Nutrition in Times of Crisis: A Qualitative Study in Siargao Island, Philippines, during the COVID-19 Pandemic

Gideon Lasco, MD, PhD,[1,2] Vincen Gregory Yu, MD,[2,3] Julie Madelo Compra,[4] Phetdavanh Leuangvilay,[5] Rapeepong Suphanchaimat,[6,7] Yunting Zhang[8] and Charina Javier[9]

[1]*Department of Anthropology, University of the Philippines Diliman, Quezon City, Philippines*
[2]*Development Studies Program, Ateneo de Manila University, Quezon City, Philippines*
[3]*Social Medicine Unit, University of the Philippines College of Medicine, Manila, Philippines*
[4]*Surigao State College of Technology – Del Carmen Campus, Siargao Island, Surigao del Norte, Philippines*
[5]*Equity Initiative, Bangkok, Thailand*
[6]*International Health Policy Program, Ministry of Public Health, Nonthaburi, Thailand*
[7]*Department of Disease Control, Ministry of Public Health, Nonthaburi, Thailand*
[8]*Child Health Advocacy Institute, Shanghai Children's Medical Center, Shanghai Jiao Tong University School of Medicine, Shanghai, China*
[9]*Food and Nutrition Research Institute, Department of Science and Technology, Taguig, Philippines*

ABSTRACT

Objectives. Despite the public-health significance of both malnutrition and crises, little has been done to explore the convergence of the two domains and develop ways to improve policies and practices, especially in rural communities. This article remedies that knowledge gap by focusing on nutrition-related changes, responses, and practices during crisis situations in Siargao Island, Philippines, using the COVID-19 pandemic as a backdrop.

Methods. Forty-six (46) semi-structured interviews were conducted among parents, caregivers, local health workers, and local officials of Del Carmen, Siargao Island. Principles of thematic analysis were applied to data analysis using NVivo 12. Afterwards, the preliminary data were presented in a virtual validation session with the local community and stakeholders.

Results. Despite the high prevalence of malnutrition amid a backdrop of economic and nutritional difficulties, the community members generally viewed their children as healthy. Rice remained (disproportionately) central to people's diets; possible alternatives like root crops were considered emergency foods *only* and not *culturally acceptable* as staples, in spite of their cheap and ubiquitous nature. Lastly, the economic and financial repercussions of the COVID-19 pandemic have also negatively affected the community members' overall nutrition and food sources.

Conclusion. More efforts should be directed toward encouraging the consumption of root vegetables and fruits as rice alternatives in everyday diet—a cost-effective strategy that would also promote dietary diversification. More importantly, nutrition responses should consider local food systems in terms of specific local economies and geographies, while health promotion efforts should engage with local notions of 'health' and 'nutrition' and encourage community participation in (re)designing policy interventions.

Keywords: Nutrition, public health, rice, root crops, Siargao Island, COVID-19

eISSN 2094-9278 (Online)
Published: May 29, 2023
https://doi.org/10.47895/amp.vi0.4963

Corresponding author: Gideon Lasco, MD, PhD
Department of Anthropology
University of the Philippines Diliman
Diliman, Quezon City 1101, Metro Manila, Philippines
Email: pdlasco@up.edu.ph
ORCiD: https://orcid.org/0000-0002-6402-682X

INTRODUCTION

Child malnutrition continues to be a significant problem for global health equity, undermining arguably the most critical period of human development.[1] Recent estimates indicate that about 250 million children under five years of age in low- and middle-income countries suffer from some form of malnutrition and are at risk of not reaching their full developmental potential.[2] In Southeast Asia, the latest statistics show that 27 percent of children in that age group are stunted.[3] These figures should be cause for alarm, given that nutritional problems during childhood can lead to lasting effects on long-term health, productivity, and socio-economic success.[4]

Stunting and wasting among children—the chronic and acute manifestations of malnutrition, respectively—are attributed mainly to poor dietary intake and severe disease conditions.[5] Consequently, these factors have been the major targets of nutrition programs.[6,7] A possible overlooked factor affecting malnutrition, however, is crisis—Southeast Asian and Philippine settings have always been rife with natural and manmade disasters, from typhoons and earthquakes to armed conflicts and forced community evacuations. The COVID-19 pandemic has only exacerbated the existing inequities of this status quo, this once-in-a-generation pandemic placing "malnourished children at an ever-high risk of death and – for the children who survive – poor growth, development and learning."[8]

Despite the public-health significance of both malnutrition and crises, little has been done to explore the convergence of the two domains in order to develop better policies and improve current practices. International organizations may have written documents or formulated plans of action that discuss nutrition management in emergency situations,[9] but they hardly provide localizing 'documents' that account for community-specific contexts. This gap in guidance is particularly salient for poor and marginalized communities, which have been inequitably impacted by both malnutrition and crises, including the COVID-19 pandemic.

In the Philippines, where over 30 percent of children under five years old are affected by stunting and over five percent suffer from wasting,[10] the Philippine Plan of Action for Nutrition 2017-2022 identifies several problem areas that need to be addressed by nutrition programs, including in terms of pregnant women's health and exclusive breastfeeding—but somehow fails to account for nutrition management during crisis situations.[11] Besides that, two policies currently exist that provide nutrition guidance in times of emergencies: the National Policy on Nutrition Management in Emergencies and Disasters, which streamlines the standards and guidelines on appropriate nutrition interventions by identifying agency involvement and bases for nutrition planning and evaluation; and Republic Act 10121, which strengthens the Philippine Disaster Risk Reduction and Management System and the Department of Health Personnel Order 2007-2492 that created the "Health Cluster with Sub-clusters on Nutrition, Wash, and Health.[12,13] However, these policies have been designed mainly for disasters that the country has long dealt with, such as typhoons, earthquakes, and armed conflicts, where—unlike the pandemic—the temporal patterns and phases have become somehow predictable for authorities.

It is crucial to recognize the negative synergy between crises and malnutrition: Crisis situations can lead to, or exacerbate, malnutrition; at the same time, malnutrition can render communities more vulnerable to the impacts of crisis situations.[14] Disasters can deplete people's financial resources and cut them off from food supply chains, exposing them to food insecurity and situating them in nutritionally vulnerable states that would affect how they cope with future disasters. Moreover, political insurgency, religious conflicts, and inequitable state measures (for instance, sweeping policies against undocumented migrant children in certain countries) can result in crisis situations that last much longer than natural disasters. The pandemic has starkly rendered this synergy in the Philippines: According to the Rapid Nutrition Assessment Survey (RNAS) conducted in November 2020 by the Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI), food insecurity shot up by as much as 24 points in RNAS areas during the pandemic's first nine months, with over 50 percent of households reporting difficulty in accessing food during the protracted community quarantines.[15] The implication, then, is that COVID-related responses have somehow aggravated people's already-limited access to food—and therefore worsened malnutrition in the country, making people more susceptible not only to the coronavirus but also to nutrition-related illnesses.

