

**IFMSA Policy Proposal**  
**[Food for Health and Sustainability]**

**Proposed by [Team of Officials]**

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## Policy Statement

### Introduction:

Nutrition is an essential activity for every human being in order to survive and thrive. However, this crucial act is at present, not properly insured for more than a quarter of the world's population affected by food insecurity. Malnutrition in all its forms, increased risk of cancer and a negative impact on an individual's mental health are some of the consequences on human health driven by a persistent lack of food security. Concurrently, the impact of our unsustainable food systems on environmental health through the loss of biodiversity, deforestation and overfishing cannot be neglected. The deadlines set in the Agenda 2030 and the Sustainable Development Goals are fast approaching, yet the proposed objectives are, in numerous cases, not on their way to fulfillment. With the world's population projected to grow even further, negative factors affecting human, animal and environmental health are likely to increase tremendously.

### IFMSA position:

The International Federation of Medical Students' Associations (IFMSA) affirms that proper nutrition and sustainable food systems are necessary for the health of all humans and the planet, and plays a critical role in achieving the 2030 Sustainable Development Goals and that it is of utmost importance to respect, protect and fulfill the human right to adequate food. Our community believes that it is incumbent upon future healthcare professionals to advocate for impactful global action against food insecurity, malnutrition and the obesity pandemic. Increased effort to address nutrition and food sustainability is urgently required to sustain the nutritional needs of the population whilst limiting the harmful impacts of food production. Food systems transformation will have the dual benefit of improving both human and planetary health. IFMSA recognises that action for nutrition will require a multi-sectoral approach, involving both the health and agricultural sectors.

### Call to Action:

#### IFMSA calls for

- **Governments to:**

- Provide ample funding to research focusing on food, nutrition, health and sustainability and apply the findings while creating and reviewing Public Health policy
- Dedicate funding and resources toward further research on the implications of climate change on food production as well as on adaptation strategies to reduce the effects of climate change on crop quality and yield
- Ensure that the entire population of the country of territory has continuous access to safe nutritious food and clean water, especially during economic, conflict- and climate-related humanitarian crises
- Develop policies to protect the natural environment and its biodiversity from conversion for agricultural purposes
- Implement effective biodiversity conservation plans and fisheries management to regulate fishing activities and avoid the overexploitation of marine resources
- Boost the presence of nutrition-related topics in the school curriculum while offering high-quality nutritious food through school cafeterias so that food insecurity is no longer a barrier to access education
- Ensuring supply of high-quality nutritious food in all community facilities, including but not limited to retirement homes, hospitals and refugee camps.
- Take legislative action to minimize the negative impact of food waste while encouraging private entities to self-regulate in this area and incentivizing thoughtful market practices
- Provide legal protection to consumers willing to challenge unethical practices within the food industry by empowering specialist-driven public agencies
- Encourage Family Farming to improve Food Sovereignty
- Protect indigenous lands and increase the forest protection area, willing to stop the harmful advance of agribusiness and deforestation.
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- **The United Nations (including FAO) and the World Health Organization to:**
  - Encourage nations to increase action towards the SDGs through regular review of national progress and reporting requirements with subsequent action plans
  - Provide increased funding and resources to improve the progress of the 2016-2025 'Decade of Action on Nutrition'
  - Provide urgent support and programs to address the impact of the COVID-19 pandemic on food insecurity and malnutrition
  - Develop programs to address the six pathways for food systems transformation as recommended by the UNFAO
- **Food Regulatory and Enforcement Agencies to:**
  - Set standards for marketing that encourage the intake of healthy food and beverages, and limit those that do not provide high nutritional value
  - Develop easily comprehensible certifications for sustainable food and raise consumers' awareness of its significance
  - Develop consistent and easily comprehensible certifications indicating the overall nutritional benefit of food and beverage products.
- **Food industry and marketing companies to:**
  - Collaborate with social influencers such as athletes and celebrities to promote good nutrition and healthy lifestyles
  - Take action to create internal regulations regarding food quality and food waste reduction
- **Universities, including medical schools to:**
  - Integrate nutrition and physiology science basics in healthcare-related study plans; to ensure understanding of its impact on NCDs.
  - Provide a variety of nutritious, sustainable and affordable food choices for healthcare workers and students
  - Aim to equip students in healthcare-related study plans with the skills to counsel their future patients on making healthy and sustainable food choices and the knowledge about the causes of food insecurity and the measures needed to reduce it.
- **IFMSA National Member Organizations (NMOs) and medical students to:**
  - Educate medical students on the burden of disease that poor nutrition and food systems contribute to globally
  - Educate medical students about the concept of food security and food sovereignty, and what are the challenges to achieve.
  - Encourage the creation of projects that educate the population about the topic and value the popular knowledge
  - Advocate to their respective governments to increase national efforts to address nutrition in line with commitments under the UN Sustainable Development Goals
  - Advocate for the public health benefits of addressing nutrition, including strategies to address overnutrition and NCDs
  - Advocate for a 'Health in All Policies' approach to food systems transformation, involving both health and agricultural sectors
  - Advocate for their countries to achieve Food Sovereignty.
  - Advocate for the governments address laws to protect indigenous lands and lands of environmental protections.
  - Advocate for the governments to improve the access of potable water and basic sanitation, indispensable for food security.
  - Provide sustainable food options in their meetings, including local products and reducing the amount of animal-derived products.

## POSITION PAPER

### Background information:

The homeostasis of every living organism on earth depends on a balanced intake of water, protein, carbohydrates, fatty acids, vitamins, minerals and microelements.[1] Any persistent disruption of this equilibrium may threaten the quality and length of one's life. Maintaining proper nutrition is a key determinant of human health, and therefore a major focus area of global and national public health policy and everyday clinical practice. [2,3] The Agenda 2030, adopted in October 2015, consists of 17 Sustainable Development Goals which serve as a universal framework for policy-making and cooperation between nations and communities to ensure a more equitable world. [4] SDG 2 - *zero hunger* - calls upon the global community to provide every human with access to nutritious food irrespective of seasonal changes in its availability, socioeconomic disparities and other relevant factors. In parallel, the *United Nations Decade of Action on Nutrition* was proclaimed by the United Nations General Assembly for the period 2016-2025 - with the end goal being the worldwide eradication of malnutrition. [5] However, according to *The Sustainable Development Goals Report 2021*, around 2 billion people (more than 25% of the global population) suffered from food insecurity in early 2020, a figure further exacerbated by the COVID-19 pandemic which put a massive strain on the global and local food markets and supply chains. [6,7] An even larger portion of the population has suffered from food insecurity, which was correctly predicted to become a pressing issue due to the disruption induced by the pandemic-related economic crisis. Newborn babies, toddlers and children are among those affected - this phenomenon is likely to leave a negative health impact on an entire generation. [8]

The continuous shift to unsustainable, meat- and processed food-based diets across countries of all income levels has increased the burden on health systems, including heightened morbidity of non-communicable diseases, among them cancer, diabetes type 2, dyslipidemia, atherosclerosis and their long-term complications. [9,10] Certain food products, as well as artificial additives, have also been proven to increase the risk of certain types of cancer, most importantly bowel cancer. [11,12] Consequently, it is often argued that ensuring a global transformation of nutrition (along with a new approach to designing food systems) is of high importance to protecting individual health, but also for the broader public health, economic and planetary benefits of more sustainable food systems value. [13]

According to UN data, an additional 3 billion people might be added to the present 8 billion global population by the year 2100. [14] Several factors such as the production systems, agribusiness and increasing human population will continue to drive environmental degradation of the world's ecosystems, mainly due to the need to expand arable land, resort to overfishing in the seas and enlarge livestock habitats. The resulting biodiversity loss poses a major threat to human health through its impact on agriculture, wild animal population stability and multiple core parts of the contemporary economy. [15,16]

