The Risks of using Artificial Intelligence in Healthcare

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Abstract:
This paper explores the risks that can be linked with using Artificial Intelligence (AI) within the healthcare industry.While AI has the potential to revolutionise not just the health sector but the world, it also has several major risks and issues that could cause a lot of harm.For example, errors in diagnosis and treatment, privacy breaches, increased reliance on technology, biassed and discrimination, increase in ransomware and cybersecurity attacks plus many more. Although there are various risks that can arise due to using AI algorithms there are various solutions that can be put in place in order to solve these issues, such as, creating ethical and legal frameworks, developers focusing on security measures and diverse datasets and having doctors double check the diagnosis that AI's give. This paper will go through the different risks and explain their impacts and solutions while using previous studies and reports to expand on points.

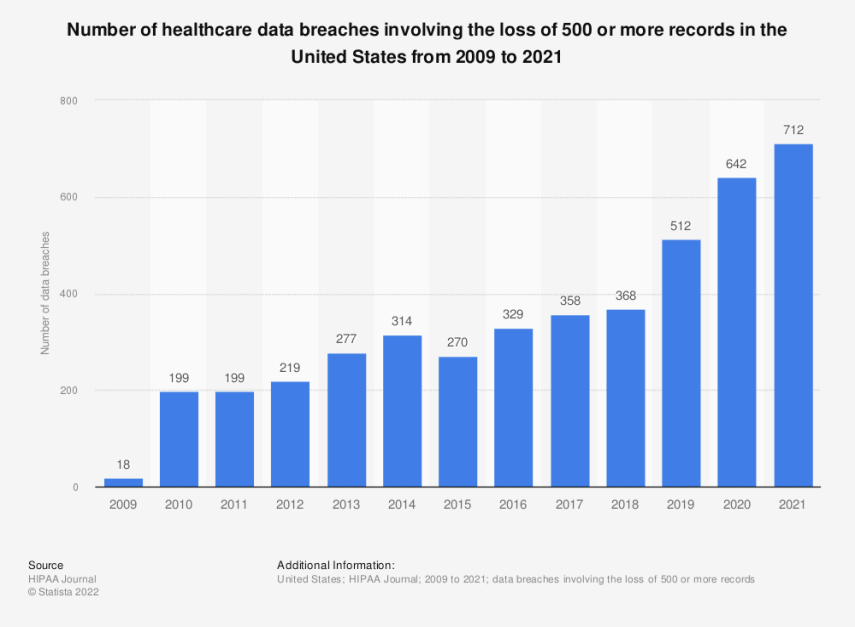
Introduction:

Throughout recent years we have seen the rapid growth of Artificial intelligence (AI), due to these enormous growths we are seeing many industries being changed either for the better (quicker automated factories) or the worse (more layoffs and fewer jobs). One of the biggest industries that is being affected by the rise of AI's help is the healthcare industry. The healthcare industry is using the advantages of AI-powered technologies to help diagnose diseases, develop treatment plans, and improve patient health. While Artificial Intelligence has the power to drastically improve the industry it also presents significant risks. For example, a systematic review that was conducted by ***Kim et al. (2020)*** helped identify several of these risks, including the potential for errors in the diagnosis and treatment, privacy breaches, and increased reliance on technology. Similarly, another study done by ***Alawadhi et al. (2020)*** found that AI in healthcare could potentially lead to biases and discrimination, particularly if the data used to train those AI algorithms were biased. As stated above, one of the major concerns with relying on AI in healthcare is the potential for privacy breaches. This is due to patient data being often stored electronically, and these AI algorithms will require access to substantial amounts of data to make accurate predictions. This could lead to massive amounts of ransomware attacks and blackmail as many unethical organisations will try to use the sensitive data for their own gain. However despite the potential risks associated with using AI in healthcare there have been several studies and reports that outline the benefits it brings. For example ***Karami et al. (2018)*** noted that Ai could improve the efficiency and accuracy of healthcare services, while ***Suresh (2019)*** argued that AI has the potential to improve patient outcomes and reduce healthcare costs.

The use of AI in healthcare has the potential to revolutionize the industry, but it also presents significant risks. I will continue to highlight these risks through numerous studies and reports as it is crucial for us to understand these risks and begin to develop strategies to mitigate them, so that we can use these algorithms safely and effectively.

