Artificial Intelligence and Public Health: Smart Health for Sustainable Goals

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Artificial intelligence (AI) is reshaping public health by enabling smarter, faster, and more equitable interventions. When aligned with the Sustainable Development Goals (SDGs), AI solutions become a systems catalyst—bridging data gaps, optimizing resources, and amplifying resilience across sectors. This article explores how AI contributes to public health within each SDG (Table 1), drawing on global research, institutional frameworks, and strategic insights.

Sustainable Development Goal	Simplified AI Impact
1. No Poverty	AI pinpoints vulnerable groups and predicts poverty linked health risks
2. Zero Hunger	Smart farming and nutrition tracking cut malnutrition
3. Good Health and Well-being	AI boosts diagnostics, telemedicine, and personalized care
4. Quality Education	Expands access to learning in underserved communities
5. Gender Equality	Detects health gaps and improves maternal care with bias aware tools
6. Clean Water and Sanitation	Tracks water quality and predicts contamination risks
7. Affordable and Clean Energy	Optimizes clinic energy use and powers remote care reliably
8. Decent Work and Economic Growth	Analytics improve workplace safety and labor equity
9. Industry, Innovation and Infrastructure	Cuts costs and strengthens infrastructure resilience
10. Reduced Inequalities	AI drives efficiency while promoting inclusive health systems
11. Sustainable Cities and Communities	Predictive insights guide urban planning and public health
12. Responsible Consumption and Production	Forecasts demand, manages inventory, and reduces waste
13. Climate Action	Models disease risks from climate stress and guides adaptation
14. Life Below Water	Monitors marine pollution and supports seafood safety
15. Life on Land	Detects zoonotic diseases and links biodiversity to health
16. Peace, Justice and Strong Institutions	AI improves transparency and equity in health governance
17. Partnerships for the Goals	Enables global data sharing and collaborative innovation

Table 1. Exploring contributions of Artificial Intelligence to public health within each SDG

Human Well-being and Equity

Artificial Intelligence is rapidly advancing the Sustainable Development Goals, with its most immediate impact in public health. Central to SDG 3—Good Health and Well-being—AI enhances diagnostics, telemedicine, epidemic forecasting, and personalized care. These tools proved critical during pandemics, helping track viral spread and guide resource allocation[i]. AI also empowers individuals through chatbots and adaptive platforms that support chronic disease management and preventive behaviors. This expansion of health literacy supports SDG 4—Quality Education, especially in underserved communities. AI's role extends to SDG 2—Zero Hunger, where precision agriculture and nutrition surveillance reduce malnutrition by analyzing soil, crops, and consumption data. These insights strengthen food systems and improve outcomes for vulnerable groups[ii]. For SDG 1—No Poverty, AI enables targeted interventions by identifying underserved populations and predicting health risks tied to deprivation. Algorithms guide inclusive insurance design and improve care access. Worthy of a mention, AI is advancing SDG 5—Gender Equality by detecting gender-based health gaps and improving reproductive and maternal care through bias-aware algorithms. Across these goals, AI enhances efficiency while reinforcing the ethical imperative (SDG 10— Reduced Inequalities) to build inclusive, resilient health systems[iii].

Infrastructure and Innovation

Artificial Intelligence is increasingly recognized as a foundational enabler of health access, economic resilience, and systemic stability. In alignment with SDG 9—Industry, Innovation and Infrastructure—AI-driven innovations are transforming the health sector by enhancing care coordination, reducing operational costs, and fortifying infrastructure, particularly in disaster-prone and underserved regions[iv]. These technologies underpin the development of smart hospitals, resilient supply chains, and interoperable health data ecosystems that can adapt to crises and scale with demand. In the context of SDG 11—Sustainable Cities and Communities—AI plays a pivotal role in shaping healthier urban environments. Smart city initiatives are leveraging AI models to detect and respond to urban health risks such as air pollution, heat stress, and emergency response needs. These predictive insights inform urban planning and bolster public health preparedness, especially in rapidly expanding metropolitan areas. Moreover, AI supports smart mobility systems and real-time environmental monitoring, contributing to more livable, sustainable, and health-conscious urban communities. Through these applications, AI not only advances technological innovation but also reinforces the infrastructure and governance needed for inclusive and resilient development.