Current food production systems and global supply chains are considerable obstacles in the way to achieving the net-zero model of greenhouse gas emissions. [17] Adding to it, artificial packaging, predominantly of plastics - which has yet to be discontinued - is a major source of waste polluting the Earth's ecosystems. [18]

### Discussion:

#### Definition of nutrition

*Nutrition* is a process that can be defined on various levels in the context of human physiology and behavior. On a more basic level, it comprises all the biochemical phenomena whose endpoint is the sustenance of every cell of a given organism. [19] In animals, there is an instinctive and/or conscious element to the choice of food being consumed. [20] Every human has their own nutritional needs, depending, among other factors, on their height, age, health status, body type and daily exertion. s. [21] Proper nutrition is one of the most basic requirements of health and wellbeing, influencing all aspects of it - including physical, mental and social health. The calorie intake, along with daily energy consumption,

types of physical activity and genetic predisposition, determine the fluctuation of body weight, while the content of one's consumption habits largely regulates the functioning of internal organs. [22]

*Nutritional status* is a secondary term used to characterize the state of one's body in the context of past and present nutrition, depending on the food consumption and absorption. [23] It applies to both healthy individuals and hospitalized (or otherwise treated) patients. In recent years, more attention has been paid to establishing clinical standards in terms of nutrition-related treatment as a constituent and inherent part of holistic patient care. [24] Nutritional status assessment is also a commonly used tool in measuring global health inequities. Its management throughout medical treatment, e.g. cancer chemotherapy, is being cited as a strong predictor of health outcomes. [25]

### **Global epidemiology of nutrition**

There are a variety of social and economic factors influencing the state of nutrition within countries, territories and communities. By far, the most impactful ones are economic status and stability. As the world goes on to become more and more interconnected and interdependent, similar patterns are being observed around the planet. [26] Globalization has led to massive changes in everyday habits for billions of people, some of which - like increased food processing and food storage, as well as a decrease in everyday physical activity due to easier access to means of rapid transportation - have swung the energy balance way beyond the net-zero norm, while other countries see hunger as the main nutritional issue brought about by globalization

*Hunger* is defined as the physical and mental distress generated by lack of access to food. [27] Between 2005 and 2014, a slow but steady decline in the prevalence of hunger has been recorded, with 2015 seen as a turning point when the positive trend eventually reversed. [4] The year 2020, the onset of the COVID-19 pandemic, was marked by a colossal increase in the prevalence of hunger and undernourishment. This unprecedented global crisis is threatening to further wipe out previously made progress on nutrition resilience strategies and set the international community back in terms of the realization of Agenda 2030. The world is estimated to be nowhere near the correct path to achieving nutrition-related indicators therein included. [28] According to *The State of Food Security and Nutrition in the World 2021* published by the Food and Agriculture Organization of the United Nations, 768 million people (a middle estimate of a range of 720 to 811 million) suffered from hunger. In 2020, the situation of over 100 million more people (compared to the year before) in total could be newly classified as poverty. [29] The statistics regarding hunger and undernourishment differ starkly between continents, and even within their borders. The worst affected regions are Middle Africa (with 31.8m undernourished), Southern Asia (15.8m) and Western Asia (15.1m). At the same time, Europe and North America remain largely unaffected. [29]

With the abundance of research undeniably proving the consistent link between dietary choices and disease incidence and health outcomes, the subbranch of epidemiology - *nutritional epidemiology* - occupies an elevated position within the world of medical science. Its core purpose is to connect diet-related data with the subsequent health status of individuals and groups, thereby discovering and testing statistical correlations. [30] It used to rely primarily on questionnaire data, but nowadays new technological solutions have emerged - including qualitative and quantitative analysis of the test group's food intake through photographs provided by participants. However, the data collection process in nutritional epidemiology remains a controversial issue. [31]

### **Malnutrition and its impact on health**

*Malnutrition* is a term used to describe a clinically relevant and potentially symptomatic bodily state characterized by the abnormality of body mass and/or lack of specific nutrients caused by a chronic (more rarely, acute) illness or a dietary imbalance of external origin. [32,33] Low body mass is not a necessary predisposition as malnutrition can occur in generally overnourished patients, even those with obesity. It is crucial to differentiate between *primary* and *secondary* malnutrition. Primary malnutrition is caused by inadequate food consumption, in most cases resulting from social or economic instability or

severe poverty. Secondary malnutrition is a consequence of a separate health condition in an individual, most likely a chronic disease like cancer or malabsorption syndromes. [34]

Malnutrition affects every single organ and tissue in the body. The clinical manifestations differ depending on the character and specific combination of deficiencies. Long-term protein-energy deficiency can be classified as *marasmus* or *kwashiorkor*, depending on the type of onset and severity of the symptoms. [35] Protein-energy malnutrition (PEM) may be caused by decreased intake, digestive issues, pathologically low intestinal absorption or abnormal renal secretion of amino acids. [36] The complications include weight loss, loss of skeletal muscle mass, decreased muscular strength and abnormal susceptibility to infectious diseases due to humoral and cellular immunodeficiency. The most fragile periods in human life are infancy and childhood when the body ought to be provided with nutrients to facilitate growth (through increased and diverse food intake) and the immune system is developing. [37]

### **The double burden of malnutrition**

Undernutrition is likely to co-exist with NCDs induced by one's diet and subsequent abnormal body weight, including overweight and obesity. This concurrence can be present throughout an individual's life and can affect some communities and cultural spheres more than others. An example of *the double burden of malnutrition* could be the coexistence of a mineral or vitamin deficiency with obesity. Both these conditions alone constitute a health problem with known symptoms and probable complications. [38,39] Yet, their simultaneous presence exacerbates the patient's state more than the sum of the two. Due to common cultural norms and eating habits, this phenomenon can be endemic to some households. [5]

One of the main root causes of the burden is the multifaceted transition that our civilization has been undergoing for the last decades. There has been a strong epidemiological shift in the global disease burden - with higher-income countries now having higher rates of NCDs over Communicable Diseases (CDs) as the leading cause of lost years of life. Demographically speaking, the lengthening of an average lifespan changes the population structure, thus altering the incidence of NCDs associated with middle and advanced age. Lastly, economic growth upturns occurring in different parts of the world influence dietary choices in favour of unhealthy and unbalanced diets - an occurrence mainly caused by rapid urbanization, increased worldwide interconnectedness and consumerism. [5]

Among the leading drivers of this concurrence, there are various internal and external factors. Genetic determinants of the body structure play a leading role in determining the double burden. [5] According to numerous studies, if a fetus is subjected to undernourishment and subsequently even intrauterine growth restriction (IUGR), the epigenetic coding may imprint metabolic changes in the genetic line, the result being an alteration in energy expenditure that can be passed on to the following generations. [5,40] Motherly overweight or obesity constitutes the leading etiology of gestational diabetes, a risk factor for stillbirth and birth complications as well as a strong predictor of over-the-norm body mass in the affected children. [41,42] Socioeconomic status determines one's level of access to nutritious food. Depending on specific circumstances and general food availability, this state can lead to weight loss (if one is subjected to hunger or food insecurity) or obesity (when the available food is rich in energy yet deficient in nutrient diversity). Lifestyle choices contribute to the total risk - accumulation of unhealthy behavior is likely to linger over time, leading to increased body weight and difficulty in taking action to reverse this trend. [42]

