Abstract

Background: The nature of the COVID-19 pandemic forced several nations to impose country-wide lockdowns. The lockdown impacted several aspects of life including the economy. Food security became a growing concern for many households. Aim: The aim of the study was to explore the diet diversity of urban households in India during the nationwide COVID-19 lockdown. Methods: Information regarding socioeconomic status (SES), family size and information regarding availability and access to food were gathered from 450 households. Diet diversity was assessed using a 69-item food frequency questionnaire. Food variety scores (FVS) were computed for individual food groups and overall. Results: The majority of the households (86.4%) belonged to the upper-middle or upper SES. Households did not experience any constraints in accessibility and availability of food except the meat group. Overall, 84% of the households had low FVS for most of the food groups except for sugar and milk and milk products. The household SES score was positively associated with the milk FVS ($B = 0.039$, $p = 0.020$) and negatively with the fat FVS ($B = -0.062$, $p < 0.001$). The number of adults ($B = 6.773$, $p < 0.001$) in the household positively predicted the FVS of cereal, vegetable, fruit, fat and total FVS. Conclusions: The higher SES households in urban India did not experience food insecurity. Despite this, their poor diet diversity is a serious cause for concern, especially in the wake of the evolving pandemic. This highlights the need to promote consumption of a diverse variety of foods.

Keywords
Food Variety Score, diet diversity, lockdown, COVID-19, pandemic

Introduction

In January 2020, the outbreak of the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) was confirmed (World Health Organization, 2019). Soon after, several countries reported cases of SARS-CoV-2. In India, the first case was reported on 30 January 2020. After the initial few cases, a surge in reported cases began in early March 2020. The Government of India took cognizance of the situation and imposed a nationwide lockdown from 25 March 2020, which was extended until 31 May 2020. After this, the government brought in a few zone-wise relaxations while the lockdown continued in the containment areas.

The lockdown period witnessed a number of changes. COVID-19 not only emerged as a public health crisis but also impacted the different economic sectors. Travel and tourism, hospitality, manufacturing and transportation were adversely affected (Saraswathy, 2020). The micro, small and medium enterprises were affected the most (Rakshit and Basistha, 2020). Migrant labourers were hit the worst, with no wages, no food and no means to travel back to their home towns. On the other hand, the workforce from the service sector such as IT firms moved to a work-from-home mode of working. To bear the economic crisis, many large companies started to lay off their employees (Ray, 2020).

With the economic crisis, food security became a cause for concern. The lockdown impacted the agri-food supply chain (ETGovernment, 2020). During this period, only essential services such as groceries, pharmacy and emergency medical services were available. Consumers were anxious about the availability, quality and prices of the fresh foods and food products. This led to some consumers purchasing huge stocks of foods. On the other hand, the government also made efforts to step up the public...
distribution system to ensure food availability to the poorer sections of the population (Pathak et al., 2020).

Studies in Kenya, Uganda, Bangladesh and Iran reported a rise in food insecurity during the lockdown period (Kansiime et al., 2021; Kundu et al., 2021; Pakravan-Charvadeh et al., 2021a, 2021b). In India too, with the rising cases and the extended lockdown, the household food purchasing power, food choices and, therefore, the diet diversity seem to have been affected (Headey and Ruel, 2020). Dietary diversity is an effective tool to assess the diet quality in an emergency situation where resources are limited. At the household level, diet diversity is a reflection of the economic ability to access food (Kennedy et al., 2011). Household food variety scores (FVS) are an extension of household diet diversity which give a glimpse of the variety of foods that the household has access to (Badari et al., 2012).

In view of the above-mentioned concerns, we undertook the present study with an aim to assess the diet diversity of urban Indian households during the lockdown period. The specific research questions that we explored were (a) did the lockdown affect the food access and availability?; (b) was food availability associated with diet diversity?; and (c) did the socioeconomic status (SES) of the household predict the diet diversity?

Methods

Study design: It was a cross-sectional study conducted in the urban areas of India during April–June 2020, when the lockdown was in place in most parts of the country.

