AMERICAN UNIVERSITY OF BEIRUT

EXPLORING THE DYNAMICS OF FOOD SECURITY IN THE KARANTINA NEIGHBORHOOD IN RELATION TO THE BEIRUT PORT EXPLOSION

by
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ABSTRACT
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In 2020, prices of food and all commodities, increased drastically, due to the deterioration of the national currency, the Lebanese Lira, and this increase in prices directly affected households' purchasing power and access to food. On August 4th, 2020, a massive explosion hit the Port of Beirut, destroying Lebanon's capital, killing over 200 people and wounding more than 5,000. Now, three years after the devastating port explosion, the impact of the economic crisis still echoes more than ever before. With the lack of urgent economic reforms and an uncaring corrupted government, more Lebanese and refugee families are being pushed further into poverty, with nearly three million in Lebanon needing humanitarian assistance.

This research aimed to assess the food security status of the permanent residents of Karantina neighborhood after the Beirut port explosion in Lebanon. It examined whether the food and nutrition security situation of the permanent residents of Karantina improved after the explosion, with all the assistance received, and whether the improvement lasted in the long-term.

A sample consisting of 100 randomly selected households, or 33% of the Karantina population, was surveyed. A questionnaire was administered, including five parts: the socio-demographics of the Karantina population, the Food Insecurity Experience Scale (FIES) to study food security, the Food Consumption Score (FCS) to study diet diversity and quality, the Livelihood Coping Strategies, and the assistance received after the explosion. The data was gathered during three time points, six months before the explosion, six months after the explosion, and two years after the explosion.

The results showed that the percentage of food secure households decreased from 71% six months after the explosion, to 2% two years after the explosion. And the percentage of households with acceptable food consumption, decreased from 96% six months after the explosion, to 30% two years after the explosion. There has been a significant decrease in people's incomes and employment status two years after the explosion, in addition, the percentage of people who were in debt also significantly increased. 95% of the population were adopting crisis coping strategies, making them more vulnerable to future shocks. All the households received food assistance six months after the explosion, and 76% received cash assistance, however, these stopped after 6 months to 1 year after the explosion. Household size, debt, the head of the household's educational

attainment and employment, increased income, and receiving cash assistance were all positively correlated with being food secure and having acceptable food consumption score.

In conclusion, the assistance received by the permanent residents of Karantina after the explosion was associated with better food security and food consumption score at the time of the incident but not with long term food security and food consumption. This is explained by the deterioration of the economic situation in Lebanon since 2020, the multiple crises that affected the country, disabled the Karantina population from being able to cope properly. Most of the households fell deeper into poverty in 2022, many lost their source of income, most of them were falling into debt and this worsened their food security status.

Keywords: Food Security – Beirut Blast – Assistance – Vulnerable populations – Lebanon.

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CHAPTER I

INTRODUCTION

On August 4th, 2020, a massive explosion hit the Port of Beirut, destroying Lebanon's capital, and killing over 200 people and wounding more than 5,000 (ACTED, 2020). The devastating explosion destroyed and damaged more than 40,000 buildings within a 10 km radius from the port area, ranging between residential and commercial buildings (Beirut Urban Lab, 2021). The damages did not only hit the buildings and people's lives, the bast also led to the destruction of basic vital supplies stored in the Port of Beirut, including Lebanon's national wheat supply stored in the wheat silos that were heavily destroyed. This negatively affected the food security situation in Lebanon, that was already unstable, due to the economic inflation that hit the country in early 2020 and increasing the cost of many goods in Lebanon. The country's high dependence on imports to satisfy the food market, further exacerbated the situation, because the silos included essential grain reserves, such as wheat, barley, and corn (ACTED, 2020).

Lebanon has faced multiple crises in recent times beginning with an economic downturn in 2019 that is continuing to worsen with time. According to the World Food Programme, food inflation rates in Lebanon soared by 245% between October 2019 and June 2020, as a result of the combined effect of the financial crisis and the COVID-19 outbreak, even before the explosion (WFP, 2020). After the explosion, prices were forecasted to increase, due to the possible disruption in supply chain and consequently reduced availability of food on markets, which was the case. In 2020, prices of food and all commodities, increased drastically, due to the deterioration of the national currency,

the Lebanese Lira, and this increase in prices directly affected households' purchasing power and access to food (Kharroubi *et al.*, 2021). In 2021, one year after the devastating port explosion, the impact of the economic crisis still echoed more than ever before. With the lack of urgent economic reforms and an uncaring corrupted government, more Lebanese and refugee families were pushed further into poverty, with nearly three million in Lebanon needing humanitarian assistance (WFP, 2021b).

To make the matters even worse, the COVID-19 pandemic further exacerbated the situation. The successive restrictive lockdowns led to the loss of income and purchasing power of the population, shut down of enterprises, and triggered an economic recession (Béné, 2020). In the case of Lebanon, given that the country is enduring a severe and prolonged economic crisis that was ranked among the top three most severe crises globally, food insecurity increased to 39% after the COVID-19 and economic crises. The Lebanese population also faced income reduction scenarios post the crises (Kharroubi *et al.*, 2021). The three causes mentioned above, COVID-19, the Beirut Blast and the already-present corruption in the country, all lead to the conclusion that Lebanon is facing a huge crisis, leading to increased rates of poverty and food insecurity in the country.

In this research, I aim to look at if the food-oriented humanitarian assistance that was received by the permanent residents of Karantina, had persistent and durable impacts, on their food security status, beyond the immediate recovery period, in terms of quantity and quality of the diet. To do this I am going to be looking at recalls of food security status, before, immediately after and two years after the 4th of August Beirut Port explosion. Karantina is a neighborhood that was already an impoverished population, which after the blast, received a lot of food aid.

A. Hypothesis

The hypothesis underpinning this research is as follows: Food and nutrition security of the permanent residents of Karantina improved after the explosion, with all the assistance that was received, but did not last in the long-term.

To be able to accept or reject this hypothesis, the below research questions were developed to be more familiar with the socio-demographics of Karantina, to establish a baseline food security assessment from before the explosion and after, to confirm the type of aid the households received, and finally to assess their food security and dietary diversity two years after the explosion.

B. Research question

Did the food security status of the households in Karantina decline or improve after the August 4th explosion?

1. Research sub-questions

- What are the socio-demographic characteristics of the permanent households of the Karantina neighborhood, immediately after and two years after the Beirut port explosion?
- What kind of assistance (specifically food and cash assistance) did the permanent households of the Karantina neighborhood receive after the explosion? What was their food security in light of the assistance received?
- What was the food and nutritional security status of the permanent residents of the Karantina neighborhood, nearly 2 years after the explosion?

CHAPTER II

LITERATURE REVIEW

A. Healthy diets

1. Definition of a healthy diet

A healthy diet is a diet that minimizes the risk of chronic diseases while achieving optimal human health; it promotes growth and prevents malnutrition (Temple, 2017). A healthy diet is a diversified diet, that includes the consumption of all food groups, daily, and in moderation. It is characterized as *"consuming an appropriate caloric intake focused on a diversity of plant-based and animal-source foods, especially whole grains, fruits, vegetables, legumes, nuts and unsaturated oils, poultry, eggs, and fish, while also reducing the consumption of processed meat. Also, replacing saturated fats with unsaturated fats, and consuming small amounts of red meat, processed meat, refined grains, starchy vegetables, highly processed foods and added sugars"* (Willett et al., 2019).

2. Benefits of a healthy diet

According to several studies, healthy diets are positively associated with positive effects on health, inversely associated with adverse negative effects, such as cardiovascular diseases, and have no association with metabolic abnormalities, due to the high consistency of fruits, vegetables, nuts and legumes, and reduced intakes of red meat, in specific processed red meat and sodium (Willett et al., 2019 & Khalil, 2020).

In a study conducted by Willet et al., the authors assessed the nutrient adequacy and prediction of mortality rates of a healthy diet. They found that the adoption a healthy diet would decrease the intake of major unhealthy nutrients and improve the intake of most essential nutrients. Healthy diets increase the consumption of healthy fats (mono and polyunsaturated fatty acids), essential micronutrients, such as zinc, iron, vitamin A and folate, and decrease the consumption of unhealthy saturated fatty acids. As for the mortality rates, it was found that adopting a healthy diet could help in avoiding around 11.1 million deaths per year in 2030 and reducing premature mortality by 19% (Willet et al., 2019).

3. *Relationship between diets and health, with a special focus on the MENA region*

Within the debates around food security, global attention usually focuses on the problems of undernutrition and the underlying factors that lead to it, such as agricultural production as well as the availability and distribution of resources and food. Although these are important things to think about, our attention should also consider the utilization pillar of food security and our consumption patterns (HLPE, 2020).

A comprehensive view of food security is essential, as food insecurity can manifest in various forms of malnutrition. Globally, malnutrition - in all its forms, including undernutrition, overnutrition and micronutrient deficiencies - remains at excessively high levels, even in the same country. According to the *2020 Global Nutrition Report*, almost one-third of all countries are facing the triple burden of malnutrition, characterized by the concurrent presence of elevated rates of all three forms of malnutrition. In addition to not having sufficient access to food, many people

worldwide, consume low-quality, unhealthy diets that contribute to high rates of diet-related morbidities, such as obesity, diabetes, hypertension, coronary heart disease, and strokes, and in many cases leading to diet-related mortalities (Willett et al., 2019). In fact, in 2020, more than 150 million children were stunted, 50.5 million were wasted and over 38 million were obese, and similarly, more than 2 billion adults were overweight or obese (Global Nutrition Report, 2020). Despite the established relationship between dietary patterns[1] and health and chronic diseases, people are still choosing unhealthy diets and low-quality foods over nutritious and healthy foods (Temple, 2017).

The answer might be attributed to the nutritional transition, characterized by the recent global changes in dietary patterns, wherein people are consuming more saturated fats, sugars, and refined foods, while reducing their intake of fiber-rich foods. This shift can be attributed to the influence of technological advances that have made energy dense, nutrient-poor foods more readily accessible and affordable on the global food markets. The nutritional transition is a result of socio-demographic, economic, epidemiological, and nutritional changes that are increasing in developing countries due to globalization and urbanization (Ghattas, 2014). This transition has been widely experienced by the MENA region in specific, because of globalization, led by social and economic changes. Food consumption and physical activity, which are highly driven by the nutrition transition and influenced by the surrounding environment and markets, directly influence the risk of developing NCDs (Khalil, 2020). This leaves the

[1] Dietary patterns are the combinations and quantities of separate and interdependent components and nutrients in the diets, and the frequency in which they are regularly consumed (FAO & WHO, 2019).

MENA region with the double burden of malnutrition, as it is facing at the same time, high rates of undernutrition and increased rates of overweight and obesity.

NCDs have been on the rise in developing countries and have been widely associated with higher mortality rates (Bahn et al., 2019). In 2015, around 58% of total deaths in the MENA region were attributed to NCDs, with cardio-vascular disease taking the lead, with around 27% of total deaths. Thus, poverty and food insecurity are considered as root causes of the double burden of malnutrition, as overnutrition and undernutrition are found to co-exist within the same communities and sometimes even within the same households in developing countries (Ghattas, 2014). This sets a setback in the way of developing countries to reach Sustainable Development Goal 2: Zero Hunger by 2030 (Bahn et al., 2019).

B. Food and nutrition security after conflict and crises

1. Difference between Food Security and Nutrition Security

Food security is defined by the Food and Agriculture Organization as *"food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life"* (FAO, 2009).

According to this definition, food security focuses on access to and affordability of food that is safe, nutritious, and consistent with personal preferences, meaning that the nutritional component is present within the wide aspect of food security. However, the nutrition aspect of the definition has long been overlooked or lost in national policies and solutions, with a resulting emphasis on quantity, rather than quality, of

food. In the MENA region, previous efforts to address food security have solely focused on food availability, while completely overlooking the other dimensions of food security, which are accessibility, utilization, and stability. These efforts have been proven to be ineffective, and here came the recommendation of using a nutrition lens when tackling food insecurity issues (Hwalla et al., 2016).

It is important in our days, to recognize the difference between the two terms, and understand their synergistic relationship. It is not enough to accommodate people with food but rather people should have constant and equal access to healthy and nutritious food. In today's world, there are widespread food, health, and equity challenges, and this calls for a shift from food security to food and nutrition security to generate access, not just to food but also to healthy and nourishing food (HLPE, 2020).

2. Food and nutrition security after conflict and crises

After crises, such as natural disasters (i.e., floods, earthquakes, etc.), economic collapse, or conflicts, food security is deeply affected, often worsening existing vulnerabilities and creating new challenges for populations. These crises can result in widespread hunger and malnutrition, disproportionately affecting vulnerable populations. People living in areas affected by crises and conflict face severe and acute food insecurity and decreased dietary diversity and quality (ICRC, 2022). In recent years, crises have increased leading to more disruptions in supply chains, price spikes, and reduced access to nutritious foods. Moreover, vulnerable populations, including low-income families and marginalized communities, are more affected by conflict and crises, due to their already-fragile situations, and thus face heightened risks of malnutrition and hunger. Furthermore, the economic aftermath of a crisis can lead to

unemployment and income loss, further limiting individuals' ability to afford and access adequate and healthy food (UNDP, 2008).

3. Humanitarian assistance after conflicts and crises

Humanitarian assistance after conflict and crises plays an important role in fostering sustainable recovery and rebuilding the affected communities. After conflict or crises, humanitarian assistance serves as a first response to the immediate humanitarian needs of the populations, by providing essential resources such as food, cash, clean water, health services, and rehabilitation and shelter. Furthermore, it empowers local communities to regain their self-reliance, re-establish essential services, and revive economic activities, ultimately leading to more resilient communities and sustainable livelihoods (Humanitarian Coalition, 2021). Two main kinds of humanitarian assistance are usually the most addressed after crisis: food assistance and cash assistance.

4. Food assistance in conflict and crises

Food assistance is a crucial component in post-conflict recovery. Food assistance acts as a first response to reduce the affected communities' gaps in food consumptions, alleviate hunger, and contribute to the restoration of the population's food security status. In a paper assessing the impact of food assistance on food insecure populations during conflict, in Mali, the researchers found that food assistance increases the household food and non-food expenditures and the household micro-nutrient consumption. The study also found that food assistance has a protective effect on food security of vulnerable populations (Tranchant et al., 2019).

However, recent studies have been criticizing food assistance, as an only measure, to improve food security. In a study aimed at examining the quality of food aid parcels in South Africa, it was found that food aid parcels included starch-rich foods, protein-source foods (mostly canned), cooking oil, tea bags, sugar, salt, and non-food items (sanitary and cleaning products). After assessing their nutritional value, they found that the food parcels lacked dietary diversity in items such as dairy, eggs, fruits, and vegetables. These parcels provided the recipients with their macro-nutrient requirements but lacked many micro-nutrient requirements (such as vitamins and minerals), that are vital for human health and normal functioning (Vermeulen et al., 2020). According to the World Health Organization, poor and vulnerable people must live on too little and the wrong kind of food. Thus, food assistance programs must first, meet their immediate needs, and then look for ways to always improve the access of all people to the food needed for a healthy life (WHO & WFP, 1997). Due to the food aid provided to them, people only access staple and processed food, such as grains, flour, sugar, and pasta, and this poses further challenges to their health. Not only will the vulnerable be inhibited from accessing healthy diets, but they will be also deprived of nutrient-adequate diets (FAO, 2020). It has been recently discussed that families who rely on food aid and food assistance, may suffer nutritional deficiencies because so much of the produce is processed rather than fresh (Morris, 2018).

Just as food security includes four important pillars; availability, accessibility, stability, and utilization, food assistance and aid must meet and take into consideration these pillars as well. In their paper titled “Nutrition security is an integral component of food security”, the authors criticized the strategies employed in the MENA region to achieve food and nutrition security. These strategies primarily focus on agricultural and

food production, while completely disregarding the more critical components such as the accessibility and quality of the food consumed by the populations. And as a response, the authors suggested recommendations to incorporate nutrition into these pillars and achieve Food and Nutrition Security (Hwalla et al., 2016).

Moreover, despite growing global attention to the importance of healthy and nutrient adequate diets, they appear to be still not affordable for all. All the recommendations do not apply to countries where there are high levels of poverty; it is commonly known that the cost of a diet increases as the quality increases across all regions of the world (SWAC/OECD, 2021). In the SOFI 2020 Report "The State of Food Security and Nutrition in the World - Transforming Food Systems for Affordable Healthy Diets", the Food and Agriculture Organization argues that the affordability and accessibility of healthy diets is even more challenging than simply accessing food; there even is a transition from only worrying to access food in general to worrying about the quality of the food to be accessed (FAO, 2020). Through comparing the cost of the diets to household food expenditures, findings from this report concluded that the cost of a healthy diet exceeded the international poverty line, which was established at USD 1.90 purchasing power parity (PPP) per person per day, in 2020, making it unaffordable for the poor. In fact, the cost of healthy diets is 60% higher than the cost of nutrient adequate diets (diets that only meet the requirements for essential nutrients), and five times the cost of energy sufficient diets (diets that only meet the dietary energy needs through a starchy staple - the diet that most of the poor can afford). Thus, the high cost and unaffordability of healthy diets is associated with increasing food insecurity and different forms of malnutrition, including child stunting and adult obesity. As stated earlier, these numbers are on the rise, and are expected to continue rising, as people's

incomes are expected to decline and the cost of food to increase, especially in countries of the South, such as Asia, Africa, and the Middle East (FAO, 2020).