Study Objectives

This article seeks to attend to those concerns by focusing on nutrition-related changes, responses, and practices during crisis situations in a rural town in Siargao Island, Philippines. Specifically, it stems from a research project that aimed to accomplish the following objectives: (1) to document family- and community-level nutrition-related responses during the COVID-19 pandemic in the municipality of Del Carmen, Siargao Island; (2) to identify the nutrition-related practices of local citizens during crisis situations, as well as the barriers and facilitators to the success of such practices; and (3) to offer recommendations that can lead to a 'nutrition resilience plan' for the local community, based on an analysis of the study's findings and the input of relevant stakeholders. If, despite the ever-changing or worsening conditions brought about by the pandemic, communities have somehow not given up and are in fact continuing to reorient their lives to adjust to the pandemic's 'new normal', what, then, can we learn from their responses and new-found best practices, from medical, nutritional, agricultural, political, and social perspectives?

METHODS

This article draws on qualitative fieldwork conducted in the municipality of Del Carmen in Siargao Island, Philippines, from August 2020 to June 2021. Siargao Island, off the northeastern coast of Surigao del Norte in Mindanao, was selected as the study site because of the following reasons: first, its vulnerability to natural disasters, particularly typhoons, given its location along the country's eastern geographical edge where typhoons entering from the Pacific Ocean would first make landfall; second, its rural setting, considering that rural Philippine towns have been documented to have higher rates of food-insecure households, with children consuming less diverse diets, than urban settlements[16]; and third, its reliance on a tourism-driven economy that witnessed a rapid and unforeseen shutdown at the start of the pandemic, adding a layer of economic vulnerability to the community. Situated on the western side of the island, Del Carmen has a population of a little over 20,000 people (as per the 2020 census) and is home to the island's airport.[17]

The fieldwork entailed semi-structured interviews (n=46) with community members closely involved in matters of child nutrition. The research team, which included one local community member, was composed of practitioners in the fields of public health, health policy, medical anthropology, nutrition, agriculture, and child advocacy. Because of unpredictable COVID-19 mobility restrictions, the interviews were all conducted by the team member who was based in the study site. This team member was also responsible for identifying the initial participants and purposively selecting individuals who had children, or worked with children or child-related community issues; in other words, parents from all economic and working backgrounds, local health workers, and local (health) officials. Subsequent participant recruitment relied on peer referrals. Data saturation determined the final sample size.

The interviews touched on four main topics: first, parents and community members' perceptions of good health and good nutrition, including their ideas of anthropometrics and in reference to children; second, the interviewees' lived experiences with regards to food and nutrition; third, their experiences with food insecurity in times of crisis, especially during the pandemic; and lastly, their experiences with the local health system, including in terms of child-related and nutrition programs. The interview guide questions were formulated by consensus among the research team members, but the actual interviews adopted an open-ended format.

The interviews were primarily conducted in Surigaonon. Given the time and mobility constraints, the interviews usually lasted around 20-30 minutes, limiting the discussions to cover mostly just the topics mentioned above. The audio recordings were then translated, transcribed, and collated in an NVivo 12 database. Data analysis used the principles of thematic analysis, with researchers independently reading and coding the transcripts and agreeing on themes by consensus. Afterwards, the preliminary data were presented in a virtual validation session with the local community and stakeholders. Ethics approval was obtained from the University of the Philippines Diliman Interim Research Ethics Board. COVID-19-related health protocols were strictly followed throughout the conduct of the research.

RESULTS

We interviewed a total of 46 individuals living in Del Carmen. Because our method of participant recruitment relied on peer referrals, most of our interviewees came from similar socioeconomic backgrounds, belonging to low-income, rural communities typical of Siargao. Fifteen interviewees (15) worked as farmers, five (5) were fisherfolk, and 13 were women who identified primarily as housewives, stay-at-home mothers, or homemakers. Among these homemakers, five (5) were the wives of fishermen, two (2) of farmers, and the rest of men who were neither (i.e., carpenters, water filling station employees, owners or employees of small- and medium-sized enterprises). A further five (5) of our interviewees were mothers who were also neither farmers nor fisherfolk, working as bank employees or in the informal economy as market vendors. Lastly, eight (8) participants could be considered community health workers, identifying as barangay health workers, nutrition scholars, public health nurses, or local health officials.

Based on our interviews, we present three major themes in this section. The first addresses general notions of child health and nutrition. The second relates to the nutritional profile of the community and the eating practices of the people. The third gathers people's experiences of the COVID-19 pandemic and how it has affected child and overall nutrition in the community.

People generally consider their children as healthy and well-nourished

Good health, according to our participants, is expressed four ways. First, it can be judged based on the frequency with which individuals fall ill. For this reason, our participants generally view their children as healthy because they rarely get sick, if at all. In the words of Rody, a 51-year-old fisherman, "I base [my family's good health] on how we seldom get sick." When they do get sick, "it is usually just cough and colds" that are manageable with herbal remedies, to quote Belen, a 62-year-old farmer's widow. Nelly, a bank teller, also shared similar insight: Asked to rate her children's health, she gave a score of 8 out of 10, saying, "It's not like they are sick. It is normal when somebody catches a fever, [but most of the time], their bodies are okay."

In conjunction, good health is also based on observable attributes or behavior. Specifically, majority of our participants described 'healthy' children as mainly the ones who are physically active or energetic. Regarding how the body looks like, our participants gave varying responses:

Some said healthy children are those who do not look thin; they have to be at least fleshy, if not outright plump. This was contradicted by others who said that thin children can also be healthy as long as they are alert, lively, and energetic; and who said that heavier children can also be timid or unenergetic, and therefore unhealthy.

Third, good health is expressed as a consequence of one's environment. Thus, some of our participants believe their children are healthy because of the rural, island environment that lets them breathe fresh air and allows them to be physically active. Perla, a 33-year-old housewife, said that, compared to children from urban areas, the children in the community have "stronger immune systems" because they "spend a lot of their time outdoors"; Mercy, a 34-year-old farmer, believed children in the city are "sickly because of the air they breathe."

Fourth, and most significantly, good health is expressed in terms of nutrition. The kind of food a child consumes matters to our participants: In general, those who eat vegetables, fruits, and seafood are supposed to be healthier than those who eat meat and junk food more frequently. But to be more precise, comparing the children in the community with those from urban areas, our participants differ in their views on what constitutes a 'healthy' child based on the *quantity* and *quality* of food the child consumes.

Some of our participants perceive children in the city as healthier because they supposedly belong to more financially well-off families who could readily provide for a range of food options, from meat to fruits to vitamin supplements. For example, Linda, a 57-year-old widowed housewife, said the families of children in the city "have work and can thus buy eggs and fruits" in contrast to the children in the community, whose parents are either unemployed or "rely on fishing and farming" for income—and whose food consists mainly of rice and root crops.