Sample selection and size: Four hundred and fifty households across Indian cities such as Mumbai, Pune, Bengaluru, Hyderabad, Chennai, Delhi and Kolkata participated in the study via convenience sampling technique. The households were selected based on the inclusion and exclusion criteria. Inclusion criteria: households in the jurisdiction of urban areas/cities were included. Quarantined households were eligible to participate in the study post their quarantine period. During the quarantine period, food access could have been affected due to restrictions in movement. Therefore, such households were eligible to participate post their quarantine. Households with at least one person having access to the internet (via smartphones or other devices) and who was able to read and write English language were eligible to participate in the study. Individuals or families residing in hostels, community-living centres, institutional homes and migrant camps were excluded from the study.

Data collection: During the lockdown and with measures of social distancing in place, collecting data on a one-to-one basis was not feasible. Thus, the electronic forms were created on Google. These were electronically shared with the eligible participants via email and social media (Facebook, WhatsApp and LinkedIn). The participants were informed about the objectives of the study, the nature of information required, confidentiality of the data and the average time required to complete the survey. The privacy of the data was ensured by access being only with the authors. The information sheet was shared with the participants and electronic consent was obtained from them.

Measurements

Diet diversity – Diet diversity of the households was assessed using FVS. FVS is a reflection of the diet quality and the diversity of the diet (Choi and Bae, 2014; Evans et al., 2018; Sonandi et al., 2017). We assessed the FVS of the household using a 69-item food frequency questionnaire. FVS was defined as the number of different food items eaten in a week during the lockdown period. The FVS of the households was calculated for commonly eaten foods listed in nine groups: (a) cereals and millets; (b) pulses and legumes; (c) nuts; (d) milk and milk products; (e) meat; (f) vegetables; (g) fruits; (h) sugar; and (i) fats. The scoring was done as follows – daily intake was given a score of 7, three to six times a week was score 4, once a week was 1, and less than once a week was 0 (Badari et al., 2012). The FVS was calculated for each food group, which helped us to understand the number and types of food eaten in that group. The FVS of individual food groups was summed up to arrive at the total FVS. In order to classify the FVS as ‘low’ or ‘high’, we calculated the minimum and maximum scores for each food group and the overall score. The score above mid-point was classified as ‘high FVS’ and those below as ‘low FVS’.

SES – The Updated Modified Kuppuswamy SES for the year 2019 was used to assess the SES of the households (Mohd Saleem, 2019). The scale included information about the education and occupation of the head of the household along with the monthly household income (in INR). The total scores of the scale ranged from 3 to 29. Based on this, the households were classified into five SES groups – ‘low’ (< 5), ‘upper-lower’ (5–10), ‘lower-middle’ (11–15), ‘upper-middle’ (16–25) and ‘upper’ (26–29) SES.

Other information regarding household size along with number of adults, senior citizens, adolescents and children was collected. We also included COVID-related information – if the household was located in a containment zone, food availability (if any food or food group was not available during lockdown), accessibility (how far did they have to travel to purchase their food supply), if they purchased food online and if any of the foods had become expensive during the lockdown.

Statistical analysis: The data were analysed using IBM SPSS 20. Mean ± SD and frequency distribution were carried out for the FVS and sociodemographic characteristics respectively. Binary logistic regression was carried out to find out the variables that influence individual and total FVS. For all the individual and total FVS, the scores below median and above median were considered as dependent variables. The independent variables considered were number of adults, adolescents in the household and SES score. In the regression model for meat variety score,
we included the availability of meat (0 = yes, 1 = no) and controlled for the food preferences of the households – vegetarian and non-vegetarian. Further, in the regression models for vegetable and fruit groups, we tested if the rise in the cost (0 = no change, 1 = expensive) predicted their FVS.

Results

Four hundred and fifty households participated in this study. The size of the household varied between a minimum of one to a maximum of 32 members. The mean size of the household was 4.06 ± 2.20 members. The mean number of adults in the household was 3.24 ± 1.56 (1–11). Nearly 56% of the households had at least one senior citizen residing with them. One-quarter of the households had at least one adolescent (mean: 0.34 ± 0.65). Almost 22% of the households had at least one child below 10 years of age (mean: 0.27 ± 0.57).

