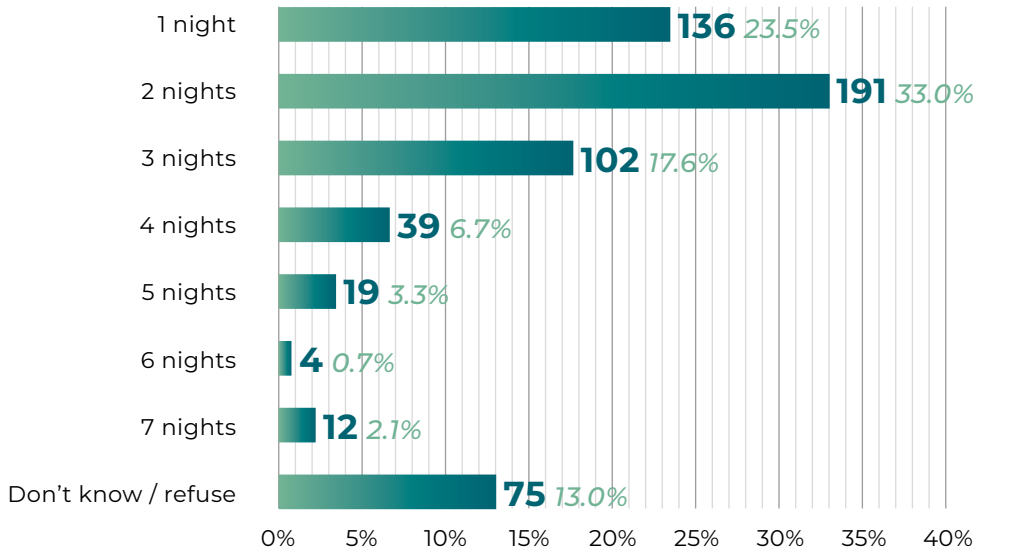


Figure 8

CHILD HUNGER

How many nights did a child go to bed hungry?



3.3. MENTAL HEALTH

3.3.1. MATERNAL MENTAL HEALTH

Two questions about mental health were posed to the study participants. The first asked about whether participants, in the seven days prior to completing the survey, felt '*hopeless, down or depressed*' and the second asked if they, in the seven days prior, '*felt little interest or pleasure in doing things*'. Sixty-one percent (n=1 578) answered '*yes*' to the first question and 62% (n=1 609) answered '*yes*' to the second. Forty-five percent (n=1 177) of participants answered '*yes*' to both questions. *Figures 9-11 provide further detail.*

Figure 9

MATERNAL MENTAL HEALTH .1

In the last 7 days, have you felt down, depressed or hopeless?

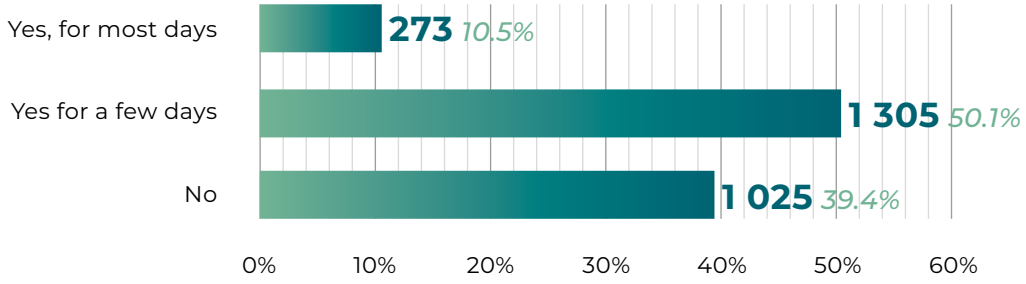


Figure 10

MATERNAL MENTAL HEALTH .2

In the last 7 days, have you felt little interest or pleasure in doing things?

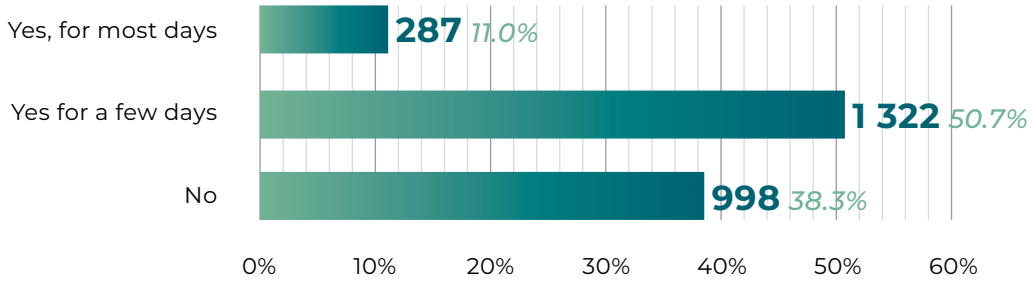
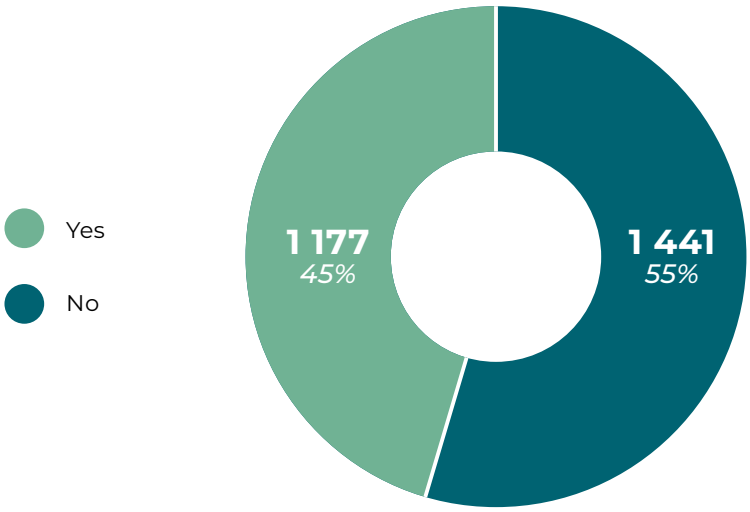


Figure 11

SCREENED POSITIVE ON BOTH MENTAL HEALTH QUESTIONS



3.4. ASSOCIATIONS BETWEEN VARIABLES

3.4.1. MATERNAL HUNGER AND MENTAL HEALTH

MATERNAL HUNGER & MENTAL HEALTH SCREENING QUESTION 1 *(down, depressed, hopeless)*

Respondents who answered '*yes*' to having gone to bed hungry in the seven days prior to their participation in the study, were found to be three times more likely (CI 2.60-3.69) to have '*felt down, depressed, or hopeless*' in the past week, compared to respondents who did not report going to bed hungry. This association was statistically significant.

