

*Right to Health and Life: Utilising Artificial Intelligence (AI) and Robotics to Transform Emergency Response for Firefighters and Diagnostic Precision for Doctors*

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**Kariuki Muigua**

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**Table of Contents**

Abstract.....	3
1.0 Introduction .....	3
2.0 Role of Artificial Intelligence and Robotics in Promoting the Right to Health and Life.....	5
3.0 Conclusion.....	7
References.....	9

**Right to Health and Life: Utilising Artificial Intelligence (AI) and Robotics to Transform Emergency Response for Firefighters and Diagnostic Precision for Doctors**

**Kariuki Muigua\***

**Abstract**

*This paper critically examines how AI and robotics can be harnessed towards fostering the right to health and life. The paper observes that in light of global health threats and challenges, modern technologies including AI and robotics provide effective solutions that can transform and improve the right to health and life. In particular, the paper notes that AI and robotics can transform emergency response for firefighters and diagnostic precision for doctors. Despite their efficacy, the paper also notes that the use of AI and robotics presents several risks and challenges that must be adequately navigated in order to harness their potential. Consequently, the paper discusses how AI and robotics can be appropriately and ethically harnessed towards transforming emergency response for firefighters and diagnostic precision for doctors in order to achieve the right to health and life for posterity.*

**1.0 Introduction**

The right to health is a fundamental human right. The World Health Organization (WHO) observes that the enjoyment of the highest attainable standard of health is one of the fundamental rights that every person is entitled to without distinction of race, religion, political belief, economic or social condition<sup>1</sup>. WHO further notes that the right to health encompasses four essential, interrelated elements which are: availability, accessibility, acceptability and quality<sup>2</sup>. *Availability* entails the need for a sufficient quantity of functioning health facilities, goods and services for all<sup>3</sup>. *Accessibility* on the other hand requires that health facilities, goods, and services must be attainable and reachable for everyone including through physical accessibility, non-discrimination, economic accessibility (affordability) and information accessibility<sup>4</sup>. *Acceptability* involves people-centred health facilities, goods, services and programmes including through respect for medical ethics, cultural appropriateness, and gender sensitivity<sup>5</sup>. *Quality* on the other hand envisages health facilities, goods, and services that are scientifically and medically approved in order to ensure safety for all<sup>6</sup>.

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<sup>1</sup> Constitution of the World Health Organization., Available at <https://apps.who.int/gb/bd/PDF/bd47/EN/constitution-en.pdf> (Accessed on 28/05/2026)

<sup>2</sup> World Health Organization., 'Human Rights' Available at <https://www.who.int/news-room/factsheets/detail/human-rights-and-health> (Accessed on 28/05/2026)

<sup>3</sup> Ibid

<sup>4</sup> Ibid

<sup>5</sup> Ibid

<sup>6</sup> Ibid

**Right to Health and Life: Utilising Artificial Intelligence (AI) and Robotics to Transform Emergency Response for Firefighters and Diagnostic Precision for Doctors**

The right to health has been enshrined at the global, regional and national levels. For example, at the global level, the *International Covenant on Economic, Social and Cultural Rights (ICESCR)*<sup>7</sup> recognizes the right of everyone to the enjoyment of the highest attainable standard of physical and mental health<sup>8</sup>. In addition, at the regional level, the *African Charter on Human and Peoples' Rights*<sup>9</sup> enshrines the right of every person to enjoy the best attainable state of physical and mental health<sup>10</sup>. The Charter requires African countries to take the necessary measures to protect the health of their people and to ensure that they receive medical attention when they are sick<sup>11</sup>. In addition, at a national level, the *Constitution of Kenya*<sup>12</sup> enshrines the right of every person to the highest attainable standard of health, which includes the right to health care services, including reproductive health care<sup>13</sup>.

The right to health is therefore a fundamental human right all over the world. It has been correctly observed that health is both a basic human right in itself and an essential means for the realisation of other human rights<sup>14</sup>. For instance, good health is one of the many aspects of human well-being that is necessary for the enjoyment of all other human rights<sup>15</sup>. Good health and well-being also plays a pivotal role in empowering people to pursue other activities that will enhance their welfare<sup>16</sup>. It is therefore one of the cornerstones for the enhancement and improvement of overall wellbeing and human development since it enables human beings to undertake social, economic and cultural activities as well partake in civil and political activities towards attaining their rights<sup>17</sup>. However, despite its universal recognition and importance, it has been observed that challenges such as poverty, underequipped health facilities, inability of the infrastructure in place to meet existing health demands, inadequate human resource in health sectors and gender inequalities undermine the ability of citizens all over the world to access quality, modern and affordable health services<sup>18</sup>. In light of these concerns, it has been observed that harnessing Artificial Intelligence (AI) among other modern technologies is necessary towards transforming and strengthening global health systems and policies in order to attain the right to health and life for posterity<sup>19</sup>.

