ASSESSING THE IMPACT OF ARTIFICIAL INTELLIGENCE ON JOB AND TASK DISPLACEMENT:

EVIDENCE FROM THE AGRICULTURE AND HEALTHCARE SECTORS

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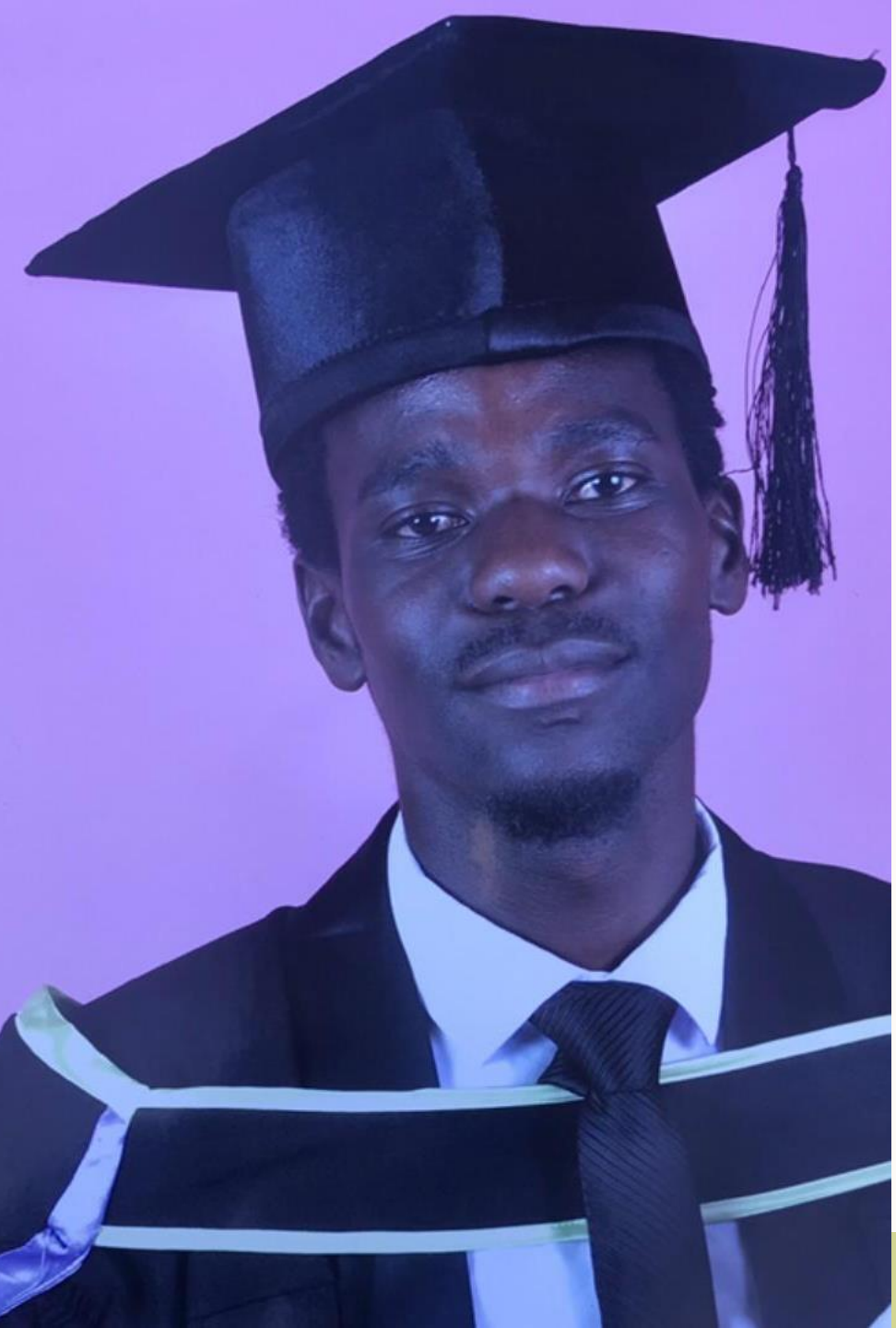