SES of the households

The majority of the households (53.1%, n = 239) belonged to the upper SES class. One-third of the households (33.3%, n = 150) were from the upper-middle SES. The remaining 13.6% (n = 61) of households belonged to the lower-middle and lower-upper SES. In over 80% of households, the head of the family was either a graduate (41.3%, n = 186) or had a professional degree (41.3%, n = 186). The rest of the head of households (18.4%, n = 78) had completed either middle school or high school or held a diploma. Over half the head of households were employed as professionals (56%, n = 252), such as engineers, chartered accountants, teachers and so on. Over 16% (n = 74) of the head of households held senior managerial positions or were legislators. Nearly 9% (n = 40) of the heads were unemployed. The rest of the heads (19%, n = 85) were involved in technical or clerical or sales-related jobs. Nearly half the households (47.1%, n = 212) had a monthly income of over INR 78,062 and 23% of the households (n = 105) earned a monthly income between INR 39,033 and 78,062. Over 16% of the households (n = 75) earned between INR 19,516 and 39,032 per month. The remaining households (12.9%, n = 58) received an income of less than INR 19,515 per month.

Food purchases during lockdown

Over two-thirds of the households (n = 314) preferred vegetarian foods while the rest (30.2%, n = 136) chose non-vegetarian foods. During the lockdown, nearly half of the households (n = 220) were able to purchase food items within 500 metres of their residence. One-quarter of the households (n = 116) purchased food items within a distance of 500–1000 metres from their homes. About 3% of families (n = 12) purchased only online. The remaining households travelled more than a kilometre to buy food items. About 9% of the families (n = 39) preferred purchasing online and physical buying.

Over half the respondents (n = 240) felt that the food items had become expensive during the lockdown while 17% (n = 76) did not feel so. The remaining 30% (n = 134) did not know about the prices of the food items. About one-third of the respondents (n = 152) expressed that the cost of vegetables and fruits had risen during the lockdown. This was followed by non-vegetarian foods (7.6%, n = 34), cereals and pulses (7.3%, n = 33) and packaged and online ordered foods (4.4%, n = 20). About 19% (n = 85) of respondents felt that all the food items had become expensive.

The majority of the participants (93%, n = 418) expressed that almost all foods were available. Of the participants who consumed flesh foods, 23.5% (n = 32) mentioned that sea foods and other flesh foods were not available.

FVS

The mean ± SD of the FVS is presented in Table 1. Overall, 84% of the households reported low total FVS. The majority of the households were seen to have low FVS for almost all the food groups except for milk and milk products and sugar.

Factors associated with FVS

We carried out binary logistic regression to find out the predictors of FVS. We did this individually for all the food groups and for the total FVS (Tables 2 and 3). The number of adults in the household were seen to positively predict the FVS of cereals, roots and tubers, other vegetables, overall vegetables, fruits, fat and total FVS (p < 0.05).
Further, the socioeconomic variables also predicted the FVS of certain food groups. A higher household SES score was noted to predict lower FVS for fat (B = 0.062, p < 0.001). On the other hand, a higher household SES score positively predicted the FVS of milk and milk products (B = 0.039, p = 0.020). The non-availability of meat foods negatively predicted the meat FVS (p = 0.011). As all the respondents reported 100% availability of other food groups, the variability was constant. As a result, the constant parameter was removed from the analysis.

**Discussion**

We carried out the present study with an aim to understand the household diet diversity among urban Indian households during the COVID-19 lockdown. The findings suggest that access and availability of the food items remained largely unaffected in the urban areas during the lockdown. However, households reported poor diet diversity. This was seen despite the fact that the majority belonged to upper-middle and upper SES.

**Impact of lockdown on food access and food availability**

The study participants did not report any challenges in accessibility and availability of food items except sea foods and flesh foods. Cariappa et al. (2020) also reported uninterrupted access to markets in India. It is noteworthy that the present study was restricted only to the urban areas. Rural India, on the other hand, may present a completely varied scenario.

A sizeable proportion of our participants expressed an increase in the cost of certain food items, particularly vegetables and fruits. In congruence with this, Tata-Cornell Institute (2020) reported that, during the months of March to May 2020, the prices of non-cereal foods such as vegetables and fruits, pulses and eggs increased. Further, a general upward trend was noted in the retail food prices as suggested by the consumer food price index (Cariappa et al., 2020).

**Diet diversity during the lockdown**

Majority of the households had poor diet diversity. Most of the households consumed not more than one to two staple cereals and pulses. Among cereals and millets, almost all the households reported consumption of rice and wheat. About 30 to 40% of the households consumed millets such as pearl millet, sorghum and finger millet at least once a week. Like millets, legumes seemed to be consumed less than pulses. Among the pulses, red gram dal (94%) and green gram dal (89.6%) emerged as the most commonly consumed by the households. About 32–57% of the households reported consumption of legumes such as whole lentils, rajmah (kidney beans), cow pea, moth beans, horsegram and field beans at least once a week. Households seemed to prefer processed cereal alternatives such as bread (77.1%) and breakfast cereals (62.2%) rather than millets and legumes.