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<sup>7</sup> United Nations General Assembly, 'International Covenant on Economic, Social and Cultural Rights.' 16 December 1966, A/RES/2200.

<sup>8</sup> Ibid, Article 12 (1)

<sup>9</sup> Organization of African Unity (OAU), *African Charter on Human and Peoples' Rights* ("Banjul Charter"), 27 June 1981, CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982)

<sup>10</sup> Ibid, Article 16 (1)

<sup>11</sup> Ibid, Article 16 (2)

<sup>12</sup> Constitution of Kenya, 2010., Government Printer, Nairobi

<sup>13</sup> Ibid, Article 43 (1) (a)

<sup>14</sup> Nampewo. Z., Mike. J., & Wolff. J., 'Respecting, Protecting and Fulfilling the Human Right to Health.' *International Journal of Equity in Health*, Volume 21, No. 36 (2022)

<sup>15</sup> Ibid

<sup>16</sup> Ibid

<sup>17</sup> Ibid

<sup>18</sup> Muigua. K., 'Ensuring Healthy Lives and Well-being for All Kenyans.' Available at <https://kmco.co.ke/wp-content/uploads/2020/12/Ensuring-Healthy-Lives-and-Wellbeing-for-All-Kenyans-Kariuki-Muigua-December-2020.pdf> (Accessed on 28/05/2026)

<sup>19</sup> World Health Organization., 'Harnessing Artificial Intelligence for Health' Available at <https://www.who.int/teams/digital-health-and-innovation/harnessing-artificial-intelligence-for-health> (Accessed on 28/05/2026)

## ***Right to Health and Life: Utilising Artificial Intelligence (AI) and Robotics to Transform Emergency Response for Firefighters and Diagnostic Precision for Doctors***

This paper critically examines how AI and robotics can be harnessed towards fostering the right to health and life. The paper observes that in light of global health threats and challenges, modern technologies including AI and robotics provide effective solutions that can transform and improve the right to health and life. In particular, the paper notes that AI and robotics can transform emergency response for firefighters and diagnostic precision for doctors. Despite their efficacy, the paper also notes that the use of AI and robotics presents several risks and challenges that must be adequately navigated in order to harness their potential. Consequently, the paper discusses how AI and robotics can be appropriately and ethically harnessed towards transforming emergency response for firefighters and diagnostic precision for doctors in order to achieve the right to health and life for posterity.

### **2.0 Role of Artificial Intelligence and Robotics in Promoting the Right to Health and Life**

AI and robotics are two modern technologies with immense potential to foster the right to health and life. For instance, it has been observed that AI is improving health outcomes through enhanced detection of diseases such as malaria and tuberculosis while also fostering access to medical and health information through online health platforms<sup>20</sup>. It has been observed that in healthcare, algorithmic decision-making can assist doctors in identifying diseases in a clinical setting, where data is complex or sparse thus aiding them to make correct diagnoses<sup>21</sup>. AI tools and systems are enabling doctors to identify, predict and monitor diseases by analyzing vast amounts of data thus bolstering health outcomes and fostering the right to health and life<sup>22</sup>. It has been observed that AI is being increasingly utilised globally to identify health risks, conduct predictive modeling and provide evidence-based recommendations for public health policy and action<sup>23</sup>. According to WHO, AI is already playing a pertinent role in diagnosis and clinical care, drug development, disease surveillance, outbreak response, and health systems management thus bolstering the right to health<sup>24</sup>.

In addition to AI, robotics is another modern technology that is bolstering the right to health and life. The concept of robotics involves the design, construction, and use of machines that are programmed to replicate or substitute human actions and decision-making<sup>25</sup>. It has been observed that these machines, known as robots, are deployed across a wide range of industries to improve productivity, efficiency, and safety<sup>26</sup>. In particular, it has been observed that the use of robotics in healthcare is enabling a high level of patient care, efficient processes in clinical settings, and a safer environment for patients and healthcare workers<sup>27</sup>. Robotics can transform how surgeries are performed, streamline supply delivery and reduce

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<sup>20</sup> Owoyemi. A et al., 'Artificial Intelligence for Healthcare in Africa' Available at <https://pmc.ncbi.nlm.nih.gov/articles/PMC8521850/> (Accessed on 28/05/2026)

