

The Restrictive Impact of Foreign Aid on Education, Healthcare, and Economic Growth: Exploring the Pragmatic Benefits of Artificial Intelligence

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Abstract

Foreign aid is often used to finance the third world's education, health, and microenterprise programs. However, when it is put into practice, it has led to relevant dependence, cost inefficiency, and a lack of attention on local agendas. Conversely, AI is a responsible, culture-sensitive, and scalable approach to traditional aid modalities. This paper then discusses the flaws of foreign aid and calls for using AI as a sustainable solution to meet development goals in education, health, and economic growth. This work employed case studies and cross-sectional studies of AI utilization in different countries to emancipate its capability to assist communities, enhance independence, and push forward the United Nations Sustainable Development Goals (UN-SDGs). In particular, the results highlight the orientation to ethical, inclusion, and partnership approaches to ensure AI's favorable developmental impact.

Keywords: Foreign Aid, Artificial Intelligence, Sustainable Development, Education, Healthcare, Economic Growth, Dependency, Capacity Building

1. Introduction

For years, international development systems have depended on foreign assistance to fill significant education, health, and economic development deficits. However, the COVID-19 pandemic revealed the inherent flaw in this approach since problems in these sectors worsened, especially in developing countries. These challenges pointed out the need for the development of more sustainable and localized solutions that adhere to the United Nations Sustainable Development Goals (UN-SDGs), which include the UN-SDGs, such as SDG 3: good health and well-being; SDG 4: quality education and SDG 8: decent work and economic growth.

Foreign aid has historically aimed at ending poverty and building more robust sociopolitical stability, which has been practiced in the past with varying results. Its time-bound nature and some negative impacts, like dependency and damaging the domestic markets, have been negatively emphasized in its time-bound nature and some negative impacts, like dependency and damaging the domestic markets (Waldron & Coyne, 2024). While aid programs meet these basic needs, they often only do so in the short term and do not help the aid recipient countries put sustainable systems in place. This paper postulates that AI provides a more practical solution to these structural deficits by implementing large-scale, effective, and culturally sensitive solutions.

Artificial intelligence has proven to be a powerful innovation solution that can boost development results in education, health, and wealth (Aerts & Bogdan-Martin, 2021). Using AI provides an enhanced teaching system, which affords quality education to people of different classes (Bajwa et al., 2021). AI-Assisted diagnostic care and predictive health informatics applied in austere health ministries can help diagnose and treat diseases and conditions wherever they exist (Javaid et al., 2022). Using the AI-based social platform means disadvantaged groups can access economic resources and financial sustainability (Regona et al., 2024). These applications show the capacity of AI in which the effectiveness of foreign aid is complementary and can be succeeded.

1.1 Thesis Statement

While rooted in altruism, this paper will argue that foreign aid has only encouraged dependency and set wrong priorities in recipient countries, thus hindering progress. On the other hand, AI is a practical solution that can help to create an independent and sustainable system needed for local development and growth.

1.2 Literature Review

Research on foreign aid remains an unending topic because of its mixed results on development. Mhlanga (2022) argues that for most countries, while foreign assistance usually solves problems in the quickest way possible, more is needed to facilitate the constant upgrading of the fundamental needs in countries, such as education, health, and communication. This aligns with negative perceptions of the traditional modelization process of assistance, which places perpetuity and priority mismatch before sustainable development (Williamson, 2020; Radelet, 2020).

The recent literature on AI offers a potential new avenue. In contrast to traditional aid, AI offers solutions tailored to a specific geographic space and surpasses traditional aid deliveries to redesign local challenges (Abulibdeh et al., 2024). For example, cognitive technologies apply an individual approach to teaching and learning, enhancing effectiveness and interest (Adel, 2024). These applications challenge the one-size-fits-all approach typical of aid-driven programs, which often fail to account for cultural and contextual nuances.

In healthcare, for instance, AI is an innovative tool that can assist in diagnosing and managing symptoms detected in patient records. Besides, it enhances the positive impact on clinical outcomes while closing significant regional disparities in access to healthcare services (Jack & Suri, 2019; Chen & Zhang, 2021). They affirm AI's potential to support locally driven progress and decrease the need for extra support.

Economic participation is another diverse domain where AI displays considerable potential. In this way, by providing meaningful tools for financial engagement based on the AI-analytical tools for small businesses and mobile applications in banking, the underprivileged status of the informal economy, AI enables its users to spend their means and rely on the fruits of their work as independent market subjects (Abulibdeh et al., 2024). This is subtly different from the situation in which international aid fosters the 'donor-conditional economies,' which focus on the donor's agenda, not that of the recipient country.

Most importantly, although AI has vast potential, its application needs to be discussed considering different theoretical perspectives. The development theories, including Amartya Sen's capabilities approach to development, posit freedom and agency as key features of human progress (Shija Kuhumba, 2022). Such principles of AI-driven solutions include building local capacities and eliminating the reliance on those systems from the USA (USAID, 2024). However, ethical considerations and infrastructural challenges, such as data privacy and digital divides, must be addressed to ensure equitable and sustainable adoption.

2. Methodology

The opposing effects of foreign aid and AI in Rwanda, India, and Kenya are examined in this study using a qualitative case study methodology. Based on their representativeness in various developmental contexts, these cases were chosen:

Rwanda: Known for successfully implementing the advanced use of artificial intelligence in teaching technologies with limited resources and analyzing how foreign aid-funded education projects and AI interventions fit with and impact each other with Rwanda as the case study.

India: A country that receives much of its healthcare aid from other countries yet a nation that has made a lot of progress in developing AI healthcare solutions. India can be well used to compare the efficiency of AI applications with traditional foreign aid.

Kenya: Kenya is a leading innovator in AI technology in agriculture in Sub-Saharan Africa. Kenya best evidences how AI assists the local economy and solves economic development problems that have long been tackled through foreign assistance.

2.1 Data Collection

The study relies on a mixed-methods approach, integrating qualitative and quantitative data:

Qualitative Data: Interviews with local policymakers and NGOs working in the region, educators, healthcare professionals, and developers of AI.