EDUCATION

- MSC MECHATRONICS AND ARTIFICIAL INTELLIGENCE
- BSC COMPUTER SCIENCE

RESEARCH INTERESTS

- COMPUTER VISION
- NATURAL LANGUAGE PROCESSING
- APPLIED AI & GOVERNANCE

CONTENTS

BACKGROUND

- AI is transforming the modern workplace, driving significant changes in productivity and efficiency in various sectors
- A central debate then emerges and this is
  - DOES AI CAUSE JOB DISPLACEMENT OR THIS IS JUST TASK DISPLACEMENT?
- The result of this debate is profound in influencing policy making, workforce development, and socioeconomic stability
- Previous research
  - lacks a detailed analysis of task displacement within job roles
  - does not provide comprehensive and sector specific comparisons.
  - Does not examine the socioeconomic impacts of AI on different demographic groups and regions

RESEARCH AIM

- To critically analyze the proposition that AI replaces tasks, but not jobs, and further examine the impact of AI on task and job displacement guided by empirical insights from AI implementations in industry

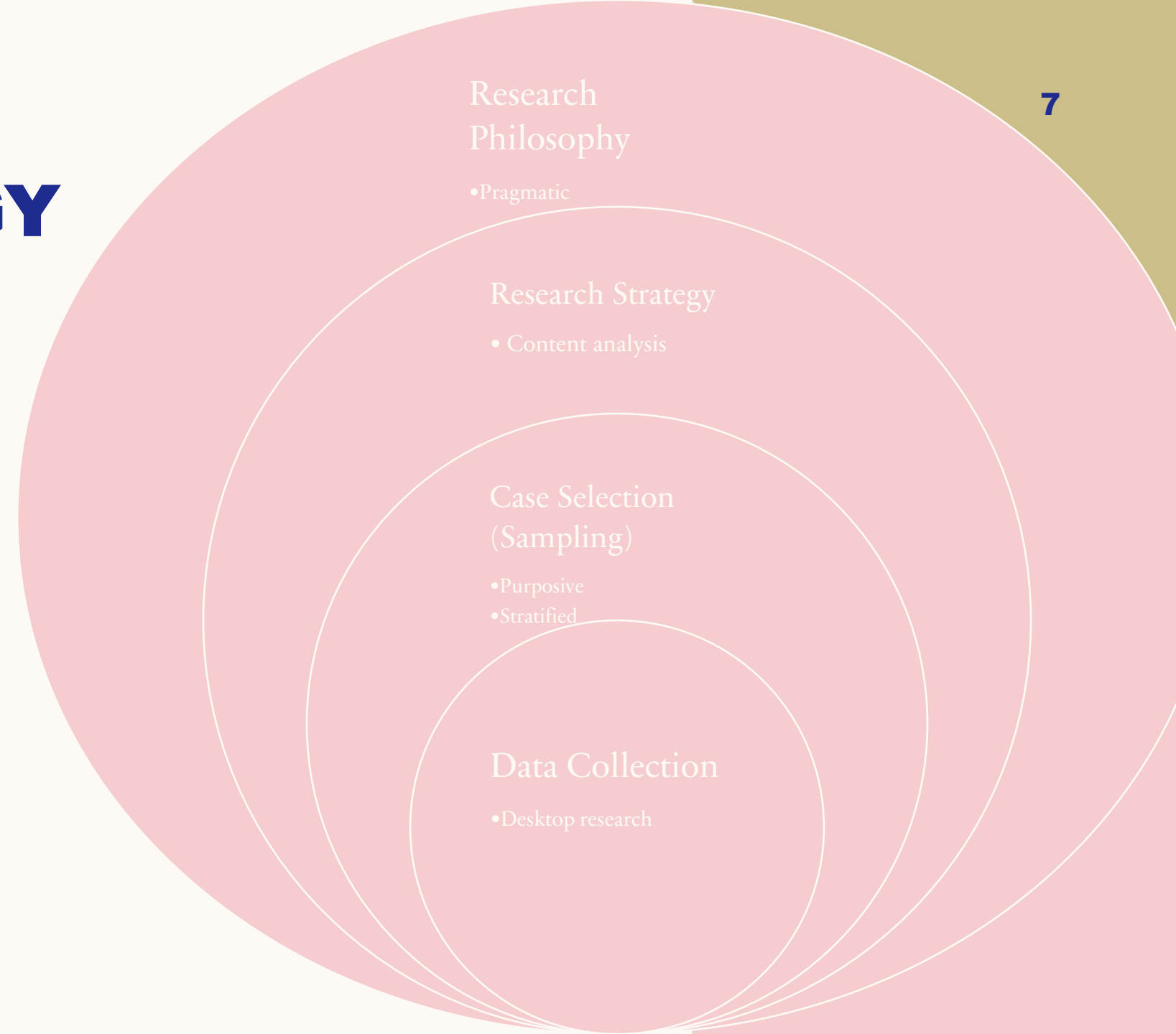
OBJECTIVES

1. To what extent does AI replace tasks within existing jobs compared to entire job roles?

2. How do different sectors and industries experience the impact of AI on job displacement and task displacement?

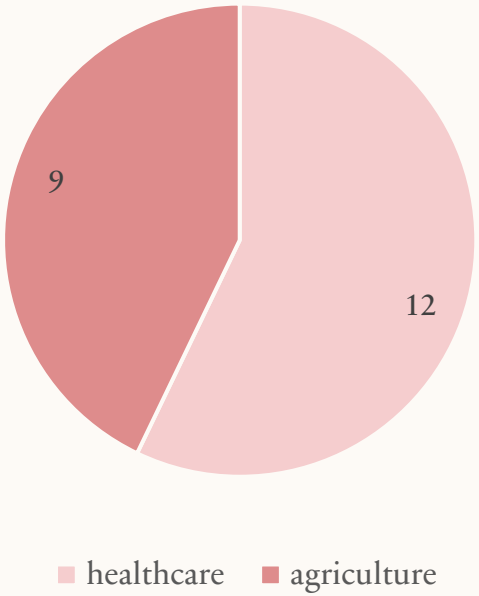
3. What are the socio-economic implications of AI-driven tasks and job displacement for the workforce?

METHODOLOGY

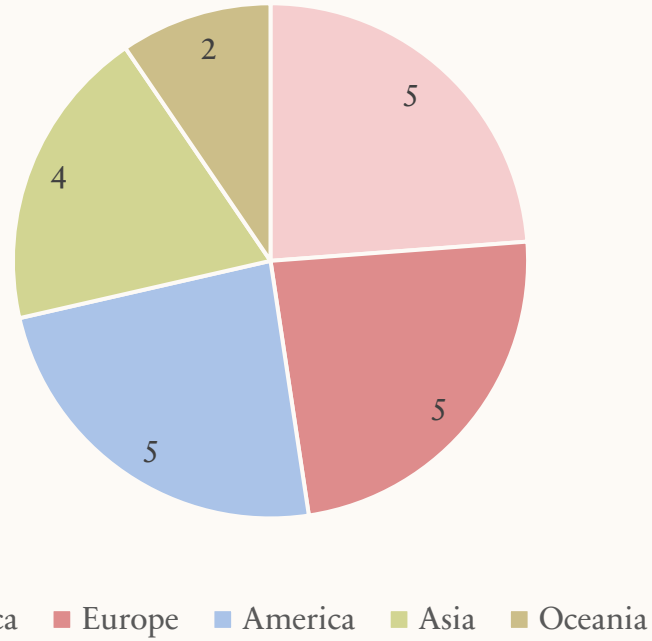


RESULTS (USE CASES DISTRIBUTION)

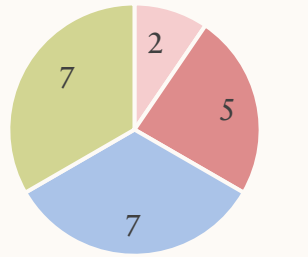
Use cases by sector



Use cases by continent



Use cases by economy type



RESULTS (CONT)