Environment and Natural Resources

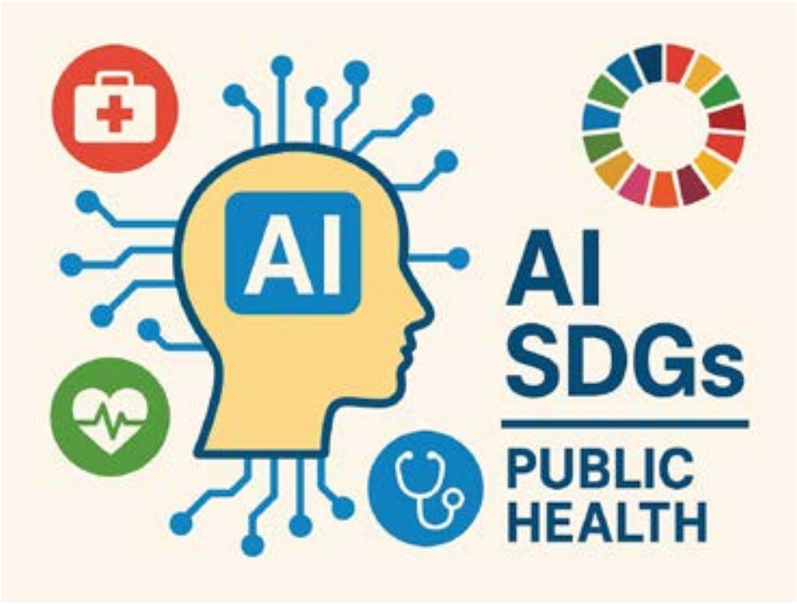
Environmental health is another domain where AI's integrative power is evident. For example, optimizing energy use in health facilities not only supports clean energy transitions but also ensures reliable power for clinics and digital platforms in remote regions, enhancing care delivery while reducing environmental impact (SDG 7—Affordable and Clean Energy). These efficiencies ripple outward, enabling smarter resource allocation and more sustainable operations across sectors. In parallel, AI-driven predictive analytics are transforming workplace safety and labor equity (SDG 8—Decent Work and Economic Growth). By identifying risks of burnout, injury, and disease, especially among healthcare workers, AI fosters healthier work environments and informs inclusive employment strategies[v]. These labor protections are deeply connected to climate resilience: as AI models forecast disease outbreaks linked to environmental stressors, they guide adaptation strategies that protect vulnerable populations and maintain workforce stability under shifting conditions, (In support of SDG 13—Climate Action). Monitoring water quality, predicting contamination, and supporting sanitation infrastructure (SDG 6—Clean Water and Sanitation) not only prevent

[i] Lancet Digital Health. (2022). AI in diagnostics and global health equity.
[ii] WHO. (2021). Ethics and governance of artificial intelligence for health.
[iii] Center for Global Development. (2022). AI and health equity in LMICs.
[iv] McKinsey & Company. (2023). AI in healthcare: Scaling impact responsibly.
[v] Deloitte. (2022). AI for health equity and ESG integration.

disease but also strengthen emergency response systems during floods or droughts—events increasingly shaped by climate change. Similarly, AI's ability to track marine pollution and model ocean-health interactions enhances seafood safety and supports the nutritional needs of coastal communities, while informing broader conservation efforts (For SDG 14—Life Below Water). On land, AI enables early detection of zoonotic diseases and models the health impacts of land-use change, reinforcing the link between biodiversity preservation and human health (SDG 15—Life on Land). These insights are critical for pandemic prevention and pharmaceutical innovation, and they underscore the importance of ecosystem integrity in sustaining life and livelihoods. Across these interconnected domains, AI serves not just as a tool for efficiency, but as a strategic enabler of systems thinking—bridging gaps between infrastructure, ecology, and equity to accelerate progress toward a healthier, more sustainable world.

Community and Governance; Collective Collaboration - Partnerships for the Goals

To promote Responsible Consumption and Production (SDG 12), AI contributes by tracking medical supply chains, reducing waste, and promoting sustainable procurement. Hospitals and health systems can use AI to forecast demand, manage inventory, and minimize environmental impact[vi]. AI enhances health governance, fraud detection, and institutional trust (SDG 16, Peace, Justice and Strong Institutions). Algorithms can monitor corruption risks, improve transparency in health financing, and support equitable access to justice in health systems[vii]. Finally, AI advances SDG 17, Partnerships for the Goals, by enabling global data sharing, federated learning, and collaborative innovation. These capabilities support cross-sectoral health initiatives, accelerate research, and foster inclusive partnerships across borders. This goal underpins all others by promoting partnerships, data sharing, and cross-sectoral cooperation. AI becomes a bridge—not just a tool—when embedded in shared systems of care.



Conclusion

Artificial intelligence is a systems enabler for public health transformation. Through the lens of Sustainable Development Goals (SDGs), it is clear how AI becomes a strategic force for equity, resilience, and sustainability in public health. Its ability to model complex interactions, personalize care, and optimize resources makes it indispensable in addressing both immediate health challenges and long-term systemic gaps. However, its deployment must be governed ethically, designed inclusively, and embedded within broader frameworks of sustainability and institutional trust. For leaders shaping the future of healthcare, AI offers new ways of seeing, connecting, and acting across the full spectrum of global health priorities.

[vi] EY. (2022). AI and sustainability: The next frontier.
[vii] Berkman Klein Center. (2022). AI ethics and institutional trust.