Quantitative Data: Analyzing parameters like literacy levels, health status and outcomes, including mortality and disease rates, and economic indicators like the gross domestic product per capita and financial services, to name a few, pre-and post-implementation of the AI solution.

2.2 Analytical Framework

The study employs a comparative analysis to evaluate the impacts of foreign aid and AI in each case. This involves:

Contextual Analysis: Understanding each country's baseline infrastructure and historical aid patterns.

Impact Assessment: Analyzing the quantitative efficiency and effectiveness of foreign aid and AI interventions regarding accessibility and sustainability.

Theoretical Integration: Extending alongside theories, such as the dependency theory and the capabilities approach to development.

3. The Restrictive Effects of Foreign Aid

3.1 Education

3.1.1 Dependency Syndrome

Foreign aid-driven educational initiatives often result in a debilitating dependency syndrome where the recipient nation becomes hooked on more foreign support than building local, sustainable education systems (Mangwanya, 2022). They not only rely on the importation of resources, but this causes them to need a local resource base often, and the cycle is complex to detach themselves from. On the other hand, AI-based technologies will enable communities to take charge of their learning environments as they try to transform themselves into more self-reliant environments rather than always relying on foreign aid, thereby making learning systems more localized (Eder, 2021). That way, it can assist in breaking the cycle of dependency and support a more adequate state of development.

3.1.2 Mismatch of Priorities

Cultural and background needs in local communities should be addressed in traditional aid-driven educational policies by developing programs that may not suit the artistic or practical framework of the communities (Yu et al., 2024). For instance, the donor's priorities might be testing and quantifiable skills, whereas the locally relevant courses might not gain as much funding (Friesner et al., 2021). Such a misallocation can reduce the effectiveness of educational efforts and their continued long-term usage. Conversely, AI-based systems allow programs and learning activities to be developed with the focus of each community address, thereby making them more likely to be effective in triggering the required interest and learning motivation.

3.1.3 Sustainability Concerns

The issue of the sustainability of the educational initiatives promoted by foreign aid often remains, with the question of the short period of the foreign assistance implemented on projects rather than within the framework of the recipient country's education systems. They are a model of maintaining weak central cores and autonomous and somewhat fragile educational systems that could hardly function without international support (Guerrero et al., 2023). AI-powered solutions provide a pathway to developing healthcare needs on a short-term basis via specific, time-bound means and relatively autonomous localized education systems that are less sensitive to volatile international donations. AI could make a positively disruptive contribution to developing regions by enabling communities to learn how to care for and evolve technologies to suit their needs, thereby reinforcing the existence of more autonomous educational structures.

3.2 Healthcare

3.2.1 Short-term Solutions & Gaps in Access

Foreign aid focuses mainly on healthcare needs on a quick-fix basis via specific, time-bound periods, even during epidemics (Fazal, 2020). However, these interventions usually need sustainability, and therefore, healthcare systems remain exposed when the aid being provided is reduced or stopped altogether. For example, international development practice seeking to combat HIV/AIDS through financial assistance has enhanced particular results. Still, it has not improved the overall developmental health systems' capacity in recipient countries (Aljonaid et al., 2022). This approach has led to episodic donor support to keep critical EH services afloat instead of encouraging locally achievable solutions (Abass et al., 2024).

3.2.2 Distortion of Local Health Systems

Foreign aid has also been criticized for disrupting locally integrated health systems by directing resources on diseases of interest to the donors rather than the health care challenges facing the population (Hennessy et al., 2023). For instance, the grant received from the countries in the West might focus on covering plans for diseases such as malaria or tuberculosis (Ralaidovy et al., 2021). However, more attention may be paid to maternal and childcare areas, where most people require these services. This misalignment can weaken the development of the healthcare system by channelling resources from essential health services to oriented single-issue campaigns.

3.2.3 Brain Drain Effect

Concerns can be made with regards to the effects of foreign aid on the health care workforce, especially as aid

initiatives open opportunities for skilled personnel to migrate to donor nations or obtain work on projects funded by donors, thereby contributing to health care system brain drain (Huffstetler et al., 2022). Popularly referred to as the ‘brain drain,’ this phenomenon negatively impacts the HCWS of developing countries since the best brains are pulled out to more resource-endowed programs or to practice in another country (Leitão et al., 2024). For example, healthcare workers in Sub-Saharan Africa seek employment in Western countries to attend to their needs, thus leaving their countries with a massive gap in meeting the required health-qualified personnel in health facilities (Scheerens et al., 2021).

3.3 Economic Development

3.3.1 Market Distortions

Foreign aid creates market imperfection by selling cheap goods and cash in the local markets or displacing local industries. Subsidy such as agriculture subsidies and letting the donor countries sell food at subsidized rates lead to local farmers being driven out of the market, thus discouraging local production of food (Mann & Iazzolino, 2021). These dynamics limit economic self-sustaining and are a condition for a ‘donor-driven economy,’ where foreign parties set the market pace and offer few opportunities for domestic industries to advance (Quan et al., 2024).

3.3.2 Inefficient Allocation of Resources

The problem of misallocating resources arising from poor management of foreign aid needs to be better established. Donor motivations direct aid funds rather than actual need requirements, thus resulting in ineffective donor behavior and, in some cases, fraud (Aidt et al., 2024). Some may be large grants where the donor has a prominent project instead of a long-term development project, hence wasting many resources on projects that do not impact society (Ilesanmi & Afolabi, 2022). The absence of safeguards leads to misallocation; the aid-recipient government could choose to fund activities more in line with their political agenda than the development needs of the economy (Dreher et al., 2024).

3.3.3 Creating “Donor-driven Economies”

Foreign aid can make the economy too dependent on donor help, limiting domestic economic and sustainable progress. Aid-dependent countries mean their governments prioritize investment projects that maintain their donors rather than prepare for self-sustenance (Lopes, 2024). This dependence on external funding can delay private sector development because firms have to compete with donor-funded initiatives for funding.