SEVERE MATERNAL HUNGER & MENTAL HEALTH SCREENING QUESTION 1 *(down, depressed, hopeless)*

The odds of having *'felt down, depressed, or hopeless'* in the seven days prior to completing the survey increased by 22% as the number of days of having gone to bed hungry increased. This association was statistically significant.

MATERNAL HUNGER & MENTAL HEALTH SCREENING QUESTION 2 *(little interest or pleasure)*

Respondents who answered '*yes*' to having gone to bed hungry in the seven days prior to their participation in the study were almost twice as likely (CI 1.58-2.22) to have *'little interest or pleasure in doing things'* in the past week, compared to respondents who did not report going to bed hungry. This association was statistically significant.

SEVERE MATERNAL HUNGER & MENTAL HEALTH SCREENING QUESTION 2 *(little interest or pleasure)*

The odds of having *'little interest or pleasure in doing things'* in the seven days prior to completing the survey increased by 25% as the number of days of having gone to bed hungry increased. This association was statistically significant.

MATERNAL HUNGER & ANSWERING *'yes'* TO BOTH MENTAL HEALTH QUESTIONS

Respondents who reported having gone to bed hungry at least once in the seven nights preceeding the survey were almost three times as likely (2.26-3.14) have answered *'yes'* to both mental health questions, compared to respondents who did not report having gone to bed hungry. This association was statistically significant.

3.4.2. CHILD HUNGER AND MENTAL HEALTH

CHILD HUNGER & MENTAL HEALTH SCREENING QUESTION 1 *(down, depressed, hopeless)*

Respondents who reported that a child in their household had gone to bed hungry at least once in the seven nights preceeding the survey, were almost four times as likely (CI 2.92-4.61) to have felt *'down, depressed, hopeless'* in the week prior to completing the survey, compared to respondents who did not report that a child in their household went hungry. This association was statistically significant.

SEVERE CHILD HUNGER & MENTAL HEALTH SCREENING QUESTION 1 *(down, depressed, hopeless)*

The odds of having felt *'down, depressed, hopeless'* in the seven days prior to completing the survey increased by 53% with increasing number of nights a child in the participant's household went to bed hungry. This association was statistically significant.

CHILD HUNGER & MENTAL HEALTH SCREENING QUESTION 2 *(little interest or pleasure)*

Respondents who reported that a child in their household had gone to bed hungry at least once in the seven nights preceeding the survey were almost twice times as likely (CI 1.54-2.32) to have *'little interest or pleasure in doing things'* in the week prior to completing the survey, compared to respondents who did not report that a child in their household went hungry. This association was statistically significant.

SEVERE CHILD HUNGER & MENTAL HEALTH SCREENING QUESTION 2 *(little interest or pleasure)*

The odds of having *'little interest or pleasure in doing things'* in the seven days prior to completing the survey increased by 17% with increasing number of nights a child in the participant's household went to bed hungry. This association was, however, not statistically significant.

CHILD HUNGER & ANSWERING *'yes'* TO BOTH MENTAL HEALTH QUESTIONS

Respondents who reported that a child in their household had gone to bed hungry at least once in the seven nights proceeding the survey, were almost three times as likely (2.20-3.25) to have answered '*yes*' to both mental health questions, compared to respondents who did not report that a child in their household went hungry. This association was statistically significant.

3.4.3. INCOME AND HUNGER

Study participants who were unemployed in the month prior were 29% more likely to have gone to bed hungry at least once in the seven nights preceeding the survey, and 51% more likely to have had a child in their household go to bed hungry that past week. Both of these associations were statistically significant.

Study participants who were recipients of government grant income from any source were 15% less likely to go to bed hungry than participants who were not recipients of grant income. This association was, however, not statistically significant.

3.4.4. INCOME & MENTAL HEALTH

EMPLOYMENT & MENTAL HEALTH

Study participants who were unemployed were 19% more likely to have answered *'yes'* to both mental health questions, compared to respondents who were employed. This association was statistically significant.

GRANT INCOME & MENTAL HEALTH

Study participants who had no grant income were 7% less likely to have answered *'yes'* to both mental health questions, compared to respondents who were receiving grant income. This association was, however, not statistically significant.

4. RESULTS: TELEPHONIC SURVEY

A total of 584 telephonic interviews were conducted with a subset of these participants for more in-depth data collection.

4.1. HUNGER

4.1.1. MATERNAL HUNGER

Mirroring trends from the SMS survey, over a third of participants (n=202, 35%) reported that they had gone to bed hungry *at least* once in the seven nights prior. Of this group of reporting past-week hunger, 27% (n=54) reported going hungry only once that past week, 44% (n=89) reported going hungry on two occasions, and 21% (n=43) on three occasions. *Figure 12 provides greater detail.*

4.1.2. CHILD HUNGER

Again, mirroring the findings of the SMS survey, 21% of study participants (who had a child living with them) reported that a child in their household had gone to bed hungry *at least* once in the seven nights preceeding the telephone interview. Of the children who went to bed hungry in the week prior to the interview, 29% (n=20) went to bed hungry only once, 41% (n=28) went to bed hungry twice, and 16% went to bed hungry on three occasions.

Figure 12

MATERNAL HUNGER

How many nights did you go to bed hungry?