<sup>21</sup> European Parliament., 'Understanding Algorithmic Decision-Making: Opportunities and Challenges' Available at [https://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS\\_STU\(2019\)624261\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU(2019)624261_EN.pdf) (Accessed on 28/05/2026)

<sup>22</sup> Ibid

<sup>23</sup> AI Solutions for One Health Approaches to Epidemic and Pandemic Prevention and Response: Scale, Inclusion and Impact., Available at <https://www.ai4d.ai/projects/ai-solutions-for-one-health-approaches-to-epidemic-and-pandemic-prevention-and-response-scale-inclusion-and-impact> (Accessed on 28/05/2026)

<sup>24</sup> World Health Organization., 'Harnessing Artificial Intelligence for Health' Op Cit

<sup>25</sup> What is Robotics?., Available at <https://www.mtu.edu/academics/robotics/what/> (Accessed on 28/05/2026)

<sup>26</sup> Ibid

<sup>27</sup> Robotics in Healthcare: The Future of Robots in Healthcare., Available at <https://www.intel.com/content/www/us/en/learn/robotics-in-healthcare.html> (Accessed on 28/05/2026)

**Right to Health and Life: Utilising Artificial Intelligence (AI) and Robotics to Transform Emergency Response for Firefighters and Diagnostic Precision for Doctors**

the workload on healthcare provides thus enabling them to focus on caring for patients<sup>28</sup>. It has been pointed out that the application of robotics and AI can lead to improvements in medical diagnosis, surgical interventions, prevention and treatment of diseases, and support for rehabilitation and long-term care<sup>29</sup>. In addition, it has been noted that the integration of AI and robotics among other digital solutions can contribute to more effective and automated work management processes, while offering continuous training for health and care workers<sup>30</sup>.

Harnessing AI and robotics can therefore bolster health outcomes towards attaining the right to health and life. In addition to their general applications in healthcare, AI and robotics provide opportunities to transform emergency response for firefighters and diagnostic precision for doctors towards strengthening the right to health and life. For instance, the integration of AI and robotics can reduce risk related to firefighting and emergency responses thus protecting human health and life<sup>31</sup>. This can be achieved through the use of drones to identify burning structures and predict effective responses before the intervention of human beings towards safeguarding human life<sup>32</sup>. Further, in adverse conditions such as extreme heat or toxic chemical spills, robots can be utilised to extinguish fire, mitigate chemical explosions and clear debris thus minimizing impacts on firefighters and protecting human life<sup>33</sup>. In addition, it has been observed that with climate change being witnessed all over the world, its impacts including wildfires are becoming more frequent and intense<sup>34</sup>. When fighting wildfires, firefighters are usually confronted with challenges such as collapsing structures, toxic smoke, and uneven steep grounds<sup>35</sup>. It has been observed that autonomous firefighting robots can tackle these challenges by predicting and locating wildfires and extinguishing wildfires especially in extreme conditions or adverse terrains<sup>36</sup>.

Utilising AI and robotics can therefore transform emergency response for firefighters by enabling them to predict, detect and extinguish fires more safely, rapidly and effectively. In addition, these tools are transforming diagnostic precision for doctors thus fostering the right to health and life. Diagnostic precision has been identified as the cornerstone of effective healthcare since it enables doctors to tailor treatment plans that are specific to an individual's condition, thus increasing the likelihood of successful outcomes towards safeguarding the right to health and life<sup>37</sup>. On the other hand, misdiagnosis can lead to inappropriate treatments which can endanger human life and health<sup>38</sup>. It has been observed that AI tools

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<sup>28</sup> Ibid

<sup>29</sup> European Parliament., 'Robots in Healthcare: A Solution or a Problem?' Available at [https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/638391/IPOL\\_IDA\(2019\)638391\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/638391/IPOL_IDA(2019)638391_EN.pdf) (Accessed on 28/05/2026)

<sup>30</sup> Ibid

<sup>31</sup> Abdullahi. A.Y et al., 'Artificial Intelligence-Driven Autonomous Firefighting Robot using Arduino and Bluetooth' Available at [https://www.researchgate.net/publication/400208640\\_Artificial\\_Intelligence-Driven\\_Autonomous\\_Firefighting\\_Robot\\_using\\_Arduino\\_and\\_Bluetooth](https://www.researchgate.net/publication/400208640_Artificial_Intelligence-Driven_Autonomous_Firefighting_Robot_using_Arduino_and_Bluetooth) (Accessed on 29/05/2026)

