IMPACT OF COVID-19 PANDEMIC ON GLOBAL FOOD SECURITY AND NUTRITION IN 2020
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Introduction

In 2020, the COVID-19 pandemic and the response by governments to try and contain its spread, led to the largest global economic contraction since the Great Depression in 1930s. WHO has reported that as of 21.3.2021, globally around 124 million individuals have been infected and 2.7 million people have died from the disease. Restrictions to slow the spread of the coronavirus started to come into force in March 2020 and affected 2,700 million workers by April 2020. The World Economic Outlook published by the International Monetary Fund reported negative annual GDP growth rates in 2020 of -8% in India, -9.2% in Italy, -9% in France and -3.4% in the US[1]. While even a slowing of a positive economic growth rate can have a strong impact on food insecurity and malnutrition, an absolute decline of this magnitude is momentous. Unquestionably, the global impact of COVID 19 on poverty, food insecurity and nutrition has been adverse and dramatic even though the definitive numbers on the impact of the pandemic in 2020 are yet to be fully computed.

The pandemic's impact has, however, varied considerably across countries with the hardest hit being the advanced economies and in those countries the impact has also varied falling hardest on those who face the greatest risks and who have most to lose; for example highly paid office workers were able to continue working from home but service sector and informal workers were unable to work. The least developed countries showed much lower rates of COVID 19 related deaths than the advanced economies, but the economic repercussions due to unemployment, under-employment and the drop in remittances were more severe in developing countries. The impact over the course of the year was also uneven. For example, in India the unemployment rate in January 2020 was around 7%, shot up to over 23% in April but had dropped back by June to about where it was in January and remained there for the rest of the year. No country has been spared the disruption of the global movement of goods, people and money, all of which have a direct impact on the lives of millions and these effects continue to unfold.

Food security and nutrition indicators were already bad in 2019 and they had been getting worse since 2014. Why? Given this truly global complex crisis, what do we know about impact of COVID 19 pandemic on food security and nutrition? How do the various indicators of hunger and nutrition at global and the country levels work and how and when will they pick up the effects that we expect must exist? Are they reliable?

The purpose of this paper is to help make sense of what we know about the dramatic impact of the COVID 19 pandemic on food security and nutrition at the global level, how we know it and what we expect to find when more data and analyses are available. It is important to keep in mind that the "global" indicators discussed are derived from common methodologies applied uniformly to common country data sets. This has advantages but, where possible, needs to be complemented by more in-depth data and analysis in a country. These country specific data may not be directly comparable to others or can be aggregated at the global level. They may be crucial in understanding the country context and formulating appropriate policy responses.

The paper presents four pieces of the COVID 19 impact puzzle. (Fig 1). The first is an overview of the measures of food security and nutrition at the global level, based on country-level estimates, followed by a discussion of those indicators for 2019 in the period prior to the epidemic. This is followed by a brief discussion of how COVID 19 and related restrictions made things much worse, concluding with a presentation of current estimates.
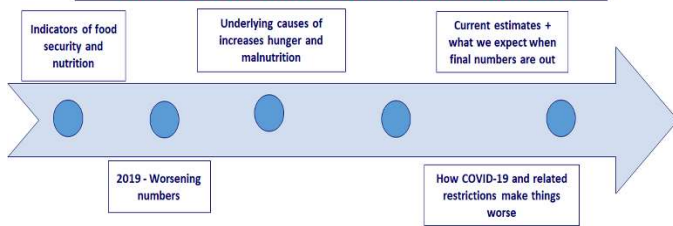
Indicators and definitions

There are two big divides in looking at the indicators of hunger and malnutrition. The first is between those indicators that measure *food security* and those that measure *nutrition outcomes*. The second divide is between measures that look at longer term *chronic* conditions and those that look at *acute* conditions, related more to emergency situations. A few definitions are helpful to keep in mind.

Food security exists ''when all people, at all times, have physical, social, and economic access to sufficient, safe, and

CONTENTS

FIG 1 FOOD SECURITY AND COVID PANDEMIC

- Indicators of food security and nutrition
- Underlying causes of increases hunger and malnutrition
- Current estimates + what we expect when final numbers are out
- 2019 - Worsening numbers
- How COVID-19 and related restrictions make things worse

Two annual global reports

The indicators outlined above are reported in two global United Nations-related annual reports. The first is the *State of Food Insecurity and Nutrition in the World* (Fig 2), often referred by its abbreviation SOFI. The second publication is the *Global Report on Food Crises* (GRFC) that bases its analyses on *acute* food in security and acute malnutrition indicators (Fig 3).

The State of Food Insecurity and Nutrition in the World (SOFI), the prevalence of under-nutrition (PoU) and other indicators

nutritious food that meet their dietary needs and food preferences for an active and healthy life"[2]. Food insecurity comes from a low level of food intake, which can be chronic when it occurs on a continuing basis, often referred to as *undernourishment,* or it can be seasonal or transitory when it occurs in times of crisis. The measurements of food insecurity, or chronic undernourishment, are based on estimates of food intake.