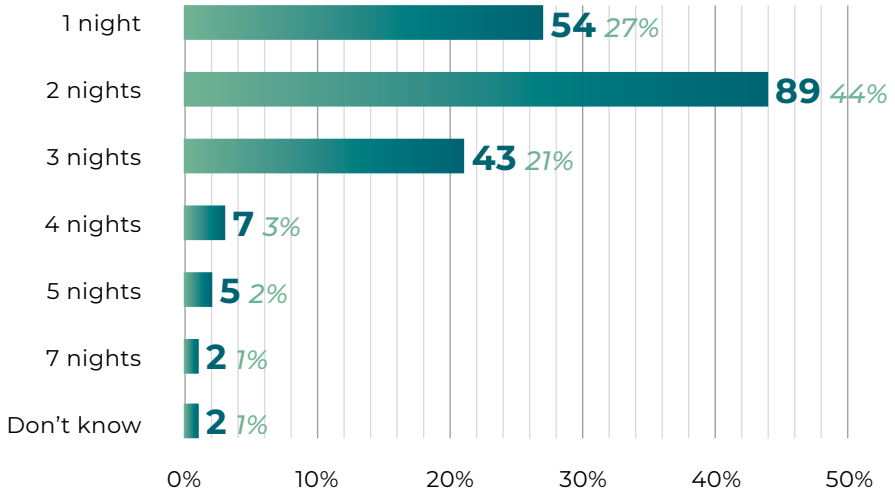
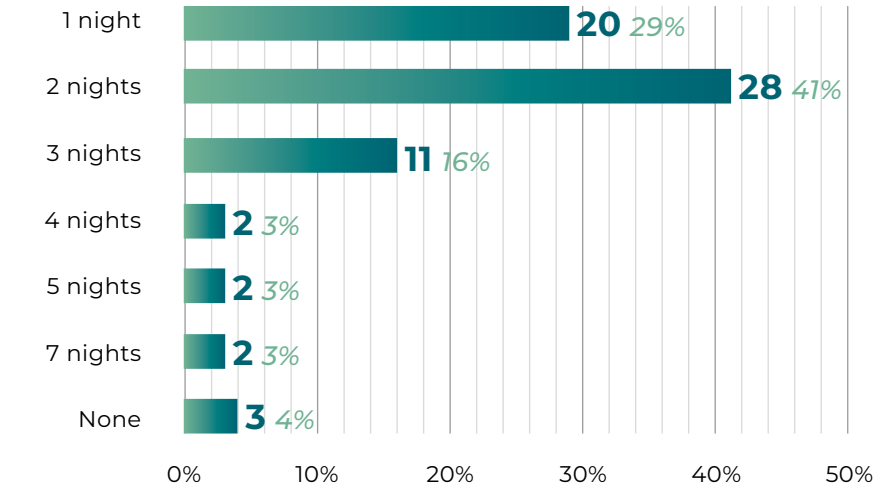


Figure 13

CHILD HUNGER

How many nights did a child go to bed hungry?



4.2. DIETARY DIVERSITY

The mean dietary diversity of participants included in the study, calculated using the Womens' Dietary Diversity Score, was found to be 4.9 (SD = 1.7), with a minimum score of 0 and maximum of 9.

4.2.1. DIETARY DIVERSITY SCORE

Nineteen percent of participants (n=112) were found to have a low dietary diversity (i.e. score of 3 or less food groups), 44% (n=254) of participants were found to have a medium dietary diversity score (4 and 5 food groups), and 37% (n=218) of study participants were found to have a high dietary diversity (≥ 6 food groups). *See Figure 15 for a graphic representation.*

4.2.2. DIETARY DIVERSITY CATEGORIES

The most common dietary categories consumed were starchy staples (96%, n=563), followed by other fruits and vegetables (80%, n=468), and then other vitamin A-rich fruits and vegetables (76%, 442). Among the pregnant women with a low dietary diversity score, the most common dietary category consumed was starchy staples (17.4%, n=98), followed by meat and fish (9.3%, n=38), then milk products (8.7%, 30). *See Figure 16 for a graphic representation.*

Figure 14

DIETARY DIVERSITY SCORES DISTRIBUTION

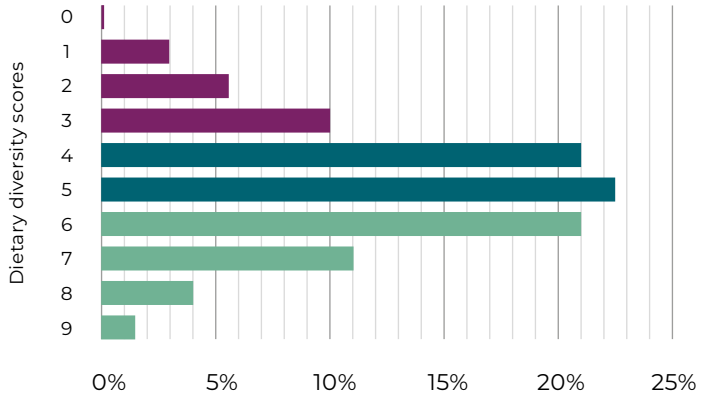


Figure 15

DIVERSITY SCORES *(n=584)*

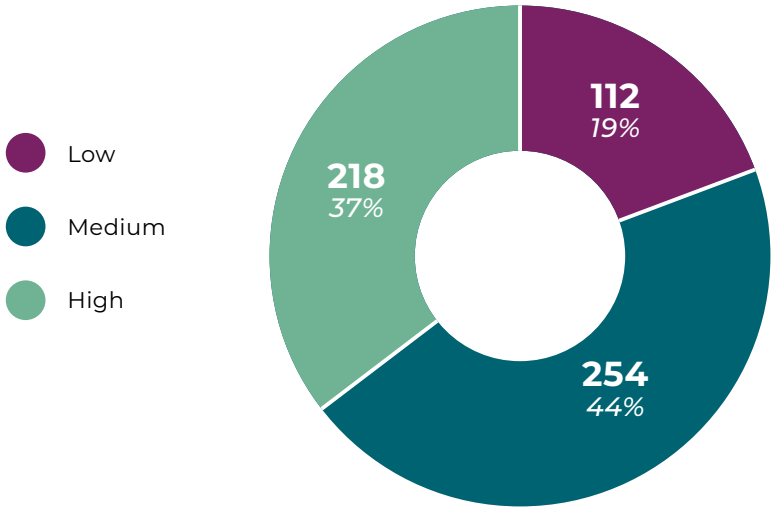
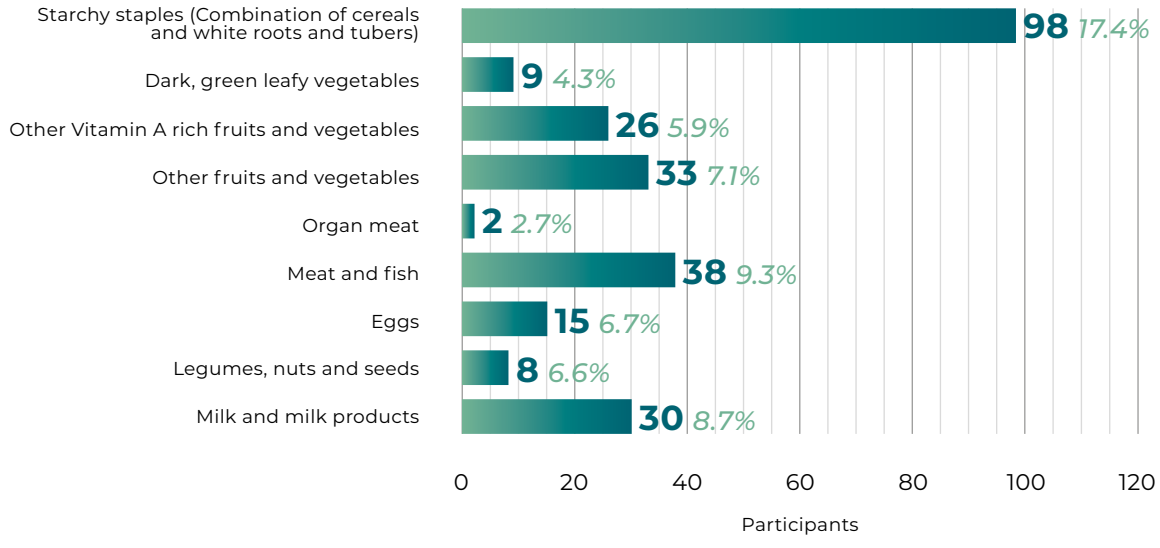