### **The obesity pandemic - underlying causes and health impacts**

Obesity is a complex, multifactorial, and largely preventable disease, defined as a BMI of  $\geq 30$  kg/m<sup>2</sup>, that has become a pandemic owing to an obesogenic environment (inexpensive calorie-dense food, technologies and structure of communities that reduce or replace physical activity, inexpensive nonphysical entertainment) and excessive emphasis on low fat intake resulting in excessive intake of simple carbohydrates and sugar. [43,44] It is not only developed from an interaction of genotype and

environment, but is also associated with behaviors including physical activity, inactivity, dietary patterns, medication use, and other contributing factors such as education, skills, and food marketing and promotion. [45] Global rates of obesity range between 11% and 15%, and results of the Non-Communicable Disease Collaboration analyses of almost 20 million adults have shown that the global prevalence of obesity doubled between 1975 and 2014. There has been a steady increase in the prevalence of obesity over the last 30 years with developed countries leading the way. Unfortunately, this trend is now also occurring in developing countries, due to urbanization, modernization and the nutrition transition. [46,47] From the past 30 years, the advance of modern food technology and the penetration of super-markets in developing countries, taking the place of the fresh markets, has enhanced the intake of cheaper, processed, high-fat, sugar-sweetened, and salt-laden foods. This process leads to changes in global food consumption, putting on evidence a nutrition transition which tends to a shift to a western diet, consisting of ultra processed and fast food. [48]

The distribution of adiposity, usually central, is associated with a metabolic and inflammatory cascade that provides a toxic environment that appears to drive many of the endocrine, cardiovascular, and malignant consequences of obesity. On the other hand, preferential peripheral fat distribution appears to be somewhat protective. [49] Obesity, in general, is associated with increased all-cause mortality and cause-specific mortality, compared to those with a healthy weight. [50] The increased risk includes many serious diseases and health conditions, such as cardiovascular disease (hypertension, coronary heart disease, stroke); type 2 diabetes; obesity-related cancers; osteoarthritis and psychological disturbance; high LDL cholesterol, low HDL cholesterol, or high levels of triglycerides (dyslipidemia), gallbladder disease; sleep apnea and breathing problems, mental illnesses such as clinical depression, anxiety, and others, body pain and difficulty with physical functioning. [45,49]

### **Multimorbidity of patients with obesity**

Multimorbidity is defined as the co-occurrence of two or more chronic conditions and has been estimated to affect up to 95% of the primary care population aged 65 years and older. [51,52] It is associated with younger age at death, impairments of physical and social functioning and mental health problems. Patients with multimorbidity are more frequent users of primary care services and may experience a lower quality of care. [53] Although the prevalence of multimorbidity increases with age, it is not exclusively a condition affecting the elderly, but also individuals from the working-age populations. [54]

Almost a third of multimorbidity could be attributed to overweight and obesity, and a fifth to obesity alone, a causal relationship to be assumed. [53] Obesity rarely appears as an isolated condition - 9 of 10 obese patients showed at least one chronic comorbidity, and its prevalence increased with age in each BMI category. [55] The incidence of multimorbidity in category I obese patients (BMI of 30 to < 35) is almost 50% higher than in people with normal weight and nearly double for category III obese patients (BMI of 40 or higher). Moreover, women had consistently higher rates of multimorbidity than men. As one's body mass index (BMI) increases, so does one's chance of developing multiple chronic conditions over time. [53] There are multiple common multimorbidity groupings for patients with obesity. Each multimorbidity combination is composed of diseases from the following clinical categories: endocrine, nutritional and metabolic diseases, diseases of the circulatory system, diseases of the digestive system, diseases of the nervous system; and diseases of the musculoskeletal system and connective tissue. [56]

Furthermore, the prevalence of multimorbidities varies by race and it is argued that "race/ethnicity may need to be considered when making clinical decisions and developing health care programs to reduce health disparities and improve quality of life". The risk of cardiometabolic multimorbidity increases as BMI increases; from double in overweight people to more than ten times in severely obese people compared with individuals with a healthy BMI. [47] It is also associated with mental health and musculoskeletal disorders and is an important independent predictor of disease clustering. [57]

Obesity is linked to persistent unhealthy lifestyles such as physical inactivity, smoking, and alcohol consumption. However, even after accounting for such behaviors, the associations of overweight and obesity with cardiometabolic multimorbidity remained strong. In addition, overweight/obesity activates inflammatory pathways that are subsequently associated with mental health disorders, resulting in anxiety and depression. [58] There are also numerous psychological pathways featuring similar directionality. For example, being overweight increases psychological distress, increases body dissatisfaction and decreases self-esteem, which is all known to increase the risk for mental health disorders. [59]

### **Food products and diets increasing the risk of cancer**

Cancer is a major cause of premature mortality, with over 10 million deaths reported in 2020, according to WHO data. [60] On average, an individual who dies of cancer is deprived of 12.5 years of life (AYLL - average years of life lost) by premature passing. This points to the need for cancer prevention to remain at the center of public health policymaking, messaging and education. [61] Evidence suggests that a large number of cancer cases are preventable, with healthy, nourishing and additive-free diets put at the forefront of the action list for the general public. [60,62,63]

The link between excessive red meat consumption and colorectal cancer was recognized by the International Agency for Research on Cancer (WHO-IARC), which assigned the “probably carcinogenic for humans” label to red meat and “carcinogenic for humans” to processed meat. [63] The 2011 *Continuous Update Project Report* by the World Cancer Research Fund (WRCF) found that every 100g of daily red meat consumption increased the risk of bowel cancer by 17%, while only 50g of processed meat daily caused the risk to be 18% higher than in the control group. Consequently, WRCF discourages consumption of more than 500g of red meat (admitting that it could be a valuable contributor to a balanced diet due to the presence of e.g. amino acids and B<sub>12</sub> vitamin), while advising against eating processed meat at all due to the considerable risks outweighing mediocre nutritional benefits. [64] However, the EAT-Lancet commission recommends that everyone aims to consume no more than 98 grams of red meat every week - however, environmental factors are also taken into account in this calculation. [65] In addition to cancers of the digestive tract, overt red meat consumption is also associated with the incidence of prostate and breast cancer. [66]

Despite not being digested by humans, fiber is a crucial element of every healthy diet. Its protective role in both small and large intestines helps to alleviate internal lesions, while the microbiota present in the distal digestive tract produces anti-carcinogenic by-products while fermenting the intact fibre. [67,68] The situation is reversed when it comes to protein and fat consumption - their metabolites promote inflammation and in consequence increase the risk of colorectal neoplasia. It is therefore imperative that every diet involves a proper daily dose of fiber - CDC recommends that on average every adult's daily intake falls between 25 and 38 grams - only about half of the suggested target. [69]

### **Undernutrition and starvation**

Undernutrition is defined as not having enough calories or nutrients to meet one's nutritional and physiological needs. This usually results from prolonged food deprivation. The impacts that undernutrition has on health include weakness, pain, weight loss, compromised immune system and impaired memory, among others. [70] Undernutrition includes four categories which are underweight, stunting, wasting, and deficiencies in vitamins and minerals. [71] Even if one is consuming enough calories to cover the daily expenditure, they may still be undernourished if the consumption of nutrients remains insufficient - a phenomenon known as hidden hunger, faced by around two billion people worldwide. [72]

Starvation is the most severe form of undernutrition. It is the lack of food, in general, that is extremely dangerous to one's health. Poor nutrition contributes to nearly half of the deaths of children under the age of five. [70] Starvation causes numerous health implications, especially in children, such as slower growth, digestive tract abnormalities and impaired immunity. It was found that 161 million children are

stunted for their age among those under the age of 5. [72] Many children have been found to be undernourished and experience starvation. It was found that it could be easily preventable since there is enough food production, but there is not enough access to it. [70]