Over 90% of the households reported daily intake of milk, and two-thirds of households consumed curd daily. Further, nearly 64% of the households consumed paneer or cottage cheese at least once a week. In India, tea with a small quantity of milk is a popular beverage which is consumed in almost every household irrespective of the SES. In addition to this, curd is an inseparable part of the meal in many parts of the country. This may explain the higher FVS for milk.

The FVS of vegetables and fruits was particularly low. The most commonly consumed vegetables on a daily basis were tomatoes, onions and potatoes. Many of the Indian curries and gravies have onion and tomato as the base. Potato is an integral part of cooking in several Indian households across the SES spectrum. The remaining

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**Table 2. Binary logistic regression of cereal, pulses, milk and meat FVS with family members and SES variables.**

| Variables       | Cereal FVS | Pulses FVS | Milk FVS | Meat FVSa |
|-----------------|------------|------------|----------|-----------|
|                 | B (SE)     | OR         | p        | B (SE)    | OR         | p        | B (SE)    | OR         | p        | B (SE)    | OR         | p        |
| Number of adults| 0.150 (0.064) | 1.161 | 0.020 | 0.999 (0.063) | 1.104 | 0.117 | 0.044 (0.063) | 1.045 | 0.483 | 0.047 (0.076) | 1.048 | 0.534 |
| Number of adolescents | 0.261 (0.151) | 1.298 | 0.084 | 0.228 (0.151) | 1.334 | 0.057 | 0.027 (0.150) | 1.316 | 0.067 | 0.303 (0.182) | 1.354 | 0.095 |
| SES score       | 0.020 (0.016) | 1.020 | 0.217 | -0.002 (0.016) | 0.998 | 0.998 | 0.039 (0.017) | 1.040 | 0.020 | -0.010 (0.020) | 0.990 | 0.616 |
| Availability of meat (1)b | - | - | - | -1.663 (0.650) | 0.190 | 0.011 |

B: unstandardized regression co-efficient; SE: standard error; OR: odds ratio.

aControlled for preference for non-vegetarian foods.

bAvailability of meat (0 = yes, 1 = no).
vegetables were consumed by 60–70% of the households. However, their frequency of consumption was not more than once a week. Likewise, the majority of the fruits were consumed in 75–80% of the households at least once a week.

Our findings of poor diet diversity resonate with those of previous studies. Gaiha et al. (2012) studied the diet quality of India between 1993 to 2009. They documented a drop in the urban consumption of cereals and pulses. Along with this, they observed a rise in the urban intake of milk and its products as well as fat. Kulkarni and Gokhale (2014) also noted that 90% of the participants had the lowest mean diversity for vegetables and fruits in higher socioeconomic areas of Mumbai. Likewise, Popkin et al. (2009) reviewed Indian diets and noted a rise in the availability and consumption of sugar. A recent survey among college students across India showed that about three-quarters of the participants had a poor dietary diversity score (Kumar et al., 2020).

Association of food availability and diet diversity

Our respondents reported 100% availability of all the food items except meat foods. Our analysis suggested that the non-availability of the meat food group resulted in significantly lower FVS. During the early days of the pandemic, there was immense uncertainty looming over the source of the coronavirus. Several reports on social media were suggestive that the virus did spread through animal markets and foods. Such reports adversely hit the availability and the sales of meat and its products. As a result, the local meat shops were closed in the study period (March to May) and opened in late June.

Although nearly one-third of our participants reported an increase in the price of fruits and vegetables, this did not seem to impact the diet diversity of these foods. As mentioned earlier, Kulkarni and Gokhale (2014) reported poor diversity of vegetables and fruits among urban Indians belonging to higher economic groups. This is much in line with our study.

Association of SES and diet diversity

The diversity of the diets consumed in households has been closely associated with the SES of the families. Studies carried out across the globe suggest that higher income and literacy levels were associated with greater FVS (Badari et al., 2012; Keding et al., 2012; Sonandi et al., 2017). Contrary to these findings, our current study indicated an inverse relationship between SES score and FVS of fat ($B = -0.062, <0.001$). In the present study, over 85% of the households were from the upper and upper-middle SES. The majority of head of households were graduates or had professional degrees. The higher socioeconomic groups are considered to be more health conscious. Obesity and other comorbid conditions have been known to increase the risk of complications of COVID-19. This could have been a
reason for the lower FVS for fat consumption in the upper and upper-middle SES households.