Figure 16

DIETARY DIVERSITY AMONG LOW-DIVERSITY PARTICIPANTS



4.3. MENTAL HEALTH

4.3.1. PHQ-9 ITEMS

All telephonic participants were asked the nine items comprising the Patient Health Questionnaire-9 (PHQ-9), assessing if they had experienced any of the below symptoms over the course of the 14 days preceeding the telephonic interview. *Figure 17 shows a breakdown of responses by question, with the most severe responses (reporting symptoms nearly every day) shown in darkest green.*

4.3.2. DISTRIBUTION OF TOTAL PHQ-9

The mean PHQ-9 score of participants included in the study was 7.88 (SD = 4.3), with zero being the lowest score and 27 the highest. Seventy percent of participants (n=405) scored below the unofficial cut-off of 10, and 30.4% respondents scored at or above this threshold, indicating moderate to high symptomatology. These findings parallel those that were found in the SMS survey i.e. one third of participants screened positive on both the mental health questions posed.

Figure 17

PHQ-9 INDIVIDUAL ITEMS

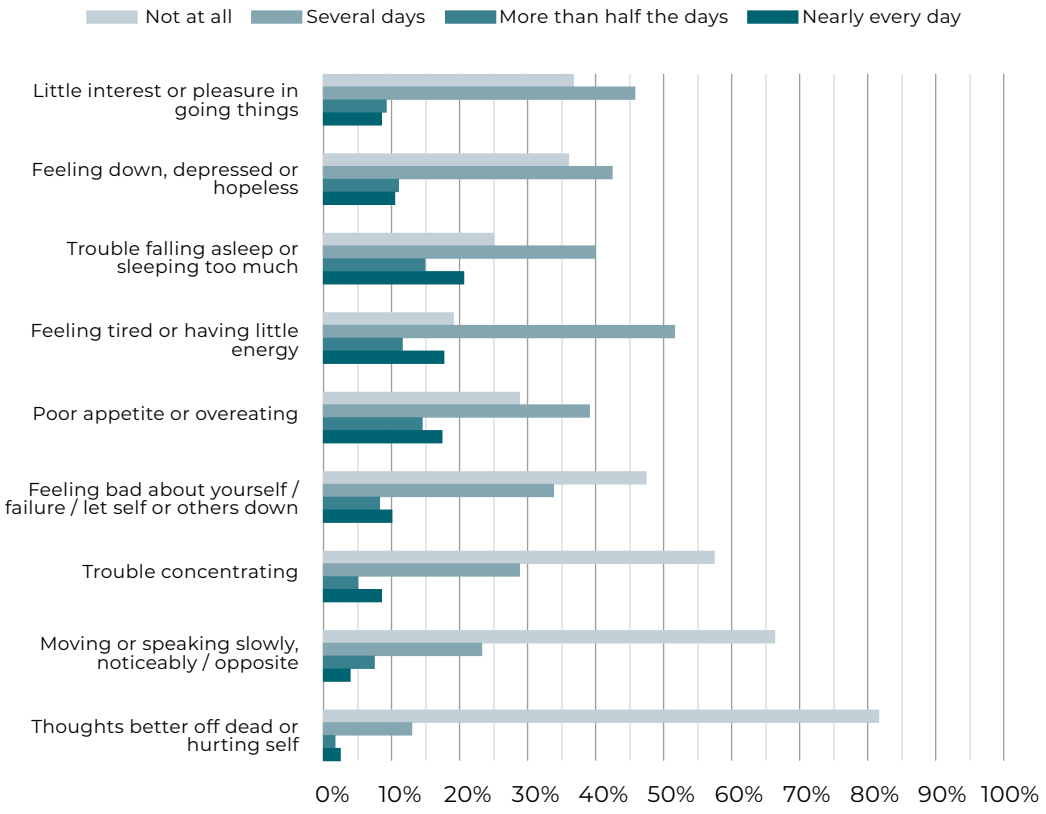
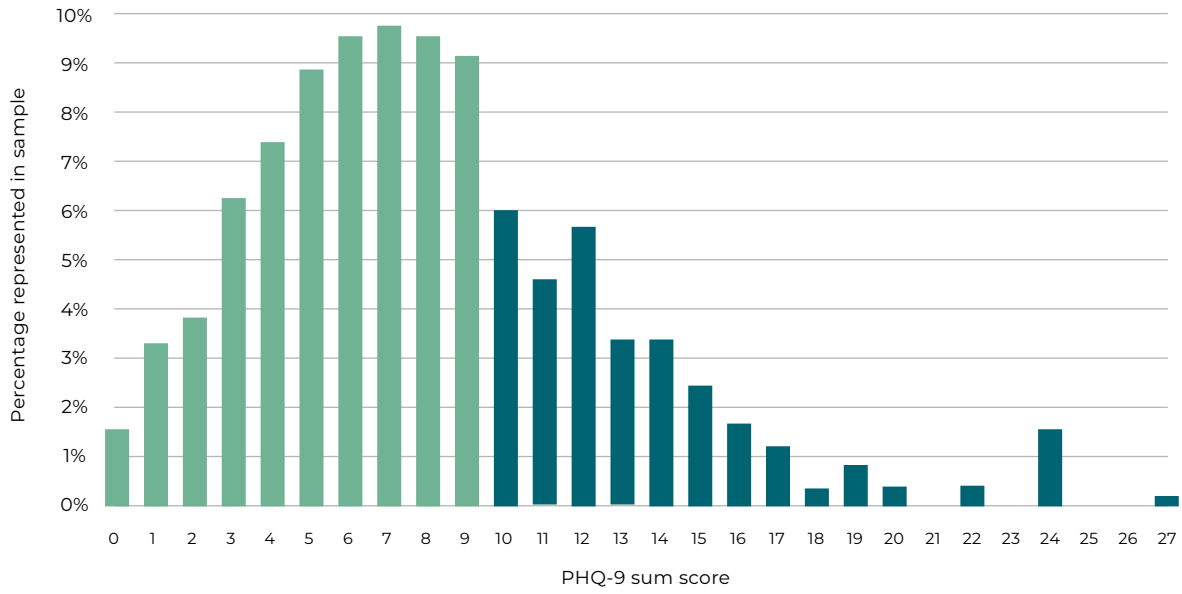


Figure 18

DISTRIBUTION OF TOTAL PHQ-9 SCORES



4.4. ASSOCIATIONS FOR TELEPHONIC DATA

HIGH SYMPTOMATOLOGY ON PHQ-9 SCALE

MATERNAL HUNGER AND HIGH SYMPTOMATOLOGY ON PHQ-9 SCALE

Respondents who reported they had gone to bed hungry at least once in the seven nights preceding the survey were twice as likely (CI 1.51-3.13) to report high symptomatology on the PHQ-9 (score ≥ 10), compared to respondents who did not report going to bed hungry. This association was statistically significant.