Under-nutrition is the result of a prolonged low level of food intake and/or poor absorption of food consumed. Physical measurement of individuals (anthropometry) is used, primarily to measure the nutritional status across all age groups especially of young children. Nutritionally deprived children are those who are significantly smaller compared to WHO child growth standards. Three different measures of under-nutrition in children are: *wasting* for low BMI (weight-for-height) for age; *stunting* for low height-for-age and *underweight* for low weight-for-age.

The *indicators of food insecurity and under-nutrition* in both their chronic and acute forms measure different things but are complementary and are important in devising short and long-term responses. Both food security and nutrition are included in the second Sustainable Development Goal (SDG 2) and each has a specific target. The Goal is *End hunger, achieve food security and improved nutrition and promote sustainable agriculture.* Target 2.1 is B*y 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round*, and target 2.2 is: *By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons*.

Historically, the annual *State of Food Insecurity and Nutrition in the World* (SOFI) has been associated primarily with chronic food insecurity and reporting on the prevalence of under-nutrition (PoU), using a modeling approach based on a limited set of variables available at the country level. The PoU is based on three parameters: (1) the average amount of dietary energy consumed by a hypothetical average individual in the population; (2) the coefficient of variation that represents the variability that exists within the population's usual consumption; and (3) a threshold that represents the minimum amount of energy needed by a hypothetical average individual of the population to be in good health, estimated based on a weighted average of the minimum energy requirements for each sex-age group in the population. In addition to FAO's methodological material, an excellent brief overview of the PoU is provided by the Data4Diets website of Tufts University[3]. However, since it first came out in 1999 it has also contained considerable information and analysis on nutrition. The report has a much longer history as an FAO publication, however, going back to the founding of FAO.

When FAO was created in 1945 one of its first tasks was to prepare a survey on the state of food and nutrition in the world. FAO's first *World Food Survey* in 1946 was based on pre-World War II data and, although very imprecise by today's standards, it covered 70 countries and was a pioneering attempt to analyse the state of food intake in the world. Based on the scientific evidence available at the time on caloric intake it confirmed long-held beliefs that wide-spread hunger and under-nutrition were rampant.
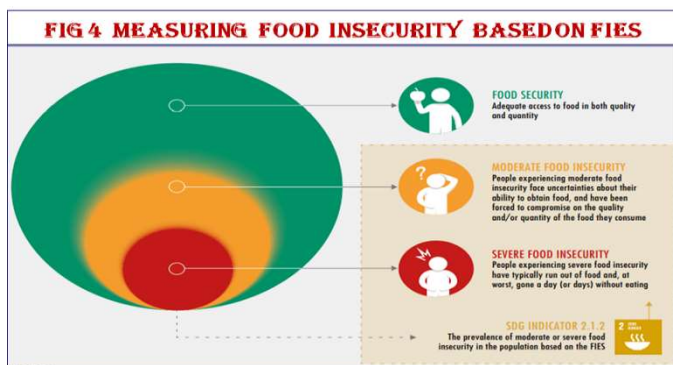
This was followed in 1952 by the Second World Food Survey, using more up-to-date information, and it found that average calorie supply per person had fallen to below pre-war levels and that the gaps between the better and worse-fed nations

FIG 2 REPORTS ON FOOD SECURITY AND NUTRITION

FIG 3 GLOBAL REPORT ON FOOD CRISIS

FIG 4 MEASURING FOOD INSECURITY BASED ON FIES

had widened since the 1946 report. Subsequent Surveys were published in 1963, 1977 and 1985 with estimates of undernourishment built on FAO's "food balance sheet" methodology, a calculation of how much food, in terms of "dietary energy supply" (DES), is available on a *per capita* basis for human consumption in a country, taking into consideration production, carry over, imports and exports, use for seed and animal feed and estimates of losses during transportation and storage.

The Sixth World Food Survey in 1996 covered the period up to 1990-92 and included anthropometric data. It came out ahead of the first World Food Summit in 1996 and was used as the background for those high-level discussions. It marked the start of the political commitment to eradicate hunger, with concrete targets and, consequently, the need to monitor progress. Member states pledged their commitment to "achieving food security for all and to an ongoing effort to eradicate hunger in all countries, with an immediate view to reducing the number of under-nourished people to half their present level no later than 2015".

This resulted in the first edition of the *State of Food Insecurity in the World (SOFI)*, launched on World Food Day in 1999 to report on global progress in achieving the agreed target, using the prevalence of under-nutrition (PoU) as the indicator, reported annually as a three-year moving average. With the advent of the Millennium Development Goals, the SOFI data became the reference point for monitoring MDG Target 1.C, to *Halve, between 1990 and 2015, the proportion of people who suffer from hunger.*

The World Food Programme (WFP) joined in publishing the SOFI in 2009 and the International Fund for Agricultural Development (IFAD) joined in 2011. The most recent change happened in 2017 following the endorsement by member states of Agenda 2030 for Sustainable Development and the Sustainable Development Goals (SDG). SOFI then began to monitor progress towards both the targets of ending hunger (SDG Target 2.1) and all forms of malnutrition (SDG Target 2.2). SOFI added "Nutrition" to its title and both UNICEF and the World Health Organization (WHO) joined the partnership of FAO, IFAD and WFP in preparing the annual report (Fig 2).