Further, a positive correlation was noted between the FVS for milk and milk products and SES. In India, milk is considered to be a wholesome food that promotes growth during childhood and adolescence. During the pandemic, milk with turmeric was being promoted as an immunity-building home remedy. Besides this, turmeric milk and curd have been integral immune-boosting foods in a traditional Indian diet. Curd, being a probiotic, plays a vital role in promoting healthy gut microbiota. In a study conducted in Tehran, Iran during the lockdown, personal savings, occupation status of the head of the family and number of educated members positively influenced the diet diversity (Pakravan-Charvadeh et al., 2021a, 2021b). These factors could probably explain the relation observed.

**Association of number of adults and diet diversity**

Regression analysis showed that the FVS of cereals, vegetables, fruits, fat and overall food groups was strongly associated with the number of adults in the family. Adults are one of the main consumers of food in the family. Thus, the more adults there are, the greater could be the variety of food consumed in households belonging to upper SES.

Studies conducted in Kenya, Uganda, Bangladesh and Iran during the lockdown reported an increase in food insecurity (Kansiime et al., 2021; Kundu et al., 2021; Pakravan-Charvadeh et al., 2021a, 2021b). Like India, all the mentioned nations are classified as developing economies. Unlike these studies, our study did not highlight food insecurity as a concern in urban India. The findings of the present study should be considered in the light of a few concerns. Firstly, owing to the restrictions imposed during the pandemic, we used convenience sampling. Secondly, we had to use electronic forms for collecting data. These forms were circulated via social media platforms. This restricted our participants to the upper-middle and upper SES. We were unable to include vulnerable groups such as below poverty line families, migrant workers and daily wage workers, who were impacted the most in our sample. As our participants were from the higher SES in urban areas, they did not experience any form of food insecurity. Despite this, it is alarming to find such poor diet diversity among the higher economic urban participants.

**Conclusions**

To the best of our knowledge, this is one of the earliest studies from India regarding household diet quality during the pandemic. Though the upper SES households of urban India did not face challenges related to food insecurity, their diets during the national lockdown were less diverse. Studies conducted prior to the pandemic suggest the same. The lockdown did not seem to impact the access and availability of essential food items except meat. However, poor diversity of the key food groups such as pulses, vegetables and fruits can adversely influence the nutritional status. Consumption of healthy diverse diets needs to be promoted more than ever before to enhance our nutritional status and immunity.

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**Authorship**

Mitravinda Aneesh and Rita S Patil contributed to the study conception, design, material preparation and data collection. Statistical analysis was performed by Mitravinda Aneesh. The manuscript was prepared by both the authors. Both the authors read and approved the final manuscript.

**Declaration of conflicting interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Ethical statement**

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**References**

Badari SAZ, Arcot J, Haron SA, et al. (2012) Food variety and dietary diversity scores to understand the food-intake pattern among selected Malaysian households. *Ecology of Food and Nutrition* 51(4): 265–299.

Cariappa AGA, Acharya KK, Adhav C, et al. (2020) Pandemic led food price anomalies and supply chain disruption: Evidence from COVID-19 incidence in India. ID 3680634, SSRN Scholarly Paper, 27 August. Rochester, NY: Social Science Research Network.

Choi M-K and Bae Y-J (2014) Evaluation of nutrient intake and food variety in Korean male adults according to Framingham Risk Score. *The Korean Journal of Food And Nutrition* 27(3): 484–494.

ETGovernment (2020) Opinion: Impact of Covid-19 pandemic on food security of India. *ETGovernment.com*, 19 July. Available at: https://government.economictimes.indiatimes.com/news/policy/opinion-impact-of-the-covid-19-pandemic-on-food-security-of-india/77048453 (accessed 20 October 2020).