SEVERE MATERNAL HUNGER AND HIGH SYMPTOMATOLOGY ON PHQ-9 SCALE

The odds of reporting high symptomatology on the PHQ-9 increased by 26% as the number of days of having gone to bed hungry increased. This association was, however, not statistically significant.

LOW DIETARY DIVERSITY AND HIGH SYMPTOMATOLOGY ON PHQ-9 SCALE

Respondents who reported low dietary diversity were 27% more likely (CI 0.82-1.96) to report high symptomatology on the PHQ-9, compared to respondents who reported a medium to high dietary diversity. This association was, however, not statistically significant.

CHILD HUNGER AND HIGH MATERNAL SYMPTOMATOLOGY ON PHQ-9 SCALE

Respondents who reported that a child in their household had gone to bed hungry at least once in the seven nights preceeding the survey had 46% higher odds (CI 0.84-2.52) of reporting high symptomatology on the PHQ-9 , compared to respondents who did not report that a child in their household went hungry. This association was, however, not statistically significant.

SEVERE CHILD HUNGER AND HIGH MATERNAL SYMPTOMATOLOGY ON PHQ-9 SCALE

The odds of reporting high symptomatology on the PHQ-9 increased by 27% as the number of days of having gone to bed hungry increased. This association was, however, not statistically significant.

EMPLOYMENT STATUS AND HIGH SYMPTOMATOLOGY ON PHQ-9 SCALE

Respondents who reported being unemployed were 9% less likely to report high symptomatology on the PHQ-9, compared to respondents who were employed . This association was, however, not statistically significant.

GRANT INCOME AND HIGH SYMPTOMATOLOGY ON PHQ-9

Respondents who reported they personally received no grant income were 63% more likely to report high symptomatology on the PHQ-9, compared to respondents who reported that they were receipients of government grant income. This association was statistically significant.

5. DISCUSSION AND CONCLUSION

The findings of this study reveal that pregnant women living in disadvantaged communities of the Western Cape experienced high levels of hunger in the months following South Africa's national COVID-19 lockdown. Of the participants in the SMS survey, 39% reported going to bed hungry, and 22% reported that a child in their home had gone to bed hungry at least once in the week prior to their participation in the study. In-depth telephonic interviews with a subset of study participants found similar trends.

These levels of hunger are comparatively higher than evidence gathered during the same period from the NIDS CRAM Wave 3 surveys with the general population,[29] supporting the arguments made by others that pregnancy places women at increased risk of food insecurity.[2] These high levels of hunger occured against a backdrop of high levels of unemployment: while Statistics South Africa identified 42% unemployment nationally (using the expanded definition of unemployment),[30] almost double this proportion of our sample reported being unemployed or not having earned money in the prior month (71%). Furthermore, 83% had no paid work that they planned to return to in the coming month. As expected, being unemployed increased the likelihood of study participants reporting maternal and child hunger by 30% and 51%, respectively.

The high levels of hunger in this study population were found to increase the likelihood of women reporting symptoms of poor mental health. Pregnant women who reported that they had gone to bed hungry at least once in the week prior to participating in the study were almost three times more likely to screen positive on both mental health screening questions posed in the SMS survey, and twice as likely to report high symptomatology of poor mental health on the PHQ-9. Both of these findings were statistically significant. In addition, there was a statistically significant positive correlation found between the severity of hunger

(the number of nights having gone to bed hungry) and the increasing likelihood of reporting poor mental health symptoms on the SMS screening questions. Similar findings were reported in the recent NIDS CRAM survey.[31]

Our findings, counterintuitively, revealed medium to high dietary diversity amongst the majority of telephonic interview study participants, which contrasts with the high levels of hunger reported. This likely points to the limitation of the DDS tool, which does not account for quantity of the various food groups consumed. Furthermore, we found no statistically significant associations between dietary diversity and mental health.

We did find that the economic insecurity many of our study participants experienced increased their likelihood of reporting poor mental health symptoms. Of the SMS survey study participants, we found that those who were unemployed were 20% more likely to screen positive on both mental health questions. This association was statistically significant. We did not see statistically significant associations between employment and poor mental health amongst telephonic interview respondents (most likely because the sample of unemployed participants in the telephonic interviews was smaller than SMS surveys), but we did find a statistically significant association between no grant income and poor mental health. Specifically amongst the telephonic interview respondents, those who received no grant income were 63% more likely to report high symptomatology on the PHQ-9, compared to respondents who reported that they were receipients of government grants.

These findings emphasise an urgent and critical need for nutrition and mental health support strategies for vulnerable pregnant women, whose needs have become increasingly more apparent during the pandemic. They build on evidence revealing worsening hunger levels, maternal buffering (i.e. mothers denying themselves food so that there is sufficient food for their children to eat), and poor mental health as a result of the ongoing COVID-19 pandemic, and can also be understood in the context of the large body of evidence attesting to the long-term adverse consequences of poor maternal nutrition and poor mental health on the

physical and cognitive development of the unborn fetus.[32-34]

Extending the Child Support Grant into pregnancy is one such strategy that is likely to have significant impact on both the nutrition and mental wellbeing of South Africa's poor and vulnerable pregnant women. Providing vulnerable and poor pregnant women with income support during pregnancy would enable them to access the nutritious food that they require for a healthy pregnancy, and likely improve their mental wellbeing. Considering that intrauterine growth restriction has globally been found to be associated with much of the global burden of stunting,[35] providing income support for poor and vulnerable pregnant women will also likely contribute to reducing South Africa's high burden of stunting in the long term. In addition, poor maternal nutrition during pregnancy increases women's risk of birth complications,[2] placing further strain on an already overstretched health system. Addressing poor maternal nutrition in pregnancy not only protects children from stunting, but also reduces later costs related to health care and services for the South African health system. Considering the well-established link between poor fetal nutrition and reduced human capital development, an investment in supporting South Africa's pregnant women's access to nutritious food is not only an investment in the health and wellbeing of these women and children, but an investment in South Africa's economic growth and development.