However, most of our participants agree that children in the community are healthier because, compared to their urban counterparts, they get to eat food that are of better quality—and therefore more nutritious. Helen, a barangay councilor, said that while "kids who grew up in the city can easily buy fruits and high-quality vitamins… the [children] here are healthier [because] we have vegetables that are organic and freshly produced." Elmer, a 63-year-old farmer, echoed similar sentiments, saying that "vegetables here are fresh," as compared to the ones in the city which contain "chemicals so they don't spoil easily." And as Rody saw it, "In the city, [children] usually eat meat rather than vegetables. That's why they are more prone to catching diseases."

Moreover, the amount of food one consumes apparently matters as well: In the words of Judy, a vegetable vendor, children in the community are healthier because they eat only "just the right amount" at meal times, compared to city kids who tend to consume "excessive" food during each meal. Separately, Terry, a housewife, put it this way: From a scale of 1 to 10, she would rate her children's health at an 8 or 9, and not a perfect 10, because "I cannot really say if [my children] will like the food at mealtime. If they like it, then they will eat a lot."

Rice remains (disproportionately) central to people's diets

Rice continues to be the *sine qua non* of our participants' and their families' diets. We first observed its essential nature in our participants' responses on their usual food during meal times: While they provided a variety of answers, down to the specific kinds of fish and vegetables, almost all of them did not mention rice. Rody, for example, defined a balanced meal as one that includes "fish, vegetables, eggs, and minimal meat"; his response notably excluded any mention of rice. In this way, for our participants, the presence of rice in a meal appears to be implicit, a given. This interpretation can be corroborated through the few other answers to the same question that did mention rice. For example, Roberto, a 66-year-old farmer, immediately responded, "Of course, rice." Mario, a 29-year-old farmer, was more declarative: While his family seldom ate meat or vegetable dishes, "we always have rice." Ana, a 41-year-old housewife, even framed her family's relative prosperity as such: "Yes, there is always plenty [to eat]. We have leftover rice most of the time."

Hardship is likewise expressed in terms of access—or lack thereof—to rice. Elmer, for one, said that, whenever he has sufficient money, his priority is always to buy rice, apart from sweet potatoes and bananas. Similarly, Larry, an elderly farmer and the breadwinner for his grandchildren, framed his relative poverty as such: "My earnings are [usually] only enough to buy rice. If I do not earn enough, then we cannot buy rice." Domeng, another farmer, shared that sometimes his family would even have only rice for a meal.

In fact, when we probed about their experiences during the COVID-19 pandemic—a topic that we expound upon further in this article—our participants had one prominently recurring thread of responses: their determination to afford rice at all costs. To do so, they have two common resorts. The first is borrowing money just to be able to afford rice. Janet, a 48-year-old mother, said that she could always "borrow from my sibling so I can afford a sack of rice." Ondette, a local bank employee, was more definite: "If we run out of rice, the only solution is to take out a loan." The second and more common resort is selling other food stuff, mainly agricultural products that our participants themselves grow in the community, in order to acquire money that is then used to buy rice. For example, Fe, a middle-aged mother, sold the sweet potatoes (*kamote*) she grew in the family backyard; while Larry sold his crop of cassava (*kalibre*).

Government and community aid during the pandemic have also been gauged in terms of the amount of rice received. This is not to say that the aid has comprised mostly of rice—our interviews prevent us from arriving at this generalization—but rather, that rice appears to be a determinant of our participants' satisfaction (or dissatisfaction) with the aid

received. For instance, Janet claimed that throughout the pandemic, the bulk of aid has been in the form of varying amounts of rice: "Sometimes the government gives us three kilos; the most they gave us was five." Sonia, another middle-aged mother, also noted that in her community, "we received just two kilos of rice," compared to other places that allegedly received sack-loads per family.

In exploring our participants' pandemic experiences, as well as their experiences with past food crises, we also gleaned the significance of (root) vegetables and fruits as hidden, ostensibly emergency resources. To the question of whether or not they have ever experienced hunger (or not having anything to eat) recently, almost all of our participants answered in the negative. These set of participants said that in the community, there is always something to eat: the readily available root crops like sweet potato, cassava, and taro; fruits like bananas, jackfruit, and squash; and green, leafy vegetables like Malabar spinach (*alugbati*) and water spinach (*kangkong*), that thrive in their own, their neighbor's, or other family members' backyards. The few who perceived themselves to have experienced hunger nonetheless clarified that such a predicament was quickly resolved by resorting, even if at times reluctantly, to the aforementioned food options.

It is noteworthy, however, that our participants do not recognize subsisting mainly on those alternatives to rice as an ideal state. To them, consuming such foods as staples are for emergency situations only. For as long as they can buy rice, our participants will not resort to these substitutes as a staple, despite their readily available nature, and even if relying on these 'cost-free' substitutes would allow them to allocate more resources toward buying other choices like meat, citrus fruits, or seafood. Furthermore, although majority of our participants recognize these potential substitutes as healthy and nutritious, a few of them believe that root crops can be unhealthy for certain populations. According to Domeng, "As we get older, eating *duma* (root crops) regularly will make us sick. It will lead to an upset stomach and diarrhea. If we eat *duma* during old age, we should mix it with rice." In contrast, Tonio, another middle-aged farmer, said cassava is bad for children "because they will not be able to digest it easily" and will lead to symptoms of indigestion. Thus, parents would refrain from feeding their children root crops too frequently.

The COVID-19 pandemic has affected the community financially and nutritionally

As hinted at earlier, the pandemic has had a negative impact on the community. It has disrupted people's livelihoods, including access to food resources, and consequently diminished their already-limited financial capacity to purchase food and other daily necessities.

To be clear, we did receive some optimistic responses on pandemic-related questions. For example, Jose, a farmer and barangay health worker, summarized his experiences thus far as such: "We have always managed. God does not let his children starve." Such responses, however, were a distinct minority. For the vast majority of our participants, the pandemic has had a detrimental effect on their nutrition, their responses expressed in terms of what they could afford to buy with their money and how many times a day they could afford to eat—and, as in the previous section, also often expressed in terms of access to rice. Curiously enough, our participants did not express this effect on their nutrition in terms of them or their children becoming 'less healthy' compared to pre-pandemic times. These responses are best exemplified by the words of Kristine, a housewife married to a fisherman: "The biggest problem has been food. Life is very hard now. We do not have [enough] money to buy rice. Sometimes we eat only once a day; sometimes, not at all because we really do not have money."

On the one hand, the shutdown of unnecessary travel has meant a drastic plunge on tourism that previously served as a major source of income for the island community. Gemma, a fruit and vegetable vendor, said that prior to the pandemic, tourists from General Luna—unofficially the island's tourism base—could easily reach her barangay and buy the items she sold; now, without tourists, her income has dipped significantly, which has meant eating fewer meals a day and prioritizing what to buy with less money. "Before the pandemic," she said, "we always had abundant food. We even ate multiple snacks a day. Now, being able to have three meals a day is a luxury."