<sup>32</sup> Ibid

<sup>33</sup> Ibid

<sup>34</sup> Robotics and AI to Predict and Fight Wildfires., Available at <https://aiforgood.itu.int/robotics-and-ai-to-predict-and-fight-wildfires/> (Accessed on 29/05/2026)

<sup>35</sup> Ibid

<sup>36</sup> Ibid

<sup>37</sup> Precision Diagnostics: The Cornerstone of Effective Treatment

<sup>38</sup> Ibid

## ***Right to Health and Life: Utilising Artificial Intelligence (AI) and Robotics to Transform Emergency Response for Firefighters and Diagnostic Precision for Doctors***

can enhance diagnostic precision for doctors for instance through machine learning models which process vast health data sets thus predicting complications before they occur for effective treatment<sup>39</sup>. AI tools and systems including imaging analysis and predictive diagnostics are being utilised to improve diagnostic accuracy, accelerate decision-making, and enhance patient outcomes<sup>40</sup>. In particular, AI improves diagnostic accuracy, speed, and cost-effectiveness, and ensures consistency by reducing human error<sup>41</sup>.

From the foregoing, it is evident that AI and robotics can transform emergency response for firefighters and diagnostic precision for doctors. However, it has been observed that the use of AI and other digital technologies in healthcare can undermine the right to privacy especially when online healthcare records, electronic medical records and communications with healthcare providers are not protected<sup>42</sup>. In addition, it has been observed that since AI models are only as good and accurate as the data they are relied on, use of diagnostic models that lack data diversity and inclusivity can perpetuate or worsen health inequalities against vulnerable and marginalized groups<sup>43</sup>. Further, it has been pointed out that in the context of firefighting, robotics are still not as adaptable as human beings and cannot operate autonomously in complex or unpredictable scenarios<sup>44</sup>. Tackling these challenges is necessary towards effectively utilising AI and robotics to transform emergency responses for firefighters and diagnostic precision for doctors in order to foster the right to health and life.

### **3.0 Conclusion**

Utilising AI and robotics is a valuable approach towards transforming emergency response for firefighters and diagnostic precision for doctors in order to foster the right to health and life. It is therefore imperative to harness these technologies in order to transform and improve health outcomes for all. In the context of firefighting, enhancing sensing and navigation capabilities of robotics and improving fire suppression including through targeted water delivery can ensure that this technology is effectively utilised to protect human life<sup>45</sup>. In addition, in the context of diagnostic precision, tackling algorithmic biases through inclusive and accurate models, protecting sensitive health data and records, and ensuring access to health technology for all especially in rural and marginalized areas is key towards harnessing the power of technology towards protecting the right to health and life<sup>46</sup>.

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<sup>39</sup> Artificial Intelligence in Medical Diagnostics., Available at <https://aslm.org/artificial-intelligence-in-medical-diagnostics-revolutionizing-precision-and-speed-in-healthcare/> (Accessed on 29/05/2026)

<sup>40</sup> Ibid

<sup>41</sup> Ibid

<sup>42</sup> United Nations Development Programme., 'Guidance on the rights-based and ethical use of digital technologies in HIV and health programmes' Available at <https://www.undp.org/publications/guidance-rights-based-and-ethical-use-digital-technologies-hiv-and-health-programmes#:~:text=Such%20technologies%20can%20support%20the,right%20to%20health%20for%20all> (Accessed on 29/05/2026)

<sup>43</sup> Artificial Intelligence in Medical Diagnostics., Op Cit

<sup>44</sup> How Robotics Can Reduce Firefighter Injuries?., Available at <https://www.shark-robotics.com/how-robotics-can-reduce-firefighter-injuries/> (Accessed on 29/05/2026)

<sup>45</sup> Abdullahi. A.Y et al., 'Artificial Intelligence-Driven Autonomous Firefighting Robot using Arduino and Bluetooth' Op Cit

<sup>46</sup> Artificial Intelligence in Medical Diagnostics., Op Cit

***Right to Health and Life: Utilising Artificial Intelligence (AI) and Robotics to Transform Emergency Response for Firefighters and Diagnostic Precision for Doctors***

Utilising AI and robotics is thus a practical endeavour towards transforming emergency response for firefighters and diagnostic precision for doctors in order to achieve the right to health and life for all.

**Right to Health and Life: Utilising Artificial Intelligence (AI) and Robotics to Transform Emergency Response for Firefighters and Diagnostic Precision for Doctors**

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