## Mental health

Poor diet is recognized globally as the leading risk factor for illness and early mortality. [73] Mental illnesses represent the greatest global burden of disease, outranking other NCDs such as cardiovascular disease (CVD) and cancer, accounting for 32.4% of the years lived with disability (YLDs) and 13% of disability-adjusted life years (DALY). [74] It is well-established that the development of mental health conditions is multifactorial. Worldwide trends in nutrition show a decreasing consumption of highly nutritious foods such as fruits and vegetables, but with significantly increasing consumption of high-energy foods; in the form of sugar, snacks, and takeaway food. [73] An unhealthy diet often results in cognitive decline, leading to comorbid conditions such as depression and Alzheimer's disease. There also appears to be a strong association between a poor diet and the aggravation of anxiety, depression, and other neuropsychiatric disorders. [75] Inversely, having a highly nutritious diet is associated with increased happiness, mental health, and well-being. [73] However, these results are solely correlational. There is still a gap in understanding how these mechanisms are connected — especially on a microscopic and molecular level. It is one aspect that the emerging field of nutritional psychiatry aims to elucidate. [76]

Food security and mental health are deeply linked. *The United Nations' Committee on World Food Security* defines the term “Food security” as when “all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life.” [76] Food insecurity occurs in settings where basic food supplies and choices are limited. A meta-analysis found that food insecurity puts individuals at significant risk of psychological distress. [77] Food insecurity causes anxiety and depression when individuals cannot eat or feed their families sufficiently. Frustration may also arise when the ability to choose preferred food is unavailable. Feelings of shame, guilt, and alienation may be involved when there is a need to borrow, steal, or ask for food from someone else. [78] Apart from food insecurity, the lack of social support contributes to poor mental health. [79]

## Social well-being

Social relationships have a substantial influence on dietary behavior. These can protect against chronic health conditions and encourage recovery from disease by providing support. [80] People typically derive meaning from food-related social events — for instance, through cooking or sharing a meal with others. Engaging in such prosocial circumstances often leads to greater emotional well-being and life satisfaction. [81] Social isolation from family and friends and the lack of intimate partnerships are associated with a low variety and low-quality diet. Social isolation is also associated with a higher risk for malnutrition, especially in older adults with low interpersonal support. [82] Social media exposure and engagement also shape dietary behaviors. Unfortunately, social media content promotes objectification and predisposes individuals to compare themselves with more attractive peers online, ultimately resulting in body image dissatisfaction. In the long term, young adults are especially inclined to develop appearance anxiety and body shaming habits. [83] This exposure contributes to eating disorders, wherein obsessive thoughts about food and the body are accompanied by dietary restriction and psychological distress. This emphasizes food and health literacy as a priority to enhance social well-being. [84]

## Vulnerable populations

*Vulnerable populations* gather all these groups of people who, due to physical, mental, social, economic and cultural factors, are exposed to a non-optimal nutritional status. In 2020, 2.37 billion people in the world faced moderate or high food insecurity, which is defined as the lack of regular and enough safe and

nutritious food for normal growth and development and active and healthy life. [29,85] While this comprises a large percentage of the world's population (almost a third of the world's population), specific clusters have a higher incidence of equals. These groups include, but are not limited to, migrant and indigenous people; children, youth and elderly, pregnant women and people with disabilities. Furthermore, it is known, mainly by obesity-related studies, that socioeconomic status is a major contributor to the BMI, and so is gender. [86-89] We assemble all these factors that can positively or negatively affect an individual's health as the Social Determinants of Health. These vulnerable groups, communities and ecosystems are echoed and specifically tackled in SDGs 1, 2, 6 and 11. [89]

### **Factors increasing the vulnerability to malnutrition**

The drivers that exacerbate malnutrition can be divided into external and internal factors concerning food systems. External drivers include climate change, conflict, economic slowdowns and downturns, poverty, and inequality. [29] Internal drivers include low food production and inefficient food supply chains. [5] Extremes and variability in climate are the most common drivers affecting countries across the world. It results in compounding impacts on food systems. Heavy floods, severe drought, and erratic changes in weather can have damaging effects on health and economic production. These threaten food safety, in which crops may become contaminated with pests, and the outbreak of diseases is more likely to occur. [5] Crop yields are negatively affected, with consequences to food prices and access to food. The variety, amount and quality of food consumed are compromised, such that countries attempt to compensate for domestic losses by importing food. On top of this, livestock loss and damage to infrastructure challenge access to food. [90] Additionally, households in drier-than-average regions reported more food insecurity. In extremely cold and hot temperatures, stunting was found to be more common as well. [91]

Conflict is the second most common driver of malnutrition and food insecurity. Conflict interrupts the overall availability of food, from production to transport to safe consumption. Food production requires land, time, and resources. All of these are shifted towards supporting the conflict. Land and natural resources are seized, people are displaced, movement is restricted, contributing to food shortages and price hikes. [5] The production of weapons and vehicular use in conflicts contaminate water and soil. Acute malnutrition has a higher prevalence in conflict-affected populations, which are prone to starvation, immune system depletion, and cardiac failure. In the presence of micronutrient and vitamin deficiencies, healing from war wounds and recovery from illness is further impaired. [92]

Economic slowdown refers to sluggish economic activity with continued growth. In the absence of economic growth, there is a downturn. Economic slowdowns and downturns result in rises in unemployment and declines in income. Healthy diets in the form of high-quality, nutritious food become even more difficult to access because they are generally less affordable. [93]

Indigenous people make up 20% of the world's extreme poor. Poverty can exacerbate malnutrition in vulnerable populations by compromising the quality and quantity of food intake, thereby reducing their intake of essential micronutrients. This situation compromises their immunity, worsening their malnutrition and predisposing them to infection. Apart from inadequate access to nutritious food, people living in poverty lack access to proper healthcare, sanitation, and hygiene - these place vulnerable populations, such as children, at increased risk of exposure to pathogens. Malnutrition increases the incidence, severity, and fatality of common infections. [94] Anemia can arise due to diarrheal diseases especially, and if persistent, children are more prone to stunting. [95]

Internal factors are related to food production and supply. Across the globe, traditional and local diets are being replaced with more unhealthy and processed food. Diets are becoming more homogenized in the sense that they commonly have high levels of saturated fat, salt, and sugar. Furthermore, these are diets with low levels of vitamins and minerals. All of which contribute to low-quality diets leading to malnutrition. [5]

### **How food can cause vulnerability or exacerbate existing vulnerabilities**

Food insecurity exacerbates vulnerability, especially in conditions of poverty. Price volatility is a massive concern in regions with a scarce food supply. This is most applicable to small-scale farmers and poor consumers. Food is considered a significant household expenditure, especially for those living in poverty. Hence, short periods of expensive food prices for consumers can take a toll. Farmers being forced to sell their produce at low prices can also lead to poverty traps. [96] During food shortages, people employ various coping strategies to avoid hunger. The most common one involves decreasing the amount of food per serving or the number of meals per day. This is accompanied by dietary changes wherein the available food is typically not the preferred or most nutritious choice. The strategy is unsustainable if recurrent shortages become increasingly frequent; thus, having long-term impacts on nutrition. [97] Without adequate nutrition, malnutrition compromises a person's physical and mental development, leading to reduced intellectual capacity and thus reducing productivity, affecting the individual's economic potential in the long run. [98] Apart from affecting a person's ability to work and earn, malnutrition also contributes to increased healthcare costs, as malnourished individuals are more vulnerable to diseases. With all of these combined, these thereby sustain the cycle of poverty and malnutrition. [71]

### **Nutrition and UHC**

Universal health coverage (UHC) and nutrition are both a part of Sustainable Development Goal 3 which is "to ensure healthy lives and promote wellbeing for all, at all ages". [99] It was found that about one in five deaths is attributable to dietary factors. The double burden of malnutrition has been contributing to the slow progress towards UHC. Malnutrition costs the global economy approximately 3.5 trillion dollars each year. [100]