4. Pragmatic Effects of AI Paradigm

4.1 AI in Education

4.1.1 Personalization & Accessibility

AI adds excellent value to the education sector as it caters to certain unique benefits, like delivering highly personalized learning that can be effective for each student. AI-assisted solutions are flexible regarding the content offered and how it is delivered because they eliminate a standardized approach common in many education programs funded by international donors (Kamalov et al., 2023). Therefore, this form of learning has been proven to enhance student learning and retention rates, especially among the marginalized group. For instance, AI-based adaptive learning systems have helped learners with their learning requirements and increased learning opportunities within different areas by providing the most relevant educational resources, which are usually scarce in developing nations (Kamaruzzaman et al., 2023). With the help of AI applications, education systems can be more flexible in addressing the needs of all learners and more efficient in fulfilling their requirements.

4.1.2 Enhancing Local Content Creation

A significant benefit of AI applications in education is the ability to facilitate the development of locally relevant content and resources. AI helps educators and students to create unique cultural and linguistically appropriate educational materials, as one of the major issues of foreign aid-driven programs is that they impose the curricula developed in the donor countries (Bloom, 2024). In this manner, AI enhances education development since it sets up educational systems that are endogenous to the cultures and experiences of the targeted communities. This is a good position because it makes the probability of these systems being supported by external institutions minimal. Such application of AI can assist the educational sector in the development regions by making education more responsive, self-sufficient, and inclusive.

4.2 AI in Healthcare

4.2.1 Improved Diagnosis and Treatment

AI can transform healthcare, especially in developing countries, since it has created diagnostic and treatment solutions that improve the situation in such countries. Machine learning algorithms can help healthcare workers diagnose various diseases with high levels of accuracy, and most of the time, they come to the equivalent of human diagnostic standards (Javaid et al., 2022). AI-powered mobile applications can also augment diagnostic services to areas with limited ad hoc access to healthcare facilities instead of aid-driven programs targeting significant cities.

4.2.2 Strengthening Local Health Systems

Through efficient resource allocation and improved decision-making, AI strengthens local health systems and decreases dependence on external funding. For example, in disease occurrence planning, the number of medicines, and human power, a regional health department can utilize the AI-based predictive model to determine the requirement and operating expense effectiveness (Schaar et al., 2020). Also, advanced telemedicine applications with artificial intelligence help to narrow the gap between healthcare providers and rural people and improve the overall quality of healthcare services in the mentioned area (Selvaraj, 2024). AI-powered telemedicine can extend privileged medical care to unserved or poorly served regions and populations. That is why, with the help of the listed and many other possibilities of AI-driven solutions, the developing states can strengthen and become independent from the support in the form of grants and aid from the developed countries, as well as include the local population in the management of the healthcare systems.

4.2.3 Preventive Care & Predictive Analytics

The proficiency of AI in predictive analytics also supports the concept of prevention since the data can help to recognize populations most at risk of certain diseases and provide intervention at this stage. Big data models could also predict outbreaks from patient information and trends in public health, allowing timely response (Zhao et al., 2024). This proactive approach is quite the opposite of most aid programs, which focus on addressing health issues rather than averting them.

5. Comparative Analysis Across Cases

5.1 Education: Rwanda vs. Healthcare: India

In Rwanda, most foreign aid programs in education have depended on the supply of school facilities and an increase in enrollment rates. Learning modules need to be improved to identify learning needs and dropout rates. Eneza Education and other AI-based solutions fill this gap by offering localized, constructively aligned learning resources (Yadav et al., 2024). Likewise, in India, AI-powered healthcare solutions solve problems that could not be solved by foreign aid, such as the imbalance of access to medical resources. For instance, IBM Watson for Oncology, in terms of improving diagnostic acumen, is desirable, especially in a nation that has a very limited number of physicians per patient.

Key Comparison: Both examples prove that AI is capable of designing individual solutions better than humans. In Rwanda, AI is applied in learning, while in India, it is about efficient resource use in a system overloaded with patients.

5.2 Economic Development: Kenya vs. Education and Healthcare

These cases of Kenya's economic development level reveal AI capabilities to increase output and efficiency and to promote independence through, for example, Hello Tractor for small-scale farmers and mobile applications to monitor the farm (Ajaj et al., 2024). Unlike Rwanda and India, where AI basically enhances public service sectors like education and health, Kenya has confined the use of AI to the advancement of the private sector, a way by which people can fend for themselves.

Key Comparison: While AI has a positive impact on supporting macro concerns such as financial inclusion and agricultural productivity in Kenya, the design of AI for Rwanda and India focuses on general service enhancements at the micro level, which includes education and healthcare.

5.3 Dependency vs. Autonomy

Across all three cases, foreign aid produces different shades of dependency. In Rwanda, propensity-based educational systems, which rely on donor funding, are very vulnerable once funding is cut (Shava, 2020). In India, healthcare programs funded by foreign aid often align more with donor priorities than local needs. In Kenya, long-duration foreign agricultural subsidies have interfered with local markets and hampered the future ability to support itself.

AI promotes decentralized decision-making by supporting local capacities. The tools that Rwanda uses for adaptive learning are self-developed with the help of local trainers, and these are sensitive to culture and context. The AI systems in India improve the capability of the existing medical facilities and are not a replacement for them. Current applications that incorporate Artificial Intelligence ideals in Kenya consist of equipping the farmers with technological tools to help them in their day-to-day farming activities and organizing subsidies from other nations.

5.4 Sustainability and Scalability

AI solutions, in all cases, look more scalable and sustainable compared to foreign aid programs. Consequently, given settings like Rwanda, the AI platforms can grow to new areas that were not expanded before with other means as a result of high additional costs. As applied to India's specific situation, AI tools and solutions are versatile in various health environments. Therefore, the implementation of AI in healthcare is applicable to a range of settings, even in different states with different health needs, realities, and priorities (Aminizadeh et al., 2024). When it comes to applying artificial intelligence in the agricultural sector, Kenya is an excellent example that can be used to extend the same solutions to other similar economies across the region.

