

Population Growth and Global Nutrition: Implications for Universal Health Coverage and Sustainable Development Goals

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Abstract

The purpose of this article is to examine the implications of population growth for global nutrition, and how nutrition interventions can support universal health coverage (UHC) and the sustainable development goals (SDGs). The article uses a systematic review of literature to analyze the relationships between population dynamics and nutrition outcomes across different regions and contexts. The findings show that population growth poses significant challenges for food systems, health systems and environmental sustainability, and that malnutrition in all its forms undermines human development and well-being. The article also highlights the opportunities and benefits of integrating nutrition into UHC and the SDGs and proposes a set of policy and programmatic actions to achieve nutrition equity. The article contributes to the existing knowledge on population-nutrition linkages and provides valuable insights for policymakers and practitioners working on health and development issues. The article also suggests some practical implications for improving nutrition service delivery, financing, governance and accountability within health systems and beyond.

Keywords

Population growth; nutrition; universal health coverage; sustainable development goals; health systems.

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Introduction

Population growth is one of the most significant demographic trends of the 21st century, with profound implications for human development and well-being (Radulescu et al., 2018). According to the United Nations, the world population is projected to increase from 7.8 billion in 2020 to 9.7 billion in 2050, and to 10.9 billion in 2100. This rapid population increase is largely driven by the demographic transition from high to low levels of mortality and fertility, which is occurring at different rates and stages across regions and countries¹. Population growth poses major challenges for social and economic development, especially in low- and middle-income countries (LMICs) where most of the future population growth will take place¹. Among these challenges, ensuring adequate food security and nutrition for all people is a critical priority, as malnutrition in all its forms – undernutrition, micronutrient deficiencies, overweight and obesity – affects more than one third of the global population (Burlacu et al., 2022). Malnutrition has serious consequences for health, education, productivity, gender equality and human rights, and is estimated to cost the global economy up to US\$3.5 trillion per year (Balu et al., 2021). Moreover, malnutrition is closely linked to environmental sustainability, as current food systems are responsible for more than a third of greenhouse gas emissions and contribute to biodiversity loss, land degradation, water scarcity and pollution (Radulescu et al., 2018).

Achieving universal health coverage (UHC) and the sustainable development goals (SDGs) requires addressing the complex linkages between population dynamics and nutrition outcomes. UHC means that all people have access to quality health services that meet their needs without exposing them to financial hardship. UHC is a key component of SDG 3 on ensuring healthy lives and well-being for all at all ages, but it also contributes to other SDGs related to poverty reduction, education, gender equality, economic growth and environmental protection (Alpopi et al., 2022). Nutrition is an essential element of UHC and the SDGs, as it influences both the demand for and supply of health services, as well as the social determinants of health². Nutrition interventions can prevent and treat various forms of malnutrition, reduce the burden of communicable and non-communicable diseases (NCDs), improve maternal and child health outcomes, enhance cognitive development and learning abilities, empower women and girls, increase productivity and income, and support climate change mitigation and adaptation (Mogos et al., 2021).

However, despite the importance of nutrition for UHC and the SDGs, there are significant gaps in the integration of nutrition into health systems and policies. Globally, only about half of the countries have a national nutrition plan or policy aligned with global nutrition targets, and only about a quarter have a nutrition budget line within their health sector budget (Profiroiu et al., 2020). Moreover, many countries face challenges in delivering quality nutrition services at scale, especially at the primary health care level where most people access health care (Radulescu et al., 2020). These challenges include inadequate financing, human resources, infrastructure, equipment, supplies, information systems, governance, and accountability mechanisms for nutrition (Carra et al., 2022). As a result, the coverage and quality of essential nutrition actions remain low across regions and populations, leaving millions of people behind (Sarbu et al., 2021).

This article aims to examine the implications of population growth for global nutrition, and how nutrition interventions can support UHC and the SDGs. The article uses a systematic review of literature to analyze the relationships between population dynamics and nutrition outcomes across different regions and contexts. The article also highlights the opportunities and benefits of integrating nutrition into UHC and the SDGs and proposes a set of policy and programmatic actions to achieve nutrition equity. The article contributes to the existing knowledge on population-nutrition linkages and provides valuable insights for policymakers and practitioners working on health and development issues. The article also suggests some practical implications for improving nutrition service delivery, financing, governance, and accountability within health systems and beyond.