5. Cash assistance and food security, post-conflict

The purchasing power of a population has a major impact on their food security status, especially in times of crisis. Vulnerable, low-income populations are usually heavily impacted by crises and disasters and are more likely to take a longer time to recover. This is due to many reasons, such as the loss of the breadwinner, the elimination of income, and loss of habitat. After a shock, such as natural disasters, many families lose their only source of income, be it the death of the head of the household, or the loss of their job, due to injury or disability (FSIN, 2023). Leading us to conclude that food security is highly linked to economic state. Lower economic status means the reliance on less nutritious food options. This is argued in the paper "Use of the Food Insecurity Experience Scale to assess food security status in Ireland, 2014-17: a cross-sectional analysis", where the authors found a strong association between food security status and financial life index. This paper studied the effect of Ireland economic crash in 2007 on the food security status of the population. The study found that food security status is affected by education, employment status, and low income (Ahmadi, 2018).

In their study "Household food insecurity after the early monsoon flash flood of 2017 among wetland (Haor) communities of northeastern Bangladesh: a cross-sectional study", the researchers assessed the post-flood household food insecurity of communities living in northeastern Bangladesh, following the devastating monsoon flash flood in 2017, using the Household Food Insecurity Access Scale (HFIAS)

(Parvez et al., 2022). The findings show 62% of the surveyed households experienced food insecurity following the flash flood. Several factors were identified as significant risk factors of food insecurity, including poverty, debt, lack of education, and relying on market purchase of food. As a conclusion, the authors recommended looking at the risk factors, and combining disaster management initiatives with food security programs to reduce food insecurity post crises (Parvez et al., 2022).

Therefore, cash assistance is a possible intervention to be considered in the context of crises. In a study evaluating the Somalia cash-based response after a drought in 2017, it was found that cash assistance was an appropriate and beneficial response after the drought; it fostered resilience among the population and had positive impacts on food security. Cash-based assistance in Somalia helped mitigate the short-term impact of the drought on the purchasing power of the population, due to the cash they received, people were still able to access food and other basic needs (Daniels & Anderson, 2018).

Cash assistance should also be constant and last in the long-term. In a paper assessing the impact of assistance on poverty and food security in a state of protracted crisis, of Palestinian households in the Gaza Strip, the researchers found a positive impact of assistance on food consumption, dietary diversity, and on poverty reduction. In the study, data from the 2013 and 2014 rounds of the Palestinian Socio-Economic and Food Security survey, were used. The results also found that although the positive impacts were found, Palestinian households were at risk of experiencing a diminished food security status, since the international assistance was slowly fading for these communities. These results highlight how the international organizations should not disregard future implications of ending of cash assistance, especially in areas of

protracted crisis. Because these populations are vulnerable and dependent on assistance, any stopping of assistance will severely impact the wellbeing of the households in the future (Romano et al., 2020). Similar results were found in the study "Cash assistance programming and changes over time in ability to meet basic needs, food insecurity and depressive symptoms in Raqqa Governorate, Syria", where the researchers found that short-term emergency cash assistance after times of conflict and crises, yields significant improvements in food security. Households were spending the cash assistance on essential food groups, such as rice, dairy and even meat. However, the findings showed that the economic relief was temporary, as people were sure that once the program ends and the cash assistance stops, they would go back to their earlier states. They would have to resort back to borrowing money to purchase food and be able to provide for their families' basic needs (Falb et al., 2020).

In another paper titled "Social cash assistance for food security during a disaster: lesson learned from Indonesia", the researchers wanted to identify how families in Indonesia who were affected by the COVID-19 pandemic took advantage of the social cash assistance they received. The findings show that the cash assistance was primarily used for basic needs, especially for food, and lasted about two to three weeks. Thus, they found that cash assistance strengthens food security, by providing families with their daily needs. However, the study recommends that cash assistance should last throughout the entire time of the crisis, in the case of the study, the Covid-19 pandemic. The reasons behind the need for a prolonged assistance period, is that during a crisis, be it immediate or protracted, incomes are not fixed, so, providing capital for families increases family income sustainably, and thus maintains food security (Susanty et al., 2023).

A study in Lebanon also highlighted the importance of long-term and constant cash assistance for the vulnerable. In 2018-2020, CAMEALEON conducted an assessment of the effects of multi-purpose cash assistance on Syrian refugees residing in Lebanon. The study involved a sample size of 11,457 Syrian refugee households situated in the regions of Bekaa, North Lebanon, and Mount Lebanon. The multi-purpose cash assistance assessed in the study was the 2017 collaboration between the World Food Programme (WFP), the United Nations High Commissioner for Refugees (UNHCR), and various non-governmental organizations (NGOs). The collaboration aimed to provide multi-purpose cash (MPC) aid to the most economically vulnerable Syrian refugee households in Lebanon, enabling them to meet their basic needs. Households were offered a monthly unconditional transfer of $27 per person, accompanied by a supplementary payment of $173.50 to Syrian refugee households. This combined assistance aimed to enhance their access to food and basic necessities throughout a 12-month cycle (CAMEALEON, 2020).

The two-year study aimed to assess both short-term impacts (occurring within 12 months or less) and long-term effects (spanning beyond 12 months) attributed to the $173.50 and $175 MPC support provided by the WFP and UNHCR, respectively, in addition to the $27 per person monthly assistance. The study also sought to investigate the impact of discontinuing MPC on the well-being of Syrian refugees, mainly household expenditures, food security, housing, water, sanitation and hygiene (WASH), education, employment, health, and decision-making processes (CAMEALEON, 2020).

The research findings indicated that the majority of the MPC's impact became evident in the long term (beyond 12 months), while its short-term effects were limited. Across the various dimensions of well-being, the long-term impact of MPC was

substantial, indicating the importance of households' access to a longer duration of MPC. Furthermore, the study revealed that the positive impact of MPC fades within a timeframe of 4 to 10 months following the ending of assistance, with households returning to their pre-assistance well-being levels. These findings suggest the potential benefits of implementing extended cash assistance cycles or integrating MPC with other services through a 'cash plus' approach. Such an approach can amplify and prolong the positive influence of cash assistance on beneficiary households, ensuring a sustainable impact over time (CAMEALEON, 2020).

C. Eating patterns

1. Global eating patterns

Globally, the average intake of healthy foods is lower than the recommended daily intake, whereas the overconsumption of unhealthy foods is higher than the recommended intake. In the Summary Report of the EAT-Lancet Commission, they compared the daily intake of food to the recommended intake in the EAT Lancet diet, referred to as Health boundaries (100%), and it showed that, worldwide, the consumption of starchy vegetables, red meat, and eggs is excessively high with 293%, 288% and 153% respectively. Whereas the consumption of healthy foods, such as fruits, vegetables, whole grains, and nuts, are consumed in very low amounts, lower than the recommended and needed intakes for a healthy and nutritious life (EAT, 2019).

2. *Eating trends and behaviors in Lebanon, pre-explosion, and the shift to the Western eating behaviors*

As a result of globalization and urbanization, the Lebanese population has recently undertaken a nutritional transition in their food preferences and choices. They transitioned from the "traditional Mediterranean[2]" diet to the "Westernized" fast food[3] and "high protein" diets. This is characterized by an increased consumption of energy-dense and fat-dense foods that are of no nutritional value, especially in the young adult population. This shift has been characterized by a decreased consumption of fruits and vegetables, and an increased consumption of fried food, sugar sweetened beverages, carbonated beverages, and desserts (Salameh et al., 2014). These results were reported among adults and young adults.

In a study, "dietary patterns and their association with obesity and sociodemographic factors in a national sample of Lebanese adults", of 2,048 Lebanese adults aged between 20 and 55 years, four dietary patterns were identified: Western pattern, traditional Lebanese pattern, prudent pattern, and fish and alcohol pattern. The most frequently identified pattern was the Western diet, followed by the traditional Lebanese diet that is highly characterized by fruits, vegetables, legumes, dairy, olive oil and burghul (Naja et al., 2011). This shift in dietary preferences has also been reported among the young adult population in Lebanon.

[2] Traditional diet inspired by the eating habits of people who live near the Mediterranean Sea, and adopted in the Mediterranean region, especially in Lebanon.

[3] Fast Food: An empty calorie food. An empty calorie food is a high calorie or calorie rich food which lacks in micro-nutrients such as vitamins, minerals, or amino acids, and fiber but has high energy (calories). These foods don't contain the nutrients that the human body needs to stay healthy (Ashakiran & Deepthi, 2012).

3. *Eating trends and behaviors in Lebanon, pre-explosion, among vulnerable populations*

In another paper, Sahyoun et al., assessed the food security status of vulnerable populations in Lebanon, Arab Family Food Security Scale (AFFSS), which was validated with data on two vulnerable populations in Lebanon, Southern Lebanon residents and Palestinian refugees (2014). The study found that 42% of the Southern Lebanese households were food insecure, and 62% of the Palestinian refugee households, were food secure. They also found that higher monthly income and higher educational attainment of the head of household were associated with a reduced risk of food insecurity. Additionally, the researchers observed a strong significant association between food insecurity and lower food expenditure per capita.

4. *Food consumption patterns in Lebanon, post-explosion*

In their national cross-sectional study, "Exploring the Impact of Crises on Food Security in Lebanon: Results from a National Cross-Sectional Study", the researchers aimed to investigate the prevalence and factors associated with food insecurity among Lebanese households following the COVID-19 pandemic, financial crisis, and Beirut port explosion (Hoteit et al., 2021). The study utilized household food security indicators, such as the food consumption score (FCS), the food insecurity experience scale (FIES), and coping strategies. The results demonstrated that 53% of the population had a low food consumption score, while 29% had an acceptable score. A significant number of the households consumed non-diversified food groups, with nine out of sixteen households having less than 2 meals per day and over 70% of households

skipping meals. Additionally, almost all households consumed main food groups less than 3 days per week. The households with poor food consumption scores primarily relied on cereals and vegetables, with low intake of pulses, fruits, dairy products, and meat. The study also found that one in two households experienced severe food insecurity (Hoteit et al., 2021). These findings highlight the critical issue of food insecurity among households Beirut, Lebanon, primarily resulting from the ongoing crises faced by the country.

D. Food and nutrition security in Lebanon after the August 4th explosion

The effect of the 4th of August explosion on Lebanon's food security has been immense and long-lasting, and the country was still recovering from its impact, two years after the explosion. However, the blast was not the only factor, coupled with the economic crisis faced by the country since October 2019, Lebanon faced many challenges in terms of food security and livelihoods (IPC, 2022). Lebanon continues to face a severe economic crisis, which has had a significant impact on the food security status of the population. The economic crisis has led to the currency depreciation, high inflation, and increasing food and non-food prices, making it increasingly challenging for households to access and afford an adequate and nutritious diet (WFP, 2022). In fact, the local currency, Lebanese Lira, lost more than 94% of its value since the start of the crisis, and in 2022, food prices rose by 208%, the average monthly wage of Lebanese residents covered only 29% of the minimum expenditure basket, unemployment rates increased by 30%, and the removal of subsidies resulted in significant increases in the prices of food and non-food commodities such as health,

fuel, transport, and others (IPC, 2022). All these affected the food security situation of Lebanese households.

In their report "Food Security and Vulnerability Analysis of Lebanese Residents", the World Food Programme provided an assessment of the food security situation and vulnerability of Lebanese residents in 2021 (WFP, 2022). The report included a sample size of 9,900 households from all over Lebanon. According to the report, 46% of Lebanese households were experiencing food insecurity between June and December 2021. Household dietary diversity and food consumption also significantly worsened in 2021. Based on the food consumption score, 41% of the population consumed inadequate diets, of which 13% had poor food consumption and 28% had borderline food consumption, between August and September 2021. Families had decreased access to nutritious food groups, and were mainly relying on staples, oils, and sugar. While their consumption of highly nutritious food that had high micronutrient contents and high-quality animal proteins decreased, such as fruits, vegetables, dairy and meat (WFP, 2022).

The report also identified increasing numbers of families facing challenges to access high quality food. Many families adopted coping strategies to manage their food shortages. The report adopted two kinds of coping strategies, food based coping strategies[4] and livelihood coping strategies[5]. For the former, 90% of the households were consuming less preferred or less expensive foods, 60% of the households limited their portion sizes, and 41% of the households reduced the number of meals eaten per day. As for the latter, 76% of the families were adopting livelihood coping strategies in

[4] These strategies include the immediate change of food consumption patterns in a household.

[5] These strategies are coping behaviors that cause changes in income earning activities and affect the capacity of families to generate income in the future.

2021. More than half the households borrowed money to purchase food, and 71% of the households reduced their expenses on health and education (WFP, 2022).

The situation got even worse in 2022, in the report, the "Integrated Food Security Phase Classification (IPC) Acute Food Insecurity Analysis" report in Lebanon, the researchers examined the food insecurity situation in Lebanon from September to December 2022 and projected the situation from January to April 2023 (IPC, 2022). This report highlighted the worsening food security situation in Lebanon and predicted that the food security situation in Lebanon will continue to worsen in 2023. The depreciation of the currency and the ongoing economic crisis are expected to persist, further driving up food prices and making it increasingly difficult for people to afford basic necessities.

The IPC report showed that 49% of the Lebanese population consumed inadequate diets, of which 18% had poor food consumption score and 31% had borderline food consumption score, in 2022. The report also analyzed the situation of Syrian refugees in Lebanon; 57% of Syrian refugees consumed inadequate diets, of which 18% had poor food consumption score and 39% had borderline food consumption score. As for livelihood coping strategies, 9% of Lebanese households adopted emergency coping strategies, and 68% adopted crisis coping strategies. As for Syrian refugees, 13% adopted emergency coping strategies, and 56% of adopted crisis coping strategies (IPC, 2022).

As a summary, these reports show a strong link between food insecurity and unemployment, unstable livelihoods, and lack of access to education and health services. And despite receiving significant levels of cash assistance, the decline in purchasing power, inflation, unfavorable currency exchange rates, and soaring food

prices are reducing the effectiveness of humanitarian food assistance in addressing food consumption gaps. This emphasizes the importance of addressing the underlying causes of the food security in Lebanon. This highlights the importance of providing long-term humanitarian assistance to vulnerable populations, through delivering sustainable comprehensive interventions that focus on improving household incomes and enhancing access to nutritious and affordable food for all Lebanese residents (WFP, 2022 & IPC, 2022).

CHAPTER III

METHODOLOGY

The core of the thesis is to see how the food security situation of the permanent residents of Karantina, changed six months and two years after the Beirut Port explosion in 2020. This will be accomplished by addressing the following research questions:

- What are the socio-demographic characteristics of the permanent households of the Karantina neighborhood, immediately after and two years after the Beirut port explosion?
- What kind of assistance (specifically food and cash assistance) did the permanent households of the Karantina neighborhood receive after the explosion? What was their food security in light of the assistance received?
- What was the food and nutritional security status of the permanent residents of the Karantina neighborhood, nearly 2 years after the explosion?

A. Location (Study area)

Karantina, a neighborhood located near the Port of Beirut, was one of the most affected by the blast. It is historically a low-income community and is home for some of the poorest families in Lebanon, as well as Syrian refugees. A series of recent crises – political, economic and a major explosion – have put pressure on the region, with adverse impacts on the population's food security. This region was one of the most affected by the triple crisis that hit Lebanon; its households were already hardly hit by the economic crisis pre-pandemic, the pandemic itself and the economic decline caused

by it, and finally the disastrous August 4th port explosion in 2020 (ACTED, 2020). The explosion is thought to have worsened their economic situation: many of Karantina's residents worked either at the port or close to it, and some lost their jobs after the explosion, negatively affecting their already precarious socio-economic and living conditions. (Beirut Urban Lab, 2021).

Karantina is historically a low-income community. Traditionally, it served as an agricultural area within the city and was a settlement area for several poverty-stricken communities who used to work at the port or in the slaughterhouse in the area. Among these communities are the Palestinians, Kurds and settled Bedouins (Arabs). In addition, it was traditionally home to poor Lebanese Christians who live side by side with the other settled communities. During the civil war, the region was the site of a major battle which resulted in the expulsion of a large part of the non-Christian population. In fact, it was the first large-scale massacre driven by the idea of ethnic cleansing. Then, at the end of the civil war, the settled populations started to swell again. And after 2011, the population was joined by the Syrians, as the area provided extremely low cost of housing and living. Currently, Karantina hosts crowded low-income households of Lebanese, Syrian refugees, and migrant workers (Beirut Urban Lab, 2021).

The Karantina neighborhood has one of the lowest population densities in Beirut, with approximately 300 residential buildings, and is divided into two main residential zones: Al-Saydeh neighborhood and Al-Khodor neighborhood. These two neighborhoods differ significantly, Al-Saydeh neighborhood, named after El-Saydeh Church, used to be directly connected to Mar Mikhael, and maintains a large number of its Christian population. In addition, it is a host to a small number of Armenians and migrant workers. On the other hand, the Al-Khodor Neighborhood, named after the Al-

Khodor Mosque, hosts Lebanese Sunni Muslims and large a concentration of Syrian refugees.

