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Exploring the Effectiveness of Artificial Intelligence in Cancer Diagnosis: A rapid review

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BACKGROUND

EVERY FOUR MINUTES A PERSON IN THE UK LOSES THEIR LIFE TO CANCER (Cancer Research UK 2017 - 2019)

As a result, cancer diagnostic tools are important because they:

- Help **spot cancer early**
- **Improve** patient outcomes

Artificial Intelligence (AI) has the ability to further improve the effectiveness of cancer diagnostic tools to assist healthcare professionals and **reduce waiting times.**

WHAT IS ARTIFICIAL INTELLIGENCE?

AI involves the use of **computer systems** to execute tasks that would typically require **human intelligence.**

AIM

The aim of this study was to review the research evidence for the **effectiveness** of **Artificial Intelligence (AI)** in diagnostic radiology on **cancer diagnosis**. This work will inform the new Welsh Government AI Commission for Health and Social Care.

METHOD

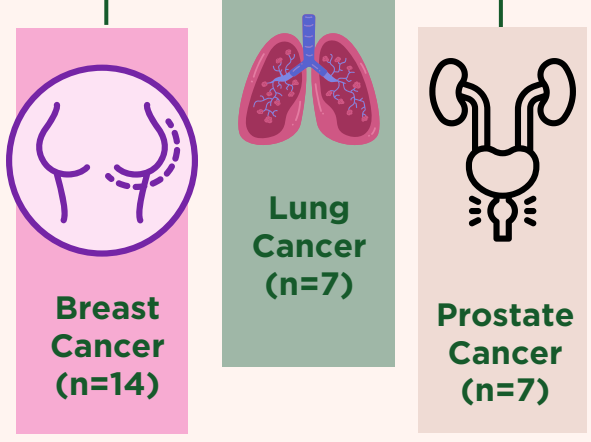
A **literature search** was conducted to identify **primary studies** that met a **predefined eligibility criteria**.

A total of **92 AI related primary studies** were used to construct an 'evidence map'.

Further discussion identified a **focus** for the rapid review.

The primary studies within the 'evidence map' were **rescreened**, and a **synthesis** of the evidence was produced.

CANCER TYPES STUDIED



KEY FINDINGS

The overall evidence for effectiveness appeared **in favour of AI,** although improvements were not always statistically significant.

MODERATE EVIDENCE

- Depending on the AI model used, findings may be **comparable to that of experienced radiologists**
- AI may be beneficial **when used as a support tool** for less experienced clinicians/radiologists
- AI may improve diagnostic **accuracy** in clinicians/radiologists with less experience of interpreting **radiological images**
- The impact of AI on diagnosis timelines are **uncertain**
- AI may **speed up the diagnostic timeline when the level of cancer suspicion is low** but **may increase diagnostic timelines when the level of cancer suspicion is high**
- Clinicians seem **accepting** of AI-based assistance for cancer diagnosis

LIMITED EVIDENCE

- There is **little evidence on the cost-effectiveness** of using AI. It may be possible for AI to assist with earlier diagnosis for health and cost benefits.

Further well-designed high-quality research is needed to better understand the effectiveness of AI in cancer diagnosis.

For the full report you can scan the QR code or access it via link as follows:
https://www.medrxiv.org/content/10.1101/2023.11.09.23298257v1

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