But COVID-19 restrictions have also prevented people from engaging in livelihoods unrelated to tourism—and which were their primary, if not the only, source of income. According to Rody, he and other fishermen in the community have been forced to fish only in areas closer to shore or to their respective barangays. Mobility restrictions have prevented them from fishing for longer hours and farther from shore, where there is more fish. On top of that, whenever he goes fishing, there is also the added apprehension that he might end up in violation of a lockdown rule; for him, fishing—his life's trade—now feels "unsafe" because it is, in many aspects, "prohibited." Terry, whose husband is a fisherman, concurred: At the start of the pandemic, she said, authorities even arrested people simply for fishing in areas that were supposedly outside their barangay's jurisdiction based on the newly instated lockdown rules.

Mobility restrictions have likewise impacted those whose trade depended on land travel, as in the cases of Jane, whose family business is selling seafood ("We can no longer transport crabs [easily], so we stopped buying crabs altogether"); and Elmer, a 63-year-old farmer ("Even if I want to sell my crops, I am prohibited from traveling far, so sometimes I do not have money to buy rice for my family). These restrictions—intended, among other things, to limit the movement of children and the elderly—have also affected those with otherwise ample resources. Ging, a 77-year-old villager who cares for several grandchildren, said that, throughout the pandemic, "I have sufficient money to buy rice and food so that my family can eat better, but I cannot

travel." Thus, she has had to "make do with the vegetables we planted."

Such a turn toward self-sufficiency, as noted in previous paragraphs, has been adopted by many other participants. Precisely because of the pandemic's family- and community-level disruptions, Kristine, for example, shared that her family "has started planting vegetables." For some community members, those disruptions have also meant consuming the very crops that they would have otherwise sold at market in pre-pandemic times, as in the case of Ferdie, who is married to a farmer: "My husband could earn PHP 700 a day from selling our vegetables, allowing us to buy food. But lately, we have had to consume those very vegetables because our income has not been enough to buy food." For others, however, this manner of self-sufficiency is neither financially viable nor physically possible. Gemma, for instance, mentioned how seedlings necessary to start one's own fruit and vegetable garden "are becoming quite expensive and unaffordable; [my family] uses the available money to buy food instead." Maria, a 27-year-old fisherwoman, said that, to begin with, her family does not even own land "where we can plant"; they have instead resorted to buying vegetables "from stores that offer them for cheap."

In the end, the pandemic's impact on people's sources of income and access to food has also translated to a detrimental effect on their participation in pandemic responses—in terms of getting tested and/or treated for COVID-19, or simply even getting checked for other health issues. For our participants, COVID-19 testing—and the mandatory quarantine that comes with testing positive—can mean losing the opportunity to work and earn in order to feed themselves and their loved ones. Terry said her family, as well as people they knew, now refrain from having even a simple cough checked at the rural health center: "[The health workers] might diagnose us as COVID-positive, even if it is just an ordinary cough. So, it is risky to go. If we get diagnosed, we might get quarantined." Gemma, on the other hand, said that, with her family's income diminished, they have had to funnel their money toward buying food and forego other needs—like seeking professional health care in times of illness—that would have been deemed necessary in more prosperous times. "Now, if someone gets sick," she said, "we just resort to massage therapy or herbal medicine. What is the point of getting ourselves treated [at the hospital] if we cannot even put food on our tables?"

DISCUSSION

Parental versus medical assessments of children's health

Our findings regarding parental perceptions of what constitutes 'good health' and 'good nutrition' resonate with the global literature showing how parents and caregivers can evaluate a child's 'health' and 'nutrition' in ways that may not necessarily align with biomedically accepted parameters and definitions.[18] These parental perceptions are themselves informed by myriad factors, from media consumption and social pressures to culturally inherited knowledge.[18] Although the task of identifying specific, underlying factors for such perceptions is beyond the scope of this study, recognizing the implications of the views and beliefs held by parents as regards their children's health and nutrition is nonetheless imperative. Be it in the Philippines or elsewhere, studies have long established that feeding practices instilled by parents during the formative years are consequential in shaping children's eventual eating behavior, healthy or otherwise.[19-21] Such behavior would then impact the major domains of life like educational performance and actual, biomedical health—and could very well determine the outcomes and successes of a child's life.[20,21] In the case of child nutrition, the quantity and quality of food, especially in terms of dietary diversity, have been shown to affect nutritional outcomes, such that children who consume less diverse diets are more likely to end up stunted and/or underweight.[22]

The challenge posed by our findings, then, is in reconciling the health- and nutrition-related beliefs of people in the communities with the existing scientific paradigm. In this, the centrality of 'nutritional wisdom' cannot be overstated: Why children eat what they eat—which largely determines how healthy or unhealthy they are—can also be partly traced to longstanding cultural notions of which foods are nutritious and which ones are not.[23] Our study, for instance, sheds light on the belief that the regular consumption of root crops, despite their scientifically recognized nutritional advantages, will supposedly cause digestive problems among children and the elderly. Parallel to this is the widespread, continuing high regard for rice, its expected presence in every major meal the result of historical, structural, and socioeconomic factors,[24] even as the regular consumption of white rice has also been linked to an increased risk of developing type 2 diabetes[25], which remains a disease of profound significance in the Philippines.[26]

All this goes to illustrate the prevailing difficulty of addressing malnutrition in the country. While local governments and nutrition officials alike may register a certain community as having a high prevalence of malnutrition, the people in those communities may not even recognize malnutrition as a problem. And if they do arrive at such a recognition, it may not even be through scientific terms, but instead, through their own kept notions of 'good health' and 'good nutrition'—rendering futile any purely biomedical approach to a problem that is in fact also cultural in nature.

Root vegetables and fruits: Widely available but not culturally acceptable as staples

The resort to root crops and other non-rice staples in times of crisis is not a phenomenon unique to Siargao. On the one hand, it has been documented in times of reoccurring crisis: People in Batangas, for example, would "reinvent" sweet potato into a replacement for rice during monsoon

season in the Philippines—a trend that has also been noted in Eastern Visayas, where "root and tuber crops are alternative food to rice, usually harvested only in particular months" such as those that fall under typhoon season.[27,28] On the other hand, this phenomenon has also been documented in times of unique or unexpected crisis, as with the 1990 earthquake in Benguet,[29] or the COVID-19 pandemic in other rural areas of the country, to go by the emerging local literature on the provinces of Capiz, Quezon, and Samar.[30-32] In both kinds of crisis, the existing literature has consistently noted people's specific perception of root crops as emergency food *only*—as rice substitutes, or even as "*pantawid-gutom*," food consumed to "overcome hunger" in times of hardship.[28]

This is all in spite of the central, historical role that root crops have occupied in the country's food systems across varying geographies, from the mountainous settlements of the Cordillera to the upland communities of Bicol, the coastal areas of the Southern Tagalog region, and the highlands of Northern Mindanao.[27,33-35] This is also despite the traditional recognition of the economic, climate-related, and to a lesser extent, nutritional, advantages of planting and consuming root crops, particularly for disaster-prone areas: Cassava, for example, takes only three months to mature and is widely regarded as a convenient crop to harvest "especially in times of typhoon and drought."[28]