Many of the residents of Karantina lived in poverty and have poor living conditions, even from before the blast. Most of the buildings' structures had signs of deterioration, and these conditions have severely worsened after the blast. In addition to poor infrastructure, the Karantina area is not connected to the rest of Beirut through public transport, making it hard for its residents to navigate outside of the city. The Beirut Urban Lab considered it as an issue since the area itself lacks many social facilities, such as schools, markets, grocery stores, and even though it may have a governmental hospital, where people can go by foot, the Karantina hospital lacks medical clinics, and can be a little too expensive for the poor residents of the neighborhood (Beirut Urban Lab, 2021).

As for the situation after the blast, immediately after the blast, many organizations rushed to the scene and started giving out assistance. According to the Beirut Urban Lab, five modalities of interventions have been identified in Karantina, humanitarian and immediate emergency aid, short term building repairs, zone recovery interventions, long-term recovery interventions, and a small-scale punctual intervention to rehabilitate the Karantina public park. The main actors included were Offre Joie, Borderless, the UNDP, International Medical Corps, and the Norwegian Refugee Council. Even the humanitarian assistance has been divided into the two neighborhoods, Offre Joie focused primarily on the Al-Saydeh neighborhood for rehabilitation, while other organizations like Ahlak W Nasak and Beirut for Social Development focused on Al-Khodor neighborhood (Beirut Urban Lab, 2021).

The explosion was massively talked about, and reached international coverage. It is not important to talk about the reasons behind the explosion, what is important to mention is that the explosion was huge, destroying Lebanon's capital, and killing over 200 people and wounding more than 5,000 (ACTED, 2020). The devastating explosion destroyed and damaged more than 40,000 buildings within a 10 km radius from the port area, ranging between residential and commercial buildings (Beirut Urban Lab, 2021).

The Karantina neighborhood was one of the most affected areas after the explosion, and all the non-governmental organizations (NGOs) and people rushed to action, it was very mediatized, people moved from all around the world, and all the Lebanese went down to the streets to help. Five main actors were involved in relief aid in Karantina, they helped the people out and helped in the repair of damaged buildings as well. People were provided with food parcels for over one year, community kitchens, household repair, and cash assistance for around six months. However, the rebuilding and rehabilitation work, along with the number of NGOs and volunteers appeared to be unevenly distributed between the different neighborhoods (Beirut Urban Lab, 2021). Nevertheless, around one year after the explosion, most of the NGOs left the area, and the community went back to being like the rest of the country, they went back to being affected by the economic crisis that hit Lebanon in 2019 (Beirut Urban Lab, 2021).

Thus, due to its high vulnerability, the Karantina neighborhood (shown in figures 1 and 2 below) was chosen as the site of study for this research. Moreover, it was one of twelve neighborhoods that were most severely affected by the Beirut blast, and one of the most regions to have received international and national assistance (WFP, 2020).

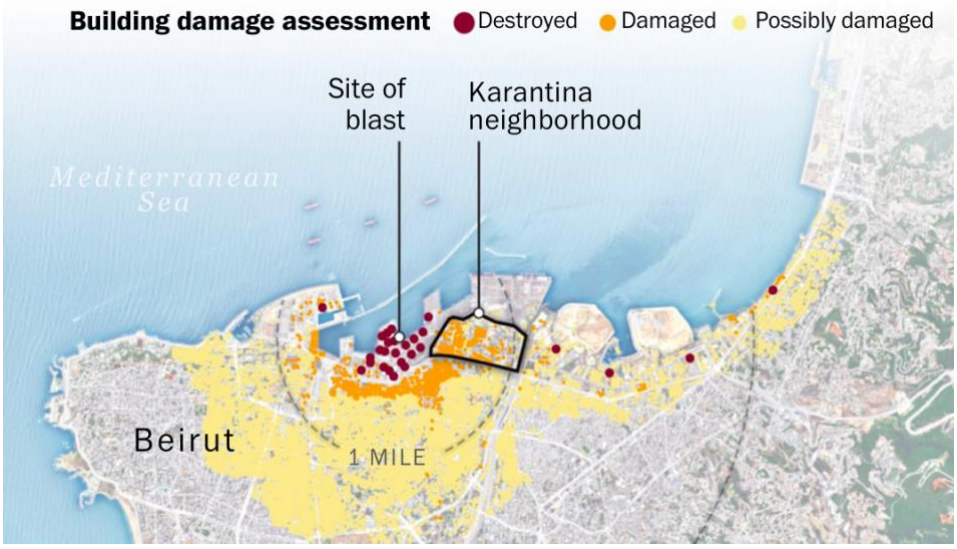

Figure 1. Map showing the building damage assessment after the Beirut blast (Beirut Urban Lab, 2021)

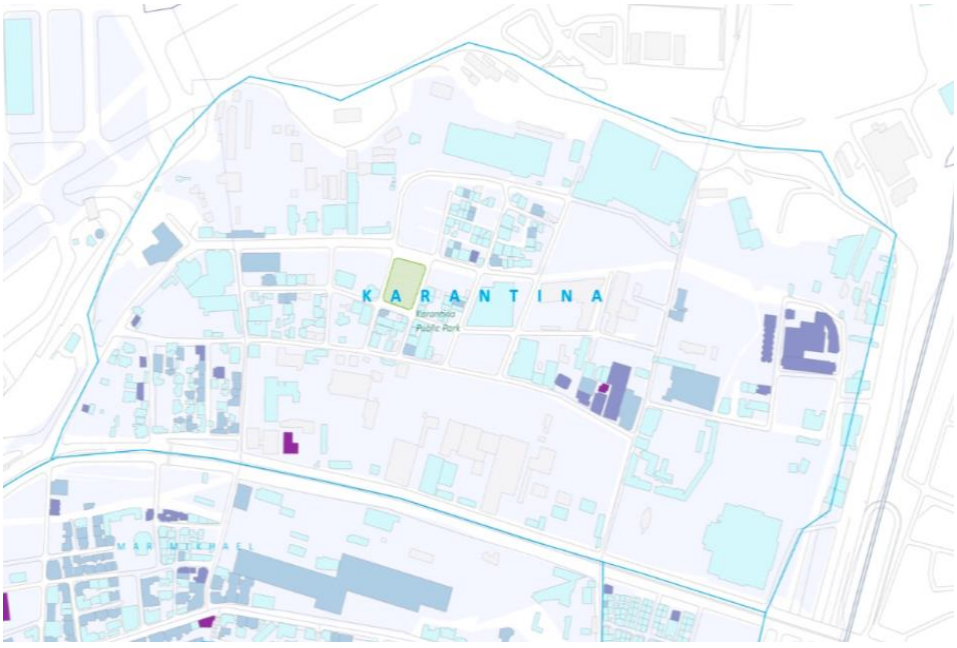

Figure 2. Map showing the Karantina neighborhood (Beirut Urban Lab, 2021)

Between the period when NGOs left Karantina and that I gathered the data, the $ exchange rate increased as an indication of the deterioration of the economic situation. The $ exchange rate at the time of data collection was 22,000 LBP (in March 2022).

B. General methodology and data collection

The goal of this research is to investigate the change in food security following the aid and support that followed the August 4th explosion, in the population of the Karantina neighborhood, in Lebanon. The questionnaire (shown in Appendix III) collected quantitative data about the residents' socio-demographics, livelihoods, assistance received, food consumption, food security situation, and coping strategies, through a questionnaire that was filled by the researcher via the online app Survey123. The questionnaire used was developed for the purpose of this research, with the help of my committee member Dr. Hala Ghattas. The interviews were conducted between February 2022 and March 2022 and were conducted using a recall during three time periods; before the explosion (6 months prior to the explosion), during the explosion (and 6 months after), and now (March 2022) (nearly 2 years after the explosion).

Normality testing was performed for the analysis, and any non-normal variables were categorized. All the variables did not follow a normal distribution, and therefore, were all categorized. Household size and education of the head of the households were categorized into 3 categories and 4 categories, respectively. Income and expenditures were transformed into quintiles. The data are listed in table 10 in Appendix II.

C. Target population

The target population is the permanent residents in the Karantina region where the AUB Land Food Project[6] was being deployed. One representative from each

[6] Following the August 4 explosion, the AUB's Land Food Recovery Initiative was created as a disaster response. The goal of this project was to introduce sustainable food practices and create open spaces that contribute to the long-term food security and mental and social well-being of communities in Karantina, the immediate priority was to improve food security in Karantina (AUB, 2020).

permanent household in Karantina was interviewed. The chosen households and interviewees had to meet the inclusion criteria. The households must be permanent households of the Karantina, and the interviewee had to be a male or female adult member aging between 18 and 65 years, who is familiar enough with the household and able to answer questions related to their socio-demographics and food consumption.

D. Sampling framework

The sample population was chosen following a systematic approach: interview one household and skip two households (even if in same building). In total, 100 randomly selected households out of a total of 300 households in Karantina were interviewed, making up 1/3 (33%) of the population. According to the Beirut Urban Lab, in their report "Karantina Urban Snapshot", in 2021, there were around 120 Syrian families in Karantina, 200 Lebanese families, and 15 to 20 migrant workers, adding up to around 330 households. However, to have more accurate numbers, a mayor of the Karantina region was interviewed, he stated that there are around 300 permanent households living in Karantina.

Each household was administered a one-to-one interview that was answered by whoever was present and self-identified as the head of the household, these included mothers, fathers, and adult children. The questionnaire covered a set of questions that allows the understanding of the household demographics, the assessment of the food and nutrition security status, and the effect of the explosion on their conditions, during the three time periods; before the explosion (6 months prior to the explosion), during the explosion (and 6 months after), and now (nearly 2 years after the explosion).

Face-to-face interviews were chosen to have a more accurate assessment of the households, and reliable results. Due to it being a critical subject, food security assessment is best performed in person, especially when dealing with a vulnerable population, as they would be hard to reach via online modes. By doing so, the researcher was able to clearly explain the objective of the survey to the participants, and if they were interested, the interview would begin. Moreover, the researcher was able to keep the interviewees focused throughout the whole interview, and the completion of the surveys was guaranteed, so there would be no missing data. Finally, the participants would refrain from delivering any false statements, especially when it comes to socio-demographic data; if it was an online platform, there would be no guarantee that the answers are truthful and accurate (Vogl, 2013).

E. Data collection

After introducing the project to each of the 100 heads of household, the interviews were conducted using six indicators:

1. Socio-demographic

a. Food Expenditure share

b. Assistance received

2. Food Consumption Score

3. Food Insecurity Experience Scale

4. Livelihood Coping strategies

2. Socio-demographic questions

This section of the questionnaire used a set of 30 questions that allowed the exploration of the socioeconomic demographics of the target population. These include questions about household demographics, household size, age groups, education, employment, income, expenditure, and debt.

This part of the questionnaire was inspired from the Arab Family Food Security Scale (AFFSS). The AFFSS is a food security tool validated to be used in Lebanon, on Lebanese citizens and Palestinian refugees. It consists of questions about socio-demographics, such as age, gender, educational attainment of the head of household, employment, household income, expenses, expenditures on food, meal sizes and frequencies of consumptions and coping strategies to secure money for food, such as receiving help from relatives, borrowing money, or staying without food (Sahyoun et al., 2014).

a. Food Expenditure Share

The Food Expenditure Share (FES) is a proxy indicator of food security, used to measure a household's economic vulnerability (Smith et al., 2007). The FES is calculated by dividing the household's expenditure on food by their total expenditure and then multiplying it by 100, this would generate a percentage. The results are classified into these following four categories: households spending over 75% of their income on food are considered very vulnerable and food insecure, people spending 65-75% of their income on food have high food insecurity, people spending 50-65% of their income on food have medium food insecurity; and those spending less than 50% of their income on food have low food insecurity (Smith et al., 2007). The FES indicates

that the larger the share of a household's income is spent on food, the poorer and more vulnerable it is. This indicator was used in the vulnerability assessment of Syrian refugees in Lebanon (VASyR, 2021).

b. Assistance received after the explosion

This section of the questionnaire used a set of 4 yes or no questions that allowed the exploration of the kind of assistance received by the Karantina region. These included questions about the kind of assistance received by the participants after the explosion. The questions were whether the assistance was in-kind food assistance, cash assistance, non-food in-kind assistance, such as clothes and hygiene products, and whether they received services such as maintenance and repair of the houses and cars.

3. Food Consumption Score

This section of the questionnaire used the Food Consumption Score (FCS) indicator that allowed the exploration of the food consumption and dietary diversity of the population, during the three time periods mentioned above.

The Food Consumption Score (FCS), developed by the WFP and validated for international use, is a quantitative tool used by calculating and analyzing the frequency of consumption of 9 different food groups consumed within a household, during the week preceding the survey. These food groups encompass cereals and tubers, dairy products, poultry and meat, fish, eggs, pulses and legumes, vegetables, fruits, oils and fats, sugar, and beverages. Each food group is assigned a specific weight, as listed in figure 3, that contributes to the overall food consumption score. The cumulative weighted frequency of household consumption can range from 0 to 112, with higher

scores indicating a more varied and nutritious diet. A score of 112 indicates the consumption of all food groups every day for a 7-day period. (WFP, 2008).

	FOOD ITEMS (*examples*)	Food groups (definitive)	Weight (definitive)
1	Maize , maize porridge, rice, sorghum, millet pasta, bread and other cereals	Main staples	2
	Cassava, potatoes and sweet potatoes, other tubers, plantains		
2	Beans. Peas, groundnuts and cashew nuts	Pulses	3
3	Vegetables, leaves	Vegetables	1
4	Fruits	Fruit	1
5	Beef, goat, poultry, pork, eggs and fish	Meat and fish	4
6	Milk yogurt and other diary	Milk	4
7	Sugar and sugar products, honey	Sugar	0.5
8	Oils, fats and butter	Oil	0.5
9	spices, tea, coffee, salt, fish power, small amounts of milk for tea.	Condiments	0

Figure 3. FCS the standard Food Groups and current standard weights (WFP, 2008)

Due to the high consumption of cereals, sugar, and oil in Karantina, the World Food Programme cutoff points (0-21: poor food consumption, 21.5-35: borderline food consumption, and > 35: acceptable food consumption) were not used in this study (WFP, 2008). In this study the adjusted cutoff points have been used: 0-28: poor food consumption, 28.5-42, borderline food consumption, and > 42: acceptable food consumption. These cutoff points were used in two recent studies:

- Exploring the Impact of Crises on Food Security in Lebanon: Results from a National Cross-Sectional Study (Hoteit et al., 2021).
- The Food Security and Vulnerability Analysis of Lebanese Residents (WFP, 2022).

The analysis of the Food Consumption Score will lead to determining the dietary diversity and quality of the residents of Karantina.

4. Food Insecurity Experience Scale

The Food Insecurity Experience Scale (FIES), developed by the FAO and validated for international use, consists of eight yes or no questions that assess people's ability to access adequate food. This scale measures the severity of food insecurity across three levels: mild, moderate, and severe. A lower score indicates a less severe level of food insecurity. The questions primarily explore self-reported, food-related behaviors and experiences related to food access challenges caused by limited resources. The questions reflect the individual respondent's or their household's experiences (FAO, 2013). The eight questions focus on: being worried about food, being unable to eat healthy and nutritious food, eating few kinds of food, skipping meals, eating less, running out of food, hunger, and spending entire day without food. And as the questions go from 1 to 8, the level of food insecurity increases. By utilizing this tool, we can assess the presence and severity of food insecurity among the permanent residents of Karantina.

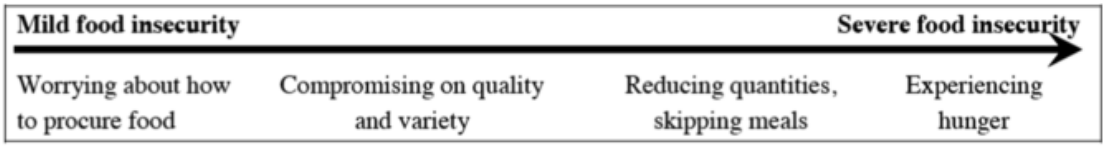

Figure 4. Food insecurity severity along a continuous scale of severity (FAO, 2013)

The cutoff points used in this study are based on the global standard, and are as follows, 0-3: food secure, 4-6: moderately food insecure, 7-8: severely food insecure.

These cutoff points were used in the following study: “Validity of the Food Insecurity Experience Scale (FIES) for Use in League of Arab States (LAS) and Characteristics of Food Insecure Individuals by the Human Development Index (HDI)” (Sheikomar et al., 2021).

5. Livelihood coping strategies

Coping strategies were identified using the Livelihood Coping Strategies (LCS-FS), developed by the World Food Programme. These were also collected during the three time periods; before the explosion (6 months prior to the explosion), during the explosion (and 6 months after), and now (nearly 2 years after the explosion). It is an indicator of a household’s food security, assessing the extent to which households use harmful coping strategies when they do not have enough food or enough money to buy food. The results are categorized into three categories: stress coping, crisis coping, and emergency coping strategies (WFP, 2021c). The three livelihood-based coping strategies are considered as a scale, where stress is the least severe and emergency is the most severe. Stress strategies, including spending savings, borrowing money to purchase food, and selling furniture, indicate a reduced ability to deal with future shocks. Crisis coping strategies, including withdrawing children from school, reducing expenses on education and health, marrying children under the age of 18, directly reduce future productivity, and thus hindering resilience. And emergency coping strategies, including accepting high risk jobs and engaging children in income generating activities, are the most difficult to reverse and the most extreme in nature, where people adopt them as a last resort (VASYR, 2021). This indicator was used in the Food Security and Vulnerability Analysis of Lebanese Residents (WFP, 2022).