The implementation of essential nutrition actions in the UHC plans differs in each country differs according to (1) the causes of malnutrition, (2) the interventions that are needed nationally and subnationally, (3) who currently do have the access to healthcare, and (4) the extent of financial hardship due to out-of-pocket payments for health services. According to the data gathered in the WHO Global Health Expenditure Database, only nine countries allocate more than 2% of general government health expenditures to nutrition and only four countries allocate more than 4%, among the 28 countries that report the expenditure data for different disease states. [101]

Moreover, the WHO Essential Nutrition Actions 2019 document reinforces the important role of the UHC and Primary Health Care to promote nutrition actions focused on communities and their needs, aiming to address determinants of health and to empower individuals to reach a healthy life. Regarding this, WHO initiative lists nutrition targets to be achieved in the UHC: reduction on the number of stunted children, reduction of anemia in reproductive age women, reduction in low birth weight, no increase in childhood overweight and increase of breastfeeding. All those goals were related to nutritional actions such as avoiding nutritional insults during early life stages, promoting and intervening for a healthy diet through educating actions, as well as offering nutritional care and supplementation in targeted situations (elderly, pregnancy, childhood).[102]

### **Nutrition and the six building blocks of UHC**

In order to integrate nutrition within UHC, some steps should be completed to include nutrition actions into the six pillars of national health systems. Governments and leaders should ensure that nutrition is integrated into the national UHC plans and that they are also aligned with national nutritional plans. In addition, they also include nutrition-related action in health services as well. Furthermore, the health workforce contributes to this integration by being properly trained on the delivery of nutrition interventions and by being supervised and mentored on how to deliver them properly. As for the health service delivery, an increase in the effective coverage of essential nutrition action UHC with a focus on those that are usually disregarded can help in the achievement of nutrition-related UHC. Essential nutrition-related health products can be included in the national essential medicines list and also be provided to the public

at affordable prices. Enough financial resources should be allocated. Leaders can also include indicators that can track any nutrition emergencies and take the appropriate decisions immediately. [101]

### General determinants of nutrition

Nutrition is one of the major determinants of health. Furthermore, there are also determinants of nutrition that vary from one person to another. The nutrition one gets and the food choices a person makes depends on several factors which include:

1. Biological, which may include hunger, taste and appetite
2. Economic, such as the cost of the food or the income one makes
3. Physical, such as access to proper nutrition, education, skills and time
4. Social, which includes class, culture and social context
5. Psychological, which includes mood, stress and guilt [103]

For example, nutritional needs may change throughout the life course. For example, it was found that many older adults living in rural populations with higher rates of low socioeconomic status and lower levels of education had worse health, lower life expectancies and higher rates of diseases. [104]

### Nutrition and health equity

Health equity provides everyone with the opportunity to reach their full health regardless of one's race, education, gender identity, sexual orientation, job, neighbourhood and whether they have a disability. [105] Health has been improving globally for many people, but it has not been improving equally for everyone. This is due to the fact that some countries have no access to food or not enough. Whereas, other countries have an overabundance of food that is nutritionally inadequate. However, these inequities are avoidable through proper social actions and addressing issues of power and wealth through policies, national economic priorities and governance. Therefore, inequity in nutrition and health has contributed to the worsening of overall health for different populations in different ways. Furthermore, steps towards health equity start at the younger ages by providing healthier food and beverage choices to children in schools or society since childhood obesity is a major threat to individual health and society. [106]

According to the *State of Food Security and Nutrition in the World (SOFI) 2021* FAO Report, approximately "one in three people in the world (2.37 billion) did not have access to adequate food in 2020". Moreover, "hunger affects 21 percent of the population in Africa, compared with 9.0 percent in Asia and 9.1 percent in Latin America and the Caribbean". This report also shows that moderate or severe food insecurity, which means, unaffordability of sufficient, safe and nutritious food to cover the dietary needs, affects more than 30 percent of the world population. However, Africa, Latin America and the Caribbean, appears with higher prevalence percentages of severe and moderate food insecurity, above the world's average prevalence, contrasting with other continents below the average. [106]

### Food and nutrition and the SDGs

The Sustainable Development Goals (SDGs) are a group of 17 goals set by the United Nations as part of the 2030 Agenda for Sustainable Development, which aim to contribute to efforts for peace and prosperity for both humans and the planet. [107] Progress and attainment of the SDGs relies directly and indirectly on good nutrition and food security, through varying impacts on health at both an individual and societal level. Importantly, the COVID-19 pandemic has had significant impacts on progress towards the SDGs, and in many cases reversed progress. Thus, strong robust commitments and strategies from all nations to address the SDGs are urgently needed if they are to remain on track for achievement by 2030. [108]

SDG 2 - *zero hunger* - aims to "end hunger, achieve food security and improved nutrition and promote sustainable agriculture". This is monitored through several targets and indicators including prevalence of undernourishment, food insecurity, stunting, malnutrition and anemia in women of reproductive age. Importantly, SDG targets include health-related indicators as well as indicators related to the food and agricultural industry, and food systems and markets. Among these are targets for productive and

sustainable agricultural practices as well as trading and market prices. [6] Despite these targets, rates of undernourishment and food insecurity have risen since 2014, with current data thought to be underestimated due to the impact of the COVID-19 pandemic which has exacerbated global hunger due to loss of income, food shortages due to insecure systems and disruption in nutrition services including both local and humanitarian services. In 2019, 8.9% of the global population experienced hunger, equivalent to a rise in 60 million people since 2014. Further, 25.9% of people were affected by moderate or severe food insecurity, over a 3% increase since 2015. [108] Hunger and malnutrition disproportionately affect people in Africa and Asia, with over one-third of the global undernourished population in Africa and over half in Asia. [92,106] Lastly, there has been no progress in the last 20 years to reduce the prevalence of anaemia in women of reproductive age, with the global prevalence still at 29.9% in 2019. [108]

SDG 1 - *no poverty* - aims to end poverty globally, which is closely linked to improving nutrition. Food insecurity and under- or malnutrition are highly associated with poverty and low socioeconomic status, due to inadequate access to food often as a result of high costs. Importantly, with current food system trends and the growing burden of climate change, this may become worse without intervention due to higher levels of food insecurity driving food market prices up further. Poverty disproportionately affects a person's ability to afford healthy dietary choices, leading to poorer nutrition. Further, tackling poverty is one of the identified pathways towards food systems transformation as set out by the UNFAO, as well as lowering the cost of nutritious foods. [93]

Attainment of SDG 3 - *good health and wellbeing* - is highly dependent on food and nutrition, with nutrition being a major determinant of health. Good nutrition is essential for normal childhood development, improved infant, child and maternal health outcomes and a reduced risk of non-communicable diseases like cardiovascular disease and diabetes. Importantly, both under and overnutrition can contribute to poor health outcomes, known as the double burden of malnutrition. [19] In 2020, due to the impact of COVID-19, 35% of countries reported interruptions in essential health services, including nutrition services. [108]

Achievement of food security and sustainability also have co-benefits for many of the SDGs. SDG 4 - *quality education* - is only able to be achieved through providing children with adequate nutrition for growth and development so that they can have the best possible health to support participation and engagement in education.