Some anthropologists have proposed that the non-adoption of root crops as a staple is in part due to their perceived inferiority, which can explain why appeals to their economic and nutritional values may not resonate with many, modern-day communities.[36,37] In contrast, rice has been largely regarded as a "prestige food" since pre-colonial times, "a marker of stratification and social inequality."[24] In some areas, it is even considered a cultural 'heirloom' demanding to be preserved and patronized.[38] Ostensibly adhering to this social dimension, evolving food consumption practices that have attempted a departure from rice as a staple have instead found other carbohydrate replacements such as bread and noodles.[24] The result is that, even among strongholds of traditional knowledge, root crops are no longer as present in daily diets, and the knowledge of how to cultivate, harvest, and cook these foods is slowly being lost among younger generations.[39]

Besides reconciling traditional and biomedical notions of what constitutes 'good health' and 'nutritious food', then, the larger anthropologic project would also involve untangling people's culturally inherited notions of what foods are supposed to be consumed during which occasions (e.g., of conflict, of disaster)—as well as unpacking people's perceptions of class and social standing as regards the food they consume.

COVID-19 and local (food) systems

Finally, our findings also resonate with the emerging regional literature demonstrating COVID-19's detrimental impact on food systems.[40,41] Specifically, we see the pandemic's disruptive, snowball effect on people's lives: how economic shutdowns effectively cut people off from their sources of income, forcing them to realign their meager budgets to accommodate only the bare minimum in terms of food—resulting, most of the time, in people making budgetary compromises that put their nutrition at a disadvantage. Because such nutritional compromises among food-insecure people inevitably result to poorer health outcomes,[42] our study only emphasizes the need to focus both scholarly attention and policy intervention toward communities that have been marginalized further by the pandemic.

In relation to this, there is also a need to rethink our local food systems and consider their systemic vulnerabilities in terms of specific economic contexts. In the case of Siargao, this means scrutinizing the pandemic's marginalizing impact in the context of its tourism-driven economy. Around the world, local communities that rely on tourism as their major source of income have been shown to be particularly malleable to changes—whether for better or for worse—brought about by the market's seasonal and outsider-driven nature.[43,44] A study on two Costa Rican tourist towns further concludes that, at a baseline (in this case, pre-pandemic times), locals of such towns are already at an economic disadvantage, their spending capacities incomparable to those of tourists.[44] Our study demonstrates the pandemic's compounding effect on this already-inequitable status quo in Siargao. Imposed upon the island, mobility restrictions that were part of blanket guidelines issued by national government effectively deprived the island of its primary source of income *while* also curtailing the locals' already-limited financial capacities from within. The urgent implication, then, lies in the plans for economic reopening now being championed by the national government: With local communities currently in tight financial states, a rash and unplanned reopening might prove disastrous for the island, as the influx of tourists leads to price inflation that local spending capacities might simply be unable to catch up with. This, in the end, would spell more families unable to buy enough food, let alone nutritious food, to feed their members—translating to poorer long-term health outcomes for children and adults alike.

Additionally, our findings also highlight the salience of eliciting the particular weaknesses—and therefore the needs—of specific geographic communities *within* the context of a larger community ecosystem. In the case of Siargao, our interviews show variations not only in the manifestations of people's coping mechanisms as regards their food sources, but also in the possibility of such mechanisms coming to fruition to begin with. For example, while citizens residing in inland, agrarian communities can easily grow their own crops for emergency food, those from coastal communities who are neither farmers nor landowners cannot even have an easily viable path toward such manner of self-sufficiency. Moreover, our participants' perceptions regarding the supposed differences between the diet of children in urban and rural areas actually resonate with previous studies

in the Philippines showing how rural families tend to have fewer food options, relying more on limited, local agricultural products, and as a result, consume less diverse diets and experience higher levels of food insecurity—all of which hint at the socioeconomic dimension of malnutrition.[16,45] It is crucial, therefore, that short- and long-term interventions advocating for self-sustaining measures toward food security adopt the view of natural and socioeconomic environments as major determinants of community (mal)nutrition.[46]

The conduct of our study had significant limitations. Because of the pandemic-related restrictions imposed by national and local governments, we had to rely on only one team member (who was based in the study site) to conduct field work, and virtual channels to engage with the local community. Our interactions with the community were also severely limited in terms of duration. Thus, we were unable to probe deeper into some of the practices already evinced in our interviews, including particular forms of food preparation and traditional nutritional knowledge, both of which we recommend as subjects for future research (see, for instance, the work of Gayao et al. [2016] among indigenous peoples of Northern Luzon).[39] Moreover, we were unable to observe and document household practices and probe on whether, as the Philippine literature on nutrition suggests, there exist age- and gender-related differences in the way food is distributed within families.[47,48] Finally, given the specificities of Siargao as a place and the pandemic as an atypical health crisis, the applicability of our findings to other Philippine geographical and socioeconomic contexts in times of disaster could only ever be established via future research of similar aims and methodological nature.

CONCLUSION

Two points best encapsulate our study's findings. First, despite prevailing economic hardship and its consequences on people's access to food, the community members of Siargao generally view their children as healthy, including in relation to those living in urban areas. This view is rooted in their *functional* conception of health, as opposed to more morphological assessments based on children's anthropometric measurements. Second, even in times of crisis, families have largely been able to avoid hunger by resorting to emergency foods like (root) vegetables and fruits; however, such foods continue to be perceived as emergency foods *only* that are not *culturally acceptable* for everyday consumption. Given the community's traditional preference for rice, this view has persisted even during the COVID-19 pandemic.

Recommendations

Our findings allow us to offer three major recommendations pointing the way forward for Philippine nutrition.

First, more efforts should be directed toward promoting the (root) vegetables and fruits identified by our participants as *acceptable* rice alternatives in everyday diet. In a 2015 nationwide survey, rice was shown to be the most commonly consumed food item, as well as the most common energy source, among households in the Caraga Administrative Region where Siargao belongs (see Table 4, Figure 14, and Appendix 3 of the relevant reference).[49] However, for many community members, the aforementioned alternatives, from root crops like sweet potatoes and cassava to fruits like squash and plantains, would be not only more accessible, in that they could be freely planted and harvested in backyard gardens, but also more cost-effective, in that people would consequently spend less on purchasing rice. Adopting these substitutes for more frequent consumption would also be a step toward diversifying people's diets, which would in turn be a step toward improving nutritional health outcomes.[50] This is all easier said than done: We recognize that this would entail untangling longstanding cultural beliefs *while* pushing for contextualized legislation. Fortunately, some headway has been made on both fronts that Siargao as a community could emulate. One such direction for the former, for example, is 'culinary gentrification'—or mainstreaming the use of marginalized foods—which, though bearing its own significant repercussions in terms of cultural appropriation, could potentially lead to a wider and better appreciation of those foods by local communities, especially in tourist towns like Siargao.[51] In terms of tangible action, small-scale initiatives like the 'Duma Ordinance' passed by neighboring Surigao del Sur in 2012 and the Hardin ng Pagbabago communal farming project initiated by the Siargao local police could serve as catalysts of cultural change—without losing sight, of course, of the agricultural and economic demands that the implementation of such legislation would entail.[52,53]