South Africa's National Development Plan identifies the provision of social protection to pregnant women and new mothers as critical to addressing poverty, inequality and unemployment.[36] The effects of COVID-19 on the livelihoods of South Africans has made it more urgent than ever before for this to move from aspiration to action.

REFERENCES

1. World Health Organization. Essential nutrition actions: improving maternal, newborn, infant and young child health and nutrition. 2013.
2. Van den Heever A, Blaauw D, Scorgie F, Chersich M. Investigating the Potential Impact of Maternity and Early Child Support in South Africa: An Options Assessment. Report produced for the Department of Social Development. 2012.
3. Sambu W. Analysis of General Household Survey South Africa. In:2017.
4. Abrahams Z, Lund C, Field S, Honikman S. Factors associated with household food insecurity and depression in pregnant South African women from a low socio-economic setting: a cross-sectional study. Social psychiatry and psychiatric epidemiology. 2018;53(4):363-372.
5. Statista. Unemployment rate in South Africa from Q1 2016 to Q1 2020, by gender. https://www.statista.com/statistics/1129142/unemployment-rate-by-gender-in-south-africa/. Published 2021. Accessed.
6. Rogan M, Alfers L. Gendered inequalities in the South African informal economy. Agenda. 2019;33(4):91-102.
7. Bonnet F, Vanek J, Chen M. Women and men in the informal economy: a statistical brief. International Labour Office, Geneva 2019;20.
8. Justice LM, Jiang H, Purtell KM, et al. Conditions of poverty, parent–child interactions, and toddlers' early language skills in low-income families. Maternal and child health journal. 2019;23(7):971-978.
9. Ashley-Cooper M, van Niekerk L-J, Atmore E. Early childhood development in South Africa: Inequality and opportunity. In: South African schooling: The enigma of inequality. Springer; 2019:87-108.
10. Patel V, Rahman A, Jacob KS, Hughes M. Effect of maternal mental health on infant growth in low income countries: new evidence from South Asia. Bmj. 2004;328(7443):820-823.
11. Hendricks M, Goeiman H, Hawkridge A. Promoting healthy growth: strengthening nutritional support for mothers, infants and children. 2013.
12. South Africa Demographic and Health Survey. National Department of Health, Statistics South Africa, South African Medical Research Council, ICF;2016.
13. Vorster HH. The link between poverty and malnutrition: A South African perspective. Health SA gesondheid. 2010;15(1).
14. Victora CG, Adair L, Fall C, et al. Maternal and child undernutrition: consequences for adult health and human capital. The lancet. 2008;371(9609):340-357.
15. Connor J, Madhavan S, Mokashi M, et al. Health risks and outcomes that disproportionately affect women during the Covid-19 pandemic: A review. Social Science & Medicine. 2020:113364.
16. Akseer N, Kandru G, Keats EC, Bhutta ZA. COVID-19 pandemic and mitigation strategies: implications for maternal and child health and nutrition. The American journal of clinical nutrition. 2020;112(2):251-256.
17. Rogan M, Skinner C. Support for women informal workers is urgent as pandemic unfolds in South Africa. The Conversation2020.
18. Scorgie F, Blaauw D, Dooms T, Coovadia A, Black V, Chersich M. "I get hungry all the time": experiences of poverty and pregnancy in an urban healthcare setting in South Africa. Globalization and health. 2015;11(1):37.
19. Pérez-Escamilla R, Cunningham K, Moran VH. COVID-19 and maternal and child food and nutrition insecurity: a complex syndemic. Maternal & Child Nutrition. 2020;16(3):e13036.
20. Yoshikawa H, Aber JL, Beardslee WR. The effects of poverty on the mental, emotional, and behavioral health of children and youth: Implications for prevention. American Psychologist. 2012;67(4):272-284.
21. Sambu W, Delany A. Review of literature on pregnancy income support and its impact on selected pregnancy and infant outcomes. South Africa: The Grow Great Campaign;2020.

22. Hall K, Sambu W, Berry L, Giese S, Almeleh C, Rosa S. South African Early Childhood Review 2017. Children's Institute, University of Cape Town and Ilifa Labantwana, Cape Town. 2017.
23. van den Heever A. Pregnancy and maternal support for the protection of mothers and young children. South African Child Gauge Cape Town: Children's Institute, University of Cape Town. 2016:84-87.
24. Kennedy G, Ballard TJ, Dop M-C. Guidelines for Measuring Household and Individual Dietary Diversity. 2013.
25. Kiboi W, Kimiywe J, Chege P. Determinants of dietary diversity among pregnant women in Laikipia County, Kenya: a cross-sectional study. BMC Nutrition. 2017;3(1):1-8.
26. Oldewage-Theron W, Kruger R. Dietary diversity and adequacy of women caregivers in a peri-urban informal settlement in South Africa. Nutrition. 2011;27(4):420-427.
27. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16.
28. Tuthill EL, Sheira LA, Palar K, et al. Persistent food insecurity is associated with adverse mental health among women living with or at risk of HIV in the United States. The Journal of nutrition. 2019;149(2):240-248.
29. Van der Berg S, Patel L, Bridgman G. Hunger in South Africa during 2020: Results from Wave 3 of NIDS-CRAM. Department of Economics, University of Stellenbosch; 2020.
30. 29 September Quarterly Labour Force Survey (QLFS) - Q2:2020 [press release]. http://www.statssa.gov.za/?p=13652: Statistics South Africa, 2020.
31. Oyenubi A, Kollamparambil U. COVID-19 and Depressive symptoms in South Africa. 2020.
32. Lewis AJ, Austin E, Knapp R, Vaiano T, Galbally M. Perinatal maternal mental health, fetal programming and child development. Healthcare. 2015;3:1212-1227.
33. Kavle JA, Landry M. Addressing barriers to maternal nutrition in low-and middle-income countries: A review of the evidence and programme implications. Maternal & Child Nutrition. 2018;14(1):e12508.
34. May J, Witten C, Lake L. South African Child Gauge 2020. Cape Town: Children's Institute, University of Cape Town;2020.
35. Danaei G, Andrews KG, Sudfeld CR, et al. Risk factors for childhood stunting in 137 developing countries: a comparative risk assessment analysis at global, regional, and country levels. PLoS medicine. 2016;13(11):e1002164.
36. South African National Planning Commission. National Development Plan 2030: Our future - make it work. 2012.

APPENDICES

APPENDIX 1:
SMS BASELINE SURVEY

Hi Mama, you have been chosen for a study to understand how the Coronavirus pandemic has affected the wellbeing of pregnant women. If you answer the questions, you will get R20 airtime. It will not cost you anything. To join the study reply "JOIN". To learn more about this study, please reply "MORE". To leave the study at anytime, reply "STOP".

