

Impact of government policies on individual choices of food and potential impact on outcomes and nutrition among vulnerable population during COVID-19 pandemic in low- to middle-income country: Literature review

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Abstract

Corona Virus Disease 2019 (COVID-19) is a highly infectious disease which has affected almost all countries globally. The disease is caused by the corona virus, transmitted from human to human through droplet infection. The virus was first identified in China in December 2019, and spread worldwide. Despite the virus being highly infectious, there is no cure for coronavirus disease COVID-19. The current global approach in the fight against COVID-19 focuses on travel bans including border closures, restrictions on mass gatherings, and mass vaccination of all adults. However, the travel bans and border closures have shown to negatively affect availability, accessibility, and affordability of basic needs such as food, especially for populations in the low- to middle-income countries. This is so since a good percentage of population in low- to middle-income countries live on hand to mouth, and cannot afford adequate food stock to sustain them for a long period of time. In addition, there is a challenge to afford purchasing storage facilities such as refrigerators for storage of fresh foods. Therefore, the purpose of this narrative literature review is to unveil the impact of government policies on individual choices of food and potential impact on outcomes and nutrition in children, elderly and chronically ill individuals in the COVID-19 pandemic era in low- and middle-income countries from 2020 to 2021.

Keywords

Corona virus, COVID-19, food, nutrition, developing countries

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Definitions

Food availability entails the availability of sufficient quantities of food of appropriate quality, supplied through domestic production, or imports.¹

Food accessibility entails access by individuals to adequate resources for acquiring appropriate foods for a nutritious diet.¹ The vulnerable population here entails women, children, the elderly, and people living with conditions that lower the body's immunity such as diabetes, cancer, obesity, Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDs), and other non-communicable diseases.²

Low-income country entails countries with per capita Gross National Income (GNI) below \$1026.³ Middle-income

country entails countries with per capita Gross National Income (GNI) of US\$10,236–US\$12,535.³

Introduction

COVID-19 is one of the major public health challenges globally.⁴ COVID-19 is a disease caused by corona virus, type 2.⁴ The disease was first discovered in 2019 in China,

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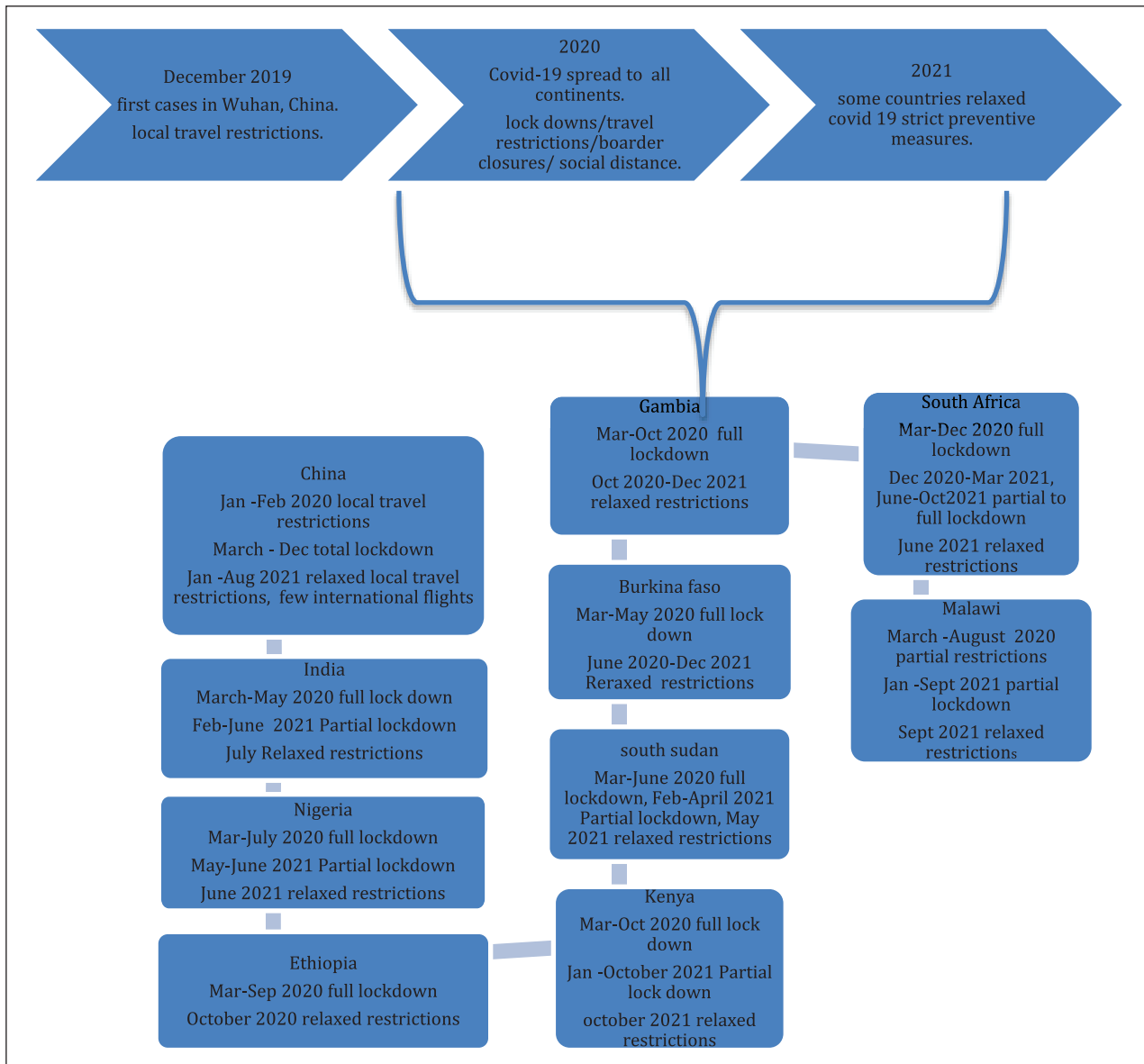