Second, the pandemic has exposed the weaknesses of our local food systems, which also means that it has laid the groundwork for the future agenda. The longer-term, macro picture would now involve rethinking local food systems according to the terms laid out earlier (i.e., in terms of specific local economies, or in terms of specific geographies). Meanwhile, short-term interventions can consider the immediate, tangible products of existing bureaucracy. For example, while our interviews prevent us from discerning whether food assistance from the government during the pandemic has comprised mostly of rice and refined-carbohydrate items, the 2020 RNAS confirms that, in general, rice and cereals have been the most common contents of food packs distributed to affected families around the country (canned goods are the second).[15] This is understandable, given that food assistance during disasters must also conform to national legislation and prioritize items that do not easily perish (i.e. rice and canned goods versus fresh fruits and vegetables).[54] The inevitable outcome, however, is the lack of diversification and "a paucity of distributed foods that [are] rich in micronutrients"—in other words, food assistance that does not really provide *nutritional* assistance at a time when people need proper nutrition the most.[55] A possible

step forward would be for local governments to device more nutritionally friendly ways to aid the community, perhaps ones that utilize the microsystems already in place—for instance, by incorporating into food packs root crops or produce that are grown in community gardens or harvested and sold by local growers, which further underscores the need for sustainable, pre-emptive action in terms of community nutrition.

Third and most importantly, any purported effort toward health promotion and community wellbeing must thoroughly engage with local notions of 'health' and 'nutrition' by "[working] with communities in a participatory way, recognizing (and anticipating) their local conceptions" in order to incorporate or introduce 'biomedical knowledge' in a more informed way.[56] Barangay health workers and nutrition scholars would therefore be the most appropriate vessels for such efforts since they work at the intersection of biomedicine and traditional medicine. Thus, they should be empowered systemically, structurally, and financially so as to be able to fulfill their responsibilities as "mediators" of community health—while remaining cognizant of specific differences between, and the various ways to bridge, those two bodies of knowledge.[57] In relatively close-knit, rural towns like Siargao, schools, barangay halls, and government venues frequented by the locals would be ideal places to engage with community members regarding health matters through methods that adopt a culturally sensitive "settings approach" to public health.[58] Taking into consideration "behavioral economics," centers of commerce such as markets and grocery stores could also be encouraged to adopt the 'localized labeling' of products: for example, by providing nutritional information for root crops in the local language and in ways that also address extant apprehensions regarding their consumption such as the ones raised by our informants.[59] Furthermore, local media outlets could be tapped to tailor and contextualize health promotion campaigns (for example, by using local language and statistics in information dissemination, as well as by engaging with prevailing beliefs and local knowledge)—a strategy that could potentially reach target populations more effectively in rural areas and consequently encourage people to take more proactive stances as regards the state of public health in their communities.[60] As with our previous recommendations, health promotion presents itself as an opportunity for local governments to step in and step up, modifying and contextualizing national interventions according to terms that would be better understood—and accepted—by their respective communities.

Statement of Authorship

All authors contributed to the conceptualization of the work, acquisition and analysis of data, drafting and revising and approved the final version submitted.

Author Disclosure

All authors declared no conflicts of interest.

Funding Source

This study was funded by the Equity Initiative.

REFERENCES

1. Black MM, Walker SP, Fernald LCH, Andersen CT, DiGirolamo AM, Lu C, et al. Early childhood development coming of age: science through the life course. Lancet. 2017;389(10064):77-90. https://doi.org/10.1016/S0140-6736(16)31389-7
2. Lu C, Black MM, Richter LM. Risk of poor development in young children in low-income and middle-income countries: an estimation and analysis at the global, regional, and country level. Lancet Glob Health. 2016;4(12): E916-22. https://doi.org/10.1016/S2214-109X(16)30266-2
3. United Nations Children's Fund, World Health Organization, World Bank Group. Levels and trends in child malnutrition: key findings of the 2021 edition of the joint child malnutrition estimates [Internet]. Geneva, Switzerland: World Health Organization; 2021 [cited 2021 Dec 10]. Available from: https://www.who.int/publications-detail-redirect/9789240025257
4. Marshall AI, Lasco G, Phaiyarom M, Pangkariya N, Leuangvilay P, Sinam P, et al. Evidence on child nutrition recommendations and challenges in crisis settings: a scoping review. Int J Environ Res Public Health. 2021;18(12):6637. https://doi.org/10.3390/ijerph18126637
5. Müller O, Krawinkel M. Malnutrition and health in developing countries. Can Med Assoc J. 2005;173(3):279-286. https://doi.org/10.1503/cmaj.050342
6. Briend A, Khara T, Dolan C. Wasting and stunting—similarities and differences: policy and programmatic implications. Food Nutr Bull. 2015;36(1 Suppl 1):S15-23. https://doi.org/10.1177/15648265150361S103
7. Shekar M, Kakietek J, Eberwein JD, Walters D. An investment framework for nutrition: reaching the global targets for stunting, anemia, breastfeeding, and wasting [Internet]. Washington, DC: The World Bank; 2017 [cited 2021 Dec 9]. Available from: https://openknowledge.worldbank.org/bitstream/handle/10986/26069/9781464810107.pdf?sequence=22&isAllowed=y
8. United Nations Children's Fund, World Food Programme. Supporting children's nutrition during the COVID-19 pandemic [Internet]. New York: United Nations Children's Fund; 2020 [cited 2021 Dec 6]. Available from: https://www.unicef.org/media/68521/file/Supporting-children%E2%80%99s-nutrition-during-COVID-19-2020.pdf
9. United States Agency for International Development (USAID). Nutrition in emergencies: Technical guidance brief [Internet]. Washington, DC: USAID; 2016 [cited 2021 Dec 5]. Available from: https://www.usaid.gov/global-health/health-areas/nutrition/technical-areas/nutrition-emergencies-technical-guidance-brief
10. Global Nutrition Report. Country nutrition profiles – Philippines [Internet]. Bristol, UK: Development Initiatives; 2021 [cited 2021 Dec 8]. Available from: https://globalnutritionreport.org/resources/nutrition-profiles/asia/south-eastern-asia/philippines/
11. NNC, DOH (National Nutrition Council, Philippine Department of Health). Philippine plan of action for nutrition 2017-2022: a call to urgent action for Filipinos and its leadership [Internet]. City of Manila: Department of Health; 2017 [cited 2021 Dec 6]. Available from: https://www.nnc.gov.ph/phocadownloadpap/PPAN/18Sept_PPAN2017_2022Executive%20Summary.pdf
12. NNC, DOH. NNC governing board resolution no. 1, series of 2009: Adopting the national policy on nutrition management in emergencies and disasters [Internet]. City of Manila: Department of Health; 2009 [cited 2021 Dec 28]. Available from: https://www.nnc.gov.ph/phocadownloadpap/userupload/elavapie/NNC%20GB%20Reso%20no.%201%20s2009_NiEm.pdf