F. Statistical analysis

STATA/SE 15.1 was used to analyze the quantitative data from the socio-demographic data, FCS, FIES, coping strategies, and the food expenditure share. Different continuous and categorical variables were used, and the statistical tests were performed through the tabulation of the different variables. The P-value (alpha = 0.05) and 95% confidence interval (95% CI) were used to study the significance of all test results. The tests used for analysis can be found in the following table, and the Stata results can be found in the Appendix II and the results section.

Topic	**Dependent Variable**	**Independent Variable**	**Test**
Socio-demographic characteristics	2020: Household size Nationality Education of head of household Employment of head of household Household Income Food Expenditure Total Expenditure Household debt	2022: Household size Nationality Education of head of household Employment of head of household Household Income Food Expenditure Total Expenditure Household debt	Chi-square test
Food and Nutrition Security	FCS	Household size	Regression test
		Nationality	Regression test
		Education of head of household	Regression test
		Employment of head of household	Regression test
		Household Income	Regression test
		Food Expenditure	Regression test
		Total Expenditure	Regression test
		Household debt	Regression test
	FIES	Household size	Regression test
		Nationality	Regression test
		Education of head of household	Regression test
		Employment of head of household	Regression test
		Household Income	Regression test

		Food Expenditure	Regression test
		Total Expenditure	Regression test
		Household debt	Regression test
Assistance	FCS	Cash assistance	Regression test
	FIES	Cash assistance	Regression test

G. Testing the validity of the recall

It is evident that participants might not remember the needed information accurately, especially the specific quantitative information, due to it being 2 years after the explosion. To verify that the reliance on the recall is valid, a subset of 20 households on whom we had both recall and baseline data, was used, for accordance/discordance between the recall and the baseline. Baseline data was gathered 4 months after the explosion, in December 2020, and the recall data was gathered 2 years after the explosion, in March 2022. The analysis was performed using Pearson's chi-square test on the FIES, FCS, the assistance, and the income and expenditure tertiles. If the answers are similar, this means that the questionnaire is validated, and there is no issue, a quantitative analysis based on the impressions of the participants can be performed.

Before the analysis, normality testing was performed for the recall analysis, and any non-normal variables were categorized. Income and expenditures were transformed into tertiles. The data are listed in table 11 in Appendix II.

There's very strong concordance between the recall and the baseline data, as there are only very few misclassifications. Such as, for the food consumption score before the explosion, the food consumption score after the explosion, and the food insecurity experience scale before the explosion, there were 1 household for each, which was misclassified based on the recall. And for the total income quintiles, 4

households were misclassified based on the recall. As for the total income quantiles, food and cash assistance received after the explosion, and food insecurity experience scale after the explosion, no misclassifications were found. Therefore, there is a strong concordance, and the recall adequately validated the data. The data are listed in tables 18 till 25 in Appendix II.

H. Ethical considerations

This study was approved by the Institutional Review Board (IRB) at the American University of Beirut (AUB) in October 2021. The IRB approval documents can be found in the Appendix I.

No data was collected without proper explanation of the project and the consent of the participants. The participant had the right to refuse to answer any question and to withdraw from the study any time they wanted. Their questions and inquiries at any time of the interview were carefully addressed. In addition, they were not forced, by any means, to participate. The participants were informed that the purpose of the study is strictly educational, and they will not receive any form of incentive or compensation to participate. Data collection was confidential, and no one except the researcher has the right to access the collected data. The data will be kept stored on a password-protected computer belonging to the researcher during the period of data collection and data analysis, with passwords allowing only the researcher to have access. After data analysis, the data will be stored for four years and then destroyed.

CHAPTER IV

RESULTS AND DISCUSSION

A. Results

1. Socio-demographics

Table 1. Socio-demographic characteristics of the permanent residents of Karantina 6 months after the explosion

Variable	Categories	Frequency
Household Size	1-2	28
	3-4	32
	>=5	40
Nationality	Lebanese	80
	Syrian	20
Education of head of household	Never attended	8
	Elementary	33
	Middle/Highschool	41
	University	18
Employment of head of household	Yes	43
	No	57
Income Quintiles	Low	42
	Lower-Middle	0
	Middle	33
	Upper-Middle	5
	High	20
Food Expenditure Quintiles	Low	22
	Lower-Middle	29
	Middle	14
	Upper-Middle	31
	High	4
Total Expenditure Quintiles	Low	24
	Lower-Middle	19
	Middle	22
	Upper-Middle	18
	High	17
Food Expenditure Share	< 50%	50
	50-65%	28
	65-75%	16
	> 75%	6
Food Assistance	Yes	100

	No	0
Cash Assistance	Yes	76
	No	24
Debt	Yes	18
	No	82

Table 1 above shows the different sociodemographic characteristics of the permanent residents of the Karantina neighborhood, 6 months after the explosion.

For the household size, 28% of the population had a household size between one and two people, 32% had a household size between three and four people, which is the average household size (Mean = 3.94), and 40% had a household size of more than five people. As for nationalities, 20% of the population were Syrians and 80% were Lebanese. 8% of the heads of the households never attended school, 33% had an elementary education, 41% reached middle and high school, and 18% had a university education.

Six months after the explosion, 57% of the heads of the households had no employment. As for income, 42% of the households were no income earners, 33% were lower income earners (received the bottom 25% of income), 5% were middle income earners (50% - 75% range of income), and 20% were the highest income earners (received the top 25% of income). (These included gifts and donations). In 2020, 49% of the households were above the national minimum wage, which in 2020, was 675,000 LBP, in dollars it was equivalent to 84$.

As for debt, 6 months after the explosion 18% of the population had debt.

Table 2. Socio-demographic characteristics of the permanent residents of Karantina 2 years after the explosion

Variable	Categories	Frequency
Household Size	1-2	28
	3-4	32

	>=5	40
Nationality	Lebanese	80
	Syrian	20
Education of head of household	Never attended	8
	Elementary	33
	Middle/Highschool	41
	University	18
Employment of head of household	Yes	46
	No	54
Income Quintiles	Low	31
	Lower-Middle	10
	Middle	19
	Upper-Middle	25
	High	15
Food Expenditure Quintiles	Low	31
	Lower-Middle	15
	Middle	18
	Upper-Middle	16
	High	20
Total Expenditure Quintiles	Low	20
	Lower-Middle	20
	Middle	22
	Upper-Middle	18
	High	20
Food Expenditure Share	< 50%	77
	50-65%	18
	65-75%	2
	> 75%	3
Food Assistance	Yes	0
	No	100
Cash Assistance	Yes	0
	No	100
Debt	Yes	53
	No	47

Table 2 above shows the different sociodemographic characteristics of the permanent residents of the Karantina neighborhood, 2 years after the explosion.

For the household size, 28% of the population had a household size between one and two people, 32% had a household size between three and four people, which is the average household size (Mean = 3.94), and 40% had a household size of more than five people. As for nationalities, 20% of the population were Syrians and 80% were

Lebanese. 8% of the heads of the households never attended school, 33% had an elementary education, 41% reached middle and high school, and 18% had a university education.

Two years after the explosion, 54% of the population's heads of households had no employment. As for income, 2 years after the explosion, 31% of the population were no income earners, 10% were lower income earners (received the bottom 25% of income), 19% were middle income earners (25% - 50% range of income), 25% were upper-middle income earners (50% - 75% range of income), 15% were the highest income earners (received the top 25% of income). (These included gifts and donations). 29% of the households were above the national mimimum wage, which in 2022, was 2,600,000 LBP, in dollars it was equivalent to 118$.

As for debt, two years after the explosion, 53% of the population had debt.

Table 3. Pearson chi2 test of socio-demographics 6 months after the explosion and 2 years after the explosion

Variable	Categories	6 months after the explosion	2 years after the explosion	P-value (alpha = 0.05)
Employment of head of household	Yes	43	46	0.00
	No	57	54	
Income Quintiles	1	42	31	0.00
	2	0	10	
	3	33	19	
	4	5	25	
	5	20	15	
Food Expenditure Quintiles	1	22	31	0.00
	2	29	15	
	3	14	18	
	4	31	16	
	5	4	20	
Total Expenditure Quintiles	1	24	20	0.00
	2	19	20	
	3	22	22	
	4	18	18	
	5	17	20	
Debt	Yes	18	53	0.01

	No	82	47	

Table 3 above shows the change in socio-demographics among the permanent residents of the Karantina neighborhood, between the 2020 (6 months after the explosion) and 2022 (2 years after the explosion). There have been significant changes in socio-demographics of the permanent residents of Karantina, in terms of employment, income, expenditures, and debt.

a. Food Expenditure Share

As mentioned above, food as a share of total household expenditure is used as a proxy indicator of food security. Households with a high share of their total expenditure spent on food, means they do not have enough resources to cover other important costs such as healthcare and education.

As listed in table 1, six months after the explosion, 6% of the households had a very high share of their total expenditure allocated for food, 16% of the households had a high share of their total expenditure allocated for food, 28% had a medium share of their total expenditure allocated for food, and 50% of the population had a lower share of their total expenditure allocated for food expenditure.

Whereas, as listed in table 2, two years after the explosion, 3% of the households had a very high share of their total expenditure allocated for food, 2% of the households had high share of their total expenditure allocated for food, 18% had medium share of their total expenditure allocated for food, and 77% of the population had lower share of their total expenditure allocated for food expenditure.

b. Assistance received

As listed in tables 1 and 2 in pages 47-49, six months after the explosion, everybody received food assistance, and 76% of the population received cash assistance. Whereas, two years after the explosion, all households did not receive food assistance nor cash assistance.

2. Food Consumption Score

As listed in table 12 in Appendix II, six months before the explosion, 1% of the population had poor food consumption, 2% had borderline food consumption, and 97% had acceptable food consumption. Six months after the explosion, 4% of the population had borderline food consumption, and 96% had acceptable food consumption. Whereas, two years after the explosion, 4% of the population had poor food consumption, 66% had borderline food consumption, and 30% had acceptable food consumption.

In this study, the binomial FCS was used to be able to perform the bivariate logistic regression. As listed in table 13 in Appendix II, six months before the explosion, 3% of the population had a poor food consumption, and 97% had acceptable food consumption. Six months after the explosion, 4% of the population had a poor food consumption, and 96% had acceptable food consumption. Whereas, two years after the explosion, 72% of the population had poor food consumption, and 28% had acceptable food consumption.

a. Food groups consumptions

(a) Dairy consumption of the permanent residents of Karantina

Table 4. Pearson chi2 test of dairy consumption 6 months after the explosion and 2 years after the explosion

		Dairy 2 years after the explosion		Total
		≤ 1 time / week	2-7 times / week	
Dairy 6 months after the explosion	≤ 1 time / week	14	2	16
	2-7 times / week	55	28	83
	> 7 times / week	0	1	1
Total		69	31	100

A chi-square test was done, and as represented in the table 4 above, six months after the explosion, 16% of the population consumed dairy products one time per week, 83% of the population consumed dairy products two to seven times per week, and 1% of the population consumed dairy products more than seven times per week. Whereas, two years after the explosion, 69% of the population consumed dairy products one time per week, and 31% of the population consumed dairy products two to seven times per week.

Six months after the explosion, all the households with poor food consumption, consumed dairy products one time per week. And out of the households with acceptable food consumption, 12.5% consumed dairy products one time per week, 83% consumed dairy products two to seven times per week, and 1% consumed dairy products more than seven times per week. Whereas, two years after the explosion, out of the households with poor food consumption, 86% consumed dairy products up to one time per week, and 14% consumed dairy products two to seven times per week. And out of the households with acceptable food consumption, 25% consumed dairy products up to one time per week, and 75% consumed dairy products two to seven times per week.

(b) Chicken and meat consumption of the permanent residents of Karantina

Table 5. Pearson chi2 test of chicken and meat consumption 6 months after the explosion and 2 years after the explosion

		Meat 2 years after the explosion		Total
		≤ 1 time / week	2-3 times / week	
Meat 6 months after the explosion	≤ 1 time / week	23	0	23
	2-3 times / week	75	2	77
Total		98	2	100

A chi-square test was done, and as represented in the table 5 above, six months after the explosion, 23% of the population consumed chicken and meat one time per week, and 77% of the population consumed chicken and meat two to three times per week. Whereas, two years after the explosion, 98% of the population consumed chicken and meat up to one time per week, and 2% of the population consumed chicken and meat two to three times per week.

Six months after the explosion, out of households with poor food consumption, 75% consumed chicken and meat one time per week, and 25% consumed chicken and meat two to three times per week. And out of the households with acceptable food consumption, 21% consumed chicken and meat one time per week, and 79% consumed chicken and meat two to three times per week. Whereas, two years after the explosion, all households with poor food consumption, consumed chicken and meat up to one time per week. And out of the households with acceptable food consumption, 93% consumed chicken and meat up to one time per week, and 7% consumed chicken and meat two to three times per week.

(c) Eggs consumption of the permanent residents of Karantina

Table 6. Pearson chi2 test of eggs consumption 6 months after the explosion and 2 years after the explosion

		Eggs 2 years after the explosion			Total
		≤ 1 time / week	2-3 times / week	> = 4 times / week	
Eggs 6 months after the explosion	≤ 1 time / week	73	3	0	76
	2-3 times / week	17	1	1	19
	> = 4 times / week	4	1	0	5
Total		94	5	1	100

A chi-square test was done, and as represented in the table 6 above, six months after the explosion, 76% of the population consumed eggs one time per week, 19% of the population consumed eggs two to three times per week, and 5% of the population consumed eggs more than four times per week. Whereas, two years after the explosion, 94% of the population consumed eggs up to one time per week, 5% of the population consumed eggs two to three times per week, and 1% of the population consumed eggs more than four times per week.

Six months after the explosion, all households with poor food consumption, consumed eggs one time per week. And out of the households with acceptable food consumption, 75% consumed eggs up to one time per week, 20% consumed eggs two to three times per week, and 5% consumed eggs more than four times per week. Whereas, two years after the explosion, out of the households with poor food consumption, 99% consumed eggs up to one time per week, and 1% consumed eggs two to three times per week. And out of the households with acceptable food consumption, 82% consumed eggs up to one time per week, 14% consumed eggs two to three times per week, and 4% consumed eggs more than four times per week.

(d) Pulses consumption of the permanent residents of Karantina

Table 7. Pearson chi2 test of pulses consumption 6 months after the explosion and 2 years after the explosion

		Pulses 2 years after the explosion			Total
		≤ 1 time / week	2-3 times / week	> = 4 times / week	
Pulses 6 months after the explosion	2-3 times / week	4	57	0	61
	> = 4 times / week	0	36	3	39
Total		4	93	3	100

A chi-square test was done, and as represented in the table 7 above, six months after the explosion, 61% of the population consumed pulses two to three times per week, and 39% of the population consumed pulses more than four times per week. Whereas, two years after the explosion, 4% of the population consumed pulses up to one time per week, 93% of the population consumed pulses two to three times per week, and 3% of the population consumed pulses more than four times per week.

Six months after the explosion, out of the households with poor food consumption, 75% consumed pluses two to three time per week, and 25% consumed pulses more than four times per week. And out of the households with acceptable food consumption, 60% consumed pulses two to three time per week, 40% consumed pulses more than four times per week. Whereas, two years after the explosion, out of the households with poor food consumption, 3% consumed pulses up to one time per week, 94% consumed pluses two to three time per week, and 3% consumed pulses more than four times per week. And out of the households with acceptable food consumption, 7% consumed pulses up to one time per week, 89% consumed pulses two to three time per week, 4% consumed pulses more than four times per week.

(e) Fruits consumption of the permanent residents of Karantina

Table 8. Pearson chi2 test of fruits consumption 6 months after the explosion and 2 years after the explosion

		Fruits 2 years after the explosion			Total
		≤ 1 time / week	2-3 times / week	> = 4 times / week	
Fruits 6 months after the explosion	≤ 1 time / week	28	0	0	28
	2-3 times / week	34	5	0	39
	> = 4 times / week	23	7	3	33
Total		85	12	3	100

A chi-square test was done, and as represented in the table 8 above, six months after the explosion, 28% of the population consumed fruits one time per week, 39% of the population consumed fruits two to three times per week, and 33% consumed fruits more than four times per week. Whereas, two years after the explosion, 85% of the population consumed fruits up to one time per week, 12% of the population consumed fruits two to three times per week, and 3% consumed fruits more than four times per week.

Six months after the explosion, out of households with poor food consumption, 75% consumed fruits one time per week, and 25% consumed fruits two to three times per week. And out of the households with acceptable food consumption, 26% consumed fruits one time per week, 40% consumed fruits two to three times per week, and 35% consumed fruits more than four times per week. Whereas, two years after the explosion, out of households with poor food consumption, 93% consumed fruits up to one time per week, and 7% consumed fruits two to three times per week. And out of the households with acceptable food consumption, 64% consumed fruits up to one time per week, 25%

consumed fruits two to three times per week, and 11% consumed fruits more than four times per week.