SDG 6 - *clean water and sanitation* - is intrinsically linked to nutrition and good health, due to water being a critical resource for agriculture and food production. SDG 13 - *climate action* - will have impacts on food systems and food security. Further, SDG 14 - *life below water* - and SDG 15 - *life on land* - will also contribute towards restoring natural ecosystems and developing sustainable food systems. SDG 16 - *peace, justice and strong institutions* - is important due to the links between areas of conflict and malnutrition. Finally, SDG 17 - *partnerships for the goals* - is necessary for a united global approach to address nutrition and food sustainability. [108]

## **Nutrition in Health and Humanitarian Emergencies**

### **General emergencies**

*Humanitarian emergencies* are understood as those unexpected, serious and harmful events which threaten the health, safety, security and wellbeing of a community or a large group of people usually in a wide area. The causes of these emergencies may vary from natural causes (geophysical such as tsunamis, earthquakes and volcanic eruptions; meteorological or biological (epidemics, pandemics and plagues) or man-made events (armed conflicts and industrial accidents among others). There are also recognized "complex emergencies", in which a combination of both factors can be found and factors such as displacement of populations, need of a large-scale humanitarian response or extensive violence and loss of lives. [109]

According to the last Global Report on Food Crises, a total of 155 million people scored 3 (Crisis) or more (Emergency or Catastrophe) in the UN's Integrated Food Security Phase Classification (IPC/CH) and its primary drivers were conflict or insecurity, economic shocks and weather extremes. [110]

One of the first consequences of these large-scale incidents is an acute lack of access to consistently available and accessible food in sufficient quantity and diversity to hold the nutritional needs of an individual and/or the dearth of means to store, cook, prepare and share that food. This is also known as acute food insecurity and can lead to a chronic state if the causes are not solved. [111] The majority of chronically food insecure and many of the malnourished individuals live in countries where there is an active conflict as food systems are often severely disrupted. Nutrition, therefore, is a key public health concern in emergency response. [29]

Food-related humanitarian response must acknowledge the nutritional requirements for:

- I. Assessing the nutritional needs of individuals, families and vulnerable groups, as well as the population as a whole.
- II. Monitoring the adequacy of nutritional intake in the mentioned groups.
- III. Ensuring that adequate quantities of food are procured. [112]

Also, the most vulnerable populations have to be identified, which include pregnant and lactating women, children and youth due to the high nutritional requirements; and also these individuals facing non-communicable diseases (cancer, diabetes, immunodeficiencies). [113]

Evidence underlines the importance of the nutritional status of women during their pregnancy, at the time of conception and through lactation as an imperative factor in the healthy growth and development of their children. and also for her ability to live a healthy life. Women have an increased nutrient requirement during the mentioned stages of maternal life, but also regularly during menstruation. Therefore, they are particularly vulnerable to undernutrition from a physiological point of view. During emergencies, women and girls more often reduce their intake (voluntarily or not) in favor of other household members. They also take on additional physically-requiring activities such as farm work and regular activities such as food, water and firewood collection which become more time consuming or require movement over greater distances. [114] Furthermore, women have shown to be at increased risk of psychological problems (including anxiety, post-traumatic stress disorder) in the emergency affected population. [115]

## **COVID-19 and nutrition**

The most recent worldwide humanitarian emergency has been the pandemic caused by the SARS-CoV-2. Under the COVID-19 shadow, world hunger increased from 1.5 points to 9.9 in just one year after being stable for 5 years. Therefore, this emergency has made the UN goal to eradicate world hunger by 2030 significantly more challenging. [29]

COVID-19 does not treat us equally. It is known that while the infection affects all groups, mortality rates are higher within the elderly, ethnic minorities and those individuals with underlying comorbidities. [116] Among these factors, type 2 diabetes and obesity are ranked as two of the most significant risk factors for severe COVID-19, and the pathology underneath them might explain the health disparities observed in those populations. Furthermore, there is significant evidence to support that protein-energy malnutrition from inadequate dietary intake increases the risk of infectious diseases. [117-119]

The new coronavirus is well known for having a significant and almost unprecedented impact on economies, lifestyles, and habits. As a result, the pandemic is having significant impacts on food security and diet quality, particularly among disadvantaged groups. The influence of COVID-19 on employment and other income-generating activities has the most immediate impact on food and nutrition outcomes. [118] Lack of physical access, availability, and price of food are the next most important factors. [121]

There is an urgent need to prepare or strengthen the interventions to mitigate the effects of the pandemic on the nutritional consequences. These actions will likely include functional and resilient food systems, healthy diets and universal access to public health services. [120,121]

## **Advocacy for nutrition**

### **Health Promotion**

According to the World Health Organization (WHO), health promotion is the process of enabling people to increase control over, and improve, their health. Promotion in this context translates into the improvement, advancement, support and promotion of health in a higher place within the personal and public agendas.. [122]

It is a social science of behavior, based on different disciplines such as biological, environmental, psychological, physical and medical sciences. Its objective is to improve knowledge, attitudes, skills and behavior around health, resulting in the prevention of diseases, disabilities and premature death. This behavior change must be voluntary, driven through educational activities at the individual, group, institutional, community and systemic levels [122].\_We found two sets of activities that contribute to improving health and are related between each other: those that provide services for people who are ill or who have disabilities, and positive health activities, which are those where the prevention of diseases and the development of healthy lifestyles are sought through personal, social and environmental changes [122]

As a central function of public health, it supports individuals and institutions to address problems by creating health-facilitating public policies and supportive environments, strengthening community action and personal skills. [124] In addition, it reduces the costs that would be spent on medical treatment. [123]

To conclude, the purpose of health promotion is to influence the health behavior of both individuals and communities, as well as the living and working conditions that influence their health; It is important not only because it improves the health status of individuals, families, communities, and the nation, but also the quality of life of all people. [122]

### **Health Prevention**

Also known as preventive medicine or prophylaxis, can be defined as the use of recognized proactive health screenings; counseling for the maintenance and prevention of future illness; and treatment related to them. It includes the advice of a healthy diet and regular exercise, regular doctor check-ups and appropriate immunizations. Preventive Health Measures focus on preventable disease, injury and patient illness that can be detected in time, avoiding the patient from suffering the resulting condition. Furthermore, it provides better patient outcomes by measuring savings from health care costs in the long run. [125]

### **Health Education**

It refers to any combination of learning experiences that facilitate voluntary actions aimed at health. [124] According to the WHO health promotion glossary, it is described although not limited to the dissemination of health-related information, and promotes the “motivation, skills and confidence (self-efficacy)” to take measures for health improvement as well as communicates “underlying social factors”. Therefore, it has an impact on the health system, the environmental and economic conditions, but also on the individual risk factors and behaviours. [127] Subsequently, addressing the determinants of health increases the knowledge about personal health behavior and develops skills that demonstrate the organizational possibilities and political viability of the forms of action.”. [122]

### **Role of youth in advocating for nutrition**

As it is known, advocacy means education, capacity building and behavior changes, looking for the persuasion of others or to take action. Youth advocacy is promising, as it can contribute and promote changes in physical activity and nutrition environments and policies. [128]

When young people are provided with support to be advocates, such as education, training, and coaching, they influence in a better and unique way changes in policies, systems, and environments. Positive Youth Development for Health (PYDH) refers to how young people are supported by the conditions and actions to become competent, caring, and contributing adults while experiencing physical, social, and emotional well-being. Integrating youth development activities into the public health principles will promote healthy behaviors using PSE (policy, systems, and environmental) change approaches, enhancing PYDH efforts. Based on the social-ecological model that elucidates the complex influences of multiple factors across multiple levels, youth can use policies, systems and environmental change approaches to advocate for health at the individual, interpersonal, community, policy, and system levels. [129]

Participation in advocacy groups can bring co-benefits as confidence, mastery, leadership, new career choices, which add to the rationale for promoting advocacy programs. Helpful components for youth recruitment include peer support and involvement, adding culturally relevant and attractive activities, and reducing personal barriers by increasing awareness, self-efficacy, and empowerment. Thus, for advocacy efforts to thrive, programs will have to share experiences and grow from collaboration. [130]