Main Body:

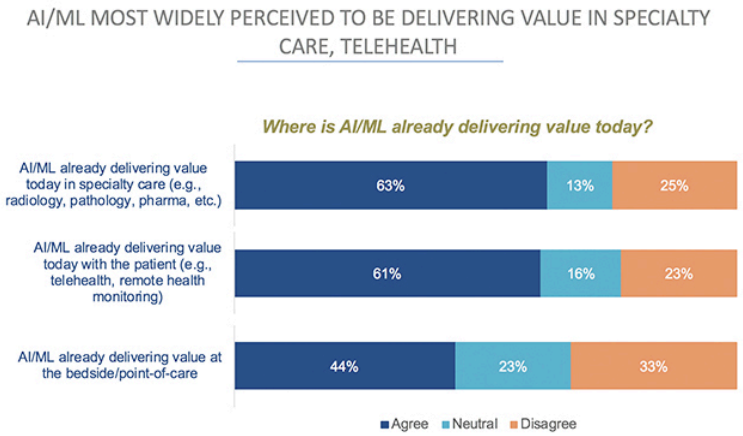
As stated in the introduction the use of Artificial Intelligence (AI) can bring many great advancements and breakthroughs to the Healthcare industry, however, it can also bring dangerous risks for all parties involved (staff, patients etc.). Several studies have been made into the revolutionising that AI brings to the healthcare industry and these studies also help bring to light the potential risks associated when AI algorithms are used, with the main ones being Privacy breaches, bias, the potential for harm to patients and ethical issues.



Arguably the most significant issue among these four is the risk of privacy breaches. This is mainly due to the fact that AI algorithms need to analyse extensive amounts of sensitive data, including medical records and personal information. One systematic study done by ***Alawadhi et al. (2020)*** helps expand on the reasoning as to why privacy breaches are a major risk associated with using artificial intelligence in the healthcare sector. Another study by ***Kim et al. (2020)*** found that currently healthcare data breaches cost companies and governments on average *$7.13 million* per incident. A solution to help mitigates this issue would be to have developers focus on their data security and implement secure and robust encryption and authentication algorithms and protocols.

Another significant risk that is brought by using AI is bias. This is due to how AI algorithms will learn from various data, if one of these datasets is bias it could result in the algorithm itself becoming bias this can cause further issues with misdiagnoses or inadequate treatment which as a whole could lead to patients losing their lives. A study done by ***Chen and Asch (2019)*** found that biased algorithms can deteriorate health clinics and reduce the quality of the overall care received. In order to help reduce this risk, developers must regularly check their algorithms for bias and also ensure all datasheets used are diverse themselves. While the other issues predominantly will affect the healthcare organisations and their security, there are also major risks that will greatly affect the patients as AI algorithms can still make mistakes that could lead to serious consequences. ***In 2019 a study***

done by Suresh found that an AI algorithm used to diagnose lung cancer had actually misdiagnosed the cancer in 13% of cases. This is arguably the risk that needs the most priority when it comes to solving the issues AI algorithms provide, as a misdiagnosed illness could cause further harm once treatment is underway, in order for this issue to mitigated we must prioritise safety and accuracy when developing the algorithms and conduct numerous testing practices. You could also implement a rule that for serious life changing treatment (Cancer etc.) the AI's diagnostic must be seen by a doctor before being finalised.



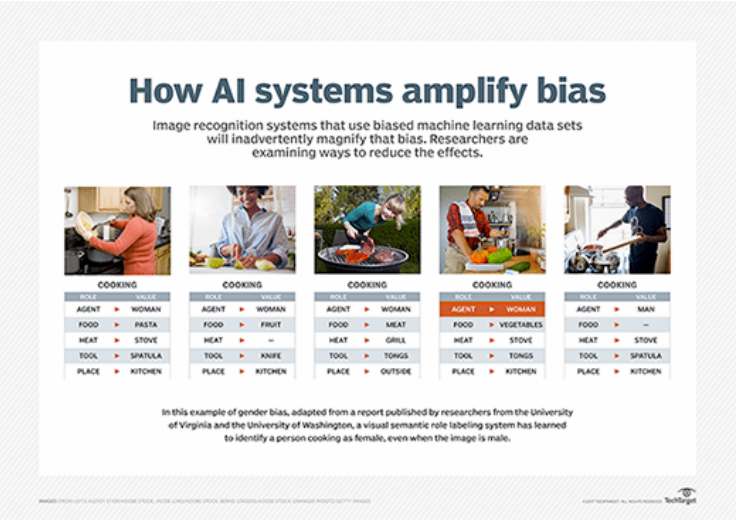
Privacy breaches, bias and potential harm are not the only risks that need to be solved when it comes to using Artificial Intelligence in healthcare, as ethical issues also need to be solved. In ***2019 Peña wrote a study*** that discussed how AI algorithms could be designed to help predict which patients have a high likelihood of developing certain diseases, however, this could lead to certain cases of discrimination from both insurance companies and employers. As well as being able to predict whether or not a patient is likely to obtain certain diseases, the AI algorithms could also be used to predict the dates that a patient is likely to pass away, this could cause and influence change in information of the patients will, this was expanded further in a study done by *Laio et al. (2020)* where they found that both legal and ethical frameworks are essential when guiding the development of the AI algorithms. This was also a solution raised by the study stated earlier by *Kim et al. (2020)* as they found that the frameworks will be good when it comes to the development and implementation. In order for us to ensure that these risks are mitigated as much as possible, healthcare providers and policymakers need to cooperate and develop ethical guidelines for the use of AI algorithms in the healthcare sector. A report that was done in ***2019 by the World Economic Forum*** states that healthcare organisations need to start focusing on *"transparency,* interpretability *and accountability"* when they develop the algorithms that will be used by healthcare operatives around the world. In addition to this a report from ***Deloitte (2020)*** suggested that healthcare providers should regularly conduct risk assessments and continue to use secure cybersecurity protocols to ensure safety.