(f) Vegetables consumption of the permanent residents of Karantina

Table 9. Pearson chi2 test of vegetables consumption 6 months after the explosion and 2 years after the explosion

		Vegetables 2 years after the explosion			Total
		≤ 1 time / week	2-3 times / week	> = 4 times / week	
Vegetables 6 months after the explosion	≤ 1 time / week	3	1	0	4
	2-3 times / week	0	22	3	25
	> = 4 times / week	1	47	23	71
Total		4	70	26	100

A chi-square test was done, and as represented in the table 9 above, six months after the explosion, 4% of the population consumed vegetables up to one time per week, 25% of the population consumed vegetables two to three times per week, and 71% of the population consumed vegetables more than four times per week. Whereas, two years after the explosion, 4% of the population consumed vegetables up to one time per week, 70% of the population consumed vegetables two to three times per week, and 26% of the population consumed vegetables more than four times per week.

Six months after the explosion, out of the households with poor food consumption, 25% consumed vegetables up to one time per week, and 75% consumed vegetables two to three times per week. And out of the households with acceptable food consumption, 3% consumed vegetables up to one time per week, 23% consumed vegetables two to three times per week, and 74% consumed vegetables more than four times per week. Whereas, two years after the explosion, out of the households with poor food consumption, 4% consumed vegetables up to one time per week, 82% consumed

vegetables two to three times per week, and 14% consumed vegetables two to three times per week. And out of the households with acceptable food consumption, 4% consumed vegetables up to one time per week, 39% consumed vegetables two to three times per week, and 57% consumed vegetables more than four times per week.

b. Bivariate regression analysis between FCS and socio-demographics

In this part, the association between the households' socio-demographic characteristics and food consumptions is studied, using a bivariate logistic regression. And the results are as follows:

A bivariate regression test, presented in table 16 in Appendix II, shows:

- A significant negative association between the household size and acceptable food consumption score at alpha $p>|z| = 0.2$. This means that as household size increase, the FCS significantly decreases.
- A significant positive association between being Lebanese and acceptable food consumption score at alpha $p>|z| = 0.2$. This means that Lebanese are four times more likely to have acceptable food consumption, as compared to being Syrian.
- A positive association between education level and acceptable food consumption score at alpha $p>|z| = 0.2$. This means that with increasing education, the odds of having acceptable food consumption increases. However, the association is not significant at alpha $p>|z| = 0.2$. Having elementary educational level increases the chances of having acceptable food consumption by two. Having middle education level increases the chances of having acceptable food consumption by almost three. Having university

educational level increases the chances of having acceptable food consumption by almost four and a half.

- A positive association between the employment of the head of the household and acceptable food consumption score. This means that being employed increases the odds of having acceptable food consumption by 1, compared to having no employment. However, the association is not significant at alpha p>|z| = 0.2.
- A positive association between the income of the head of the household and acceptable food consumption score. This means that with increasing income, the odds of having acceptable food consumption increases. However, the association is not significant at alpha p>|z| = 0.2.
- A positive association between the household food expenditure share and acceptable food consumption score. This means that having a lower percentage of total expenditure spent on food, increases the odds of having acceptable food consumption by 1. However, the association is not significant at alpha p>|z| = 0.2.
- A positive association between the household total expenditure and acceptable food consumption score. This means that with increasing total expenditure, the odds of having acceptable food consumption increases. However, the association is not significant at alpha p>|z| = 0.2.
- A significant negative association between having debt and acceptable food consumption score at alpha p>|z| = 0.2. This means that having debt decreased the odds of having acceptable food consumption, compared to not having debt.

- A significant positive association between receiving cash assistance after the explosion and having acceptable food consumption at alpha p>|z| = 0.2. This means that as households who received cash assistance after the explosion, have increased odds of having acceptable food consumption, compared to households who did not receive cash assistance.

c. Food consumption score by receipt of cash assistance

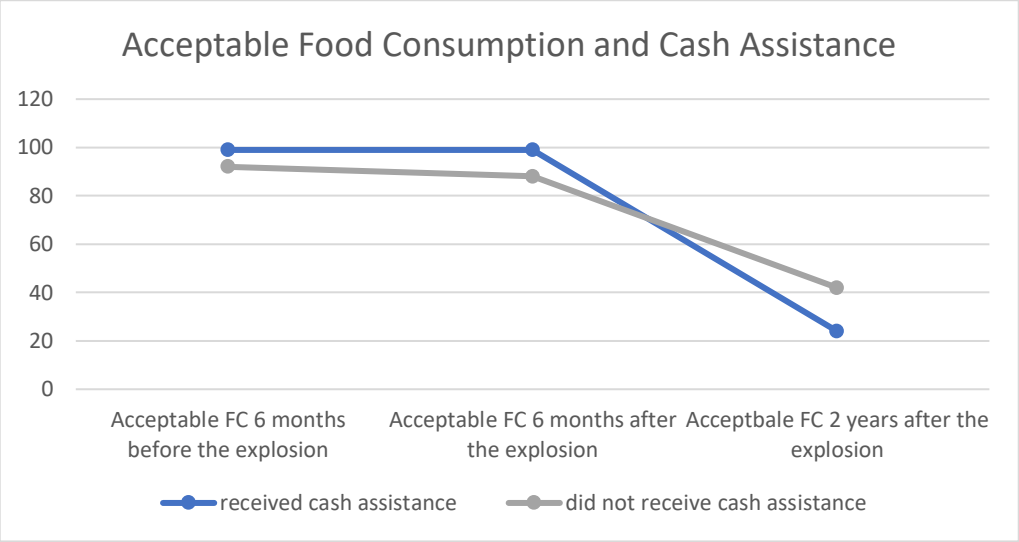

Figure 5. Percentage of households with acceptable food consumption based on receipt of cash assistance 6 months after the explosion

As represented in figure 6 above, six months before the explosion, out of the 100 households who received cash assistance 6 months after the explosion, 99% had acceptable food consumption. Whereas, out of the households who did not receive cash assistance 6 months after the explosion, 92% had acceptable food consumption.

Six months after the explosion, out of the households who received cash assistance 6 months after the explosion, and 99% had acceptable food consumption.

Whereas, out of the households who did not receive cash assistance 6 months after the explosion, 88% had acceptable food consumption.

And two years after the explosion, out of the households who received cash assistance 6 months after the explosion, 27% had acceptable food consumption. Whereas, out of the households who did not receive cash assistance 6 months after the explosion, 42% had acceptable food consumption.

3. Food Insecurity Experience Scale

As listed in table 14 in Appendix II, six months before the explosion, 80% of the population were food secure, 17% were mildly food insecure, and 3% were severely food insecure. Six months after the explosion, 71% of the population were food secure, 29% were mildly food insecure. Whereas, two years after the explosion, 2% of the population were food secure, 64% were mildly food insecure, and 34% were severely food insecure.

In this study, the binomial FIES was used to be able to perform the bivariate logistic regression. As listed in table 15 in Appendix II, six months before the explosion, 20% of the population were food secure, and 80% of the population were food insecure. Six months after the explosion, 71% of the population were food secure, and 29% of the population were food insecure. Whereas, two years after the explosion, 2% of the households were food secure, and 98% were food insecure.

a. <u>FIES answers six months after the explosion</u>

During the past 6 months after the explosion, out of the households:

- 61% reported they were concerned that they would run out of food for the household for the next month.
- 26% reported the food that they bought was not enough and they didn't have money to get more.
- 86% reported there are foods they feel their family did not eat enough of six months after the explosion.
- 9% reported they or any other adult in the household cut the size of their meal because there was not enough food.
- 5% reported that at least one adult in the household skipped a meal because there was not enough food.
- 89% reported there was a time when at least one adult in the household was unable to eat healthy and nutritious food because of a lack of money or other resources.
- 0% reported there was a time when at least one adult in the household was hungry but did not eat because there was not enough money or other resources for food.
- 0% reported there was a time when at least one adult in the household went without eating for a whole day or got to bed hungry because of a lack of money or other resources.

b. <u>FIES answers two years after the explosion</u>

Two years after the explosion, out of the households:

- 99% reported they were concerned that they would run out of food for the household for the next month.

- 97% reported the food that they bought was not enough and they didn't have money to get more.
- 99% reported there are foods they feel their family did not eat enough of six months after the explosion.
- 96% reported they or any other adult in the household cut the size of their meal because there was not enough food.
- 44% reported there at least one adult in the household skipped a meal because there was not enough food.
- 99% reported there was a time when at least one adult in the household was unable to eat healthy and nutritious food because of a lack of money or other resources.
- 61% reported there was a time when at least one adult in the household was hungry but did not eat because there was not enough money or other resources for food.
- 2% reported there was a time when at least one adult in the household went without eating for a whole day or got to bed hungry because of a lack of money or other resources.

c. Bivariate regression analysis between FIES and socio-demographics

In this part, the association between the households' socio-demographic characteristics and food security is studied, using a bivariate logistic regression. And the results are as follows:

A bivariate regression test, presented in table 17 in Appendix II, shows:

- A significant negative association between the household size and being food secure at alpha p>|z| = 0.2. This means that as household size increase, the odds of being food secure decreases.
- A significant positive association between being Lebanese and being food secure at alpha p>|z| = 0.2. This means that Lebanese are three times more likely to be food secure, as compared to being Syrian.
- A significant positive association between education level and being food secure at alpha p>|z| = 0.2. This means that with increasing education, the odds of being food secure increases. Having elementary educational level increases the chances of being food secure by four. Having middle school education increases the chances of being food secure by three. Having university educational level increases the chances of being food secure by almost 28.
- A positive association between the employment of the head of the household and being food secure. This means that being employed increases the odds of being food secure by 1, compared to not being employed. However, the association is not significant at alpha p>|z| = 0.2.
- A positive association between the income of the head of the household and being food secure. This means that with increasing income, the odds of being food secure increases. However, the association is not significant at alpha p>|z| = 0.2.
- A negative association between the household food expenditure share and being food secure. This means that having a higher percentage of total

expenditure spent on food, decreases the odds of being food secure. However, the association is not significant at alpha p>|z| = 0.2.

- A positive association between the household total expenditure and being food secure. This means that with increasing total expenditure, the odds of being food secure increases. However, the association is not significant at alpha p>|z| = 0.2.
- A significant negative association between having debt and being food secure at alpha p>|z| = 0.2. This means that having debt decreased the odds of being food secure, compared to not having debt.
- A significant positive association between receiving cash assistance after the explosion and being food secure at alpha p>|z| = 0.2. This means that receiving cash assistance 6 months after the explosion increased the odds of being food secure.

d. Prevalence of food insecurity by receipt of cash assistance

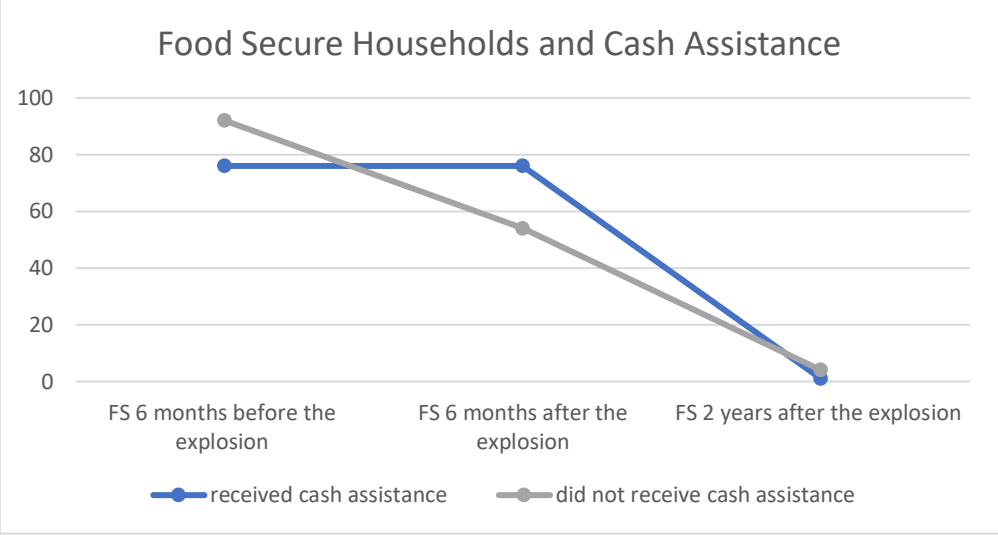

Figure 6. Percentage of food secure households based on receipt of cash assistance 6 months after the explosion

As represented in figure 7 above, six months before the explosion, out of the households who received cash assistance 6 months after the explosion, 76% were food secure. Whereas, out of the households who did not receive cash assistance 6 months after the explosion, 92% were food secure.

Six months after the explosion, out of the households who received cash assistance 6 months after the explosion, 76% were food secure. Whereas, out of the households who did not receive cash assistance 6 months after the explosion, 54% were food secure.

Whereas, two years after the explosion, out of the households who received cash assistance 6 months after the explosion, only 1% were food secure. And out of the households who did not receive cash assistance 6 months after the explosion, 4% were food secure.

4. Livelihood coping strategies

Six months after the explosion, 8% of the population did not adopt any coping strategies, 51% of the population adopted stress coping strategies, 40% of the population adopted crisis coping strategies, and 2% of the population adopted emergency coping strategies.

Whereas, two years after the explosion, one household did not adopt any coping strategies, 3% of the households adopted stress coping strategies, 94% of the households adopted crisis coping strategies, and 2% of the households adopted emergency coping strategies.

a. Coping strategies answers six months after the explosion

During the six months after the explosion, because of the lack of food or money to buy food, out of the households:

- 19% sold household goods (radio, furniture, television, jewelry etc.).
- 32% reduced expenses on health (including medicine).
- 12% reduced expenses on education.
- 66% spent some or all the HH savings.
- 39% bought food on credit and/or borrowed money to purchase food.
- 0% moved to a cheaper rental place or live on the street.
- 8% withdrew children from school.
- 2% had school children (6 -15 years old) involved in income generation.
- 0% had household members accepting high risk, dangerous, or exploitative work.
- 0% married their children under 18.
- 24% ate at family or relatives.

b. Coping strategies answers two years after the explosion

Two years after the explosion, because of the lack of food or money to buy food, out of the households:

- 81% sold household goods (radio, furniture, television, jewelry etc.).
- 97% reduced expenses on health (including medicine).
- 2% reduced expenses on education.
- 8% spent some or all the HH savings (+ 66% already did)
- 94% bought food on credit and/or borrowed money to purchase food.

- 0% moved to a cheaper rental place or live on the street.
- 1% withdrew children from school (+ 8% already did)
- 2% had school children (6 -15 years old) involved in income generation.
- 0% had household members accepting high risk, dangerous, or exploitative work.
- 0% married their children under 18.
- 47% ate at family or relatives.

B. Discussion

Two years after the Beirut explosion, the economic situation in Karantina has worsened significantly. Many people were pushed below the national minimum wage, employment rates have fallen, and debt levels have increased, compared to the time of the explosion. In 2022, 29% of households were above the national minimum wage, which was equivalent to 118$, 53% of households in Karantina had debt, 54% of heads of households were unemployed, and income disparities were evident, with 31% of the population having the lowest incomes and 15% having the highest incomes. This indicates that a high percentage of people in Karantina are now living in poverty. The increase in the exchange rate and price inflations are likely factors that have contributed to this decline. The main reason for households being in debt was to purchase food, which shows the challenges that people are facing in accessing basic necessities.

These findings are consistent with the results of studies conducted on a national level. A study by Hoteit et al. (2021) found that most Lebanese households reported a decline in income and an increase in debt. The study found that 54% of Lebanese households had debt in 2021, 29% were unemployed, and 45% of Lebanese households

were among the lowest income earners. The findings of this study are also consistent with the findings of a study by the IPC (2022). The IPC report found that unemployment rates in Lebanon increased from 11% to 30% between 2019 and 2022. The report also found income disparities among the Lebanese population.

There has been a huge decrease in the food security status and food consumption scores of the permanent residents of Karantina, two years after the explosion, compared to the time of the explosion.

For the food Consumption Score (FCS), six months after the explosion, none of the households had poor food consumption, whereas, two years after the explosion, 4% of the population had poor food consumption. The percentage of households with borderline food consumption increased from 4% six months after the explosion, to 66% two years after the explosion. And the percentage of households with acceptable food consumption, decreased from 96% six months after the explosion, to 30% two years after the explosion. The acceptable food consumption scores of the households reflect the diversity of their diet, and the results are consistent with the scores on the national level, where in 2021, 53% of Lebanese residents had a poor food consumption score, 18% had borderline food consumption score, and 28% had acceptable food consumption score after the explosion (Hoteit et al., 2021).

The low food consumption scores found in this population indicate that food consumption patterns have worsened, dietary diversity has decreased, and food intake has become insufficient.

Two years after the explosion, there has been a significant decrease in the consumption of high-micronutrient foods such as fruits, vegetables, and legumes,

compared to the time of the explosion. There has also been a decrease in the consumption of high-quality animal source protein such as meat and dairy. In 2022, 97% of the population consumed fruits and pulses less than three times per week, 70% consumed vegetables less than three times per week, 97% consumed pulses less than three times per week, 100% consumed meat less than three times per week, and 83% consumed dairy products less than three times per week.

These findings are consistent with the findings of Hoteit et al. in 2021, in Lebanon, where they found that 71%, 71%, 83%, 80%, and 77% of the Lebanese population consumed fruits, vegetables, pulses, meat and dairy products respectively, less than three times per week.