6. Feasibility of AI in Developing Countries: Key Considerations and Steps

Implemented correctly, AI can greatly benefit education processes, healthcare, and the economy of developing countries; however, there are several crucial questions concerning infrastructure, training, and policies that must be answered for AI to work. Here are some of the critical factors to consider for the effective deployment of AI in these regions:

6.1 Infrastructure Requirements

The successful deployment of AI technologies in developing countries hinges on robust infrastructure. This includes:

Internet Access: Cloud service is popular among AI tools, so they become dependent on steady Internet connections. For instance, where internet connectivity cannot be guaranteed due to facility or geographical location, AI applications may be restricted in rural or developing regions in the long run (Mhlanga, 2021). Governments and international agencies should focus on establishing the required stable digital base for the advanced application of AI systems.

Hardware and Connectivity: It is imperative to note that the fundamentals of any AI system are its hardware computing capabilities. Some AI models can be implemented on the client side, while others will do well on the client-server model. To address this problem, funds could be channeled to local data centers or partnered with cloud providers. Besides, more investments in technologies, such as affordable smartphones and laptops, can enhance opportunities in AI-driven platforms.

6.2 Training and Capacity Building

Developing local expertise is essential for the long-term sustainability of AI initiatives. This includes:

Technical Training for Local Professionals: Another concerning issue for development will remain if these excellently trained systems are not supported by adequately skilled local professionals who will be responsible for their further training and day-to-day operation. It is proposed that governments and NGOs should provide training resources to educate people in fields such as data science, machine learning, and artificial intelligence programming. Institutions of learning in the developing world could adopt curricula offered by their counterpart institutions in the developed world (USAID, 2024).

Healthcare Workers' AI Literacy: In industries like the healthcare sector, the local workforce must be trained to use AI applications. The most effective programs will educate doctors, nurses, and technicians on how to properly interpret the results from analytical insights generated by these artificial intelligence diagnostics. Programs like AI4Health and collaborations with innovative health-tech start-ups are already planning to offer such training in those parts of the globe (Weronika, 2024).

6.3 Policy Development

For AI to contribute to sustainable development, policies must be developed that address both the opportunities and challenges it presents. These include:

Ethical Guidelines and Data Privacy: Concerns often arise about the application of AI in the management of sensitive data to privacy and security questions. As much as the use of AI systems offers opportunities, implementing sound guidelines on data acquisition, usage, and retention when designing AI systems for use would act as the key driver towards outcome efficiency and ethical practice (Aldoseri et al., 2023). Countries in

development can adopt some frameworks like the General Data Protection Regulation (GDPR) so that the quality of data protection can be guaranteed.

Supportive AI Policies: Policymakers should come up with best practices for the creation of AI and ensure that it is of added value to society. This can incorporate the establishment of AI innovation stations, the offering of funding to AI-related projects that can help fix difficulties experienced locally, and guaranteeing that AI strategies are reasonable. It will also assist in attracting foreign affiliations with clear rules guiding most aspects of the business (Yigitcanlar et al., 2021).

6.4 Collaboration and Partnerships

The cooperation between governments and private sectors around the world, as well as innovative companies and international organizations, is crucial for the widespread use of AI solutions. This can help to clarify the difficulties of implementation in terms of financing and technology dissemination, together with the involvement of the local population. For example:

Public-Private Partnerships (PPPs): Multilateral partnerships between governments and technology corporations can help address the technology divide. Some of these universities, including Google and Microsoft, have started releasing AI tools to developing countries through such partnerships. The general aim of these partnerships is to enhance education, healthcare, and governance (Iazzolino & Stremlau, 2024).

NGO and Academic Collaboration: Academic institutional partners involved in development, together with NGOs, should have a crucial role in implementing AI. It can allow for local adaptation of solutions and obtain feedback from the process, enhancing the use of artificial intelligence tools.

7. Case Studies

7.1 AI Applications Overcoming Aid Challenges

Experience and research have also shown that several developing areas have effectively incorporated AI technology to address primary education, health, and economic development needs. These examples prove that AI-driven initiatives can address the limits of foreign aid and reduce more localized and sustainable development.

7.1.1 Education in Rwanda

Rwanda has leveraged AI to manage the educational challenges of reliance on foreign aid, especially in rural regions. The picture below shows a pilot project in one Rwandan High School that uses Artificial Intelligence in education (Anderson, 2024).



Figure 1. Pilot project in one Rwandan High School that uses Artificial Intelligence in education (Anderson, 2024)

For example, adopting innovative learning applications, such as the widely-used e-learning software designed according to the local language and curriculum, has enhanced learning interest and elevated literacy levels (Writer, 2023). These AI tools learn with students' progress rate and speed to help address issues with inflexible centralized foreign aid systems of education that do not consider localized reality. The Rwandan experience indicates that technology can provide a more culture-appropriate and sustainable solution for educational interventions than one based on foreign assistance.

7.1.2 Healthcare in India

AI has dramatically impacted the Indian healthcare industry in rural areas and urban centers that lack medical specialists. One well-known example is the use of diagnostic apps in hospitals and clinics without adequate medical professionals. Below is a patient pathway to using Mobile health (mHealth) to access healthcare services (Osei & Mashamba-Thompson, 2021).