As mentioned in the introduction, using, and incorporating Artificial Intelligence in the healthcare industry has the power to completely revolutionise the industry, but at current times it will also be accompanied by great risks. Due to this healthcare companies must focus their efforts on increasing patients' safety and start implementing ethical frameworks to help subside these risks. The AI algorithms should be used responsibly to ensure that it can have all the benefits with as insignificant risk as possible. As ***Healthcare IT News (2021)*** states, healthcare organisations must prioritise transparency, interpretability and accountability when developing and using AI algorithms to ensure patient safety.

Limitations and Further Research:

In the past few years Artificial Intelligence has become an ever-growing and expanding topic, especially how the introduction of AI algorithms can be used to benefit industries. Within the healthcare space many researchers have begun dissecting AI algorithms and their potential to improve patient outcomes and in certain cases reduce costs. However, like I have stated above, there are great risks that come with implementing AI algorithms into the healthcare system. Although extensive amounts of research have been conducted, there are still several limitations that still need to be addressed, with further research needed in order to help us understand these risks and the solutions needed to remove them.

One major limitation of the current research is the lack of a standard metric system for evaluating the AI systems that will be used. With no consistent system, challenges can start to arise when trying to identify the most effective solutions to a patient's problems. Because of this more testing and validation of these systems is drastically needed to ensure that they are reliable, accurate and effective ***(Liao et al. 2020)***. Another limitation that was stated in a previous section is that the datasets lack diversity, and this lack of diversity can lead to bias data that the algorithms are learning off. As I had briefly mentioned a solution that is needed to be researched and developed further is the application of fair and unbiased datasets when it comes to the AI algorithms, more research into how to identity and stop the biases that accumulate inside of the algorithms is needed to ensure that we completely remove any and all bias a AI algorithm could hold, especially if that algorithm is used in healthcare as the results of a bias algorithm could lead to loss of life or serious injury to patients.



To conclude, while there has been crucial research on the various risks and benefits of incorporating AI into healthcare, there are still multiple limitations that must be addressed before it can be seamlessly used, further research is mandatory in order to help understand the implications of this new technology and it should focus on developing standard metrics and biases as by addressing and fixing these issues we can help ensure that AI algorithms are used safely and effectively.

Conclusion:

The use of Artificial Intelligence in healthcare has the potential to improve patients' outcomes, and to increase the successfulness of diagnosing, however it also provides significant risk. Some of the most prominent risks that could occur are privacy breaches, biassed datasets, potential harm to patients and ethical issues. In order to help reduce and

eventually remove these risks, developers need to ensure that they focus on upholding safety and accuracy when developing these AI algorithms that will be used in the health sector. This can be done through regular checks for bias and diverse datasheets, an increase in security, having doctors check the algorithms diagnoses for important cases and creating ethical and legal frameworks.

In conclusion, the use of AI within the healthcare space can lead to significant growth in the advancements of medicine and treatment within the industry, but it is imperative to understand the potential risks associated with its use. lowering these risks and implementing proper regulations and protocols can help guarantee that AI is being used safely and effectively. It is also important that we ensure the safety and well-being of patients is at the foremost of importance by using the algorithms ethically and responsibly. The future of AI in healthcare is inevitable, however, if we fail to keep researching and solving these issues it will cause massive amounts of issues in the years to come.

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Image 2: 3 charts show where artificial intelligence is making an impact in healthcare right now (2019) Healthcare IT News. Available at: https://www.healthcareitnews.com/news/3-charts-show-where-artificial-intelligence-making-impact-healthcare-right-now (Accessed: April 30, 2023).

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