

Journal of Developing Country Studies (JDCS)

**Commentary: Antibiotic Resistance, Sustainable Development 2030 and
Poverty in Developing Countries**

Jawad M. A.



Commentary: Antibiotic Resistance, Sustainable Development 2030 and Poverty in Developing Countries



Jawad M. A.

Article History

Received 1st January 2024

Received in Revised Form 10th January 2024

Accepted 18th January 2024



How to cite in APA format:

Jawad, A. (2024). Commentary: Antibiotic Resistance, Sustainable Development 2030 and Poverty in Developing Countries. *Journal of Developing Country Studies*, 8(1), 1–8. <https://doi.org/10.47604/jdcs.2264>

Abstract

Sustainable Development - 2030 is poised for a transformative global landscape, marked by two pressing challenges: antibiotic resistance, an escalating public health crisis, and the pursuit of Sustainable Development Goals (SDGs) to alleviate poverty and enhance living standards. This commentary explores the intricate relationship between antibiotic resistance, the 2030 agenda for sustainable development, and poverty in developing countries. Antibiotic resistance, primarily fuelled by overuse and misuse, threatens to intensify the burden of infectious diseases, particularly among vulnerable populations. Concurrently, sustainable development in these regions is beset with hurdles. Eradicating poverty, a central SDG-2030 goal hinges on addressing healthcare disparities and the impacts of antibiotic resistance. This in-depth analysis comprehensively examines the complex interplay of these factors, evaluating the challenges they pose to the SDGs-2030. It assesses the current state of sustainable development and its potential to uplift impoverished communities, highlighting the consequences of antibiotic resistance on healthcare access and the challenges related to achieving food security amid antibiotic residues. The paper explores strategies and obstacles in the dual pursuit of poverty elimination and antibiotic resistance mitigation, emphasizing the need for holistic, evidence-based solutions across social, economic, environmental, and health dimensions. These commentaries offer insights and recommendations to inspire proactive efforts towards a more equitable and sustainable future.

Keywords: *Sustainable Development – 2030, Antibiotic Resistance, Poverty*

©2024 by the Authors. This Article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>)

INTRODUCTION

In 2030, the global landscape is poised for a profound transformation. Antibiotic resistance, an enduring and escalating crisis, will persist as a substantial threat to public health.¹ Concurrently, pursuing sustainable development 2030, a multifaceted mission to enhance living standards, preserve the human environment, and mitigate poverty, remains an ongoing imperative.² Amid this backdrop, the intricate interplay of antibiotic resistance, sustainable development, and poverty in developing nations is a formidable and pressing challenge.³ The significance of this relationship cannot be emphasized enough. Antibiotic resistance, driven by the overuse and misuse of these drugs, is foreseen to exacerbate the burden of infectious diseases, creating formidable barriers to effective treatments, especially for the world's most vulnerable populations.⁴ Simultaneously, the journey toward sustainable development in these regions is fraught with hurdles. The realization of the United Nations' Sustainable Development Goals (SDGs) - 2030, particularly the first goal of eradicating poverty, hinges on addressing healthcare disparities and the impacts of antibiotic resistance.²

This in-depth analysis comprehensively examines the complex relationship between antibiotic resistance, sustainable development in 2030, and poverty within developing countries. The commentary delves into the ever-evolving landscape of antibiotic resistance, highlighting its significant challenges for the SDGs - 2030. Additionally, it assesses the current state of sustainable development in these regions and its potential to uplift impoverished communities. The discussion extends to encompass the negative consequences of antibiotic resistance on healthcare access and the intricate issues associated with achieving food security while dealing with antibiotic residues. The paper evaluates the strategies implemented and the obstacles encountered in the dual pursuit of eliminating poverty and addressing antibiotic resistance, considering potential conflicts and resource limitations. The commentary underscores the need for holistic, evidence-based solutions by SDGs - 2030, considering various dimensions, such as social, economic, environmental, and health, to ensure the well-being of impoverished populations and preserve global health. These commentaries will navigate the complexities of this interplay, offering valuable insights and recommendations to inspire proactive efforts toward a more equitable and sustainable future.

Sustainable Development in 2030

Sustainable Development 2030 will remain a central global pursuit, underpinned by the United Nations' Sustainable Development Goals (SDGs).² While the world will have made progress in addressing poverty, improving healthcare, enhancing food security, and promoting economic growth, it is imperative to critically assess the projected state of sustainable development and the specific challenges developing countries face in the context of antibiotic resistance. Foreseeing the future, it is anticipated that the SDGs will persist as the guiding framework for sustainable development in 2030.² These goals, spanning objectives like poverty eradication and hunger alleviation to the promotion of health and well-being, will maintain their influence on global policy and actions.² The agenda for SDGs will adapt to meet new challenges and integrate novel aspects, notably the intersection of antibiotic resistance with healthcare, agriculture, and economic development.