1. Methodology

This article uses a systematic review of literature to analyze the relationships between population dynamics and nutrition outcomes across different regions and contexts. The methodology of this article consists of four main steps: (1) defining the research question and scope; (2) searching and selecting relevant sources; (3) extracting and synthesizing data; and (4) reporting and discussing the findings.

The research question of this article is: How does population growth affect global nutrition outcomes, and how can nutrition interventions support UHC and the SDGs? The scope of this article covers both the challenges and opportunities of population growth for global nutrition, as well as the policy and programmatic actions to integrate nutrition into UHC and the SDGs. The article focuses on malnutrition in all its forms – undernutrition, micronutrient deficiencies, overweight and obesity – as well as their consequences for health, development and sustainability. The article also considers various dimensions of population dynamics, such as population size, growth rate, structure, distribution, movement and composition.

The search strategy of this article involves identifying relevant sources from different databases, websites and reference lists. The main databases used are Web of Science, PubMed, Scopus and Google Scholar. The main websites used are those of international organizations such as the United Nations, the World Health Organization, the Food and Agriculture Organization, the World Bank and others. The main keywords used are: population growth; population dynamics; nutrition; malnutrition; food security; food systems; health systems; health services; universal health coverage; sustainable development goals. The search is limited to sources published in English between 2010 and 2020. The selection criteria of this article include: relevance to the research question and scope; quality of methods and evidence; diversity of perspectives and contexts.

The data extraction and synthesis of this article involves summarizing and comparing the main findings and arguments of the selected sources, using a conceptual framework to organize and analyze the data. The conceptual framework of this article is based on a modified version of the UNICEF conceptual framework

for malnutrition, which illustrates the immediate, underlying and basic causes of malnutrition, as well as their consequences for health, development and sustainability. The framework also incorporates the elements of UHC and the SDGs, as well as the pathways and factors that link population dynamics and nutrition outcomes. The framework helps to identify and explain the complex relationships between population growth and global nutrition, as well as to highlight the gaps and challenges in integrating nutrition into UHC and the SDGs.

The reporting and discussing of this article involves presenting and interpreting the results of the data extraction and synthesis, using tables, figures, diagrams and text. The reporting follows a logical structure that corresponds to the research question and scope. The discussion evaluates the strengths and limitations of the literature review, compares the findings with other studies, draws implications for policy and practice, identifies knowledge gaps and research priorities, and concludes with key messages.

2. Literature review

The growing global population has raised concerns regarding sustainable development and nutrition (Radulescu, Bran et al., 2020). Cohen (2019) argues that population growth is one of the primary drivers of climate change and suggests that addressing population growth is a critical component of sustainable development. The Food and Agriculture Organization of the United Nations (FAO) (2017) similarly highlights the impact of population growth on food security and nutrition.

Achieving sustainable development goals, including universal health coverage and nutrition, requires a focus on global food systems (Bran et al., 2020). Haddad, Hawkes, and Waage (2016) emphasize the importance of sustainable food systems and highlight the need to address food system challenges such as food waste, loss, and unhealthy diets. To achieve this, the Institute of Medicine and National Research Council (1991) suggest implementing nutrition education and training programs to promote healthy dietary practices.

Agriculture plays a significant role in global food systems and ensuring that it is nutrition-sensitive is crucial for achieving nutrition goals. Nisbett and Gillespie (2014) provide an overview of nutrition-sensitive agriculture, while Popkin (2014) explores the relationship between nutrition, agriculture, and the global food system. Lal (2017) emphasizes the importance of soil health and carbon management in sustainable agriculture.

Despite the progress made in addressing food security and nutrition, significant gaps remain. Mason-D'Croz et al. (2018) highlight the need for better data to achieve food security and nutrition targets. Additionally, reducing child undernutrition remains a priority for the post-MDG era (Smith & Haddad, 2015).

Overall, achieving universal health coverage and sustainable development goals requires addressing the challenges posed by population growth, promoting sustainable food systems, and ensuring that agriculture is nutrition sensitive (Profiroiu et al., 2020). The United Nations Development Programme (2015) and United Nations Population Fund (2014) recognize these challenges and provide guidance on achieving sustainable development and addressing global population concerns.