Evans CEL, Hutchinson J, Christian MS, et al. (2018) Measures of low food variety and poor dietary quality in a cross-sectional study of London school children. *European Journal of Clinical Nutrition* 72(11): 1497–1505.
Gaiha R, Kaicker N, Imai K, et al. (2012) Dietary shift and diet quality in India: An analysis based on 50th, 61st and 66th rounds of NSS. ASARC Working Paper 2012/17. Available at: https://acde.crawford.anu.edu.au/publication/asarc-working-papers/8961/dietary-shift-and-diet-quality-india-analysis-based-50th-61st

Headey D and Ruel M (2020) The COVID-19 nutrition crisis: What to expect and how to protect. In: International Food Policy Research Institute Blog. Available at: https://www.ifpri.org/blog/covid-19-nutrition-crisis-what-expect-and-how-protect (accessed 1 October 2020).

Kansiime MK, Tambo JA, Mugambi I, et al. (2021) COVID-19 implications on household income and food security in Kenya and Uganda: Findings from a rapid assessment. World Development 137: 105199.

Keding GB, Msuya JM, Maass BL, et al. (2012) Relating dietary diversity and food variety scores to vegetable production and socio-economic status of women in rural Tanzania. Food Security 4(1): 129–140.

Kennedy G, Ballard T, Dop MC, et al. (2011) Guidelines for measuring household and individual dietary diversity. Report, Food and Agriculture Organization of the United Nations, Rome.

Kulkarni N and Gokhale C (2014) Vegetable and fruit diversity in an Indian community. International Journal of Food, Nutrition and Public Health 7(1): 13–24.

Kumar A, Ayub A, Roy R, et al. (2020) Assessment of diet diversity and eating pattern of undergraduate students: A pan India study. International Journal of Medicine and Public Health 10(1): 46–51.

Kundu S, Banna MHA, Sayeed A, et al. (2021) Determinants of household food security and dietary diversity during the COVID-19 pandemic in Bangladesh. Public Health Nutrition 24(5): 1079–1087.

Mohd Saleem S (2019) Modified Kuppuswamy socioeconomic scale updated for the year 2019. Indian Journal of Forensic and Community Medicine 6(1): 1–3.

Pakravan-Charvadeh MR, Mohammadi-Nasrabadi F, Gholamrezai S, et al. (2021a) The short-term effects of COVID-19 outbreak on dietary diversity and food security status of Iranian households (A case study in Tehran province). Journal of Cleaner Production 281: 124537.

Pakravan-Charvadeh MR, Savari M, Khan HA, et al. (2021b) Determinants of household vulnerability to food insecurity during COVID-19 lockdown in a mid-term period in Iran. Public Health Nutrition 24(7): 1–10.

Pathak P, Gope T and Bader N (2020) Effect of COVID-19 on public distribution system in India. International Journal of Community Medicine and Public Health 7(6): 2411–2415.

Popkin BM, Horton S, Kim S, et al. (2009) Trends in diet, nutritional status, and diet-related noncommunicable diseases in China and India: The economic costs of the nutrition transition. Nutrition Reviews 59(12): 379–390.

Rakshit B and Basistha D (2020) Can India stay immune enough to combat COVID-19 pandemic? An economic query. Journal of Public Affairs 20(4): 1–7.

Ray A (2020) Lockdown impact: 5 million salaried Indians lost their jobs in July, show data. Mint, 18 August. Available at: https://www.livemint.com/news/india/covid-19-five-million-salaried-people-lost-their-jobs-in-july-shows-cmie-data-11597752797552.html (accessed 19 September 2020).

Saraswathy (2020) 10.8 million and counting: Take a look at how many jobs Covid-19 has wiped out. Moneycontrol, 15 August. Available at: https://www.moneycontrol.com/news/business/economy/10-8-million-and-counting-take-a-look-at-how-many-jobs-covid-19-has-wiped-out-5704851.html (accessed 13 April 2021).

Sonandi A, Zwane EF and Niekerk JAV (2017) Feeding practices, food variety, and dietary diversity – indicators of nutritional status among historically disadvantaged agri-business families, South Africa. Journal of Nutrition and Food Security 2(4): 308–317.

Tata-Cornell Institute (2020) Pandemic prices: COVID-19 price shocks and their implications for nutrition security in India. 16 July. Tata-Cornell Institute. Available at: https://tci.cornell.edu/news/publications/pandemic-prices-covid-19-price-shocks-and-their-implications-for-nutrition-security-in-india/ (accessed 19 April 2021).

World Health Organization (2019) Archived: WHO Timeline – COVID-19. Available at: https://www.who.int/news/item/27-04-2020-who-timeline—covid-19 (accessed 24 October 2020).