Developing countries, while making progress, still grapple with unique challenges. The eradication of poverty, the SDGs 2030, will remain an overarching goal. However, the interplay of antibiotic resistance presents a complex challenge. Antibiotic-resistant infections can drain the limited resources of impoverished communities, making it difficult for them to break the cycle of poverty. The goal of improving healthcare SDGs is goal 3, in which the world's governments have committed to “ensure healthy lives and promote well-being for all at all ages.”⁵

The continued spread of antibiotic resistance threatens to undermine the gains made in healthcare access in developing countries.⁶ Inadequate access to effective antibiotics can result in prolonged illnesses, economic burdens, and, in some cases, loss of life.⁷ For example, India, a developing country with a significant burden of antibiotic-resistant infections, has recognized the need to integrate efforts to combat AMR with poverty alleviation.⁸ The National Action Plan on Antimicrobial Resistance (NAP-AMR) launched by the Indian government exemplifies this approach.⁹ NAP-AMR aims to address the public health threat posed by AMR and ensure that vulnerable populations have access to effective treatments. In India, where a substantial portion of the population lives below the poverty line, antibiotic resistance exacerbates healthcare disparities.⁸ The government's initiative involves regulating antibiotics in healthcare and agriculture, promoting responsible antibiotic prescribing, and increasing access to essential antibiotics for impoverished communities. By doing so, they simultaneously tackle AMR and improve healthcare access, aligning with SDG goal 3, Good Health and Well-being and SDG goal 1, no Poverty.²

Food security SDGs goal 2 in developing countries will face hurdles due to antibiotic residues in the food supply.² Antibiotic use in agriculture can lead to residues in meat, dairy, and other products, which, when consumed, can contribute to antibiotic resistance in humans.¹⁰ This issue will necessitate more stringent regulations and sustainable agricultural practices that balance food production with health considerations. Economic growth SDGs goal 8 - 2030 will remain intrinsically linked to sustainable development.¹¹ While economic growth is vital for poverty reduction, it should be environmentally sustainable and socially equitable.¹¹ Balancing economic development with antibiotic stewardship will be a challenge. The economic cost of antibiotic resistance, including increased healthcare expenditures and lost productivity, must be considered.¹² Sub-Saharan African countries face the dual challenge of food security and antibiotic resistance. Unsustainable agricultural practices can lead to antibiotic residues in food products, affecting food safety and public health.¹³ Sub-Saharan Africa is home to many of the world's impoverished population. Countries like Kenya, Ethiopia, and Nigeria increasingly adopt organic farming, integrated pest management, and agroecological approaches.¹⁴ These sustainable agricultural practices aim to reduce the usage of antibiotics in animal farming and crop production, thereby minimizing antibiotic residues in food. Such practices contribute to achieving SDG 2 (Zero Hunger), SDG 1 (No Poverty), and SDG 15 (Life on Land) by ensuring food security, increasing economic opportunities for farmers, and preserving ecosystems.¹⁵

The potential role of SDGs - 2030 in addressing poverty within the context of antibiotic resistance is significant.¹⁶ Sustainable development, emphasising equity, inclusivity, and environmental protection, can provide a framework for tackling these challenges comprehensively. By integrating efforts to combat antibiotic resistance into existing sustainable development initiatives, developing

countries can strengthen healthcare systems, enforce responsible antibiotic use in agriculture, and promote economic opportunities that are both economically viable and environmentally sound. SDGs - 2030 will continue to drive global efforts to address poverty, improve healthcare, enhance food security, and promote economic growth. However, the interplay with antibiotic resistance introduces additional layers of complexity. Developing countries will face unique challenges in balancing these objectives; holistic, evidence-based approaches are essential. Sustainable development offers a promising framework for addressing these intertwined challenges. Still, it will require adaptation and innovation to ensure that the world's most vulnerable populations can escape poverty while safeguarding public health and environmental sustainability.

Antibiotic Resistance and Healthcare Access

The intricate interplay between antibiotic resistance and healthcare access is paramount, particularly in developing countries with vulnerable and often under-resourced healthcare systems. Challenges stemming from antibiotic resistance are multifaceted and profound.¹² The escalating complexity of treating antibiotic-resistant infections demands using advanced and often more expensive antibiotics.¹⁷ In resource-constrained healthcare settings, this complexity translates into limited access to effective treatment options.