13. Department of Health (DOH). Department personnel order no. 2007-2492-A: Amendment to the department personnel order 2007-2492 dated 30 August 2007 regarding the "creation of the health cluster with Sub-clusters on nutrition, wash, and Health" [Internet]. City of Manila: DOH; 2007 [cited 2021 Dec 28]. Available from: https://www.nnc.gov.ph/phocadownloadpap/userupload/nnc-ncr/DOH%20DPO%202007_2492_A_NNC%20as%20Chair%20of%20NutrnCluster.pdf
14. Wright ME, Vesala-Husemann M. Nutrition and disaster preparedness: focusing on vulnerability, building capacities. Online J Issues Nurs. 2006;11(3):5. http://doi.org/10.3912/OJIN.Vol11No03Man05
15. DOST-FNRI (Department of Science and Technology-Food and Nutrition Research Institute). Rapid nutrition assessment survey on food security, coping mechanisms, and nutrition services availed during COVID-19 pandemic in selected areas in the Philippines [Internet]. Taguig City: DOST-FNRI; 2020 [cited 2021 Dec 7]. Available from: http://enutrition.fnri.dost.gov.ph/site/uploads/RNAS%20Virtual%20Dissemination%20to%20Partners.pdf
16. Dela Luna KLG, Bullecer ER. Rural and urban differences in household food insecurity and diet diversity of preschool children (PSC) in Occidental Mindoro. Acta Med Philipp. 2020;54(5):558-66. https://doi.org/10.47895/amp.v54i5.2254
17. Philippine Statistics Authority. Caraga – total population by province, city, municipality, and barangay: as of May 1, 2020 [Internet]. 2020 [cited 2022 Mar 17]. Available from: https://psa.gov.ph/sites/default/files/attachments/ird/pressrelease/Caraga.xlsx
18. Adamo KB, Brett KE. Parental perceptions and childhood dietary quality. Matern Child Health J. 2014; 18:978-95. https://doi.org/10.1007/s10995-013-1326-6
19. Scaglioni S, Salvioni M, Galimberti C. Influence of parental attitudes in the developments of children eating behaviour. Br J Nutr. 2008;99(S1): S22-5. https://doi.org/10.1017/S0007114508892471
20. Florentino RF, Villavieja GM, Laña RD. Dietary and physical activity patterns of 8- to 10-year-old urban schoolchildren in Manila, Philippines. Food Nutr Bull. 2002;23(3):267-73. https://doi.org/10.1177/156482650202300306
21. Teves KLY, Narciso JFT. The consequences of students' eating behaviors and food perception on their nutritional status and academic achievement. PEOPLE: Int J Soc Sci. 2017;3(1):761-9. https://doi.org/10.20319/pijss.2017.s31.761769
22. Ocampo-Guirindola ML, Garcia-Malabad CJ, Valdeabella-Maniego MLM, Punzalan SLM. Association between dietary diversity score and nutritional status of Filipino children aged 6-23 months. Philipp J Sci. 2016;145(1):57-69. https://philjournalsci.dost.gov.ph/images/pdf/pjs_pdf/vol145no1/pdf/association_between_dietary_diversity_score_FinalCopy.pdf
23. Messer E. Anthropological perspectives on diet. Annu Rev Anthropol. 1984; 13:205-49. https://doi.org/10.1146/annurev.an.13.100184.001225
24. Aguilar F. Rice in the Filipino diet and culture. PIDS Discussion Paper Series No. 2005-15 [Internet]. Quezon City: Philippine Institute for Development Studies; 2005 [cited 2021 Dec 8]. Available from: https://www.econstor.eu/bitstream/10419/127896/1/pids-dps2005-15.pdf
25. Hu EA, Pan A, Malik V, Sun Q. White rice consumption and risk of type 2 diabetes: meta-analysis and systematic review. BMJ. 2012;344: e1454. https://doi.org/10.1136/bmj.e1454
26. Tan GH. Diabetes care in the Philippines. Ann Glob Health. 2015;81(6):863-9. https://doi.org/10.1016/j.aogh.2015.10.004
27. Dalisay SNM. Survival strategies to overcome inaagosto and nordeste in two coastal communities in Batangas and Mindoro, the Philippines. Disaster Prev Manag. 2008;17(3):373-82. https://doi.org/10.1108/09653560810887293
28. Bertuso A. Gender, climate change and root and tuber crops: a case study in Eastern Visayas, Philippines. In: Paris T, Rola-Rubzen MF, editors. Gender dimension of climate change research for agriculture: case studies in Southeast Asia. Wageningen, the Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security; 2018. pp. 81-102.
29. Sano EO, Fang-azan MLD, Gayao B, Alupias EB. Sweet potato as a buffer in crisis situations: the case of Amlimay, Buguias during the 1990 earthquake crisis in Benguet. In: Rhoades RE, Sandoval VN, editors. Sweet potato cultures of Asia and South Pacific: proceedings of the 2nd annual UPWARD international conference. Los Baños, Laguna: UPWARD; 1991. pp. 120-125.
30. Biñas EE Jr. Economic security assessment of Ma-ayon, Capiz, Philippines during COVID-19 pandemic. Int J Res Appl Sci Biotechnol. 2020;7(6):159-61. https://doi.org/10.31033/ijrasb.7.6.23
31. Bollido ME. Economic security assessment of San Jorge, Samar, Philippines, as it experiences coronavirus. J Agric Food Syst Community Dev. 2020;9(4):131-4. https://doi.org/10.5304/jafscd.2020.094.005
32. Espino A, Itliong K, Ruba CD, Thy O, Barbon WJ, Monville-Oro E, et al. COVID-19 impact on local agri-food systems in Cambodia, Myanmar, and the Philippines. Working Paper No. 357 [Internet]. Wageningen, the Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security; 2021 [cited 2021 Dec 9]. Available from: https://cgspace.cgiar.org/bitstream/handle/10568/113843/CCAFS%20WP%20357_Covid%2019_food%20systems.pdf?sequence=1&isAllowed=y
33. Balauro SB, Camfili-Talastas MA. Traditional food crops and their role in the nutrition well-being of a semi-subsistent community in Kibungan, Benguet, Philippines. Mt J Sci Interdiscip Res. 2019;79(2 Suppl 1):177-89. http://portal.bsu.edu.ph:8083/index.php/BRJ/article/view/246/330
34. Guiriba GO. Documentation of indigenous knowledge on production and post-harvest management of sweet potato in the Bicol region, Philippines. J Asian Rural Stud. 2019;3(1):93-108. http://dx.doi.org/10.20956/jars.v3i1.1719
35. Dejarme-Calalang GM, Bock L, Colinet G. Crop production of Northern Mindanao, Philippines: its contribution to the regional economy and food security. Tropicultura. 2015;33(2):77-90. http://www.tropicultura.org/text/v33n2/77.pdf
36. Datar FF. Famine food, prestige food: food evolution in an Ivatan culture [Internet]. In: Food (in)security: an international conference on anthropology of food and eating. Book of abstracts of the 41st Annual Conference of the Ugnayang Pang-Aghamtao, Inc.; 2019 Nov 7-9; Baybay City, Leyte, Philippines. Quezon City: Ugnayang Pang-Aghamtao, Inc.; 2019. p. 61 [cited 2021 Dec 2]. Available from: https://drive.google.com/file/d/1kvYYy-mlG__TKJtvdtkh7a6uJ1xFNuys/view
37. Lasco G. Reclaiming our root crops [Internet]. Philippine Daily Inquirer. 2020 Mar 5 [cited 2021 Dec 4]. Available from: https://opinion.inquirer.net/127805/reclaiming-our-root-crops
38. Bairagi S, Custodio MC, Durand-Morat A, Demont M. Preserving cultural heritage through the valorization of Cordillera heirloom rice in the Philippines. Agric Human Values. 2021; 38:257-70. https://doi.org/10.1007/s10460-020-10159-w
39. Gayao BT, Meldoz DT, Backian GS. Loss of traditional root crops knowledge (TRK) among some indigenous people in northern Philippines. Mt J Sci Interdiscip Res (formerly Benguet State Univ Res J). 2016; 75:6-15. http://journals.bsu.edu.ph/index.php/BRJ/article/view/73/235
40. Musa SFPD, Basir KH. Covid-19 and food security in Southeast Asia. Int J Sustain Agric Manag Inform. 2021;7(2):90-110. http://doi.org/10.1504/IJSAMI.2021.10038365
41. Rasul G, Nepal AK, Hussain A, Maharjan A, Joshi S, Lama A, et al. Socio-economic implications of COVID-19 pandemic in South Asia: emerging risks and growing challenges. Front Sociol. 2021; 6:629693. http://doi.org/10.3389/fsoc.2021.629693
42. Gundersen C, Ziliak JP. Food insecurity and health outcomes. Health Aff. 2015;34(11):1830-9. https://doi.org/10.1377/hlthaff.2015.0645
43. Degarege GA, Lovelock B. Addressing zero-hunger through tourism? Food security outcomes from two tourism destinations in rural Ethiopia. Tour Manag Perspect. 2021;39:100842. https://doi.org/10.1016/j.tmp.2021.100842