### **Nutrition and health in all policies**

Given the impact that nutrition has on health, strategies should be implemented to improve the consequences of the current dietary practices being implemented. One way to contribute to this is by working on policies that focus on ways to improve the accessibility and affordability of healthy food and nutrition-related services and information. Several strategies can be used in policy-making. Some include the promotion of healthy foods in the retail food environment, the improvement of access to healthy foods, and the reduction in the consumption of less healthful foods through taxation. [131] Currently, there has been significant progress in public health nutrition policies such as school food policies, implementation of trans fat regulations and reformulation of food products. However, in order to greatly reduce the risk of NCDs, wider and more extensive policies need to be implemented nationally and globally such as food labeling regulations, marketing of food especially to children, promoting breastfeeding and so on. It is also important to set monitoring, surveillance and evaluation systems. [132]

### **Nutrition and Environmental Health**

#### **The carbon footprint of food supply and transportation**

The continuous process of globalization, including the rise of affordable long-distance transportation, has created new trade routes and supply chains within the global food market, resulting in unprecedented food varieties available in different corners of the world. According to FAO's projections, the carbon footprint of the food supply system is on its way to becoming a top food-related greenhouse gas emission source, overtaking farming and land use as the biggest contributor. A bulk of these emissions comes from fossil fuel-dependent air transportation. As societies around the world become more aware of the importance of individual decisions in tackling climate change, new systems of measuring and communicating the carbon footprint of individual food products are being introduced. Although not as widespread as nutritional labels due to lack of mandates or voluntary action on behalf of many producers, the move to introduce an objective environmental measure is gaining ground in many jurisdictions. For example, the European Commission has recommended that products of all kinds, including food, be labeled for their impact on the environment. [133] Looking forward, it is pointed out that the most cost-effective way to reduce the environmental food supply burden is to remove non-recyclable artificial

packaging and reduce the cumulative distance made by all kinds of food products. [134] It is proposed that a greater focus be placed on encouraging consumers to check the product's origin - the closer to one's location the ingredients were harvested, the more likely it is that their total carbon footprint is at a tolerable level. [135]

### **The impact of meat and dairy industries on greenhouse gas emissions**

Although it is extremely difficult to measure general trends in people's diet across the world, reliable estimates suggest that a great majority of people are meat-eaters, with India being the most vegetarian country in the world at about a quarter of the population not consuming meat at all. [136] At the same time, the total consumption of milk and dairy products remains at a high degree. While there are benefits to the intake of meat and milk at moderate levels, the public health advice about excessive consumption has recently been joined by the calls from the scientific community to consider alternative food choices and diets while keeping the nutritional value the same or closely similar. [137] Various environment-oriented dietary models have been developed, including the EAT-Lancet diet model and specific IPCC recommendations. [138] In order to measure the total impact of meat production on climate change, a specific scientific model was developed. GLEAM (Global Livestock Environmental Assessment Model) has been developed by FAO. It takes into consideration the type of animal feed use, living conditions of livestock and agro-ecological zones. By far, the largest producers of meat (measured in millions of tonnes of protein) are Asia (at 19,6 mln tonnes) and South America (12.2 mln tonnes). GLEAM also considers three main greenhouse gases - carbon dioxide, methane and nitrous oxide. [139] Out of these, methane is the major gas emitted, at 50% of the total. Livestock production contributes greatly to climate change with 8.1 gigatonnes of CO<sub>2</sub>-equivalents (2010 data). Among the measures seen as a way forward to curb the livestock-related emissions are a reduction in the number of livestock (through encouraging dietary changes), manure management and improvements in animal feeding and improved pasture facility. [140]

### **Food security and climate change**

Maintaining long-term food security is a public health challenge with far-reaching consequences on the global state of health. Every crisis that is affecting the ability to produce, transport or afford food inevitably leads to a less balanced and more deficient diet. [141] Climate change is predicted to alter ecosystems, destabilize food systems and, as a consequence, push millions of people into varying degrees of food insecurity. There are already recent historical examples of climate change-induced drought severely impacting the crops - such as the 2007 food security crisis in Lesotho. [142] Another valid reason to view climate change as a threat to harvest volume is that certain plant diseases are likely to become more of an issue in a warmer climate. [143]

### **The impact of food (especially livestock production but also other products) on deforestation and continuous degradation of ecosystems**

*The land* is understood as the basic notion embracing climate, topography and natural resources (vegetation, soil, etc.) as the basis for agriculture. *Cropland* is the land used for the production of crops, and *pastures* as the one used for livestock grazing. The conversion of soil for agricultural purposes, which comprises one-third of the total land, is the main driver of biodiversity loss and the degradation of land. [144] Concurrently, the world population is increasing and it is estimated to follow this trend for the next few years. Consequently, the demand for food will also be increased and so will the strain on land, even though the cropland per capita has seen a tendency to be reduced in the last decades. [143] As a solution, agricultural investment is proposed, but this economical backing has only been reported in high- and middle-income countries during the last two decades, leaving apart the low-income countries in which the agricultural sector is less capital-intensive. [146]

The global meat production in 2018 was estimated to be above 341 million tonnes worldwide, which is approximately a 4-fold increase from 50 years before. [147] Livestock is a major driver of rural landscapes and economics but also raises a debate concerning animal welfare, the environmental footprint regarding the production of greenhouse gas and the impact its consumption has on human's

health. [148] The main effects of biodiversity destruction include the removal of biomass, destruction of root systems and the replacement of wild and native grazers by livestock. [149] Simultaneously, livestock production is a risk due to its impact on a general global scale on water, soils, consumption of natural resources and its impact on climate change. [148] According to recent studies, the livestock industry could be globally responsible for more than 50% of greenhouse gas emissions. [149]

A significant consequence of livestock but also of other agricultural practices is deforestation, which is the conversion of forested areas to non-forest land used for other profits. The usage of these plots include cropland and pastures but can also be used for urban purposes or as wastelands. This transformation can be due to the direct effect of humans or as a result of natural processes such as wildfires, climatic catastrophes or uncontrolled grazing. It implies long-term or permanent loss of forest cover. [150] Forest area has decreased from 32.5% to 30.8% in the last three decades and its first cause is agricultural expansion. Considering this data, it is projected that the UN Strategic Plan for Forests will not reach the 3% growth of the forest area worldwide by 2030. [151]

### **Overfishing as a major threat to sea ecosystems**

*Overfishing* is defined as removing fish species quicker than they can replenish themselves. [152] In more technical terms, according to the FAO, it is when the amount of fish stock is depleted below the maximum sustainable yield that can be attained. Approximately 34.2% of the global marine fisheries' stocks in 2017 were categorized as overfished to unsustainable levels. The highest activity took place in the Mediterranean and the Black Sea, the Southeast Pacific, and the Southwest Atlantic areas. [153] Fish production is on an alarming decline, with implications to global food security and the biodiversity of marine ecosystems. This is partially due to the lack of proper policy enforcement aimed at protecting fish species. Fish are vital to maintaining balance in marine ecosystems through predator-prey dynamics in the marine food web and are crucial for human nutrition and livelihood. Depletion of fish stock not only disrupts the natural environment but also has severe consequences for human life as well. Fish serve as the primary protein source for 35% of the world population and the industry provides 57 million jobs worldwide. [154]