Furthermore, the economic burden imposed by antibiotic-resistant infections is substantial. Extended hospital stays, heightened medical expenses, and lost productivity collectively act as significant deterrents, further restricting healthcare access.⁷ Another critical challenge revolves around the limited availability of essential antibiotics, particularly in certain regions. The absence of antibiotics is exacerbated by the overuse or misuse of these medications, thus perpetuating the development of resistance. This scarcity impedes healthcare access and contributes to the perpetuation of antibiotic resistance. The context of India, grappling with drug-resistant tuberculosis (DR-TB), serves as an illustrative example of these challenges. Patients plagued with DR-TB necessitate protracted and financially taxing treatment regimens, resulting in a formidable economic burden for both individuals and the healthcare system.¹⁸ The accessibility of innovative and more productive drugs may be significantly restricted, particularly for marginalized communities.¹⁹ This scenario perpetuates a dual challenge, concomitantly implicating healthcare access and antibiotic resistance.

Proposed solutions to these challenges are noteworthy but not without critique. Promoting responsible antibiotic use represents a fundamental strategy to mitigate the emergence of resistance. However, the successful application of this solution relies upon the presence of stringent regulatory systems and unwavering adherence from healthcare professionals—both of which may be lacking in many developing countries.⁶ Ensuring affordable access to antibiotics, especially novel and effective ones, is another critical approach. Initiatives to reduce the costs of essential antibiotics can alleviate the challenges impoverished populations face. Nonetheless, drug affordability is only one facet of the issue, as access barriers can be exacerbated by geographical remoteness and limitations in healthcare infrastructure.⁶ Finally, raising public awareness regarding antibiotic resistance is imperative for encouraging judicious antibiotic use.²⁰ Nevertheless, this approach may necessitate substantial time to yield tangible outcomes and may not satisfactorily address the immediate access quandaries.

Strategies and Challenges in Combating Antibiotic Resistance and Poverty

A set of crucial strategies has emerged in the intricate web of addressing antibiotic resistance and poverty in developing countries.²¹ A cornerstone of the approach involves strengthening healthcare systems in developing nations. This encompasses improvements in healthcare infrastructure, the upskilling of healthcare professionals, and the extension of healthcare access to underserved communities. These multifaceted efforts not only enhance healthcare provision but also alleviate the economic burdens imposed by antibiotic-resistant infections, thus directly contributing to poverty reduction.

Implementing robust regulations to govern antibiotic usage in healthcare and agriculture is a pivotal strategy. Responsible antibiotic prescribing, attentive surveillance of antibiotic consumption, and regulating over-the-counter sales of antibiotics all contribute to the containment of antibiotic resistance. In parallel, these measures reduce the healthcare costs borne by impoverished populations. While sustainable agricultural practices, including organic farming and responsible antibiotic use in animal farming, play a crucial role in combatting antibiotic resistance. These practices safeguard food supplies while promoting agricultural economic opportunities, positively impacting livelihoods and food security.

Although these strategies show substantial potential, their execution is not devoid of challenges, such as enforcing antibiotic use and sales regulations, which can be fraught with challenges, particularly in regions with weak regulatory systems. Resistance to change from healthcare providers and pharmaceutical industries may impede progress. Developing countries often grapple with resource constraints, making investing in healthcare infrastructure and sustainably sourced agricultural practices challenging. Balancing economic growth with antibiotic stewardship can also be resource-intensive. Global cooperation and partnerships are indispensable in addressing these multifaceted challenges. International organizations, governments, pharmaceutical companies, and NGOs must collaborate to facilitate access to affordable antibiotics, strengthen healthcare systems, and promote sustainable agricultural practices. For example - The Global Antibiotic Research and Development Partnership (GARDP) is an exemplary initiative that embodies global cooperation.²² It partners with multiple stakeholders to develop and provide affordable antibiotics for drug-resistant infections. By working together, GARDP aims to ensure that new antibiotic treatments are accessible to the populations that need them the most, thereby addressing antibiotic resistance and poverty. The strategies to combat antibiotic resistance and poverty in developing countries are promising but require rigorous efforts to overcome challenges. Global cooperation and partnerships are vital in aligning these strategies to benefit public health and poverty alleviation.

Conclusion

The intricate interplay among antibiotic resistance, sustainable development, and poverty in developing countries in 2023 constitutes a multifaceted challenge demanding immediate attention. This commentary has underscored the profound implications of antibiotic resistance on healthcare access and the economic well-being of impoverished populations. Simultaneously, it has shed light on the pivotal role of sustainable development in shaping the trajectory of poverty reduction. However, the evolving landscape of antibiotic resistance will continue to threaten public health,

particularly in resource-constrained regions. The economic and social burden of antibiotic-resistant infections exacerbates the challenges faced by impoverished communities, further complicating the achievement of sustainable development goals, notably those aimed at eradicating poverty. To effectively address these issues, developing countries must urgently and comprehensively act. Evidence-based policies, founded on a profound understanding of the intricate interplay between these challenges, are imperative. Healthcare systems need strengthening, antibiotic use must be regulated, sustainable agriculture should be promoted, and global cooperation and partnerships should be encouraged.

Acknowledgments. I thank my supervisor for this support of commentary, and to all my colleagues whose support me in my journey.