Please type your ID number. (We will not be using your ID number for any personal purposes. The only reason we are asking for this is so that we can follow up with you later and be sure we are speaking with the same person.)

Do you have any other children?
0 *No, this is my first* **1** *Yes, 1 child* **2** *Yes, 2 children* **3** *Yes, 3 children* **4** *Yes, 4+ children* **8** *Don't want to answer*

How many people do you live with? (Don't forget to include babies.)
1 *None* **2** *One* **3** *Two* **4** *Three* **5** *Four* **6** *Five or more* **7** *Don't want to answer*

How many grants does your household receive?
0 *None* **1** *One* **2** *Two* **3** *Three* **4** *Four* **5** *Five or more* **6** *Don't want to say*
Did you have any kind of job or sell things or earn any income (no matter how small) last month?
1 *Yes* **2** *No* **9** *Don't want to answer*

Do you have any paid activity or job that you will return to in the next 4 weeks?
1 *Yes* **2** *No* **3** *No, I'm retired* **4** *I don't want to say.*

What is your highest level of education?
1 *Completed primary school* **2** *Some high school* **3** *I've passed matric* **4** *Tertiary qualification*
9 *Don't want to answer*

In the last 7 nights did YOU ever go to bed hungry?

1 *Yes* **2** *No* **3** *Don't know* **9** *Don't want to answer*

How many nights did YOU go to bed hungry?

0 *Never* **1** *1* **2** *2* **3** *3* **4** *4* **5** *5* **6** *6* **7** *7* **8** *Don't know* **9** *Don't want to answer*

In the last 7 nights did A CHILD go to bed hungry in your household?

1 *Yes* **2** *No* **3** *Don't know* **8** *No children* **9** *Don't want to answer*

How many nights did the child go to bed hungry?

0 *Never* **1** *1* **2** *2* **3** *3* **4** *4* **5** *5* **6** *6* **7** *7* **8** *Don't know* **9** *Don't want to answer*

In the last 7 days have you felt hopeless, down or depressed?

1 *No* **2** *Yes, for a few days* **3** *Yes, for most days* **4** *Don't want to answer*

In the last 7 days have you felt little interest or pleasure in doing things?

1 *No* **2** *Yes, for a few days* **3** *Yes, for most days* **4** *Don't want to answer*

This is the last question: Are you willing to be contacted to participate in a short follow on telephonic interview? You will also receive R20 for your participation.

1 *Yes* **2** *No*

Thank you! If you need help in these difficult times, contact Lifeline 0861 322 322 or National Mental Health Information Line at 0800 567 567.

APPENDIX 2:
TELEPHONIC BASELINE SURVEY

Hello, you are speaking to [call agent name] *from the CoCare Survey. Thank you for taking my call. In this survey I will be asking you questions about how the Coronavirus pandemic has affected your wellbeing. Some questions are the same as those answered in the SMS survey, others are new. As with the SMS survey, you will receive R20 airtime for participating and you can stop at anytime. This call will be recorded for quality control but your information will be kept confidential and anonymous. We may also store the information you share with us for future use, but none of this information will be attached to your name or identity. Stellenbosch University approved this research and you can reach us at anytime on 021-4248664 if you have more questions. Are you willing to continue with the survey?*

How old are you?

Can you confirm your date of birth?

How many biological or legally adopted children do you have who are under 18?

Are any of these children, or other children, living with you in your household at the moment?
Yes / No / Refuses to say

Can you confirm the highest grade in school you have successfully completed or passed?

Have you completed any tertiary qualifications like diplomas, certificates or degrees?
None / Certificate / Diploma / Undergraduate degree / Postgraduate degree / Other

What other tertiary qualifications have you completed?

Last month, did you have any kind of job or sell things or earn any income, no matter how small?
Yes / No / Refuses to say

Do you have any paid activity or job that you will return to in the next 4 weeks?
Yes / No / Refuses to say

Which government grants did you or somebody in your household receive last month?
None / Child Support Grant (CSG) / Old Age Pension Grant (OAP) / Disability Grant / Foster Child Grant / Care Dependency Grant / War veterans grant / COVID-19 Social Relief of Distress Grant (R350) / Grant in Aid / The National Student Financial Aid Scheme (NSFAS) / Don't know / Refuses to say

Which government grants did you yourself receive last month?
None / Child Support Grant (CSG) / Old Age Pension Grant (OAP) / Disability Grant / Foster Child Grant / Care Dependency Grant / War veterans grant / COVID-19 Social Relief of Distress Grant (R350) / Grant in Aid / The National Student Financial Aid Scheme (NSFAS) / Don't know / Refuses to say

Please describe the foods (meals and snacks) that you ate yesterday during the day and night, whether at home or outside the home. Start with the first food eaten in the morning. There are no right or wrong answers, but please answer as honestly as possible.

CEREALS eg: Oatmeal, grain / maize, rice, wheat, sorghum, squash, pasta or any other grain or food made from these grains, for example bread, noodles, pasta, cookies, rusks, porridge, breakfast cereals, popcorn. If respondent ate pastries (such as muffins, cake, dessert), mark this column and also mark the SWEETS column as well as the OIL / FAT column. **Yes / No**

VITAMIN A RICH VEGETABLES eg: Pumpkin, carrot, squash, sweet potato, peanut butter, butternut squash, red pepper, or any other vegetable that is orange on the inside. **Yes / No**

WHITE ROOT VEGETABLES eg: Potatoes, carrots, cassava, tubers, and / or products / dishes made from these tuberous vegetables (for example potato chips, potato salad and soup). If any fried dishes have been eaten, mark this column and also mark the OIL / FAT column. **Yes / No**

DARK GREEN LEAFY VEGETABLES eg: Spinach, marog, broccoli, rocket, cabbage, lettuce, or any other dark green leafy vegetable, including wild vegetables. **Yes / No**

OTHER VEGETABLES eg: Tomatoes, onions, eggplant, cucumber, corn, marrow, mushrooms, green beans, mangetout (baby peas), peas, beets, celery, red cabbage, cabbage, green / yellow pepper, asparagus or any other available vegetables. **Yes / No**

VITAMIN A RICH FRUITS eg: Fresh or dried yellow / orange fruits including fiber peach, melon, apricot, papaya, grapefruit, plum, guava, granadilla, watermelon and 100% fruit juice made from these fruits. **Yes / No**

OTHER FRUITS eg: Banana, grapes, apples, pears, kiwi, oranges, lemons, strawberries, pineapple, winter melons, peaches, peaches, raspberries, blueberries, blueberries, cherries, gooseberries and / or 100% fruit juice made from these fruits. **Yes / No**

ORGAN MEAT (IRON RICH) eg: Liver, kidney, heart or other organ meats or blood-based foods. **Yes / No**