The latest editions of the SOFI contain a great deal of information on food security and nutrition and in-depth discussion on a range of challenges[4]. Nevertheless, the headline number remains the prevalence of under-nutrition

(PoU), which is seen as the annually reported "hunger number" representing chronic under-nutrition. The PoU indicator has come under criticism from its early days onward for being too focused on calories as a representation of hunger and other methodological concerns. Over the years, the methodology has continued to be refined and the presence of other indicators in the SOFI report alongside the PoU has increased understanding of the complementarity of food insecurity and nutritional indicators. A major strength of the PoU is that it can be calculated from reasonably attainable data every year for almost all countries. It also represents a long time series by now, which has been adjusted periodically as better estimates of the underlying country parameters become available. For these reasons it has special status as one of the recognized indicators in monitoring and reporting on the Sustainable Development Goals.

Tracking global hunger numbers has been critical in reaching political consensus and commitment to eradicate hunger, starting with the 1995 World Food Summit target of cutting the number of hungry in half by 2015. This, along with other commitments, led to the Millennium Development Goals and then to the SDGs with their agreed targets and indicators. However imperfect their accountability may be, they have encouraged governments to take seriously the need for measurable progress on the most critical global challenges. There is no question, however, that beyond measures like the PoU, to understand and act on food insecurity we need to know more about people's own experience on their direct access to food. This is where the other FAO indicator reported in the SOFI comes in, namely the Food Insecurity Experience Scale (FIES).

SOFI and the Food Insecurity Experience Scale (FIES)

Most studies looking at direct access to food are based on household surveys that offer much greater detail than any model-based indicator can achieve. The drawback is that the surveys generally rely on small samples, may focus on a specific locality and are difficult to aggregate at a higher level. A relatively recent solution to this dilemma has been the adoption of the Food Insecurity Experience Scale (FIES), now included in SOFI reporting and an official indicator of one of the SDG hunger targets. FIES builds on the experience of several countries, primarily in North America and Latin America. The United States implemented its Household Food Security Survey Module in 1995 as part of its national food security monitoring. In the early 2000s several Latin American countries, notably Brazil and Mexico, implemented their own experiential food insecurity measurements. This led to the regional Latin America and Caribbean Food Insecurity Scale called ELCSA. FAO built on the research behind these experiences and through a project called *Voices of the Hungry* developed a globally applicable questionnaire that it tested for reliability in diverse socio-cultural contexts[4].

The result was the global Food Insecurity Experience Scale and its survey was designed to measure both the *prevalence* and the *severity* of food insecurity experienced by individuals. Adequacy of access to food is assessed using a series of

questions, administered to a nationally representative sample of the population, focusing on whether the respondents had experienced over the past 12 months the behaviours and conditions that typically indicate food insecurity. In 2014 FAO contracted the Gallup Corporation to collect data in all 149 countries covered by the Gallup® World Poll (GWP), inserting eight questions into the longer survey instrument. Based on the FIES survey, individuals or households are assigned to be in one of three classes: food secure or only marginally insecure, moderately food insecure and severely food insecure (Table 1). The prevalence of undernourishment (PoU) is one of the two indicators for SDG target 2.1, the second indicator is the *prevalence of moderate or severe food insecurity* in the population, based on FIES results. Given this wording of the SDG indicator, the SOFI provides FIES-based numbers on i) severe food insecurity and ii) moderate or severe food insecurity. (Fig 4)

Since 2014, the FIES survey module has been applied in more than 140 countries included in the Gallup World Poll, covering 90% of world population. In most countries, samples include about 1,000 individuals, with larger samples of 3,000 individuals in India and 5,000 in mainland China. The FIES results have been included in the SOFI from 2017 onward, although data are published only for those countries that have agreed to share their country's results. Given the nature of the FIES indicator, the impact of the pandemic on people's access to food in 2020 should be readily picked up by the survey and will provide an important perspective on how severe that impact has been over the previous 12 months.

The Global Report on Food Crises (GRFC)