REFERENCES

1. World Health Organization. Global antimicrobial resistance and use surveillance system (GLASS) report: 2021.
2. World Health Organization. Health in 2015: from MDGs, millennium development goals to SDGs, sustainable development goals.
3. Ledingham K, Hinchliffe S, Jackson M, Thomas F, Tomson G. Antibiotic resistance: using a cultural contexts of health approach to address a global health challenge.
4. Simmons B. Improving access to essential medicines: 2021.
5. World Health Organization. World Health Statistics 2016 [OP]: Monitoring Health for the Sustainable Development Goals (SDGs). World Health Organization; 2016 Jun 8. P.7.
6. Sakeena MH, Bennett AA, McLachlan AJ. Non-prescription sales of antimicrobial agents at community pharmacies in developing countries: a systematic review. *International journal of antimicrobial agents*. 2018 Dec 1;52(6):771-82.
7. World Health Organization. Antimicrobial resistance and primary health care. World Health Organization; 2018.
8. Nair M, Zeegers MP, Varghese GM, Burza S. India's National Action Plan on Antimicrobial Resistance: a critical perspective. *Journal of Global Antimicrobial Resistance*. 2021 Dec 1;27:236-8.
9. Manyi-Loh C, Mamphweli S, Meyer E, Okoh A. Antibiotic use in agriculture and its consequential resistance in environmental sources: potential public health implications. *Molecules*. 2018 Mar 30;23(4):795.
10. Lim, Michelle ML, Peter Sogaard Jørgensen, and Carina A. Wyborn. "Reframing the sustainable development goals to achieve sustainable development in the Anthropocene—a systems approach." *Ecology and Society* 23.3. 2018.
11. Roope LS, Smith RD, Pouwels KB, Buchanan J, Abel L, Eibich P, Butler CC, Tan PS, Walker AS, Robotham JV, Wordsworth S. The challenge of antimicrobial resistance: what economics can contribute. *Science*. 2019 Apr 5;364(6435):eaau4679.
12. Enyiukwu DN, Nwaogu GA, Bassey IN, Maranzu JO, Chukwu LA. Imperativeness of Agricultural Technology for Sustainable Crop Production, Food Security and Public Health in Sub-Saharan Africa.
13. Akinyemi AO. Exploring integrated pest management strategies in the control of the fall armyworm in smallholder organic agriculture farms in Africa. *Agro-Science*. 2021 Sep 29;20(3):65-70.
14. Darwish WS, Eldaly EA, El-Abbasy MT, Ikenaka Y, Nakayama S, Ishizuka M. Antibiotic residues in food: the African scenario. *Japanese Journal of Veterinary Research*. 2013 Feb;61(Supplement):S13-22.
15. Greco S, Putans R, Springe L. Antimicrobial and antibiotic resistance in developing countries: Health economics, global governance, and sustainable development goals. In *Antimicrobial Resistance 2022* Aug 3 (pp. 113-140). CRC Press.
16. Godman B, Ekwuenu A, Haque M, Malande OO, Schellack N, Kumar S, Saleem Z, Sneddon J, Hoxha I, Islam S, Mwita J. Strategies to improve antimicrobial utilization with a special focus on developing countries. *Life*. 2021 Jun 7;11(6):528.

17. Godman B, Egwuenu A, Haque M, Malande OO, Schellack N, Kumar S, Saleem Z, Sneddon J, Hoxha I, Islam S, Mwita J. Strategies to improve antimicrobial utilization with a special focus on developing countries. *Life*. 2021 Jun 7;11(6):528.
18. Bhattacharya Chakravarty A, Rangan S, Dholakia Y, Rai S, Kamble S, Raste T, Shah S, Shah S, Mistry N. Such a long journey: What health seeking pathways of patients with drug resistant tuberculosis in Mumbai tell us. *PloS one*. 2019 Jan 17;14(1):e0209924.
19. Nicholson T, Admay C, Shakow A, Keshavjee S. Double standards in global health: medicine, human rights law and multidrug-resistant TB treatment policy. *Health and human rights*. 2016 Jun;18(1):85.
20. Ancillotti M, Eriksson S, Veldwijk J, Nihlén Fahlquist J, Andersson DI, Godskesen T. Public awareness and individual responsibility needed for judicious use of antibiotics: a qualitative study of public beliefs and perceptions. *BMC Public Health*. 2018 Dec;18:1-9.
21. Dadgostar P. Antimicrobial resistance: implications and costs. *Infection and drug resistance*. 2019 Dec 20:3903-10.
22. Rushton J, Gilbert W, Coyne LA, Thomas LF, Pinchbeck G, Williams N. Interactions between intensifying livestock production for food and nutrition security, and increased vulnerability to AMR and zoonoses. *InScience Forum 2018 Background Paper 2018 Aug 15*. CGIAR Independent Science and Partnership Council.