The decrease in the consumption of these foods is an indication of poverty. People are unable to afford healthy and nutritious food due to price inflations, and are relying on less expensive, less nutritious food to feel full. This is a concerning trend, as it could lead to a number of health problems, including malnutrition, stunting, and wasting.

In addition, it appears that the Mediterranean diet is deeply entranced into the culture and the habits of people living in Karantina. After the removal assistance, the nutrient dense foods are dropped out of the diet, but vegetables and legumes, which are mains of the Mediterranean diet, continued to be there. Vegetables and legumes consumption remained high even in households who have severe coping strategies, have debt, and pushed further into poverty. People stopped spending on meat and replaced meat with legumes and vegetables.

As per the Food Insecurity Experience Scale (FIES), the percentage of food secure households decreased to 2% two years after the explosion, compared to the time of the explosion. Two years after the explosion, the percentage of households with mild food insecurity increased to 64%, and severe food insecure appeared in the population with 34% being severely food insecure. Six months after the explosion, the proportion of severe food insecurity disappeared, which is an indicator that the majority of people were fine shortly after the blast, however, their situation has worsened a lot two years after the explosion. Severe food insecurity indicates extreme food deprivation, with substantial disruptions in their food intakes.

These findings show that food insecurity was a serious problem for households in Karantina, two years after the explosion. The results are consistent with the scores on the national level, where 43% of Lebanese residents were severely food insecure in 2021 (Hoteit et al., 2021). The increase in food insecurity was also found by the WFP in 2022, where they found that food insecurity increased to 46% in 2021, and the share of food secure households dropped to 54% in 2021.

Lebanon also fits in the global trend of food insecurity. The results are consistent with the findings of other studies studying the effect of immediate shocks on food security. A study assessing the post-flood household food insecurity of communities living in northeastern Bangladesh, following the devastating monsoon flash flood in 2017, found similar results, where 62% of surveyed households were found to be food insecure after the flood, however, it is important to mention that the researchers in this study used a different method, the HFIAS (Parvez et al., 2021).

According to the FIES questions, a large proportion of households perceived themselves as food insecure two years after the explosion. Two years after the explosion, the percentage of households concerned they would run out of food increased to 99%. The percentage of households who were cutting the size of their meals increased to 96%. And the percentage of households skipping their meals increased to 44%.

Similar results were found on a national level; 87% of Lebanese households were concerned they would run out of food, 77% were cutting the size of their meals, 67% of Lebanese households were skipping their meals, and 47% reported there was a time when at least one adult in the household was hungry but did not eat because there was not enough money to buy food, in 2021 (Hoteit et al., 2021).

In Karantina, lots of people ate less than 2 meals per day, especially two years after the explosion, and the results showed that two years after the explosion, 61% of the households reported there was a time when at least one adult in the household was hungry but did not eat because there was not enough money to buy food.

All the households received food assistance six months after the explosion, so there was no variability and food assistance. Therefore, we cannot see whether food assistance played a role in improving the food security status of the population. However, it is evident that food parcels as a first emergency response, help counter the impact of inflation and decreased purchasing power for the vulnerable, freeing up money and resources to cover other basic needs and commodities (WFP, 2022).

As for cash assistance, six months after the explosion, 76% of the households received cash assistance. A bivariate logistic regression analysis was performed on receiving cash assistance six months after the explosion and the FIES and FCS of the households six months after the explosion. The analysis showed that the households who received cash assistance six months after the explosion were more likely to be food secure and have acceptable food consumption scores than the households who did not receive cash assistance. These findings are not consistent with the findings of Parvez et al. (2021) where they found that receiving cash assistance after the flood made no difference to the food security status of the Hoar population, this might be due to many factors. However, similar findings were found in the paper of Romano et al. (2020) where they found that cash assistance had a positive effect on food consumptions, dietary diversity in West Bank, Gaza. In addition to the findings of both studies, Susanty et al. (2023), and Daniels & Anderson (2018), that found that cash assistance after crises, strengthened food security, by providing families with the ability to purchase their daily basic needs such as food and other commodities (Susanty et al., 2023 & Daniels & Anderson, 2018).

Looking at the trend in figures 6 and 7 (found in pages 61 and 66), showing the food security status and FCS of the households who received cash assistance six months after the explosion, we can see that the people are still food insecure and have poor food consumption two years after the explosion. Out of the households who received cash assistance, 76% were food secure and 99% had acceptable food consumption, six months after the explosion. These percentages dropped two years after the explosion, food secure households consisted of only 1% and 27% of the households had acceptable

food consumption, two years after the explosion. Out of the households who did not receive cash assistance, 54% were food secure and 88% had acceptable food consumption, six months after the explosion. These percentages dropped two years after the explosion, food secure households consisted only of 4% and 42% had acceptable food consumption, two years after the explosion. Thus, today no one is receiving any kind of assistance and yet food insecurity is high and food consumption scores are low. Hence, the assistance received by the permanent residents of Karantina after the explosion was associated with better food security and food consumption score at the time of the incident but not with long term food security and food consumption.

These findings demonstrate that the food security situation improved after receival of cash assistance, however, their situation declined when cash assistance stopped. Although no causality can be established, the strong correlation between cash assistance and food security, is enough to say that cash assistance does seem to offer temporary relief, households who got more money spent it on eating better.

No studies compared FCS and FIES between different time periods, especially in light of cash assistance received after a crisis. These findings cannot be compared to other studies. However, some studies found the effect of humanitarian assistance on food security through other methods.

Falb et al. (2020) found that although cash assistance after crisis, yielded significant improvements in food security, in Syria. Households were worried that once the program ends and the assistance stops, they would go back to their earlier states, and not be able to provide for their families' basic needs (Falb et al., 2020).

Two studies, assessing cash assistance and food security and livelihoods, acknowledged the relationship between cash assistance and improved food security and

livelihoods. Nonetheless, both studies advocated for the development of longer-term interventions that lead to sustainable enhancement of food security and livelihoods. However, it is important to mention that these papers were considering situations of protracted crisis, in Gaza and Northern Syria respectively, and the Beirut port explosion is considered an immediate shock (Romano et al., 2020 & Dautriat, 2022).

The bivariate logistic regression between socio-demographics and FCS showed similar results to the bivariate logistic regression between socio-demographics and FIES. Households with big household size and households with family members having debt were less likely to be food secure and have acceptable food consumption score.

This study found that, six months after the explosion, 55% of households with debt were food insecure, whereas 23% of households without debt were food insecure. These findings are consistent with the findings of Hoteit et al. (2021), where they found that, households who had debt had twice the odds of being food insecure. The findings are also consistent with other international studies performed after a crisis or shock. Parvez et al., found that households among the households who had debt, 64% were food insecure, whereas, among households with no debt, 56% were food insecure, after the flood (Parvez et al., 2021).

The bivariate logistic regressions also found that, households with higher educational attainment of the head of the household, the employment of the head of the household, and households with higher income, were more likely to be food secure and have acceptable food consumption score. Having middle school education increases the chances of being food secure by 3, and having university educational level increases the chances of being food secure by almost 28. However, the results are not significant, it

maybe because of small sample size. Nonetheless, these findings are consistent with the findings of Sahyoun et al., 2014, Parvez et al., 2021, and Ahmadi et al, 2018, all these studies found that better household socio-economic conditions reduced the risk of food insecurity. Parvez et al. (2021) found that non-poor households, had 31% less risk of food insecurity compared to poor households after the flood. The study also found that the head of the household having secondary education level, decreased the risk of food insecurity by 30% (Parvez et al., 2021).

The number of households who reported facing challenges to access food continued to grow in the two years following the explosion, making them more vulnerable to future shocks. The use of crisis coping strategies also increased dramatically two years after the explosion, compared to the time of the explosion. From six months to two years after the explosion, the use of crisis coping strategies increased from 40% to 94%. This indicates that people were becoming more desperate to rely on coping strategies to survive.

The findings are consistent with the findings of Hoteit et al. (2021) where they found that on a national level, one in two Lebanese households were adopting crisis or emergency coping strategies (Hoteit et al., 2021).

The high use of crisis coping strategies is a sign of decreased resilience. People who use crisis coping strategies are more likely to have poor food consumption scores and decreased future productivity as reported by VASyR (2021). This means that they are less able to deal with future shocks and less likely to be able to recover from them.

This can be seen by the percentage of people adopting the following coping strategies: the percentage of households who sold their goods, and spent some or all

their household savings, because of the lack of food or money to buy food, increased from 19% and 66% respectively, six months after the explosion, to 81% and 74 respectively, two years after the explosion. Households who reduced expenses on health, increased from 32% six months after the explosion, to 97% two years after the explosion. And the percentage of households who bought food on credit increased from 39% six months after the explosion, to 94% two years after the explosion.

The findings are consistent with the findings of the Food Security and Vulnerability Analysis of Lebanese Residents performed by the WFP in 2022, and the IPC Acute Food Insecurity Analysis in Lebanon in 2022. Both reports assessed the food security status of the Lebanese population in 2022, following the economic crisis, the currency depreciation, and the increase in food and other commodities' prices, and found that 68% of the Lebanese population adopted crisis coping strategies in 2022. In addition, between 2021 and 2022, more than half the Lebanese population were buying food on credit, and 71% reduced their expenses on health (WFP, 2022 & IPC, 2022).

The findings show that despite the people living in an impoverished society, the majority were able to guarantee their food needs however, two years after the explosion, the repercussions have come in, and really damaged their coping strategies.

In summary, although no causality can be determined, the permanent residents of Karantina who received cash assistance after the explosion, were more likely to have better food security and food consumption score at the time of the explosion. However, the improved situation did not last in the long-term when cash assistance stopped. This is explained by the deterioration of the economic situation in Lebanon since 2020. The multiple crises that affected the country, disabled the Karantina population from being

able to cope properly. Most of the households fell deeper into poverty in 2022, many lost their source of income, none were receiving cash assistance, most of them were falling into debt and this worsened their food security status.

C. Limitations

The present study has several strengths. First, this paper contributes to the scarce literature on the relation between humanitarian assistance and food security. This paper aims to explore the prevalence and correlates of household food insecurity among households living in Karantina post the Beirut port explosion. This was an interesting way to get out an in-depth community case study, specific to the Karantina neighborhood, that describes the situation after the blast. The sample consisted around 30% of the population, making it a good sample size to be able to generalize the results to the Karantina population. We have collected data on them before, after and two years after the explosion. Very few people have done that kind of study in Lebanon, we have in depth data and understanding of the same households in Karantina at three different time points, allowing for comparison. In addition, the demographic and socioeconomic characteristics of the sample population were found to be comparable to national figures most recently available in Lebanon, post the economic crisis. Another strength is the use of face-to-face interviews, these help in having a more accurate and in-depth assessment of the households, and reliable results. Due to it being a critical subject, food security assessment is best performed in person, especially when dealing with a vulnerable population, as they would be hard to reach via online modes. By doing so, the participants would refrain from delivering any false statements, especially when it

comes to socio-demographic data; if it was an online platform, there would be no guarantee that the answers are truthful and accurate (Vogl, 2013).

However, results from the study need to be interpreted in the light of several limitations as well. One of the major limitations is the recall issue, given that the data was collected two years after the explosion people might not be remember their situation correctly, from the time of the explosion. The unreliability of memory, coupled with the passage of time, can alter the participants' ability to recall events accurately. And thus, may compromise the validity of the research findings. However, this was addressed by verifying the reliability of the recall. A subset of 20 households on whom we had both recall and baseline data, was used, for accordance between the recall and the baseline, adding strength to the study.s Additionally, when reporting about assistance, vulnerable populations tend to under-report, due to them being under the impression that reporting assistance could hinder their future eligibility for other forms of assistance (VASyR, 2017). This was handled by telling all the participants at the start of the interviews, that this study was strictly for academic purposes and no compensation was available at the end of the survey. Another limitation in this study is the small sample size, only 100 households were interviewed. Although this was a good sample size for a descriptive community case study, the study was limited by the sample size. The sample size was not big enough to be able to detect significances in the changes over time. Nor was it able to detect the effect of assistance on food security. The study was only valid for associations, but not for adjusting for confounders. In this study, we do not have enough numbers to run a multivariable model and extract significances, given the high number of variables and the small sample size. To be able to do so, three digits are needed, which was not feasible in this study. One final

limitation is that food security was measured at the household level, and it may not reflect the severity of food insecurity that is witnessed at the intra-household level.

CHAPTER V

CONCLUSION

A. Conclusion

In conclusion, the results from this study support the hypothesis, and agree that the food and nutrition security of the permanent residents of Karantina improved after the 4th of August Beirut Port explosion, however, the improved situation did not last in the long-term.

There has been a huge decrease in people's incomes and employment status two years after the explosion, in addition, almost half of the households had debt two years after the explosion. This was an indication of their decreased socio-economic conditions, which were negatively affected not only as an aftermath of the blast, but also the economic crisis that hit the country in 2019-2020. There has been a huge deterioration of the food security status and food consumption scores of the permanent residents of Karantina after the blast. The percentage of food secure households decreased from 71% six months after the explosion, to 2% two years after the explosion. And the percentage of households with acceptable food consumption, decreased from 96% six months after the explosion, to 30% two years after the explosion. This deterioration led to many challenges for people to be able to access food. Two years after the explosion, the number of households who reported facing challenges to access food continued to grow, 95% of the population were adopting crisis coping strategies, making them more vulnerable to future shocks. All the households received food assistance and the majority received cash assistance six months after the explosion, however, all kinds of assistance stopped six months to one year after the

explosion. Household size, having debt, the head of the household's educational attainment and employment, increased income, and receiving cash assistance were all found be associated with higher odds of being food secure and having acceptable food consumption score. The assistance received by the permanent residents of Karantina after the explosion, was associated with higher food security and food consumption score at the time of the explosion, but not with long term food security and food consumptions on the long run.

B. Recommendations

This community case study can enable future research and aid in formulating a comprehensive plan to develop future food security interventions targeted at Lebanese communities, pre- and post-crises. It is important to examine the humanitarian assistance received after the Beirut blast to assess its quality and long-term impact on the population, as there is a scarcity of such studies in the literature. A review of the existing body of research, titled "Food aid for nutrition: A landscape review of current research and implications for future studies" analyzing the formulation and effectiveness of food aid products in addressing nutrition issues, revealed that most studies examine the immediate effects of food aid, and that it is primarily provided in response to acute malnutrition and hunger (Wrabel et al., 2020). Studying the characteristics of aid and relief in Lebanon, will set recommendations for the better delivery of future aid programs that are both time efficient and meet the evolving needs of nutritionally vulnerable populations.

Addressing food insecurity is a critical national priority due to its far-reaching impact on the health and long-term productivity and resilience of Lebanese households.

And recognizing the six pillars of food security, availability, accessibility, utilization, stability, agency, and sustainability, as the core of future interventions is imperative for a successful long-term impact. It is important to educate all members of communities that the quality of food consumed by people is as important as the quantity, and even more. Nutrition security should be integrated into each member that is advocating for a better food security and food system. For example, while offering food aid and relief, the focus should be on offering beneficial food for people for them to be able to lead healthy lifestyles, and not something that might harm them. People with low income can only afford energy sufficient diets, containing the same components of the food offered to people as aid and relief (Hwalla et al., 2016). This highlights the importance of timely and sustained delivery of assistance both in terms of food and cash, to people in dire need during emergency settings, such as the case of the Beirut port explosion when people needed immediate food aid and cash assistance.

The reason why humanitarian assistance does not support the people with the components of a healthy diet that will benefit them and facilitate their access to what they cannot afford needs to be further examined. Due to the direct link between health, food security, and nutritional well-being, there have been global efforts and recommendations to improve the nutritional quality and composition of food aid. This involves considering the macro- and micro-nutrient content that is suitable for each country and population to optimize health outcomes. Emergency feeding programs should be required to provide needy populations with both food parcels and cash- and voucher-based assistance that deliver essential nutrients crucial for human health and well-being (Hwalla et al., 2016 & Ignowski et al., 2021).

Furthermore, future interventions should focus on the long-term improvement of communities, instead of just the short-term delivery of food aid. This can be done through first, developing a national crisis response plan that would enable us to dive right into action when future crises hit Lebanon. In addition, constant monitoring, and evaluation of the effectiveness of interventions is crucial for any humanitarian intervention. This way non-governmental organizations and governments can know more about the situation of the population, how it changed and how it was affected by the primary assistance, and thus, which way to go from there. Another crucial point is developing population-specific assistance, because as we know each population has its own characteristics and the needs might differ from population to another. This community case study contributed with evidence-based findings that would help in future policy development and decision-making processes, ensuring that future interventions are better suited to the community's needs.

Another recommendation would be studying how people eat when they are under stress. Although households in Karantina dropped nutrient dense food; they stopped spending on meat, but they maintained the consumption of vegetables and pulses. This might be due to the affordability of vegetables and legumes in Lebanon, or the knowledge of the households. Therefore, it is beneficial to assess the situation of the Mediterranean diet under times of crisis and conflict.

Furthermore, the situation after the blast had revealed significant shortcomings in the government's and international community’s response. The response lacked organization in planning, and most importantly, a lack of coordination. There was lack of coordination between the different actors involved in relief and assistance, and this led to many inequalities in the distribution processes, where many areas were full of

NGOs and volunteers working intensely on repairing homes and providing relief, while others were being disregarded (Beirut Urban Lab, 2021). All these, fall under the umbrella of planning a proper crisis response.