Figure 1. Timeline for COVID-19 preventive policies.

South-East Asia, which later spread worldwide.⁴ Since 2019 no cure has been discovered for COVID-19. Currently, preventive measures such as mass vaccination and travel restrictions are emphasized to fight the virus. This has affected many countries in terms of food accessibility and availability. Several studies have revealed disruption in food availability, affordability, and accessibility especially in developing countries.⁵⁻⁷ Such being the case, people cannot go out to buy food on daily basis, worse enough poor populations cannot afford to buy food in bulk to sustain them for a longer period. Eventually this may have negative effects on children's nutrition status, the elderly, and people living with chronic conditions.

Therefore, this literature review attempts to unveil the impact of government policies on individual choices of

foods, and potential impact on outcomes and nutrition among vulnerable population, that is, women, children, people with chronic conditions, and people in low social economic status amid COVID-19 pandemic. The review focuses on the impact from the period between December 2019 and December 2021 where countries in Africa and Asia were under lockdowns (Figure 1).

Methods

The contents of this literature review are based on the information collected through a literature review of available document most relevant to developing countries in Africa and Asia, in the light of COVID-19 and its negative impact on food availability and accessibility (see Table 1 in the

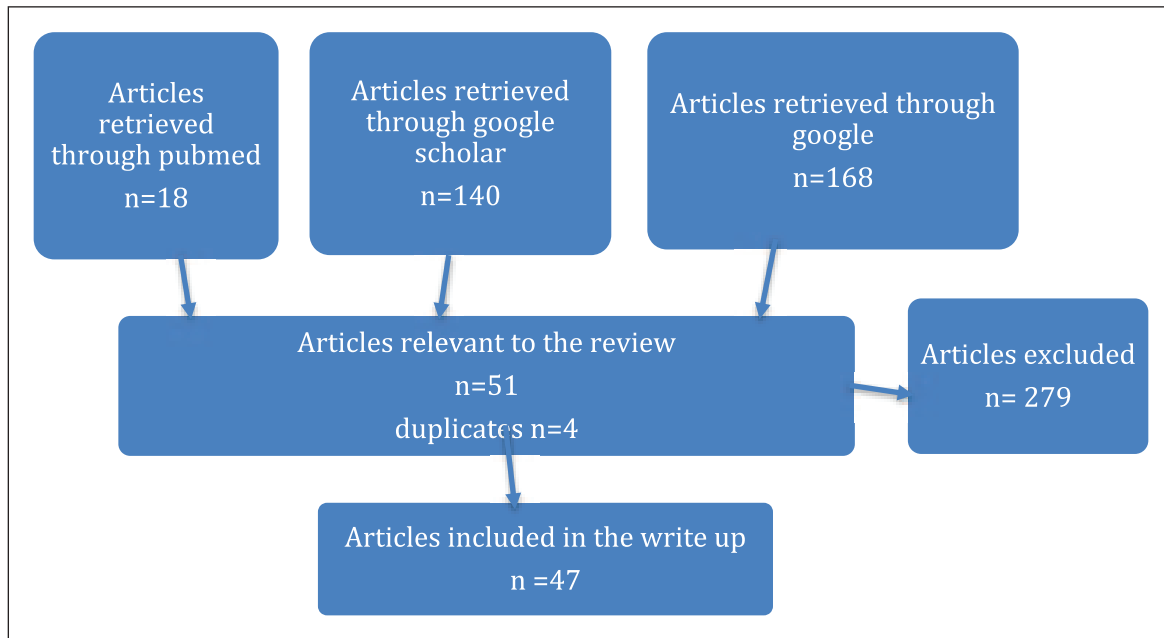


Figure 2. Flow diagram.

supplementary files). The papers included original research, review papers, and short articles. The papers extracted using PubMed, Google Scholar, and Google (see Figure 2). In PubMed, 18 papers were retrieved of which eight articles were included in the review. In Google scholar, 140 papers were retrieved of which 35 articles were included in the write up, and last but not least, in Google, 168 papers were retrieved and 4 articles were relevant. The search strategy was guided by the keywords which included the following:

COVID-19 AND food availability AND developing countries.

COVID-19 AND accessibility AND Developing countries.

COVID-19 OR food availability OR food accessibility AND developing countries.