44. Himmelgreen DA, Daza NR, Vega M, Cambronero HB, Amador E. "The tourist season goes down but not the prices." Tourism and food insecurity in rural Costa Rica. Ecol Food Nutr. 2006;45(4): 295-321. https://doi.org/10.1080/03670240600848753
45. Siy Van VT, Sales ZG, Gordoncillo NP, Advincula-Lopez L, Sescon JT, Miro ED. Multilevel pathways of urban and rural poverty as determinants of childhood undernutrition in the Philippines. J Poverty. 2021. https://doi.org/10.1080/10875549.2021.2011818
46. Raza A, Fox EL, Morris SS, Kupka R, Timmer A, Dalmiya N, et al. Conceptual framework of food systems for children and adolescents. Glob Food Sec. 2020; 27:100436. https://doi.org/10.1016/j.gfs.2020.100436
47. Horton S. Birth order and child nutritional status: evidence from the Philippines. Econ Dev Cult Change. 1988;36(2):341-54. https://www.jstor.org/stable/1153771
48. Kwiatkowski LM. Struggling with development: the politics of hunger and gender in the Philippines. New York: Routledge; 1998.
49. DOST-FNRI. Philippine nutrition facts and figures 2015: dietary survey [Internet]. Taguig City: DOST-FNRI; 2016 [cited 2021 Dec 7]. Available from: http://enutrition.fnri.dost.gov.ph/site/uploads/2015_DIETARY_SURVEY.pdf
50. Mbuya NVN, Demombynes G, Piza SFA, Adona JV. Undernutrition in the Philippines: scale, scope, and opportunities for nutrition policy and programming [Internet]. Washington, DC: World Bank Group; 2021 [cited 2021 Dec 9]. Available from: https://openknowledge.worldbank.org/bitstream/handle/10986/35530/9781464817014.pdf
51. Grey S, Newman L. Beyond culinary colonialism: indigenous food sovereignty, liberal multiculturalism, and the control of gastronomic capital. Agric Human Values. 2018;35(3):717-30. https://doi.org/10.1007/s10460-018-9868-2
52. Sugian JC. PLGU SDS launches DUMA ordinance [Internet]. Tandag, Surigao del Sur: Tandag Farmers Information Technology and Services Center; 2013 Apr 23 [cited 2021 Dec 5]. http://tandagfits.blogspot.com/2013/04/plgu-sds-launches-duma-ordinance_3155.html
53. Catoto R. Remote Siargao island to launch communal farming soon [Internet]. MindaNews. 2020 Aug 2 [cited 2021 Dec 10]. Available from: https://www.mindanews.com/top-stories/2020/08/remote-siargao-island-to-launch-communal-farming-soon/
54. Department of Social Welfare and Development (DSWD). Administrative order no. 51 series of 2003: Omnibus guidelines and procedures on the maintenance and operation of the National Resource Operations Center (NROC) [Internet]. City of Manila: DSWD; 2003 [cited 2021 Dec 10]. Available from: https://www.dswd.gov.ph/issuances/AOs/AO_2003-051.pdf
55. Gomez KG, Ignacio MAE. Adequacy of food aid packs provided during natural disasters: a provincial case study. Acta Med Philipp. 2020;54(5):472-8. https://doi.org/10.47895/amp.v54i5.2218
56. Lasco G, Mendoza J, Renedo A, Seguin ML, Palafox B, Palileo-Villanueva LM, et al. Nasa dugo ('It's in the blood'): lay conceptions of hypertension in the Philippines. BMJ Glob Health. 2020;5: e002295. http://dx.doi.org/10.1136/bmjgh-2020-002295
57. Mallari E, Lasco G, Sayman DJ, Amit AML, Balabanova D, McKee M, et al. Connecting communities to primary care: a qualitative study on the roles, motivations and lived experiences of community health workers in the Philippines. BMC Health Serv Res. 2020; 20:860. https://doi.org/10.1186/s12913-020-05699-0
58. Poland B, Krupa G, McCall D. Settings for health promotion: an analytic framework to guide intervention design and implementation. Health Promot Pract. 2009;10(4):505-16. https://doi.org/10.1177/1524839909341025
59. Gustafson CR, Prate MR. Healthy food labels tailored to a high-risk, minority population more effectively promote healthy choices than generic labels. Nutrients. 2019;11(10):2272. https://doi.org/10.3390/nu11102272
60. Young R, Willis E, Stemmle J, Rodgers S. Localized health news releases and community newspapers: a method for rural health promotion. Health Promot Pract. 2015;16(4):492-500. https://doi.org/10.1177/1524839915580538