

Chapter 4

Leveraging AI and Big Data for Predictive Healthcare in Public Administration in Malaysia

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ABSTRACT

The current research works for the integration of Artificial Intelligence (AI) and Big Data analytics in public healthcare administration. The focus of the integration is on their predictive capabilities. The research methodology primarily employs secondary data analysis sourced from the United Nations and other reputable healthcare reports relevant to Malaysia. The study has analyzed the secondary data which examines how AI-driven models and Big Data are being utilized to forecast health outcomes, optimize resource allocation, and enhance decision-making processes in

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government-run healthcare systems in the country Malaysia. This research method builds for an in-depth evaluation of the effectiveness of these technologies in predicting diseases, managing public health crises, and reducing healthcare costs. The findings aim to show the potential of AI and Big Data in transforming healthcare systems to become more proactive, efficient, and sustainable. The outcomes of the study present the healthcare services in Malaysian public healthcare administration.

INTRODUCTION

The current study explores the integration of Artificial Intelligence (AI) and Big Data analytics in the domain of public healthcare administration, with a particular focus on predictive healthcare (Pencheva et al., 2020). The research aims to demonstrate how AI-driven models and Big Data analytics can transform healthcare systems by predicting health outcomes, optimizing resources, and enhancing decision-making in government-run healthcare systems. The study emphasizes the role of these technologies in making healthcare systems more proactive, cost-efficient, and sustainable, ultimately improving the quality of care and public health management. It uses secondary data from trusted sources like the United Nations and Malaysia's healthcare reports to analyze the effectiveness of these technologies in disease prediction, resource management, and health crisis mitigation. The research examines how AI and Big Data can address long-standing challenges in public healthcare systems, reduce inefficiencies, and ensure that healthcare systems can respond effectively to emerging health issues (Magakwe, 2025).

Artificial Intelligence (AI)

AI means creating computer systems that do tasks needing human intelligence (Al-Dmour et al., 2025). These tasks include learning, reasoning, and problem-solving. In this study, AI helps predict healthcare needs. It analyzes large data to find trends and forecast diseases. AI uses tools like machine learning and deep learning. These tools build models for early treatment and personal care. AI helps doctors make treatment plans suited to each patient. For example, it can spot health risks early and suggest care steps (Phuangthuean & Nuansang, 2024). Today, AI is used to make healthcare faster and more accurate. Some uses of AI in healthcare are given below:

- Diagnosing Patients: AI reads X-rays, MRIs, and CT scans.
- It checks medical history and symptoms.
- AI suggests possible diseases.

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