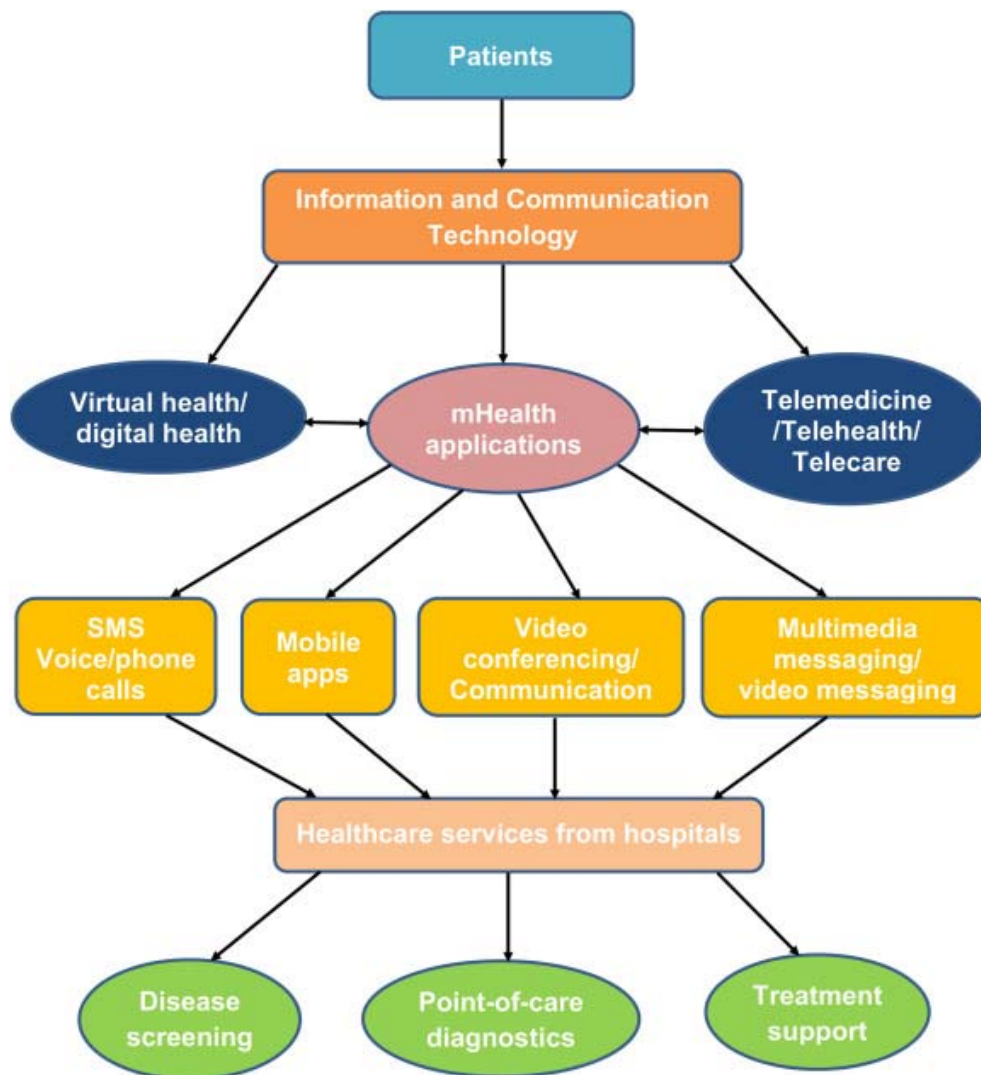


Figure 2. A patient pathway of using mHealth for healthcare delivery

For instance, AI tools help in preliminary analysis of patients, detecting symptoms in tuberculosis treatment, the early symptoms of diabetes and cardiovascular diseases, and patient outcomes are notably observed (Das et al., 2024). This proactive healthcare model has significantly relieved the country's dependence on foreign-funded medical projects and has empowered local medical practitioners with technology diagnostics that are highly relevant to the country's priorities in the sphere of healthcare.

7.1.3 Economic Development in Kenya

Kenya has emerged as one of the world's leading innovators in artificial intelligence to spur economic growth, primarily through machine learning in agriculture.



Figure 3. The application recognizes objects on plant leaves and patterns that point to disease outbreaks using TensorFlow image detection technology (Achieng', 2023)

Farmers employ mobile applications powered with AI that offer forecasts on yields, weather, and pests to counterbalance the prices and elevate productivity with minimal interferences from the assistance of outer support (Spratt, 2023). Utilizing this AI-supporting model, the agricultural segment has become more independent from donor funding, which makes Kenya's economy more stable.

7.2 Lessons Learned from AI-Based Initiatives

Education, health, and agricultural sector development initiatives spearheaded by AI demonstrate that these technologies are more likely to inspire sustainable improvements when implemented to suit local environments (Srivastava & Maity, 2023). Some models, like the foreign aid models, have a history of external problems and standards that may not fit local contexts. These case studies reveal three critical lessons for sustainable development:

Local Empowerment: AI technology is localized and owned by different jurisdictions, so it does not have to rely on much funding support from outside sources.

Scalability and Sustainability: AI systems can be applied to a large area and usually have fewer incremental costs than continuity foreign aid projects.

Alignment with Local Needs: AI efforts can be adapted to address the problems of individual zones to create development rather than relying on one-shot solutions based on the principles of aid programs (Abulibdeh et al., 2024).

8. Challenges & Ethical Considerations of AI Implementation

8.1 Ethical Concerns and Data Privacy

Adopting AI has many benefits, yet various ethical issues accompany its practice. Some aspects are as follows: Data privacy is important because AI uses large datasets containing personal data. In developing countries, there could be essential to no data protection measures; therefore, the tendencies toward misuse or unauthorized access to personal information could be high (Daalen, 2023). Data ownership and privacy concerns have to be approached through ethical guidelines like those of the European Union's General Data Protection Regulation (GDPR) and

AI4People to ensure data is treated ethically.

8.2 Access to Technology & Capacity Building

AI technologies are highly dependent on the internet, electricity, and technical personnel to facilitate the technological needs of the equipment. The lack of these core resources in most developing regions contributes to this skewing of the benefits. Therefore, there is a need to invest in digital infrastructure and undertake capacity-building schemes. For this reason, new partnerships between governments, NGOs, and private sector entities need to be formed in order for investments have to be made to improve WI-FI connectivity in these areas, bring in a stable electricity supply, and implement digital literacy programs for those in need of such services (Aerts & Bogdan-Martin, 2021). This will allow more people to benefit from AI-based solutions and gain access to relevant markets. Suppose stakeholders care enough to build an inclusive AI technology landscape. In that case, he said, these values drive can also unleash AI for the poorest of the poor to make them their agents of change for sustainability. Technology accessibility is necessary for the Global Goals; thus, incorporating artificial intelligence technologies is groundbreaking for the Global Goals.

AI capability must remain sustainable and self-contained to ensure that primary populations can run and maintain it over time. The lack of training and knowledge sharing leaves communities in such a state that they still have to rely on external professional help, contrary to the supposed concept of AI self-sufficiency. AI deployment requires local professionals to be armed with the capacity to create, implement, and manage AI technologies, which can only be done through capacity-building. These programs should call for technical training, system maintenance, and background adaptation to meet local conditions where an AI solution is to be implemented (Aerts & Bogdan-Martin, 2021). They can do it thus: objectives of the process and directions of its development can be defined with the help of partnerships between governments, educational institutions, and private organizations, including their informational and resource support. When local capacity enhancement is given priority in the adoption of AI, the practice attains enhanced sustainability while at the same time fostering the process of employees dwelling on the implementation of AI technologies while minimizing their dependence on foreign assistance.