Therefore, it is important, when designing programs to deliver aid and relief to populations, the primary focus should be on providing safe and nutritious food for everyone, in addition to improving their purchasing power, through cash assistance, vouchers, or livelihood improvement programs. By combining these interventions with dietary recommendations, vulnerable populations can have both short-term and long-term access to food that promotes their health and productivity. And finally, vouchers and nutrition education can empower individuals to have some control over their food choices (Hwalla et al., 2016).

In addition, humanitarian assistance should not only be in the form of food or cash assistance, increasing and enhancing livelihoods can have many benefits on the food security of the populations given the direct link that was found between increased income and employment with improved food security and food consumption score. This can be seen in this study, despite high levels of assistance immediately after the blast, the ability of humanitarian assistance to mitigate food security challenges and food consumption gaps, was reduced by the decline in purchasing power, dollar inflation, unfavorable exchange rates, and soaring food prices. More investment is needed in exploring the idea of short-term emergency assistance vs longer term assistance. Additionally, it is crucial to enhance the connections between cash and in-kind support, and income-generating opportunities and livelihood support, for optimal outcomes. This approach will enable households to endure future shocks and increase their resilience. After the blast, the Beirut Urban Lab assessed the Karantina situation, and proposed a

long-term, holistic, and participatory recovery framework for Karantina. The framework included methods that not only rebuild social and economic connections but also revitalize places of collective memories and societal importance. This approach helps in reconstructing both the physical structures and the cultural identity of the communities and will finally help in identifying the main areas to tackle to improve the livelihoods and resilience of the Karantina population (Beirut Urban Lab, 2020). According to the Beirut Urban Lab, the main areas of analysis are affordable housing and social inclusion, spatial, economic, and social connectivity, cultural and economic vitality, inclusive and sustainable development, and quality of the urban environment (2020).

As for this research, many recommendations come to mind, first, a larger sample size should have been adopted, to be able to detect significances in the changes over time, in addition to the effect of cash assistance on food security. Another recommendation is the use of the HFIAS along with the FIES to measure household food insecurity, given that many studies used the HFIAS, and better comparisons would have been made. Another recommendation would be to go down another time to the field and assess the current changes in socio-demographics, food security, and food consumption scores, in 2023, and compare the results to the rest of the study. The results of this study are applicable to the year 2022, however, since then, the country has faced further deterioration in food security and poverty. It would be beneficial to see whether the Karantina residents faced the same trends as the rest of the country.

Three years after the blast, and four years after the economic crisis that hit the country, food insecurity persists as the economic crisis continues. Lebanon is still facing severe economic and social challenges. The already dire situation has been exacerbated

by the still ongoing (and increasing) dollar inflation leading to increasing prices of food and other essential commodities. Poverty is still on the rise, and basic living conditions are continuing to decline (IPC, 2023). According to the IPC, in 2023, increased levels of food insecurity were found among the Lebanese population and the Syrian refugee population in Lebanon. In 2023, the depreciation of the currency and the ongoing economic crisis persist, further driving up food prices and making it increasingly difficult for people to afford basic necessities. Therefore, households are still increasingly opting for less diversified foods, and reducing their consumption of highly nutritious foods. This shows the continuously deteriorating food security situation of the Lebanese population and sets an idea about the current food security situation of the Karantina population.

APPENDIX I

(INSTITUTIONAL REVIEW BOARD APPROVAL OF RESEARCH)

AMERICAN UNIVERSITY OF BEIRUT
INSTITUTIONAL REVIEW BOARD (IRB)

APPROVAL OF RESEARCH

October 4, 2021

Dr. Rami Zurayk
American University of Beirut
01-350000 ext. 4571
rzurayk@aub.edu.lb

Dear Dr. Zurayk,

On October 4, 2021, the IRB reviewed the following protocol:

Type of Review:	Initial; Expedited
Project Title:	The Impact of the Beirut Port Explosion on Food Security in Karantina neighborhood, Beirut, Lebanon
Investigator:	Rami Zurayk
IRB ID	SBS-2020-0496
Funding Agency:	None
Documents reviewed:	Received October 4, 2021: Response Letter, Amended IRB Application, Proposal, Amended Consent Form (Arabic and English versions), Amended Data Collection Tool.

The IRB approved the protocol from **October 4, 2021,** to **October 3, 2022,** inclusive. Before August 3, 2022, or within 30 days of study close, whichever is earlier, you are to submit a completed "FORM: Continuing Review Progress Report" and required attachments to request continuing approval or study closure.

If continuing review approval is not granted before the expiration date of **October 4, 2022,** approval of this research expires on that date.

Please find attached the stamped approved documents:

- Proposal (received January 2021),
- Consent Form Arabic and English versions (received October 4, 2021),
- Data Collection Tool (received October 4, 2021).

Only these IRB approved consent forms and documents can be used for this research study.

Thank you.

The American University of Beirut and its Institutional Review Board, under the Institution's Federal Wide Assurance with OHRP, comply with the Department of Health and Human Services

(DHHS) Code of Federal Regulations for the Protection of Human Subjects ("The Common Rule") 45CFR46, subparts A, B, C, and D, with 21CFR56; and operate in a manner consistent with the Belmont report, FDA guidance, Good Clinical Practices under the ICH guidelines, and applicable national/local regulations.

Sincerely,

Michael Clinton, PhD
Co-Chairperson IRB Social & Behavioral Sciences

Cc:

Fuad Ziyadeh, MD, FACP, FRCP
Professor of Medicine and Biochemistry
Chairperson of the IRB

Ali K. Abu-Alfa, MD, FASN, FAHA
Professor of Medicine
Director, Human Research Protection Program
Director for Research Affairs (AUBMC)

APPENDIX II

(RESULTS)

Table 10. Shapiro-Wilk test for normal distribution of continuous data

Variable	Observation	W	V	Z	Prob > z
Household Size	100	0.973	2.161	1.709	0.043*
Education of Head of Household	100	0.889	9.123	4.904	0.000*
Household Food Expenditure	100	0.960	3.241	2.609	0.004*
Household Total Expenditure	100	0.893	8.829	4.832	0.000*
Household Income	100	0.809	15.701	6.109	0.000*
Household Food Expenditure Now	100	0.934	5.396	3.739	0.000*
Household Total Expenditure Now	100	0..828	14.151	5.878	0.000*
Household Income Now	100	0.804	16.106	6.165	0.000*

Table 11. Shapiro-Wilk test for normal distribution of continuous recall data

Variable	Observation	W	V	Z	Prob > z
Household Size	20	0.970	0.702	-0.731	0.762
Household Size Recall	20	0.970	0.702	-0.731	0.762
Household Food Expenditure	20	0.951	1.155	0.290	0.385
Household Food Expenditure Recall	20	0.905	2.233	1.619	0.052
Household Total Expenditure	20	0.899	2.383	1.750	0.040*
Household Total Expenditure Recall	20	0.869	3.096	2.278	0.011*
Household Income	20	0.884	2.732	2.025	0.021*
Household Income Recall	20	0.884	2.732	2.025	0.021*

Table 12. Food Consumption Scores during the three time periods as reported by the permanent residents of Karantina

FCS	Categories	Frequency
FCS 6 months before the explosion	Poor FCS	1
	Borderline FCS	2
	Acceptable FCS	97
FCS 6 months after the explosion	Poor FCS	0
	Borderline FCS	4
	Acceptable FCS	96
FCS 2 years after the explosion	Poor FCS	4
	Borderline FCS	66
	Acceptable FCS	30

Table 13. Bivariate Food Consumption Scores during the three time periods as reported by the permanent residents of Karantina

Bivariate FCS	Categories	Frequency
FCS 6 months before the explosion	Poor FCS	3
	Acceptable FCS	97
FCS 6 months after the explosion	Poor FCS	4
	Acceptable FCS	96
FCS 2 years after the explosion	Poor FCS	72
	Acceptable FCS	28

Table 14. Food Insecurity measured by the FIES during the three time periods as reported by the permanent residents of Karantina

FIES	Categories	Frequency
FIES 6 months before the explosion	Food Security	80
	Mild to moderate Food Insecurity	17
	Severe Food Insecurity	3
FIES 6 months after the explosion	Food Security	71
	Mild to moderate Food Insecurity	29
	Severe Food Insecurity	0
FIES 2 years after the explosion	Food Security	2
	Mild to moderate Food Insecurity	64
	Severe Food Insecurity	34

Table 15. Bivariate Food Insecurity measured by the FIES during the three time periods as reported by the permanent residents of Karantina

Bivariate FIES	Categories	Frequency
FIES 6 months before the explosion	Food Security	80
	Food Insecurity	20
FIES 6 months after the explosion	Food Security	71
	Food Insecurity	29
FIES 2 years after the explosion	Food Security	2
	Food Insecurity	98

Table 16. Bivariate logistic regression between FCS and socio-demographics 2 years after the explosion

Variable	Categories	Odds Ratio	P > |z|
Household Size	3-4	0.16	0.006*
	>= 5	0.43	0.111*
Nationality	Lebanese Nationality	4.33	0.061*
Education of Head of Household	Elementary	2.24	0.481
	Middle / Highschool	2.89	0.344
	University	4.45	0.203
Employment of Head of Household	Yes	1.25	0.617
Household Income	Middle Income Earner	1	1.000
	Highest Income Earner	2.25	0.139*
	50 - 65%	0.23	0.341
	< 50%	2.03	0.533
Household Total Expenditure	Lower-Middle	0.75	0.705
	Middle	1.12	0.867
	Upper-Middle	1.15	0.846
	High	2	0.315
Debt	Yes	0.37	0.034*
Cash Assistance	Yes	10.71	0.045*

Table 17. Bivariate logistic regression between FIES and socio-demographics 6 months after the explosion

Variable	Categories	Odds Ratio	P > |z|
Household Size	3-4	0.3	0.104*
	>= 5	0.16	0.008*
Nationality	Lebanese Nationality	3.21	0.025*
Education of Head of Household	Elementary	4.44	0.072*
	Middle / Highschool	3.21	0.145*
	University	28.3	0.008*

Employment of Head of Household	Yes	1.34	0.513
Household Income	Middle Income Earner	0.8	0.657
	Upper-middle Income Earner	0.6	0.600
	Highest Income Earner	1.6	0.473
Food Expenditure Share	65 - 75%	0.44	0.501
	50 - 65%	0.5	0.554
	< 50%	0.46	0.503
Household Total Expenditure	Lower-Middle	1.15	0.836
	Middle	0.88	0.845
	Upper-Middle	0.64	0.509
	High	1.92	0.402
Debt	Yes	0.24	0.009*
Cash Assistance	Yes	2.72	0.041*

Table 18. Pearson chi2 test of income between recall and baseline data

		Household Income Recall			Total
		Lowest Income Earners	Middle Income Earners	Highest Income Earners	
Household Income Baseline	Lowest Income Earners	9	0	0	9
	Middle Income Earners	0	6	0	6
	Highest Income Earners	0	0	5	5
Total		9	6	5	20

Table 19. Pearson chi2 test of total expenditure between recall and baseline data

		Household Total Expenditure Recall			Total
		Low	Middle	High	
Household Total Expenditure Baseline	Low	7	3	1	11
	Middle	0	3	0	3
	High	0	1	5	6
Total		7	7	6	20

Table 20. Pearson chi2 test of FIES before the explosion between recall and baseline data

		FIES 6 months before the explosion Recall			Total
		Food Security	Mild Food Insecurity	Severe Food Insecurity	
FIES 6 months before the explosion Baseline	Food Security	4	0	0	4
	Mild Food Insecurity	0	13	0	13
	Severe Food Insecurity	0	1	2	3
Total		4	14	2	20

Table 21. Pearson chi2 test of FIES after the explosion between recall and baseline data

		FIES 6 months after the explosion Recall			Total
		Food Security	Mild Food Insecurity	Severe Food Insecurity	
FIES 6 months after the explosion Baseline	Food Security	12	0	0	12
	Mild Food Insecurity	0	8	0	8
	Severe Food Insecurity	0	0	0	0
Total		12	8	0	20

Table 22. Pearson chi2 test of FCS before the explosion between recall and baseline data

		FCS 6 months before the explosion Recall			Total
		Acceptable Food Consumption	Borderline Food Consumption	Poor Food Consumption	
FCS 6 months before the explosion Baseline	Acceptable Food Consumption	17	0	0	17
	Borderline Food Consumption	0	2	1	3
Total		17	2	1	20

Table 23. Pearson chi2 test of FCS after the explosion between recall and baseline data

		FCS 6 months after the explosion Recall			Total
		Acceptable Food Consumption	Borderline Food Consumption	Poor Food Consumption	
FCS 6 months after the explosion Baseline	Acceptable Food Consumption	16	0	0	16
	Borderline Food Consumption	1	3	0	4
Total		17	3	0	20

Table 24. Pearson chi2 test of food assistance received between recall and baseline data

		Received Food Assistance Recall	Total
		Yes	
Received Food Assistance Baseline	Yes	20	20
Total		20	20

Table 25. Pearson chi2 test of cash assistance received between recall and baseline data

		Received Cash Assistance Recall		Total
		No	Yes	
Received Cash Assistance Baseline	No	2	0	2
	Yes	0	18	18
Total		2	18	20

APPENDIX III
(QUESTIONNAIRE)

Assessment of the food security status of the residents of Karantina, pre- and post- explosion.

DAT	Date											
DCID	Data Collector's name											
Location	LOT number											
QR	Survey Status	Complete	Partially complete	No one qualified available to answer	Refused to be interviewed	Vacant	No one at home	Not eligible/ Not Applicable	No one answering the phone	Moved to another location	wrong number	dropped for logistic or security reasons
		1	2	3	4	5	6	7	8	9	10	11

Note: Data collector reads the consent form and asks respondent if he/she is interested to participate in the study. If yes, data collector should sign the provided consent form. Data collector then proceeds with writing household member names on data collection sheet.

ELIG2	Are you interested in participating in this study?	1	Yes
		0	No **(discontinue the survey and go to QR)**
HHRES	How many people have lived with you, in this house for more than 6 months? (including yourself)		
HHSIZE	Members in your household, who have lived with you for more than 6 months and share dwelling, food and budget, amount to:		
Age groups	|___| < 5 years old |___| Between 5 – 17 years old |___| Between 18 and 65 years old |___| > 65 years old		
Pregnant women	1 Yes	|___| of pregnant women	
	0 No		

DEM: Demographics1									
DEM1	**DEM2**	**DEM3b**		**DEM4**	**DEM5**				
Please give me the order number of the person who has lived with you in this house and shared with you food and budget for more than 6 months. Please, start with the head of household as number 1 and follow in order of age. Includes babies, other residents etc. The Head of Household should be a resident of the household	Is (number) the respondent?	Relationship of (number) to head of household number 1		What is (number)'s gender?	What is (number)'s age in years?				
	1 Yes 0 No	2	Husband/Wife	1 Male 2 Female	Age in years (Record 0 for ages less than 1)				
		3	Son/Daughter						
		4	Father/Mother						
		5	Brother/Sister						
		6	Grandfather/Grandmother						
		7	Grandson/Granddaughter						
		8	Niece/Nephew						
		9	Son/Daughter in Law						
		10	Father/Mother in Law						
		11	Brother/Sister in Law						
	DEM3a								
	Is {number} the head of household?	12	Wife of the Son of the Head of HH/ Husband of the Daughter of the Head of HH						
	1 Yes 0 No	13	Other Relative						
		14	Other, Not Relatives						
		15	Cousin of the head of household						
		88	Don't know						
		99	Refuse to answer						
	DEM6 What is (number)'s nationality?	1	2	3	4	77	88	99	

		Syria	Lebanese	Palestinian from Lebanon	Palestinian from Syria	other	Don't know	Refuse to answer
	DEM6_a:	**If DEM10=77** If other, please specify:						

DEM1	EDU1		EDU2		EDU2_a
Please give me the order number of a person who has lived with you in this house, and shared with you food and budget for more than 6 months. Please, start with the head of household as number 1 and follow in order of age Includes babies, other residents etc. The Head of Household should be a resident of the household.	During the current school year, that is 2020-2021, was (number) enrolled in formal or informal school or preschool at any time? **If DEM5<3 OR >21**		**If EDU1=0** If not, what is/are the reason(s) for not attending school/university?		**If EDU2=77** If other, please specify:
	1	Yes, formal	19	Child is too young	
			1	Cost of education	
	2	Yes, informal	2	Informal education program/ short course/ vocational training	
	5	Yes, formal but dropped out	3	No space in school	
	6	Yes, informal but dropped out	4	School did not allow enrolment	
	0	No	5	No school shifts or school in area	
	88	Don't know	6	Difficulties at school with curriculum or language of instruction	
	99	Refuse to answer	7	School too far	
			8	Marriage	
			9	Work	
			10	Disability or illness	
			11	Learning difficulty	
			12	Cultural/religious reasons	
			13	Children need to stay at home	
			14	Fear of violence/bullying in schools	
			15	Fear of violence on the way to school	
			16	No interest in attending school	
			17	Transportation problems/cost	
			18	Already graduated	
			77	Other	
			88	Don't know	
			99	Refuse to answer	