FLESH MEATS eg: Beef, pork, lamb, goat, game, chicken, duck and / or products made from these meats, for example minced meat, sausage, stew, hamburger, biltong. **Yes / No**

EGGS eg: Chicken, duck, guinea hen or any other egg (boiled, scrambled egg, poached, baked, omelette). **Yes / No**

FISH eg: Fresh, dried or canned fish, calamari, shellfish (shrimp, mussels, lobster). **Yes / No**

LEGUMES, NUTS AND SEEDS eg: Dried beans, dried peas, lentils, nuts and peanuts, chickpeas, seeds or foods made from the above, for example hummus, peanut butter, dukhah. **Yes / No**

MILK AND MILK PRODUCTS eg: Milk, cheese (any kind), yoghurt, buttermilk, amazi (sour milk) and other dairy products. Shakes and "smoothies" made from milk. **Yes / No**

OILS AND FATS eg: Oil, fats, margarine or butter added to food or used in the preparation of food, for example animal fat or seed / fruit oils, for example canola, olive, avocado, palm kernel / fruit or coconut oil, salad dressing, mayonnaise. **Yes / No**

RED PALM PRODUCTS eg: Red palm oil, palm nut or palm nut pulp sauce. **Yes / No**

SPICES, CONDIMENTS, BEVERAGES eg: Spices(black pepper, salt, curry), condiments (soy sauce, tamatiesous, hot sauce), coffee, tea (any kind), alcoholic beverages of local examples. **Yes / No**

SWEETS eg: Sugar, honey, sweetened fruit juice, sweetened soft drinks (including sports drinks), flavored and sweetened milk / yoghurt, or sweetened foods such as chocolate, sweets, milkshakes, ice cream and so on). **Yes / No**

You selected "No" for all food groups. Please only continue if this is correct.

Did you eat anything (meal or snack) OUTSIDE of the home yesterday?
Yes / No

Did anyone in your household eat anything (meal or snack) OUTSIDE of the home yesterday?
Yes / No / Don't know

In the last 7 nights did YOU ever go to bed hungry?
Yes / No / Don't know / Refuses to say

How many nights did YOU go to bed hungry?

None / 1 / 2 / 3 / 4 / 5 / 6 / 7 / Don't know / Refuses to say

In the last 7 nights did A CHILD go to bed hungry in your household?

Yes / No / Don't know / Refuses to say

How many nights did the child go to bed hungry?

None / 1 / 2 / 3 / 4 / 5 / 6 / 7 / Don't know / Refuses to say

Over the last 2 weeks, how often have you been bothered by any of the following problems?

Little interest or pleasure in doing things:

Not at all / Several days / More than half the days / Nearly every day

Feeling down, depressed, or hopeless:

Not at all / Several days / More than half the days / Nearly every day

Trouble falling or staying asleep, or sleeping too much:

Not at all / Several days / More than half the days / Nearly every day

Feeling tired or having little energy:

Not at all / Several days / More than half the days / Nearly every day

Poor appetite or overeating:

Not at all / Several days / More than half the days / Nearly every day

Feeling bad about yourself, or that you are a failure or have let yourself or your family down:

Not at all / Several days / More than half the days / Nearly every day

Trouble concentrating on things, such as reading the newspaper or watching television:

Not at all / Several days / More than half the days / Nearly every day

Moving or speaking so slowly that other people could have noticed? Or the opposite, being so fidgety or restless that you have been moving around a lot more than usual:

Not at all / Several days / More than half the days / Nearly every day

Thoughts that you would be better off dead or of hurting yourself in some way:

Not at all / Several days / More than half the days / Nearly every day

Thank you! If you need help in these difficult times, contact Lifeline 0861 322 322 or National Mental Health Information Line at 0800 567 567.

APPENDIX 3:
ASSOCIATION BETWEEN VARIABLES SMS SURVEY

MENTAL HEALTH-SCREENING QUESTION 1 *(down, depressed, hopeless)*		ODDS RATIO (95% CI)
MATERNAL HUNGER	Ref: No Yes	3.09(2.60-3.69)*
	Severe maternal hunger (increasing number of nights having gone to bed hungry)	1.22(1.06-1.40)*
CHILD HUNGER	Ref: No Yes	3.67(2.92-4.61)*
	Severe child hunger (increasing number of nights having gone to bed hungry)	1.53(1.22-1.92)*

MENTAL HEALTH-SCREENING QUESTION 2 *(little interest or pleasure in doing things)*		ODDS RATIO (95% CI)
MATERNAL HUNGER	Ref: No Yes	1.87(1.58-2.21)*
	Severe maternal hunger (increasing number of nights having gone to bed hungry)	1.25(1.10-1.42)*
CHILD HUNGER	Ref: No Yes	1.89(1.54-2.32)*
	Severe child hunger (increasing number of nights having gone to bed hungry)	1.17(1.00-1.38)

**=statistically significant finding i.e. p value <0.05*

SCREENING POSITIVE ON BOTH MENTAL HEALTH QUESTIONS		ODDS RATIO (95% CI)
MATERNAL HUNGER	Ref: No Yes	2.66(2.26-3.13)*
CHILD HUNGER	Ref: No Yes	2.67(2.20-3.25)*
MATERNAL EMPLOY-MENT	Ref: No Yes	1.19(1.01-1.42)*
GRANT INCOME	Ref: No Yes	0.86(0.72-1.03)

MATERNAL HUNGER		ODDS RATIO (95% CI)
MATERNAL EMPLOY-MENT	Ref: No Yes	1.29(1.08-1.55)*
GRANT INCOME	Ref: No Yes	0.85(0.71-1.03)

CHILD HUNGER		ODDS RATIO (95% CI)
MATERNAL EMPLOY-MENT	Ref: No Yes	1.51(1.21-1.88)*

**=statistically significant finding i.e. p value <0.05*

APPENDIX 4:
ASSOCIATION BETWEEN VARIABLES TELEPHONE SURVEY

	HIGH SYMPTOMATOLOGY ON PHQ-9 SCALE	ODDS RATIO (95% CI)
MATERNAL HUNGER	Ref: No	
	Yes	2.17(1.51-3.13)*
	Severe maternal hunger	1.26(0.94-1.67)
	Low dietary diversity	1.27(0.82-1.96)
CHILD HUNGER	Ref: No	1
	Yes	1.46(0.84-2.52)
	Severe child hunger	1.27(0.84-1.96)
EMPLOY-MENT STATUS	Ref: No	
	Yes	0.91(0.61-1.35)
GRANT INCOME	Ref: No	
	Yes	0.61(0.41-0.92)*

**=statistically significant finding i.e. p value <0.05*

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