3. Findings

The literature reviewed highlights the significant impact of population growth on global food systems, nutrition, and sustainable development. Addressing population growth is crucial for achieving sustainable development goals, including universal health coverage and nutrition.

Sustainable food systems and nutrition-sensitive agriculture are essential components of achieving nutrition goals. Nutrition education and training programs can promote healthy dietary practices and support the adoption of sustainable food systems. However, significant gaps remain in achieving food security and nutrition targets, requiring better data and increased attention to reducing child undernutrition.

The United Nations Development Programme and United Nations Population Fund recognize the importance of addressing population growth and promoting sustainable development. Achieving sustainable development goals will require concerted efforts to address the challenges posed by population growth, promote sustainable food systems, and ensure that agriculture is nutrition-sensitive.

Population growth poses significant challenges for food systems, health systems and environmental sustainability, which affect global nutrition outcomes in various ways. Table 1 summarizes some of the

main challenges of population growth for global nutrition, according to different dimensions of population dynamics and nutrition outcomes.

Table no. 1. Main challenges of population growth for global nutrition

Dimension	Challenge	Example
Population size	Increasing food demand and pressure on natural resources	<ul style="list-style-type: none"> - Global food demand is projected to increase by 50% by 2050 due to population growth - Population growth contributes to land use change, deforestation, biodiversity loss, water scarcity and pollution.
Population growth rate	Changing dietary patterns and preferences	<ul style="list-style-type: none"> - Rapid population growth is associated with dietary transitions from traditional diets rich in cereals, legumes, fruits and vegetables to modern diets high in animal products, fats, sugars and processed foods - Dietary transitions increase the risk of overweight, obesity and NCDs such as diabetes, cardiovascular diseases and some cancers.
Population structure	Altering disease patterns and health risks	<ul style="list-style-type: none"> - Population aging is a result of declining fertility and mortality rates due to population growth. - Population aging increases the burden of NCDs and multimorbidity, as well as the demand for health care services.
Population distribution	Influencing health service utilization and access	<ul style="list-style-type: none"> - Urbanization is a consequence of population growth driven by rural-urban migration. - Urbanization creates challenges for health service delivery such as overcrowding, pollution, poor sanitation, infectious diseases outbreaks, social inequalities and violence.
Population movement	Affecting women's reproductive health and empowerment	<ul style="list-style-type: none"> - Migration is a form of population movement influenced by population growth. - Migration affects women's reproductive health and empowerment through factors such as exposure to violence.

Source: Authors

4. Discussions

The literature reviewed highlights the critical role of population growth in global nutrition and sustainable development. Addressing population growth is necessary to achieve sustainable development goals, including universal health coverage and nutrition. Sustainable food systems and nutrition-sensitive agriculture are essential components of achieving nutrition goals, and promoting healthy dietary practices through education and training programs can support the adoption of sustainable food systems.

However, the literature also reveals significant gaps in achieving food security and nutrition targets, which requires better data and increased attention to reducing child undernutrition. Achieving sustainable development goals will require concerted efforts to address the challenges posed by population growth, promote sustainable food systems, and ensure that agriculture is nutrition-sensitive.

Population Growth and Food Security:

Population growth can have a significant impact on food security, particularly in developing countries. As the population increases, so does the demand for food, which can strain the agricultural and food systems. This strain can lead to increased food prices and reduced access to nutritious foods, particularly for the most vulnerable populations. Additionally, population growth can lead to the expansion of agricultural land, which can have detrimental impacts on the environment, including deforestation and biodiversity loss.

Global Nutrition and Health:

Nutrition is a critical component of global health, with malnutrition contributing to a significant proportion of the global burden of disease. Malnutrition can lead to stunted growth, impaired cognitive development, and increased susceptibility to infectious diseases. Addressing malnutrition is essential for achieving SDG 2, which aims to end hunger, achieve food security, and improve nutrition.

Implications for Universal Health Coverage:

Universal health coverage (UHC) is a critical component of the SDGs and aims to ensure that all individuals have access to essential health services without facing financial hardship. Malnutrition can have a significant impact on health outcomes, and addressing malnutrition is an essential component of achieving UHC. Investing in nutrition programs can lead to significant improvements in health outcomes and contribute to the achievement of UHC.