EDU: Education 2				
DEM1	**EDU3**		**EDU4**	
Please give me the order number of a person who has lived with you in this house, and shared with you food and budget for more than 6 months. Please, start with the head of household as number 1 and follow in order of age. Includes babies, other residents etc. The Head of Household should be a resident of the household.	**If DEM5>3** Current educational attainment: What is the highest level of schooling (number) has achieved?		**If EDU7=1 and DEM5>=6** If never attended, which of the following applies to (number)?	
	1	Never Attended	1	Read and write
	2	Elementary (grades1,2,3,4,5,6) – no certificate	2	Illiterate
	3	Elementary (grades1,2,3,4,5,6) - with certificate	88	Don't know
	4	Preparatory level (grades 7,8,9) - no Brevet	99	Refuse to answer
	5	Preparatory level (grades 7,8,9) - with Brevet		
	6	Secondary (grades 10,11,12) - without Baccalaureate		
	7	Secondary (grades 10,11,12) - with Baccalaureate		
	8	Vocational (no certificate)		
	9	Vocational (with certificate TS/ BTS / Diploma)		
	10	University (without Degree)		
	11	University (with Degree.-License, BSc, BA, etc.)		
	12	Post Graduate (Masters, PhD)		
	88	Don't Know		
	99	Refuse to answer		

EMP: Employment1
To be asked to members aged>=5
Participants are not requested to identify anyone by name or the illegal activity they might have engaged in, and limit their response by yes or no, and that they are free to refuse to answer this question or any other question

Dem1	EMP1		EMP2		EMP3		EMP4		EMP5	
			Unemployed				Employed			
			If did not work at all the past 30 days				If did work in the past month			
Please give me the name of a person who has lived with you in this house, and shared with you food and budget for more than 6 months. Please, start with the head of household as number 1 and follow in order of age. Includes babies, other residents etc. The Head of Household should be a resident of the household.	Did (number) work for wage (cash or in kind) even for one hour during the last four months (Work without pay does not include domestic work and family care)?		If EMP1=0 Was (number) out and looking for work in the past four months?		If EMP1=0 & EMP2=0 If no, why?		If EMP1=1 or EMP3=10/11 Classify the job in one of the below categories		If EMP1=1 & EMP3=10/11 In which economic sector does (number) work in their main job?	
	1	Yes	1	Yes	1	Lost hope of finding a job so gave up	1	Agriculture (Farming, raising and selling livestock products)	1	Agriculture
	0	No	0	No	2	Fears to be detained because is illegal	2	Construction(excluding crafts like plumbing) and quarrying	2	Industry
	88	Don't Know	88	Don't Know	3	Student	3	Concierge/housemaid/Janitor/cleaning services	3	Construction
	99	Refuse to answer	99	Refuse to answer	4	Housewife /pregnant/ raises children	4	Manufacturing/Industry (machine operators)	4	Education
	EMP1_a IF EMP1 =1 Is the job located in the neighborhood?						5	Food processing - agrofood		
	1	Yes			5	Has Independent Means	6	Wholesale and retail trade	5	Health care
	0	No			6	Has a disability or sick	7	Street vendor and street services (shoe cleaning, selling food/vegetables)	6	Trade
	EMP1_b If EMP1=0 Was it lost by the explosion?				7	Retired/pensioner/old	8	Personal and other services workers(Hairdressers, barbers, beauticians, day care, data collector, delivery)	7	Transport and Communication
	1	Yes			8	Social and family beliefs/pressure	9	Restaurant services workers(Cooks, Waiters, waitresses and bartenders)	8	Other services
	0	No			9	Afraid/ Unable to leave the place of residence	10	Transportation, valet service, delivery driver, truck driver	9	Insurance and Financial Sector
					10	In agreement with employer but did not start work yet→ EMP4	11	Admin/support and clerks (secretaries, office boy, cashier, receptionist)	10	Hospitality (Food and Beverage services) and Tourism
					11	Works but on vacation/ sick leave→ EMP4	12	Crafts (painting, carpentry, metal, aluminum, plumbing, cooling/heating systems, tailoring, car repair)	11	Environment
					12	Too young	13	Environment (including garbage collection and recycling	88	Don't Know

			13	Not allowed to work legally	14	other elementary occupations (filling bags at supermarket)	99	Refuse to answer
			14	Lost work because of the explosion				
			77	Other				
			88	Don't Know				
			99	Refuse to answer	15	Asking strangers for money		
					16	Professionals and technicians (teachers, architects, engineers, doctors)		
					77	Other		
					88	Don't Know		
					99	Refuse to answer		

EMP: Employment2

DEM1	EMP6		EMP8	
	If EMP1=1 & EMP3=10/11 Is (number)'s main job seasonal?		If EMP1=1 & EMP3=10/11 On what basis is (name) paid in their main job?	
Please give me the name of a person who has lived with you in this house, and shared with you food and budget for more than 6 months. Please, start with the head of household as number 1 and follow in order of age. Includes babies, other residents etc. The Head of Household should be a resident of the household.	1	Yes	1	Hourly
	0	No	2	Daily
	88	Don't know	3	Weekly
	99	Refuse to answer	4	Monthly
			5	By piece/ service
			88	Don't know
			99	Refuse to answer
	EMP7			
	If EMP1=1 & EMP3=10/11 (number)'s main job is:			
	1	Full-time (monthly)		
	2	Part-time (monthly)		
	3	Daily or by piece/service regular		
	4	Daily or by piece/service irregular		
	77	Other		
	88	Don't know		
	99	Refuse to answer		

DEM1	EMP9
Please give me the name of a person who has lived with you in this house, and shared with you food and budget for more than 6 months. Please, start with the head of household as number 1 and follow in order of age. Includes babies, other residents etc. The Head of Household should be a resident of the household.	**If EMP1=1 & EMP3=10/11** What is the amount of (number's) income or net value profit in? (for the last month for all jobs) |___|
	EMP10
	If EMP1=1 & EMP3=10/11 CURR:
	1 Lebanese Lira (LL)
	2 US Dollars
	66 Not applicable
	88 Don't know
	99 Refuse to answer

Food Consumption		Pre-explosion		Post-explosion		
	How often do members of your household eat the following foods **before the explosion** (how many times per day, per week, per month)?	Frequency enter 0 if never **_frequency**	Timeframe 1. Daily 2. Weekly 3. Monthly 4. Never 88 – Don't Know 99-Refuse to answer **_timeframe**	Frequency enter 0 if never **_frequency**	Timeframe 5. Daily 6. Weekly 7. Monthly 8. Never 88 – Don't Know 99-Refuse to answer **_timeframe**	Has any member of the household eaten this food in the last 24 hours (during the day and night)? Yes=1, No=0, Don't Know=88 Refuse to answer=99 **_24hours**
Cereals	Cereals (Bread, Rice, Burghol, Pasta, Frikeh, bulgur Manakish)					
Tubers	Roots and Tubers (baked potatoes, beet root)					
Dairy	Milk and Dairy products fresh milk / sour, yogurt, lebneh, cheese, other dairy products (Exclude margarine / butter or small amounts of milk for tea / coffee)					
Chicken_meat	Chicken and Meat (goat, beef, chicken, ,, turkey, , (meat and fish consumed in large quantities and not as a condiment)					
Fish	Fish (Fresh/Canned) (dried, fresh and smoked fish, including canned tuna, and / or other seafood (fish in large quantities and not as a condiment)					
Eggs	Eggs					
Pulses	Pulses and legumes (lentils, chickpeas, beans, fava beans, green beans, peas, , cowpeas, groundnut, ground bean):					
Vegetables	Vegetables and leaves (: Spinach, Onion, Tomatoes, Carrots, Peppers, Lettuce, Cucumber, Radish, Cabbage Etc)					
Fruits	Fruits (Fruits: Banana, Apple, Lemon, Mango, Papaya, Apricot, Peach, Watermelon etc…)					
Oil_fats	Oils and fats (butter, vegetable oil, margarine, olive oil , fried, chips)					

Sugar_sweets	sugar and sweets and(sugar, honey, jam, cakes, candy, cookies, pastereies, Chocolate/ Candies/ Desserts / Biscuits/ Ice-cream)					
Bev	Beverages (Sodas/ Bottled Beverages/ Jellab/Tout)					
Wild	Wild plants/ herbs (Wild thyme, akkoub, khibbayze, hindbeh)					
nuts	Nuts(walnuts, almonds, peanuts)					

FOOD: COPING STRATEGIES			
During the past 6 months did anyone in your household have to do one of the following things because there was not enough food or money to buy it?		Insert the code below: 1-4 Pre-explosion	Insert the code below: 1-4 Post-explosion
COPE1	Sold household goods (radio, furniture, television, jewelry etc.)	|__|	|__|
COPE3	Reduce expenses on health (including drugs)	|__|	|__|
COPE4	Reduce expenses on education	|__|	|__|
COPE5	Spent some or all of the HH savings	|__|	|__|
COPE6	Bought food on credit and/or borrowed money to purchase food	|__|	|__|
COPE7	Moved to a cheaper rental place/live on the street	|__|	|__|
COPE8	Withdrew children from school	|__|	|__|
COPE9	Have school children (6 -15 years old) involved in income generation	|__|	|__|
COPE11	HH members accepting high risk, dangerous, or exploitative work	|__|	|__|
COPE15	Marriage of children under 18	|__|	|__|
COPE16	Eat at family/ relatives	|__|	|__|
1=No, wasn't necessary 2=No, because I already did it (so cannot continue to do it) 3=Not applicable 4=Yes 88=Don't know 99=Refuse to answer			

FOOD SECURITY- PRE-EXPLOSION				**FOOD SECURITY – POST EXPLOSION**			
FOOD1	Which of these sentences applies the most to the food eaten by your household before the explosion?	1	We had enough to eat of the kinds of food we wanted (quantity & quality)	**FOOD1a**	Which of these sentences applies the most to the food eaten by your household after the explosion?	1	We had enough to eat of the kinds of food we wanted (quantity & quality)
		2	We had enough to eat but not always the kinds of food we wanted (only quantity)			2	We had enough to eat but not always the kinds of food we wanted (only quantity)
		3	Sometimes we did not have enough to eat (quantity)			3	Sometimes we did not have enough to eat (quantity)
		4	Often we did not have enough to eat			4	Often we did not have enough to eat
		88	Don't know			88	Don't know
		99	Refuse to answer			99	Refuse to answer
FOOD2	Before the explosion, was there a time when you were concerned that you would run out of food for your household for the next month?	1	Yes	**FOOD2a**	After the explosion, was there a time when you were concerned that you would run out of food for your household for the next month?	1	Yes
		0	No			0	No
		88	Don't know			88	Don't know
		99	Refuse to answer			99	Refuse to answer
FOOD3	Did the following statement apply to your household before the explosion? "The food that we bought was not enough and we didn't have money to get more."	1	Yes	**FOOD3a**	Did the following statement apply to your household after the explosion? "The food that we bought was not enough and we didn't have money to get more."	1	Yes
		0	No			0	No
		88	Don't know			88	Don't know
		99	Refuse to answer			99	Refuse to answer
FOOD4	Are there any foods you feel your family did not eat enough of before the explosion?	1	Yes	**FOOD4a**	Are there any foods you feel your family did not eat enough after the explosion?	1	Yes
		0	No			0	No
		88	Don't know			88	Don't know
		99	Refuse to answer			99	Refuse to answer
FOOD5	Before the explosion, did you or any other adult in your household ever cut the size of your meal because there was not enough food?	1	Yes	1	After the explosion, did you or any other adult in your household ever cut the size of your meal because there was not enough food?	1	Yes
		0	No	0		0	No
		88	Don't know	88		88	Don't know
		99	Refuse to answer	99		99	Refuse to answer
FOOD6	Before the explosion, did you or any other adult ever skip a meal because there was not enough food?	1	Yes	**FOOD6a**	After the explosion, did you or any other adult ever skip a meal because there was not enough food?	1	Yes
		0	No			0	No
		88	Don't know			88	Don't know
		99	Refuse to answer			99	Refuse to answer
FOOD7		1	Yes	**FOOD7a**		1	Yes

	Before the explosion, was there a time when you or any adult in your household were unable to eat healthy and nutritious food because of a lack of money or other resources?	0 88 99	No Don't know Refuse to answer		After the explosion, was there a time when you or any adult in your household were unable to eat healthy and nutritious food because of a lack of money or other resources?	0 88 99	No Don't know Refuse to answer
FOOD8	Before the explosion, was there a time when you or any adult in your household were hungry but did not eat because there was not enough money or other resources for food?	1 0 88 99	Yes No Don't know Refuse to answer	FOOD8a	After the explosion, was there a time when you or any adult in your household were hungry but did not eat because there was not enough money or other resources for food?	1 0 88 99	Yes No Don't know Refuse to answer
FOOD9	Before the explosion, was there a time when you or any adult in your household went without eating for a whole day or got to bed hungry because of a lack of money or other resources?	1 0 88 99	Yes No Don't know Refuse to answer	FOOD9a	After the explosion, was there a time when you or any adult in your household went without eating for a whole day or got to bed hungry because of a lack of money or other resources?	1 0 88 99	Yes No Don't know Refuse to answer

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EXP: Expenditure

	AMNT_		CURR_				TF_								
	How much did your family spend in the last 6 months on each of the following? Note: This includes all types of cash or in-kind assistance received		Please specify the currency				Please specify the timeframe								
		Amount	Lebanese Pound (L.L.)	US Dollar ($)	Don't know	Refuse to answer	Daily	Weekly	Monthly	Quarterly	Yearly	One time	Never /Not applicable	Don't know	Refuse to answer
EXP1	Rent	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP2	Food/groceries	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP3	Water Service	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP4	Drinking Water	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP5	Cooking Gas	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP6	Benzene / Fuel For Transport	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP7	Coal / Diesel for heating	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP8	Electricity/Generator Subscription	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP9	Trash removal	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP10	Clothing	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP11	Household repair/maintenance/insurance	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP12	Vehicle repair/maintenance/insurance	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP13	Education (tuition, books, stationery, tutoring)	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP14	Doctor consultations/diagnostic tests/hospitalization/medication	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99

HOUS: Housing1

HOUS1	Specify type of residence	Apartment/house (Not shared) 1; Apartment/house (Shared) 2; Active construction site 3; engine room 4; Concierge's room in residential building 5; Factory 6; Garage 8; Prefab unit 10; Shop 12; Warehouse 14; Workshop 15; other 77; Don't know 88; Refuse to answer 99
HOUS1_1	If HOUS1=77	If other, please specify: ______
HOUS2	Specify type of tenure	Owned 1; Rented (direct payment) 2; Rented (in exchange of work) 3; Hosted for free 4; Squatting 5; Assisted (by organizations, agencies, charity) 6; other 77; Don't know 88; Refuse to answer 99
HOUS3	Total area of your house (Meters squared)	|__| m²
HOUS4	What is the number of rooms occupied by your household? (excluding kitchen, bathrooms, garage, balcony)	|__|rooms

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EXP15	Public Transportation	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP16	School Transportation	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP17	Communications (landline, mobile phones, internet fees)	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP18	Outings and other entertainment (dvd rentals, etc.)	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP19	Tobacco (cigarettes, cigars, argileh)	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP20	Debt repayment	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP21	Other (including weddings, funerals, ceremonies)	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99
EXP22	Total	|__|	1	2	88	99	1	2	3	4	5	6	66	88	99

ASST: Assistance					
		Yes	No	Don't know	Refuse to answer
ASST1	Have you received in-kind food assistance post explosion?	1	0	88	99
ASST2	Have you received any other cash assistance post-explosion?	1	0	88	99
ASST3	Have you received any other non-food in-kind assistance post explosion (clothes, hygiene products, etc…)?	1	0	88	99
ASST4	Have you received any services assistance (dwelling maintenance/repair etc…) post explosion?	1	0	88	99

INC: INCOME						
INC1	**INC2**		**INC3**			**INC4**
Approximately how much is the household income?	**If INC1>0** Please specify the currency.		**If INC1>0** How frequently do you receive this income?		Rank the three main sources of income you use to cover your expenses? (multiple options) Note: Buying on credit is a form of income	Income source 1:
|__|	1	Lebanese Pound (L.L.)	1	Daily	1	Remittances	
	2	U.S. Dollars ($)	2	Weekly	2	Employment (wage, profit)	**INC5**
	88	Don't know	3	Fortnightly			Income source 2:
	99	Refuse to answer	4	Monthly	4	Savings	
			5	Every 6 months	5	Credits/debts/loan (including credits from shops)	

		6	Annually	6	Sale of assets/household goods/livestock/crops	**INC6**
		88	Don't know	7	Sale of in-kind aid	Income source 3:
		99	Refuse to answer	8	Assistance from humanitarian organization(cash, voucher, in-kind, other assistance and services)	
				9	Gifts, donations from friends/relatives in Lebanon	
				10	No other source of income (only for INC5 and INC6)	
				77	Other	
				88	Don't know	
				99	Refuse to answer	

DEBT: Debt			
DEBT1	Does your family have debt?	1	Yes
		0	No
		88	Don't know
		99	Refuse to answer
DEBT2	**If DEBT1=1** How much?	|__|	
CURR_	Currency	1	Lebanese Pound (L.L.)
		2	US Dollar ($)
		88	Don't know
		99	Refuse to answer

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