The Global Report on Food Crises (GRFC) has a much shorter history than the SOFI but is nevertheless built on long experience of the humanitarian community in collecting and analysing data on acute food insecurity and malnutrition. It provides information both on the extent and the severity of acute food insecurity and malnutrition. The Report arose from the need by governments and the national and international humanitarian communities to understand the absolute and relative severity of simultaneous crises, in order to plan and fund evidence-based responses. It provides timely, indepen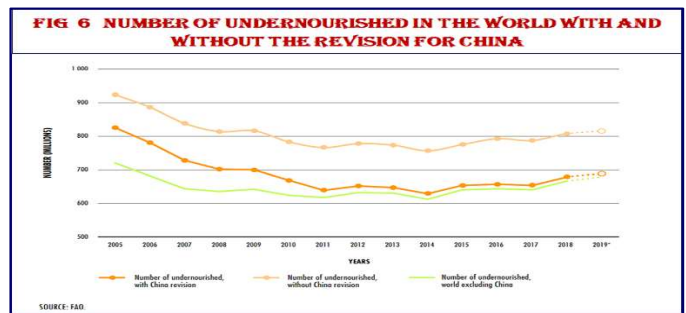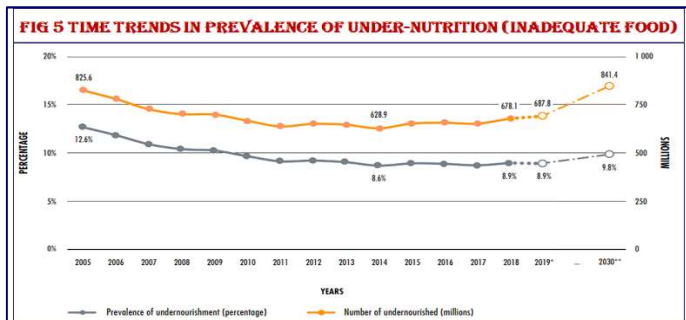dent and consensus-based information on the severity and magnitude of the crises and on the factors that are driving food insecurity and malnutrition in those contexts.

Like SOFI, the Global Report on Food Crises has separate sections and indicators for food insecurity and for under-nutrition and, like SOFI, the reporting on food insecurity is more prominent and has received most public attention. There are several additional key differences between the GRFC and SOFI estimates, beyond the chronic versus acute divide. As discussed above, the PoU and FIES indicators in the SOFI identify *average chronic food insecurity* during a year for almost all countries, and they are calculated and reported once annually. The GRFC focuses on *acute food insecurity and malnutrition* using a series of measurements that may take place throughout the year, according to the severity of the crisis, and are compiled in the annual report at their *worst (peak) point* in the previous year and only for a select group of countries that meet certain crisis-related criteria. The Report also provides a forecast of the severity of the crises in the months ahead.

The methodologies behind the Global Report have been in development since the late 1990s by several UN and other humanitarian agencies although the Report was first published in 2017. It followed the establishment of the Global Network Against Food Crises, launched at the 2016 World Humanitarian Summit by the European Union, FAO and the World Food Programme (WFP) with the objective of tackling the root causes of food crises through shared analysis and knowledge and strengthened coordination in response. A Technical Working Group was set up under a Food Security Information Network (FSIN), which produces the annual GRFC. There are currently 16 members of the Network who all contribute to the Report (Fig 3).

The heart of the analysis, and the way that the numbers are reported, relates to the definition of five phases of acute food insecurity and five phases of acute malnutrition, each based on a series of indicators, within the so-called *Integrated Food Security Phase Classification (IPC)* and *Cadre Harmonisé (CH)* methodologies (Table 1). These parallel methodologies were first developed for the Sahel (CH) and for the rest of the world (IPC). Based on the data, the size of the population that meets the criteria for each phase is reported.

TABLE 1   ACUTE FOOD INSECURITY - DEFINITION AND RESPONSE (IPC/CH)

Phase	Technical description	Priority response objective
1 None/Minimal	Households are able to meet essential food and non-food needs without engaging in atypical and unsustainable strategies to access food and income.	Resilience building and disaster risk reduction.
2 Stressed	Households have minimally adequate food consumption but are unable to afford some essential non-food expenditures without engaging in stress-coping strategies.	Disaster risk reduction and protection of livelihoods.
3 Crisis	Households either: • Have food consumption gaps that are reflected by high or above-usual acute malnutrition; OR • Are marginally able to meet minimum food needs but only by depleting essential livelihood assets or through crisis-coping strategies.	URGENT ACTION REQUIRED to protect livelihoods and reduce food consumption gaps.
4 Emergency	Households either: • Have large food consumption gaps which are reflected in very high acute malnutrition and excess mortality; OR • Are able to mitigate large food consumption gaps but only by employing emergency livelihood strategies and asset liquidation.	URGENT ACTION REQUIRED to save lives and livelihoods.
5 Catastrophe/Famine	Households have an extreme lack of food and/or other basic needs even after full employment of coping strategies. Starvation, death, destitution and extremely critical acute malnutrition levels are evident. (For Famine classification, area needs to have extreme critical levels of acute malnutrition and mortality.)	URGENT ACTION REQUIRED to revert/prevent widespread death and total collapse of livelihoods.

FIG 5 TIME TRENDS IN PREVALENCE OF UNDER-NUTRITION (INADEQUATE FOOD)

FIG 6   NUMBER OF UNDERNOURISHED IN THE WORLD WITH AND WITHOUT THE REVISION FOR CHINA

The five phases of acute food insecurity are 1. *None/Minimal*, 2. *Stressed*, 3. *Crisis*, 4. *Emergency* and 5. *Famine/Catastrophe* (Table 1). The "headline" numbers that gets the most public attention is the number of people classified in IPC/CH phase 3 or above (i.e. the combined total of those classified as in crisis, emergency or famine/catastrophe phase).