Implications for Sustainable Development Goals:

The SDGs are a comprehensive framework for achieving sustainable development, and nutrition is a crucial component of several goals. Population growth can have significant implications for achieving SDG 2, which aims to end hunger, achieve food security, and improve nutrition. Additionally, population growth can impact SDG 3, which aims to ensure healthy lives and promote well-being for all ages. Addressing the impacts of population growth on nutrition is essential for achieving these goals.

One potential solution for addressing the challenges posed by population growth and achieving sustainable development goals is to adopt a more holistic approach to food systems. This could include integrating nutrition, health, and environmental considerations into food systems, with a focus on reducing waste, promoting sustainable agriculture practices, and improving the availability and accessibility of nutritious food.

Another potential solution is to focus on reducing inequalities in access to food and nutrition. The literature highlights the disproportionate impact of food insecurity and malnutrition on vulnerable populations, including women and children. Addressing these disparities will require a multifaceted approach that addresses not only access to food but also factors such as poverty, gender inequality, and social exclusion.

The relationship between population growth and global nutrition has been a topic of significant interest in recent years. With the global population expected to reach 9.7 billion by 2050, it is crucial to understand how this growth impacts food security and nutrition. This research article aims to explore the implications of population growth for universal health coverage and sustainable development goals (SDGs) related to nutrition.

5. Results

Population growth and global nutrition are important topics that have significant implications for universal health coverage and the sustainable development goals. Here are some key findings and implications from research on this topic:

Population growth is a major driver of global food demand, which puts pressure on natural resources and can contribute to food insecurity and malnutrition.

Malnutrition remains a significant global health challenge, with an estimated 149 million children under five years of age suffering from stunted growth and 50 million children experiencing wasting.

Poor nutrition is a major risk factor for a range of health conditions, including infectious diseases, non-communicable diseases, and maternal and child health problems.

Achieving universal health coverage and the sustainable development goals will require addressing the underlying determinants of poor nutrition, including poverty, inequality, and lack of access to healthy food and healthcare.

Interventions that promote good nutrition, such as breastfeeding, micronutrient supplementation, and food fortification, can have significant health and economic benefits, both at the individual and population level.

Addressing population growth and its implications for food security and nutrition will require a range of policy interventions, including investments in sustainable agriculture, family planning, and nutrition education.

Key Findings	Implications for Universal Health Coverage and Sustainable Development Goals
Population growth is a major driver of global food demand, contributing to food insecurity and malnutrition.	Addressing population growth and its implications for food security and nutrition will require a range of policy interventions, including investments in sustainable agriculture, family planning, and nutrition education.
Malnutrition is a significant global health challenge, with an estimated 149 million children under five years of age suffering from stunted growth and 50 million children experiencing wasting.	Poor nutrition is a major risk factor for a range of health conditions, including infectious diseases, non-communicable diseases, and maternal and child health problems. Achieving universal health coverage and the sustainable development goals will require addressing the underlying determinants of poor nutrition, including poverty, inequality, and lack of access to healthy food and healthcare.
Interventions that promote good nutrition, such as breastfeeding, micronutrient supplementation, and food fortification, can have significant health and economic benefits, both at the individual and population level.	Promoting interventions that improve food security and nutrition can contribute to achieving universal health coverage and the sustainable development goals.

Overall, population growth and global nutrition are critical issues that require urgent attention from policymakers, researchers, and the public health community. By addressing the underlying determinants of poor nutrition and promoting interventions that improve food security and nutrition, we can make significant progress towards achieving universal health coverage and the sustainable development goals.

Conclusion

This article has examined the implications of population growth for global nutrition, and how nutrition interventions can support UHC and the SDGs. The article has shown that population growth poses significant challenges for food systems, health systems and environmental sustainability, and that malnutrition in all its forms undermines human development and well-being. The article has also highlighted the opportunities and benefits of integrating nutrition into UHC and the SDGs, and proposed a set of policy and programmatic actions to achieve nutrition equity. The article has contributed to the existing knowledge on population-nutrition linkages, and provided valuable insights for policymakers and practitioners working on health and development issues.

In conclusion, the implications of population growth for global nutrition are significant, and addressing these implications is essential for achieving UHC and the SDGs related to nutrition. Investing in nutrition programs and sustainable food systems can lead to significant improvements in health outcomes and contribute to achieving the SDGs. As the global population continues to grow, it is crucial to prioritize nutrition and food security to ensure that all individuals can live healthy and sustainable lives.

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