COVID-19 OR corona virus 2019 AND food availability OR food accessibility AND developing countries.

General view of COVID-19 global impact

At the rate COVID-19 virus is spreading, the healthcare systems are overwhelmed, leading to poor service delivery. In addition, socio-economic development is negatively impacted at government level and population at large, thus leading to the development and implementation of new policies to curb the COVID-19 virus. Despite the positive outcomes of the policies, there is disruption in people's livelihood and this may have a negative impact on post-pandemic recovery.

Most developing countries will have to make major efforts to ensure economic recovery. However, there is no clear picture as to when the pandemic will be eradicated. Reaching this far, citizens are still losing jobs, businesses, companies closing, and high inflation levels globally.⁸⁻¹⁴ According to the International Labor Organization (ILO), there will be approximately 195 million job losses globally, while developing countries should expect at least US\$220 billion loss in income. Since mode of transmission is through human contact/droplets;⁸⁻¹⁰ hence minimizing contacts and gatherings to curb the pandemic.^{8,15} This has also led to global food shortage.^{16,17} In 2020, over 720 million people had food shortage, of which a large population is from developing countries in Asia and Africa.¹⁸⁻²⁰ According to the global network against food crisis, food shortage has approximately doubled due to COVID-19. This is due to the disruption of markets, lack of international trade, lowered travel, and mobility restrictions. These are going to impact people's ability to grow, buy, sell, or prepare the food they need to stay healthy.

Impact on children nutrition

Prior to the onset of this pandemic, approximately 820 million people already had food shortage, with 135 million in food crisis.²¹ The population affected with food shortage could rise due to COVID-19 pandemic.²² This may have a huge negative impact on the nutrition of children. Globally, 144 million and 47 million under-five children are wasted (severe weight loss) and stunted (too short for age), respectively,²³ for instance, in India, 35.5% of under-five children are underweight,²⁴ similarly, in Gambia, 18% of children are stunted, and 45% of under-five children are anemic.²⁵