8.3 Balancing AI with Human Expertise

AI should supplement human skills in order to avoid overdependence on technology. In healthcare, for example, artificial intelligence can assist in diagnostics and undertake tests on patients to give crucial information to doctors. Nevertheless, such tools should not replace the clinician's evaluation, as human skill is significant when assessing multidimensional factors that may apply to specific use cases. AI platforms can improve teaching by customizing learning and easing other pedagogical burdens. However, it is important to stress again that it is the teacher who happens to be uniquely capable of teaching students critical thinking, emotional intelligence, and cultural sensitivity. Human and artificial intelligence are used here to supplement each other, making the systems more efficient, sensitive to the social environment, and culturally relevant. This approach also helps underpin technology as an enabler of professionals rather than a threat that replaces them, where innovation creates a more productive atmosphere for sectors while maintaining humane results.

9. Conclusion

The COVID-19 pandemic revealed the inefficiency of the traditional approach to foreign aid in the context of solving structural problems in education, health care, and socioeconomic development. The failure of twenty years of aid to encourage sustainable advances is proof of this and why other strategies are required. Foreign aid locks recipient countries in dependency traps, fails to allocate resources appropriately, and does not address the country's needs. With AI solutions in place, such nations can turn the post-crisis era into an opportunity that helps to create new personal development models while providing communities with innovative local solutions to break out of a crisis response approach to solving problems.

Artificial intelligence provides an opportunity to rethink development and make sustainable development out of it. By aligning with the UN Sustainable Development Goals (SDGs), which include SDG 3: Good Health and Well-being, SDG 4: Quality Education, and SDG 8: Decent Work and Economic Growth, AI unlocks context-adaptive, sustainable solutions so that people, organizations, and societies can own their respective futures. Artificial Intelligence is superior to conventional modes of development in that it focuses on causes rather than symptoms of development challenges, ranging from education with its approach to improving healthcare systems to attaining economic self-sufficiency. Rugged by design, AI-based interventions help several underprivileged regions bypass age-old developmental challenges and become more sustainable and part of overall global prosperity.

Artificial intelligence requires a focus on critical areas where stakeholders must allocate resources with policy

support and generate socio-technical settings tailored to embracing digital innovation: organization of digital channels, values of technology use, and accessibility for all. Members of government, NGOs, and private actors should develop culturally sensitive AI solutions within communities and be able to promote sustainability within these communities. Developing countries may create an environment for self-sustainable development when moving from dependence-stimulating aid to AI solutions designed for development. This approach assists communities, incubates ideas through invention, and will trigger sustainable development since most activities are carried out independently.

Moving forward, it may be possible to reverse or limit some adverse effects of AI, but in the current reality, its acceptance as the instrument of development may help the underrepresented areas gain more autonomy, adapt to the local context, and thus help build a fair global future. As the world strives for a post-pandemic future, AI allows redesigning the process of development to make it genuine and people-independent. The positive impact of AI can be used to foster sustainable, localized development and simultaneously solve local and global challenges.

References

- Abass, A., Opoku, O. G., David, A. M., Daniel, O., & Ellen, N. B. (2024). The influence of foreign aid on the landscape of higher education in Ghana: a multi-stakeholder analysis. *Cogent Education*, 11(1). <https://doi.org/10.1080/2331186x.2024.2389360>
- Abulibdeh, A., Zaidan, E., & Abulibdeh, R. (2024). Navigating the confluence of artificial intelligence and education for sustainable development in the era of industry 4.0: Challenges, opportunities, and ethical dimensions. *Journal of Cleaner Production*, 437, 140527–140527. <https://doi.org/10.1016/j.jclepro.2023.140527>
- Achieng², M. (2023, October 17). *AI in agriculture: How Kenyan farmers benefit from plantvillage nuru app—scholar media Africa*. Scholar Media Africa. Retrieved from <https://scholarmedia.africa/agribusiness/ai-in-agriculture-how-kenyan-farmers-benefit-from-plantvillage-nuru-app/>
- Adel, A. (2024). The convergence of intelligent tutoring, robotics, and IoT in smart education for the transition from industry 4.0 to 5.0. *Smart Cities*, 7(1), 325–369. <https://doi.org/10.3390/smartcities7010014>
- Aerts, A., & Bogdan-Martin, D. (2021). Leveraging data and AI to deliver on the promise of digital health. *International Journal of Medical Informatics*, 150, 104456. <https://doi.org/10.1016/j.ijmedinf.2021.104456>
- Ajaj, R., Buheji, M., & Hassoun, A. (2024). Optimizing the Readiness for Industry 4.0 in Fulfilling the Sustainable Development Goal 1: Focus on Poverty Elimination in Africa. *Frontiers in Sustainable Food Systems*, 8. <https://doi.org/10.3389/fsufs.2024.1393935>
- Aldoseri, A., Khalifa, K. N. A., & Hamouda, A. M. (2023). Re-Thinking Data Strategy and Integration for Artificial Intelligence: Concepts, Opportunities, and Challenges. *Applied Sciences*, 13(12), 7082–7082. <https://doi.org/10.3390/app13127082>
- Aljonaaid, N. A. A., Qin, F., & Zhang, Z. (2022). The heterogeneous impact of sectoral foreign aid inflows on sectoral growth: SUR evidence from selected sub-saharan african and MENA countries. *Journal of Risk and Financial Management*, 15(3), 107. <https://doi.org/10.3390/jrfm15030107>
- Aminizadeh, S., Heidari, A., Dehghan, M., Toumaj, S., Rezaei, M., Navimipour, N. J., ... Unal, M. (2024). Opportunities and challenges of artificial intelligence and distributed systems to improve the quality of healthcare service. *Artificial Intelligence in Medicine*, 149, 102779. <https://doi.org/10.1016/j.artmed.2024.102779>
- Anderson. (2024, March 4). *How AI helped overcome the Education Gap with this Pilot Project in Rwanda—A Story of Hope*. Medium; Medium. Retrieved from <https://medium.com/@vforqa/ai-helps-overcome-the-education-gap-in-third-world-countries-ft-a9c752013a4b>
- Bajwa, J., Munir, U., Nori, A., & Williams, B. (2021). Artificial intelligence in healthcare: Transforming the practice of medicine. *Future Healthcare Journal*, 8(2), 188–194. NCBI. <https://doi.org/10.7861/fhj.2021-0095>
- Bloom, H. N. (2024). *Access method disabled in the proquest administrator module—proquest*. Proquest.com. Retrieved from <https://www.proquest.com/openview/40962a19d3d573a0d5ba92d79dc015e2/1?pq-origsite=gscholar&cbl=18750&diss=y>
- Butcher, N., Wilson-Strydom, M., & Baijnath, M. (2021, March 29). *Artificial intelligence capacity in sub-Saharan Africa: Compendium report*. Handle.net; AI4D Africa. <http://hdl.handle.net/10625/59999>