The definition of the phases is based on acute food insecurity *first-level outcomes* that refer to characteristics of food consumption and livelihood change, *second-level outcomes* that refer to local-level estimations of nutritional status and mortality, and food insecurity contributing factors that need to be analysed according to the specific livelihood context[5].

The acute malnutrition phases are: 1. *Acceptable*, 2. *Alert*, 3. *Serious*, 4. *Critical* and 5. *Extremely Critical*. The classification is based on the percentage of children that are acutely malnourished and on mortality and morbidity levels. In addition to the population numbers in each of the IPC/CH classification phases, the GRFC provides a detailed description of the crisis in the worst affected countries along with a projection of future conditions. The process of collecting and analysing the data and reaching consensus on the severity of the crises among the partners can be arduous but the work represents a very significant advance in understanding the absolute and relative severity of multiple, simultaneous food crises and their underlying causes, and it provides critical evidence-based insight into how best to address them.

The 2019 pre-COVID-19 indicators

Both SOFI and GRFC reports published in 2020 referred to the situation in 2019 and showed worsening food insecurity and malnutrition. In terms of the PoU indicator, nearly 690 million people or 8.9% of the population were under-nourished (Fig 5). This represented an increase of 10 million people over 2018 and an increase of 60 million people over the previous five years. If these trends are not reversed, the SDG 2.1 Zero Hunger target will not be met. This SOFI "headline number" of 690 million chronically under-nourished may have looked surprisingly low to those who follow the SOFI regularly, given the previous year's estimate of 820 million people. Sadly, this was not a real decrease but reflects improved parameters underlying the PoU estimates for a number of countries. As more household-level data becomes available for some countries, every year the parameters underlying the PoU estimates are reviewed and often revised. A key parameter in this regard is the country-specific coefficient of variation that tells us how food availability is distributed within the country's

population. These revisions can have a significant impact on the resulting PoU calculations for those countries.

In 2019 it was possible to revise this crucial parameter of inequality in food consumption for 13 countries, among them China. As China counts for one-fifth of the world's people, this update of the parameter for China led to a significant updating of the PoU estimate for the country and, for consistency, to a revision of its series back to 2000. This resulted in a substantial downward shift of the estimated number of under-nourished in China and, consequently, in the world. Nevertheless, even with the revision the trend reported in past editions was confirmed: the number of people affected by chronic hunger globally has been slowly on the rise since 2014 (Fig 6).

Looking at the FIES indicator for 2019, 750 million people were estimated to be affected by severe food insecurity and 2,000 million suffered from severe or moderate food insecurity. In terms of anthropometric data, in 2019, 21.3% (144.0 million) of children under 5 years of age were estimated to be stunted, 6.9% (47.0 million) wasted and 5.6% (38.3 million) overweight, while at least 340 million children suffered from micro-nutrient deficiencies. It should be recognized, however that between 2000 and 2019 the global prevalence of child stunting declined by one-third. Still, the world is not on track to achieve the global nutrition targets, including those on child stunting, wasting and overweight by 2030.

What explains the increase in food insecurity since 2014? The basic reasons, as analysed in the SOFI 2020, are the weak, stagnant or deteriorating economic conditions in many countries, particularly those that are most vulnerable to economic and climate-related shocks. Most of the countries where hunger increased in the last few years experienced economic slowdown or downturns, and most of them are middle-income countries. Lower economic growth translates into less income locally and fewer remittances from abroad, leading to increases in poverty and hunger. There has been an increasing debt burden in poorer economies and increasing extreme weather events and the spread of pests and diseases including the devastating outbreak of desert locusts in East Africa. There has also been growing inequality and uneven benefits of economic growth. The world has also seen an increase in displacements of people due to conflict and violence, which reached 79 million people in 2019, approaching almost double the number in 2010.

The 2020 Global Food Crisis Report found that 2019 had the highest numbers ever, in the four years of the GRFC's

FIG 7 NUMBER OF ACUTELY FOOD-INSECURE PERSONS IN CRISIS OR WORSE

**FIG 8 DRIVERS OF FOOD CRISIS 2019**

existence, of people categorized in *crisis*, *emergency* or *famine/catastrophe* phases. It reported that 135 million people were in *crisis* phase or worse (IPC/CH Phase 3 or above) across the 55 countries and territories analysed. More than half of these people were in Africa (73 million), 43 million were in the Middle East and Asia, 18.5 million in Latin America and the Caribbean and 0.5 million in Europe (Fig 7).

This increase in 2019 over the previous year reflected, in part, the inclusion in the analysis of additional countries and areas within some countries. When comparing the 50 countries that were in both the 2019 and 2020 reports, the population in IPC/CH Phase 3 or above rose from 112 to 123 million. Of these, 15 million were children under-five. This reflected worsening acute food insecurity and malnutrition in key conflict-driven crises, notably the Democratic Republic of the Congo and South Sudan and the growing severity of drought and economic shocks in countries such as Haiti, Pakistan and Zimbabwe. An additional 183 million people in 47 countries were classified in *stressed* (IPC/CH Phase 2) conditions, at risk of slipping into *Crisis* or worse.