Around 368 million schoolchildren are unable to get food from their schools as most schools are closed, hence affecting their nutrition as most depend on school feeding program.²⁶ For instance, in Gambia, 76.2% urban and 70.2% of rural children attend school,²⁵ with closures of schools most children will not benefit from the school feeding program, 31% of children in Gambia depend on school feeding program, this is one of the nutritious food for the children.²⁷ The program is beneficial to those children who are malnourished because their families cannot afford nutritious food required for their children's good health. Therefore, the closing of schools has a negative effect on nutrition of the school children. Globally, it is estimated that over 365 million children are not getting food from the school feeding program.²⁶ The impact is huge for children from poor families. Poor people spend most of their earnings on food, this is because the money they get is not enough to save or buy food in bulk.²⁸ With the coming in of COVID-19 pandemic, the restrictions in place, poor people are unable to maintain income streams.^{28,29} This may lead to poor nutrition due to alterations in income generating activities in several countries and food stock outs.²⁸ Hence, requiring global effort to curb nutrition disruption, especially increasing the number of children receiving nutrition assistance globally.³⁰ It is a major challenge in low-income countries where a huge population live in extreme poverty and some single parented homes. Most families rely on hand to mouth, being paid just enough to have food for the day.²⁹ Therefore, the imposed lockdown may affect the vulnerable population, which includes women and children.

Impact on geriatric nutrition and women

This food crisis has not left the general population including the elderly, as estimates project 265 million people are at risk of food shortages.³⁰ Females would be highly affected with food shortage and even displaced,²¹ especially female-headed households.³⁰ Hence, increasing gender-based violence (GBV) with acute food shortages.^{29,30} The other groups highly affected by the pandemic are elderly populations.^{31,32} The elderly includes people from the age of 60 years and above.³³ The elderly people have weak immunity and require healthy diet to fight infections such as COVID-19. In addition, the elderly persons are prone to chronic conditions such as diabetes, hypertension, and cancer.^{31,32} A study in India revealed that providing the elderly with healthy nutritious food improves nutritional status of an individual. Poor nutritional status influences mortality and co-morbidities in the elderly. The nutrition supplement provided to the elderly in Kerala reduced case fatality rate due to COVID-19 among the elderly. This entails buildup of immunity against COVID-19 with good nutrition status. Good nutrition may help to boost their immune system and minimize severity of coronavirus disease.³⁴

Nutrients that may impact COVID-19 outcomes

The policies/measures to prevent and control COVID-19 will contribute to food shortage/crisis especially nutritious food, yet nutrients play a huge role in the fight against infections including COVID-19 infection. The situation is critical in people with diet-related chronic medical conditions (e.g. obesity and diabetes type 2), as these people have higher risk of contracting the virus with high mortality rate.^{31,32} Therefore, this category of people requires adequate nutrients to prevent and recover from COVID-19. Consuming healthy foods increases the body's ability to fight against infections³⁵ including corona virus infection. However, the pandemic has reduced accessibility and availability of healthy foods across populations.³⁶ This has forced people to take unhealthy foods with long shelf life.³¹ Most of the long shelf life foods are highly processed with high sugar and fats content.³¹ Consumption of highly processed foods is associated with chronic conditions such as obesity and type 2 diabetes.³¹ These chronic conditions increase the risk and severity of COVID-19.³¹ In addition, Western Diet (WD) (food high in fat and sugar content) consumption alter the body's immune function, thereby reducing the immune reaction against the COVID-19.³¹ This further causes peripheral inflammation leading to psychiatric conditions for COVID-19 survivors,^{31,37,38} including high lung infection³⁹ due to the consumption of high-fat diet (HFD).⁴⁰ However, taking nutritious food filled with vitamins will boost the immune system which will aid in combating the virus.^{41–43} These foods include fruits and vegetables,⁴⁴ and these will minimize the risk of lower respiratory tract infections.⁴⁵ For instance, Isotretinoin a vitamin A derivative is a crucial host cellular protein required for the entry of SARS-COV-2 in the body.⁴⁶ Besides, supplementation with vitamins D and E may boost our resistance to COVID-19,⁴⁷ while the decrease in levels of vitamins D and E could lead to infection by coronavirus.⁴⁸ However, availability and accessibility of the healthy fresh foods rich in vitamins is a challenge with the restrictions in place. This has a negative impact on nutrition especially in people with compromised immunity, for example, diabetic patients.