- Daalen, O. L. van. (2023). The right to encryption: Privacy as preventing unlawful access. *Computer Law & Security Review*, 49, 105804. <https://doi.org/10.1016/j.clsr.2023.105804>
- Das, S. K., Dasgupta, R. K., Roy, S. D., & Shil, D. (2024). AI in Indian healthcare: From roadmap to reality. *Intelligent Pharmacy*, 2(3). <https://doi.org/10.1016/j.ipha.2024.02.005>
- Dreher, A., Lang, V., & Reinsberg, B. (2024). Aid effectiveness and donor motives. *World Development*, 176, 106501. <https://doi.org/10.1016/j.worlddev.2023.106501>
- Eder, J. (2021, April 22). *Decreasing dependency through self-reliance: Strengthening local economies through community wealth building*. ResearchGate. Retrieved from https://www.researchgate.net/publication/351051512_Decreasing_Dependency_through_Self-Reliance_Strengthening_Local_Economies_through_Community_Wealth_Building
- Fazal, T. M. (2020). Health diplomacy in Pandemical times. *International Organization*, 74(S1), 1–20. <https://doi.org/10.1017/s0020818320000326>
- Fentahun, G. (2023). Foreign aid in the post-colonial Africa: Means for building democracy or ensuring Western domination? *Cogent Social Sciences*, 9(1). <https://doi.org/10.1080/23311886.2023.2241257>
- Friesner, J., Colón-Carmona, A., Schnoes, A. M., Stepanova, A., Mason, G. A., Macintosh, G. C., ... Yadegari, R. (2021). Broadening the impact of plant science through innovative, integrative, and inclusive outreach. *Plant Direct*, 5(4), e00316. <https://doi.org/10.1002/pld3.316>
- Hennessy, J., Mortimer, D., Sweeney, R., & Maame, E. W. (2023). Donor versus recipient preferences for aid allocation: A systematic review of stated-preference studies. *Social Science & Medicine*, 334, 116184–116184. <https://doi.org/10.1016/j.socscimed.2023.116184>
- Huffstetler, H. E., Bandara, S., Bharali, I., Kennedy Mcdade, K., Mao, W., Guo, F., ... Ogbuaji, O. (2022). The impacts of donor transitions on health systems in middle-income countries: a scoping review. *Health Policy and Planning*, 37(9), 1188–1202. <https://doi.org/10.1093/heapol/czac063>
- Iazzolino, G., & Stremlau, N. (2024). AI for Social Good and the Corporate Capture of Global Development. *Information Technology for Development*, 30(4), 1–18. <https://doi.org/10.1080/02681102.2023.2299351>
- Ilesanmi, O. S., & Afolabi, A. A. (2022). *Sustainability of donor-funded health-related programs beyond the funding lifecycle in Africa: A systematic review*. Cureus. <https://doi.org/10.7759/cureus.24643>
- Javaid, M., Haleem, A., Khan, I. H., & Suman, R. (2022). Understanding the potential applications of Artificial Intelligence in Agriculture Sector. *Advanced Agrochem*, 2(1), 15–30. ScienceDirect. <https://doi.org/10.1016/j.aac.2022.10.001>
- Javaid, M., Haleem, A., Singh, R. P., Suman, R., & Rab, S. (2022). Significance of machine learning in healthcare: Features, pillars and applications. *International Journal of Intelligent Networks*, 3(2), 58–73. <https://doi.org/10.1016/j.ijin.2022.05.002>
- Kamalov, F., Calonge, D. S., & Gurrib, I. (2023). New era of artificial intelligence in education: Towards a sustainable multifaceted revolution. *Sustainability*, 15(16), 12451. <https://doi.org/10.3390/su151612451>
- Kamruzzaman, M. M., Alanazi, S., Alruwaili, M., Alshammari, N., Elaiwat, S., Abu-Zanona, M., ... Ahmed, A. B. (2023). AI- and IoT-Assisted Sustainable Education Systems during Pandemics, such as COVID-19, for Smart Cities. *Sustainability*, 15(10), 8354. <https://doi.org/10.3390/su15108354>
- Leitão, C. A., Lucca, G., Bukunmi, M. I., & Farouk, D. (2024). Drivers of Global Healthcare Worker Migration. *Journal of the American College of Radiology*, 28(8). <https://doi.org/10.1016/j.jacr.2024.03.005>
- Lopes, C. (2024). The disappointing discussion about aid effectiveness. *The Self-Deception Trap*, 39–57. https://doi.org/10.1007/978-3-031-57591-4_3
- Mangwanya, M. (2022). Evaluating the impacts of foreign aid on low-income countries in sub-saharan africa. *International Journal of Research in Business and Social Science* (2147-4478), 11(6), 370–377. <https://doi.org/10.20525/ijrbs.v11i6.1925>
- Mann, L., & Iazzolino, G. (2021). From development state to corporate leviathan: Historicizing the infrastructural performativity of digital platforms within kenyan agriculture. *Development and Change*, 52(4), 829–854. <https://doi.org/10.1111/dech.12671>
- Mhlanga, D. (2021). Artificial Intelligence in the Industry 4.0, and Its Impact on Poverty, Innovation, Infrastructure Development, and the Sustainable Development Goals: Lessons from Emerging Economies? *Sustainability*,