As in previous years, *conflict/insecurity* remained the main driver of food crises in 2019, but *weather extremes* and *economic shocks* became increasingly significant (Fig 8). *Conflict/insecurity* was the main driver for 77 million acutely food-insecure people in 22 countries. Over half of these people were in the Middle East and Asia. *Weather extremes* were found to be the main driver of acute food insecurity for 34 million people in 25 countries, and Africa had the largest numbers of acutely food-insecure people in need of assistance in countries badly affected by weather events, particularly in the Horn of Africa and Southern Africa, followed by Central America and Pakistan. *Economic shocks* were the main drivers for 24 million people in eight countries.

The Global Report is launched each year in April so by April 2020 the impact of COVID-19 was already very much in evidence. The 2020 report included a section outlining anticipated shocks from the pandemic that were likely to make things worse. These included the impacts on health and nutrition, food supply, food access due to increasing unemployment and under-employment, the size of the displaced population, social tensions and conflict and the ability to deliver humanitarian assistance (Fig 9). While these factors were fully expected to move more people from phase 1 (*minimal*) to phase 2 (*stressed*) the dynamics of food crises in phases 3 or higher are much more complex and more difficult to predict. Looking ahead to 2020, economic shocks
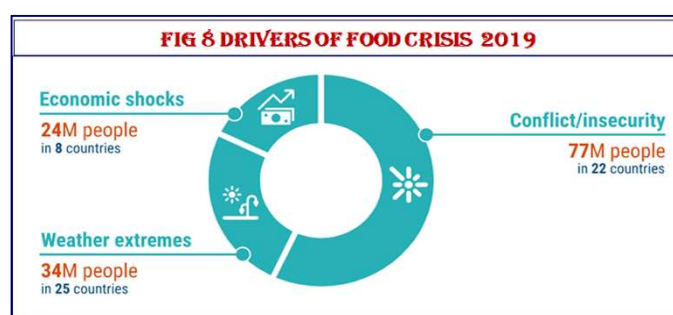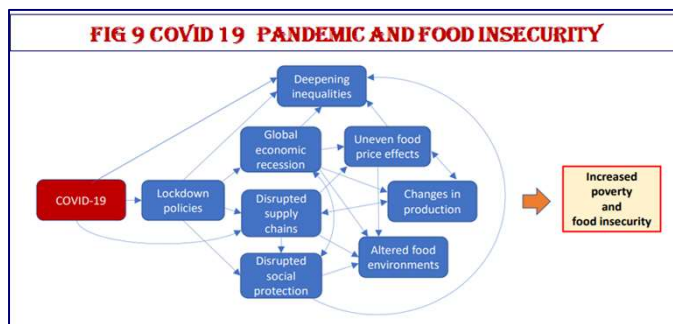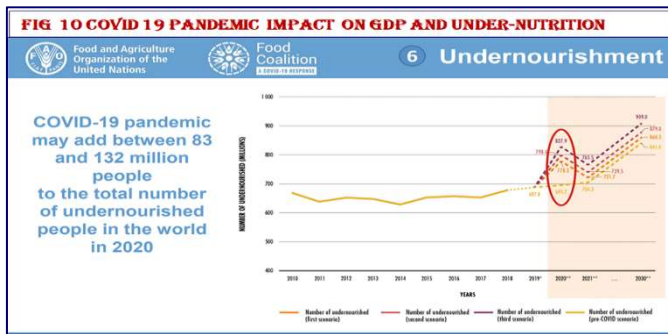
were clearly on the increase but the other main drivers of crises, i.e., *conflict/insecurity* and *extreme weather events*, are not necessarily linked to the pandemic and may move in the other direction in some cases.

How COVID 19 and Related Restrictions Affect Food Insecurity and Malnutrition

Thinking through the factors behind the numbers reported in the SOFI or the GRFC, it is easy to imagine the many ways that the pandemic and the resulting restrictions on movement would have a major impact on food security and nutrition (Fig 9). The most obvious one is the economic impact of unemployment and under-employment leading to loss of income. Inevitably, this hits hardest on those who are least able to withstand the shock, those relying on daily income to pay for daily needs and those working in the service sector or the informal sector in general. One fear that did not materialize was the widespread closing of borders to import and export of food. Food prices have been rising but global food supplies are at record or near record highs for most staple foods. Food supply chains were disrupted, however, as coronavirus containment measures limited labour mobility in areas dependent on seasonal or migrant labour, making it difficult to access markets and to transport food and agricultural inputs, in addition to the direct impact on incomes of the labourers. Particularly in the early weeks of the pandemic, food supply chains were thrown into disarray as restaurants, schools and other institutional settings closed, while demand grew for food prepared at home. As these categories often have much different specifications, particularly in bulk versus smaller packages, it led to dumping of perishable products and shortages of others.