Overfishing results from illegal, unregulated, and unreported fishing activities. It is also the outcome of harmful government subsidies that encourage the seizure of fish beyond necessary levels. [155] Most fish are utilized for various purposes ranging from food to pharmaceuticals. However, a significant number are still discarded. Estimates state that 10.8% of the global catch in 2010-2014 was equivalent to 9.1 million tons of waste. [156] Such wastage is considered outright exploitation, accompanied by habitat destruction. This is intertwined with indiscriminate fishing practices. Entire sections of the ocean floor are decimated by deep-sea trawling. Along with purse-seine nets, these increase the number of *bycatch*. These are species not desired by the fisheries and are typically thrown away or not utilized. Discarded fishing gear can entangle and cause unnecessary death of species. Chemical fishing with cyanide or dynamite also poisons marine ecosystems. Such dangerous practices can have subsequent health impacts when consumed by humans. To combat these, a vast number of policies are in place. Yet again, the problem predominantly lies in poor enforcement. For a healthier ocean, the sustainable seafood movement must be continually supported. [157]

### **Nutrition on Global and National Levels**

#### **Global Efforts**

Globally, efforts to address nutrition have historically been seen as poor. This is due to a number of factors, including a lack of political momentum, engagement from donors and multilateral/bilateral organizations and translating policy into tangible action and outcomes. In 2016, the United Nations declared 2016-2025 as the 'Decade of Action on Nutrition' which was subsequently endorsed by the World Health Assembly. This was supposed to mark a commitment to action with the implementation of

policies and programs involving multi-sectoral collaboration to address malnutrition. However, this has not translated to sustainable progress. [158]

The latest *Global Nutrition Report* in 2021 found that across the world, diets are not improving and food production continues to have increasing demands on the environment, whilst levels of malnutrition remain high. [159] Globally it is estimated that with current progress, five out of six of the global maternal, infant and young children nutrition (MIYCN) targets - including stunting, wasting, low birth weight, anemia and childhood overweight - are not on track to be achieved, while on other hand, breastfeeding is successfully on track and progressing. In addition, all diet-related NCD targets are also not on track to be met, including salt intake, raised blood pressure, adult obesity and diabetes. [158,159] These concerning trends have only been exacerbated by the COVID-19 pandemic, with a 2021 report by the United Nations Food and Agriculture Organization (UNFAO) on Food Security and Nutrition finding that the prevalence of undernourishment increased by 1.5% in 2020 and the increase in moderate or severe food insecurity in 2020 was equivalent to the previous five years combined. [29]

The latest global efforts to address global nutrition recently occurred in December 2021 with the Tokyo Nutrition for Growth (N4G) Summit. This Summit brought together governments, bilateral and multilateral organizations to address three key aspects relating to nutrition: (1) health, including nutrition and Universal Health Coverage, (2) food, including establishing sustainable food systems and (3) resilience, to mitigate the impacts of malnutrition. [160]

Urgent global action is needed to address the six pathways for food systems transformation as outlined by the UNFAO: strategies for development and peace policies in areas affected by conflict, climate resilience of food systems, community resilience to economic adversity, strategies along the food supply chain to lower the costs of nutritious foods, eradicating poverty and inequality, inclusive interventions and promoting good public nutrition education and dietary choices. [29]

### **National Efforts**

Individual nations need to scale up their efforts to address nutrition. The latest *Global Nutrition Report* from 2018 found that only 48% of countries were on track for at least one nutrition target, with most countries classified as *not on track* to achieve the SDG nutrition targets by 2025. [159,160] Further, for diet-related NCD targets, no countries are on track for adult obesity levels and reducing salt intake, and less than 25% of countries are on track for hypertension and diabetes targets. Further, no WHO region meets the recommendations for healthy diets. [159] Urgent investment in nutrition is required and significant financial investment and support from high-income countries as part of development assistance is necessary to achieve these targets. This is particularly important given the global economic impact due to COVID-19, which has severely affected national financing. [160] National governments have a critical role to play in transforming food systems and protecting food security, prioritizing nutrition as part of universal health coverage and preventative health strategies, financing nutrition, setting effective nutrition policies and regulating the food industry to promote availability and affordability of nutritious foods. [159]

### **Food Security and Food Sovereignty**

Food Security is the guarantee that individuals have access to food in quantity and quality so that they can meet their nutritional needs, providing a healthy life. This concept, however, does not question how this food is produced and by whom. The concept of food sovereignty is the guarantee of the right of peoples to have their own food production and distribution strategies, based on small and medium production, with sustainable means and respecting the culture of each region, valuing popular knowledge and local plants. Thus, the means for people to achieve independence in food production, how to eliminate oppression and inequalities and who controls natural and productive resources are discussed. (161)

The current food production model, focused on agribusiness, monoculture and commodity exports, does not guarantee stability in food distribution. On the contrary, it is subject to crises (such as the one in 2007 and 2008), to speculation, to the variation of prices in the international market and to international trades. In addition, the current production system has a prevalence of unsustainable practices, with high rates of deforestation, intense use of pesticides and labor that is often poorly paid. Achieving food sovereignty is the way to guarantee the right to food and, also, the reduction of inequalities and oppression, environmental protection and respect for local culture. Encouraging family farming is the main way to achieve food sovereignty, and several initiatives around the world focus on this theme. such as the Purchase of Africans for Africa (PAA), Movimento sem Terra and the Global Convergence of Struggles for Land and Water. (162)

### **Food Policies**

Due to the ongoing struggles with food security and overproduction and consumption of food, food policies are being developed. Food policies are usually created on a national level catering to the individual needs of a certain population. There are 4 reasons for food policies which are:

1. To improve the nutrition standards
2. To improve the efficiency of the production and the distribution of food
3. To improve the conditions of rural populations
4. To improve the conditions internationally in order to end world hunger [163]

Several countries have implemented food policies and were a success. However, despite all this, the overall progress has been low as compared to the rapid increase in NCDs. [164]

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## Bylaws Paragraphs concerning Policy

### 17.2 Definitions

- a. **Policy Statement:** Short and concise document highlighting the position of IFMSA for specific field(s). A policy statement does not include background information, discussion related to the policy, a bibliography and neither does it quote facts and figures developed by outside sources. The maximum length of a policy statement is 2 pages, including introduction, IFMSA position and call to action.
- b. **Position Paper:** A detailed document supporting the related policy statement that contains background information and discussion in order to provide a more complete understanding of the issues involved and the rationale behind the position(s) set forth. A position paper must cite outside sources and include a bibliography.
- c. **Policy commission:** A policy commission is composed of three people, with 2 representatives of the NMOs and one Liaison Officer. The proposer of the draft is part of the policy commission and is responsible of appointing its members. The tasks of the policy commission are the following:
  - a. They are responsible of the quality of the policy document with the approval of the proposal.
  - b. Ensuring the content is based on global evidence.
  - c. Collecting and incorporating NMO feedback after the call for input.
  - d. Coordinating the discussion during the General Assembly.

### Adoption of policies

17.3. A draft policy statement, position paper and the composition of the policy commission must be sent to the NMO mailing list by the proposer and in accordance with paragraph 9.4. Input from NMOs is to be collected between submission of the draft and submission to the General Secretariat.

17.4. The final policy statement and position paper are to be sent in accordance with paragraph 9.4, using the template provided in the call for proposals. The proposal must be co-submitted by two NMOs from different regions or the Team of Officials. A corrected version of this document may be submitted according to paragraph 9.5. Correction may not be used to add members to the policy commission.

17.5. Policy statements and position papers must be presented to NMOs during the first working day of the IFMSA General Assembly.

17.6. A motion to adopt the policy statements and position papers must be submitted the day before the relevant plenary by two NMOs from different regions or an IFMSA Official, the IFMSA Team of Officials or the IFMSA Executive Board. Adoption requires  $\frac{2}{3}$  majority.

17.7. Amendments may be sent to the proposer in accordance with Annex 1. Amendments made during a General Assemblies or after the deadline stipulated in Annex 1, shall be submitted to the Chair at the latest 23:59 observed in the timezone of the relevant General Assembly on the day before the scheduled start of the session in which the policy will be voted on. These amendments require  $\frac{2}{3}$  majority to pass.