Recommendations

There is a need to learn from other outbreaks to manage food crises in the era of COVID-19, especially since it is spreading rapidly worldwide and with uncertainties.⁴⁹ The effect of COVID-19 on food availability requires critical analysis. For instance, there some countries, which already have existing challenges especially developing countries, some have locust infestation, which affected their food production. Therefore, these food shortages affect the already weak immune system hence worsening the spread of COVID-19 and increasing its mortality rate.⁴⁹ If there are no tangible solutions to the

pandemic, the situation may get worse as supply and demand of food will go down due to sickness and strict restrictions. This will further force the population at large to go for non-nutritious food with high shelf life hence affecting supplies of other foods. This will lead to food inequalities and the less privileged will be highly affected.⁴⁹

There are measures put in place to curb the COVID-19 pandemic. However, these measures are affecting the availability of food.⁵⁰ This is so, because the food suppliers cannot travel from one place to another due to travel restrictions.⁵⁰ Even the workers are affected and cannot fend for their homes.⁵⁰ In addition, there is loss of products as the food is rotten due to decreased demand of food.⁵⁰ As such in urban set up, there is a challenge to get fresh healthy foods.⁵¹ In the long run, this may lead to diet-related chronic conditions. Let alone increased job loss due to illnesses and closure of markets leading to extreme poverty, especially in Sub-Saharan African (SSA) countries.⁵² In addition, SSA has been affected with other natural disasters such as floods and locust infestation worsening the food crisis.^{53,54} Developing countries are fighting double burden. Therefore, there is need to have lasting solutions that will cover all the burdens.

Nutritious food plays a huge role in the fight against several diseases. Therefore, promoting consumption of health foods may help in the fight against the pandemic. For instance, consumption of herbal and Chinese medicines such as ginseng help in the treatment of viral respiratory diseases like those due to strains of influenza.^{55,56} Since food plays a role in the fight against the virus, in Asia-Pacific region, the governments and partners put in place measures of ensuring continuous supply of health diets. These include protection of subsistence farmers; access of food to all including vulnerable population; ensuring good nutrition for infants, children, and mothers who are breastfeeding; proper management of wasted children and malnourished mothers.⁵⁷ Also, provision of micronutrient supplementation to pregnant women and children and school feeding program despite closure of schools with digital nutrition surveillance.⁵⁷ Opening schools will assist in food accessibility to the vulnerable children, and similarly, reducing the prices could allow poor families to get access to fresh fruits and vegetables.⁵⁸ In addition to that, restrictions on consumption of foods that contribute to overweight and obesity which worsen the effects of COVID-19 virus.⁵⁷

Some measures to reduce COVID-19 undesirable effects on nutrition include inclusion of diet experts in the fight against COVID-19. Second, strategize on reaching out populations in remote areas. In addition, provision of food packages for vulnerable populations. Not only that but also put-up surveillance system to ensure help is reached to the right population. In addition, reduction of prices for eggs, milk, and fortified infant cereals to be affordable for poor population. Establish a policy on COVID-19 in the line of food and nutrition. In addition, nutritional assistance and agricultural development programs that encourage diversification and

consumption of home-produced foods. The critical importance of feeding nutrient-dense foods to infants and young children, and for pregnant and breastfeeding women also justifies efforts to improve nutritional knowledge among both present and future caregivers.⁵⁸ Finally, yet importantly, conducting routine nutrition assessments and management in patients with COVID and those at high risk of contracting the virus.

Conclusion

The literature review reveals that most of developing countries are affected with the COVID-19 pandemic in terms of food availability and sustaining acceptable nutritional status. The literature review has identified several challenges such as inadequate food supply, accessibility of foodstuff among low social status population, high costs of food, nutritional value/content of food consumed, and marginalization of vulnerable population. COVID-19 has brought about disruption in all angles of human being's life and health, largely the availability of food and nutrition to the population at large. Countries are struggling to meet nutritional demands, worse enough developing or low- to middle-income countries (LMICs). This problem requires collective efforts from every individual, and all stakeholders.

Limitations

The challenges with the methodology would lead to missing important papers or articles which are relevant to the topic. In addition, without data analysis, it is not carrying weight and inadequate reporting of pertinent issues considering that COVID-19 is a new condition or disease.

Lessons learnt from the literature review

Despite the significant number of published resources, the literature review has identified several gaps in the available information. The world needs to work in unity to combat the undesirable COVID-19 effects on vulnerable populations. Health food is expensive, hence inaccessible, and not affordable for low social class population.

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Author contribution

The author collected literature from various studies and put in manuscript form.

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Supplemental material

Supplemental material for this article is available online.

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