- 13(11), 5788. <https://doi.org/10.3390/su13115788>
- Mhlanga, D. (2022). Human-Centered artificial intelligence: The superlative approach to achieve sustainable development goals in the fourth industrial revolution. *Sustainability*, 14(13), 7804. <https://doi.org/10.3390/su14137804>
- Osei, E., & Mashamba-Thompson, T. P. (2021). Mobile health applications for disease screening and treatment support in low-and middle-income countries: A narrative review. *Heliyon*, 7(3), e06639. <https://doi.org/10.1016/j.heliyon.2021.e06639>
- Quan, T., Zhang, H., Quan, T., & Yu, Y. (2024). Unveiling the impact and mechanism of digital technology on agricultural economic resilience. *Chinese Journal of Population Resources and Environment*, 22(2), 136–145. <https://doi.org/10.1016/j.cjpre.2024.06.004>
- Ralaidovy, A. H., Lauer, J. A., Pretorius, C., Briët, O. J., & Patouillard, E. (2021). Priority Setting in HIV, Tuberculosis, and Malaria – New Cost-Effectiveness Results From WHO-CHOICE. *International Journal of Health Policy and Management*. <https://doi.org/10.34172/ijhpm.2020.251>
- Regona, M., Yigitcanlar, T., Hon, C., & Teo, M. (2024). Artificial Intelligence and Sustainable Development Goals: Systematic Literature Review of the Construction Industry. *Sustainable Cities and Society*, 108, 105499–105499. <https://doi.org/10.1016/j.scs.2024.105499>
- Schaar, M., Alaa, A. M., Floto, A., Gimson, A., Scholtes, S., Wood, A., ... Ercole, A. (2020). How artificial intelligence and machine learning can help healthcare systems respond to COVID-19. *Machine Learning*, 110. <https://doi.org/10.1007/s10994-020-05928-x>
- Scheerens, C., Bekaert, E., Ray, S., Essuman, A., Mash, B., Decat, P., ... Ruysen, I. (2021). Family Physician Perceptions of Climate Change, Migration, Health, and Healthcare in Sub-Saharan Africa: An Exploratory Study. *International Journal of Environmental Research and Public Health*, 18(12), 6323. <https://doi.org/10.3390/ijerph18126323>
- Selvaraj, S. (2024). Enhancing healthcare access in rural communities: Assessing the influence of telehealth services and information technology. *International Journal of Science and Research (IJSR)*, 13(7), 1141–1145. <https://doi.org/10.21275/sr24723160704>
- Shava, E. (2020). Financial Sustainability of NGOs in Rural Development Programmes. *Development in Practice*, 31(3), 1–11. <https://doi.org/10.1080/09614524.2020.1853059>
- Shija, K. (2022). Amartya Sen’s Capability Approach as Theoretical Foundation of Human Development Published in JSD. 1(1), 127–145. Retrieved from https://www.researchgate.net/publication/362961137_Amartya_Sen
- Spratt, A. (2023, March 14). *How AI helps Kenyan small-holder farmers to adapt to climate change*. BMZ Digital. Global. Retrieved from <https://www.bmz-digital.global/en/how-ai-helps-kenyan-small-holder-farmers-to-adapt-to-climate-change/>
- Srivastava, A., & Maity, R. (2023). Assessing the potential of AI–ML in urban climate change adaptation and sustainable development. *Sustainability*, 15(23), 16461. <https://doi.org/10.3390/su152316461>
- Thapa, I. (2020, July). *Foreign aid: Positive and negative impact in developing countries*. ResearchGate. Retrieved from https://www.researchgate.net/publication/342899519_Foreign_Aid_Positive_and_Negative_Impact_in_Developing_Countries
- USAID. (2024). *AI IN GLOBAL DEVELOPMENT PLAYBOOK 2 AI in Global Development Playbook*. Retrieved from <https://www.usaid.gov/sites/default/files/2024-09/Artificial%20Intelligence%20in%20Global%20Development%20Playbook.pdf>
- Waldron, K., & Coyne, C. J. (2024). You Can’t Develop What You Don’t Know: The Realities and Limitations of Foreign Aid Missions. *International Studies in Entrepreneurship*, 191–212. https://doi.org/10.1007/978-3-031-49196-2_11
- Weronika, D. (2024, September 25). *How AI Is Improving Diagnostics and Health Outcomes*. World Economic Forum. Retrieved from <https://www.weforum.org/stories/2024/09/ai-diagnostics-health-outcomes/>
- Writer, G. (2023, December 20). *Introducing the national artificial intelligence policy for rwanda*. ICTworks. Retrieved from <https://www.ictworks.org/national-artificial-intelligence-policy-rwanda/>

- Yadav, M., Singh, S. K., Chandel, A., & Hung, T. H. (2024). AI in Teacher Training. In *Advances in Educational Technologies and Instructional Design Book Series* (pp. 171–200). <https://doi.org/10.4018/979-8-3693-0884-4.ch008>
- Yigitcanlar, T., Corchado, J. M., Mehmood, R., Li, R. Y. M., Mossberger, K., & Desouza, K. (2021). Responsible Urban Innovation with Local Government Artificial Intelligence (AI): A Conceptual Framework and Research Agenda. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), 71. <https://doi.org/10.3390/joitmc7010071>
- Yu, Y., Appiah, D., Zulu, B., & Kofi, A. A.-P. (2024). Integrating Rural Development, Education, and Management: Challenges and Strategies. *Sustainability*, 16(15), 6474–6474. <https://doi.org/10.3390/su16156474>
- Zhao, A. P., Li, S., Cao, Z., Hu, P. J.-H., Wang, J., Xiang, Y., ... Lu, X. (2024). AI for Science: Predicting Infectious Diseases. *Journal of Safety Science and Resilience*, 5(2). <https://doi.org/10.1016/j.jnlssr.2024.02.002>

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