COVID 19 triggered shocks to both the supply and demand sides of the global economy. A good example of this is migrant remittances. Remittances are a very significant source of economic support for many countries and for many poor

FIG 9 COVID 19 PANDEMIC AND FOOD INSECURITY

FIG 10 COVID 19 PANDEMIC IMPACT ON GDP AND UNDER-NUTRITION

FIG 11 ECONOMIC GROWTH PROJECTIONS (IMF 2021)

households, who tend to be those whose members work abroad send money home. Global remittances are estimated to have fallen by 7% in 2020, from USD 716.7 thousand million to 666.2 thousand million, which is even larger than the 5% decline during the global financial crisis in 2009. Lower employment in host countries made it difficult for migrants to send money home and lockdowns and travel restrictions created obstacles to mobility, preventing would-be migrants from working overseas[4]. A further 7% drop in remittances is expected in 2021, owing to the pandemic's lingering effects on the global economy.

Many countries, India included, saw massive internal movement of people as migrants went home following coronavirus restrictions. Health services were severely affected as were school feeding programmes and other community-led services and social protection programmes. There was a deterioration of childcare practices due to quarantine, along with many other direct and indirect effects of COVID 19. In all these areas, the impact of COVID 19 lead to increased poverty and unequal burdens on the poor.

While there have been estimates from March 2020 onwards of the expected impacts of COVID 19, a lot remains unknown. The trajectory of the pandemic has varied across countries, within countries and across time periods within the year. The rise and fall in numbers of newly infected people and the degree to which different countries have closed down and reopened - in some cases multiple times - have made future predictions uncertain. One area of note has been the widely varying rates among countries of COVID 19-related deaths. To cite two examples, on a per-capita basis, Bangladesh reported 3.5% of the COVID 19 deaths in USA; India reported less than one-tenth of COVID 19 deaths in Mexico even though the age pyramid of the two countries are similar[6].There are several important aspects of the pandemic that are not yet well understood and it is far from over.

The impact of COVID 19: Current Estimates

Given these uncertainties, estimating effect of COVID 19 on food security and nutrition comes with a high degree of uncertainty, both in terms of the disease trajectory and to a lack of clarity about the future of the world economy. We do not yet have the PoU calculations of chronic under-nutrition for 2020, although FAO undertook a modeling exercise to estimate the results under three different scenarios. Likewise, we do not have the full FIES results that will be published in the 2021 SOFI but we do have estimates for a few countries.

The Global Report on Food Crises will be released in April and, while not yet available as of this writing, we have some of the key numbers relating to acute food insecurity.

Concerning the estimate of the global PoU figure, the FAO exercise used the IMF World Economic Outlook estimates for global GDP growth from April 2020 and combined them with a statistical analysis of the relationship between economic growth and food availability. Based on time series of total food supplies and GDP growth from 1995-2017, the statistical analysis showed that GDP growth reduction significantly affects food supply in net food-importing countries, and especially so in low-income food-deficit countries (LIFDCs). On average, a one percentage point decline in GDP growth is estimated to reduce the food supply by 0.06% in net food-importing countries that are not low-income, and by 0.3% in LIFDCs.

Using these figures for the impact of economic downturns on food supply, the study then looked at three scenarios of world economic growth and estimated the resulting impact on the global PoU. The first scenario used the April 2020 World Economic Outlook of the IMF forecast of global economic growth of -4.9% in 2020 and +5.4% in 2021. This scenario would imply an increase of about 83 million under-nourished in 2020 (from 695.7 to 778.3 million) that would be attributable to the COVID 19 pandemic. The second, less optimistic scenario used a world economic growth rate of -7% in 2020 and +3.3% in 2021. In that scenario, the increase in the number of under-nourished in 2020 would be approximately 103 million (rising from 695.7 to 798.4 million). The third, even more pessimistic scenario used an economic growth rate of -10% in 2020 and +0.3% in 2021. This scenario would bring the number of under-nourished up to 828 million in 2020, of which more than 132 million would be attributable to the impact of COVID 19 (Fig 10).

The most recent World Economic Outlook came out in January 2021 and it contained more positive estimates and projections of global economic growth[1]. The downturn was not as bad it had been estimated earlier in the year. This current estimate shows a -3.5% growth rate in 2020 (a smaller negative rate than the -4.9% estimate in the FAO most optimistic scenario) and a projection of +5.5% in 2021, about the same as the FAO optimistic scenario (Fig 11). Consequently, while recognizing the limitations of this estimated PoU, the negative economic growth in 2020 may translate into around 75 million additional under-nourished people; an 11% increase attributable to the pandemic. This is clearly an important number, but we will

need the full PoU calculations later on in 2021, the FIES results, new anthropometric data to obtain a more complete picture of COVID 19 impacts in 2020 on food security and nutrition.

Regarding FIES surveys, while the global survey results are not yet available, the World Bank Living Standards Measurement Study utilizes FAO's FIES questionnaire in its work, including in high frequency phone surveys in four African countries that were carried out monthly between April and September 2020 covering 10,865 households in Ethiopia, Malawi, Nigeria and Uganda. The results were reported in March 2021[7]. The surveys found the prevalence of moderate or severe food insecurity high but with a slight but statistically significant decline in each month survey after that, going from 61% over all to 58% of households. The highest rates were in Malawi and Nigeria at over 60% in each round, compared to over 40% in Ethiopia and Uganda. The prevalence of moderate or severe food insecurity reported for the 2014-2017 period in the 2020 SOFI was as follows: Ethiopia 57.9%, Malawi 82.2%, Uganda 66.3% and Nigeria 44.1%.The World Bank paper concluded that "Compared to countries in North America and Europe, the confirmed COVID 19 cases remain low in Ethiopia, Malawi, Nigeria, and Uganda. The picture that emerges from the data is that households saw a substantial economic hit due to the pandemic and a global economic slow-down. Without additional assistance, households are likely to continue to suffer economically and be in a particularly precarious position if widespread outbreaks occur in those countries."

As outlined above, data on acute food insecurity and malnutrition in crisis countries may be collected periodically throughout the year and complied in the annual Global Report, using data for each country at their worst peak points. The GRFC comes out in April each year and while the report has not yet been published as of this writing, some results for the countries included in the report are available. There are 39 countries for which it is possible to compare numbers of peak acute food insecurity (IPC/CH phase 3 and above) between 2019 and 2020. Of the 39 countries, seven showed improvement, seven showed stable numbers and 25 showed deterioration. For these 39 countries, the number of people suffering from acute food insecurity rose from 109 million in 2019 to 132 million in 2020, a staggering increase of 21%. When it comes to the acute malnutrition analyses in the GRFC, it is possible to compare the situations in five countries where analyses were available in both 2019 and 2020 (Burkina Faso, Kenya, Madagascar, Somalia and South Sudan). This comparison indicates an increase between 2019 and 2020 in the number of children affected by acute malnutrition by 26% across the countries, an agonizingly high magnitude.

Concluding remarks

The global pandemic of 2020 was of a scale unlike anything we have seen in our lifetimes. The impact of the disease and of the policies put in place to limit the spread of the coronavirus is still unfolding. While there is a lot yet to understand, there is no question that the negative economic impact will continue to reverberate into 2021 and beyond, with enormous hardship inflicted on those least able to cope. While the measurements

included in the SOFI and the GRFC are far from ideal, the world is fortunate to have information systems in place to monitor and report on the repercussions in food insecurity and malnutrition. Given past history, they will no doubt continue to improve based on collaborative research and innovation, building on new experiences around the world.

One final point is called for in this discussion, particularly given the Nutrition Foundation of India's contribution to the topic, and that is the challenge, beyond hunger, of healthy diets. The negative trends discussed above on hunger and malnutrition are extremely important and need to be reversed but we need to go further and ensure access not only to sufficient food, but also to nutritious foods that constitute a healthy diet.

The greatest barrier to achieving this is the cost of nutritious foods and the affordability of healthy diets. They remain out of reach for an estimated 3,000 million people, located in every region of the world, due to their high costs relative to people's incomes, a problem that has been made worse by COVID 19. When the impacts of the pandemic have played out and the word has returned to a hopefully much improved new normal, the issue of healthy and nutritious diets and their affordability will continue to require even bolder actions and innovative policies to make them a reality for all.

Dr Daniel Gustafson was former FAO representative in India and retired as Deputy Director-General of Food and Agriculture Organization Rome, Italy. The article is based on his presentation in the NFI webinar on "Food security and health during COVID 19 pandemic 2020" held on 1st Feb 2021.

References
1. International Monetary Fund. World Economic Outlook Update January 2021. Available from: https://www.imf.org/en/Publications/WEO/Issues/2021/01/26/2021-world-economic-outlook-update
2. The Rome Declaration on World Food Security, November 1996. Available from: http://www.fao.org/3/w3613e/w3613e00.htm.
3. FAO State of Food Security and Nutrition in the World (SOFI) 2020. Available from: http://www.fao.org/publications/sofi/2020/en/
4. WFP: Global report on food crisis 2020 Available from: https://www.wfp.org/publications/2020-global-report-food- crises
5. Smith MD, Rabbitt MP, Coleman-Jensen, A. Who Are the World's Food Insecure? New Evidence from the Food and Agriculture Organization's Food Insecurity Experience Scale. World Development: 90, 402-412, 2017.
6. Mukherjee S. The COVID Conundrum. *The New Yorker*. 1 March 2021:18-24.
7. Furbush A, Josephson A, Kilic T, Michler JD. World Bank Policy Research Working Paper 9556. The Evolving Socioeconomic Impacts of COVID-19 in Four African Countries. March 2021. Available at: http://www.worldbank.org/prwp

FOUNDATION NEWS

NFI organized a webinar on "Food security and health during COVID 19 pandemic 2020" held on 1st Feb 2021.
There were three presentations:
Dr Daniel Gustafson: Global food security during COVID 19 pandemic in 2020.
Dr Prema Ramachandran: Food security in India during COVID 19 pandemic in 2020
Dr CS Reddy: Impact of COVID 19 on health and health care delivery in India in 2020.