NO DISPLACEMENT --->

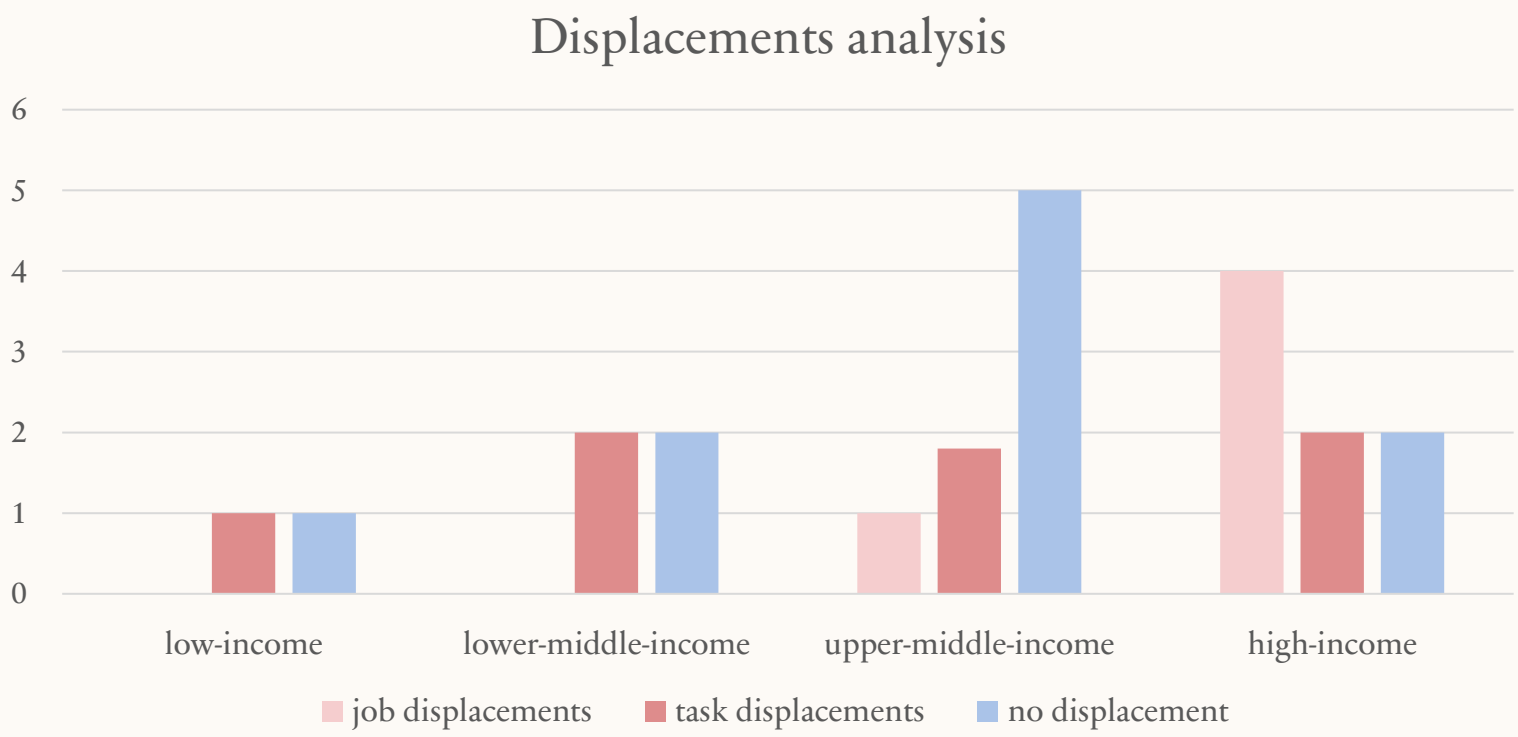
JOB DISPLACEMENT

Use Case	Role	ISCO Skill Level	Economy
Robotti. Sweden Self-driving robot used for tasks, such as seedbed preparation, sowing, and mechanical weed control in agriculture. [26]	Agriculture Assistant	3	upper-middle-income
John Deere CP770. United States of America Automated cotton harvesting machine that uses AI to optimize harvesting process and improve yield quality. [27]	Agriculture Assistant	2	high-income
Agrist Robot. Japan AI-powered robots to harvest crops like cucumbers and tomatoes autonomously. [28] [29]	Agriculture Assistant	2	high-income
YV01. France Autonomous vineyard spraying robot addressing both labor shortages and environmental compliance. [30]	Agriculture Assistant	2	high-income
Oxin Tractor. New Zealand AI-driven autonomous tractor used for tasks like plowing, seeding, and weeding. [31]	Agriculture Assistant	2	high-income

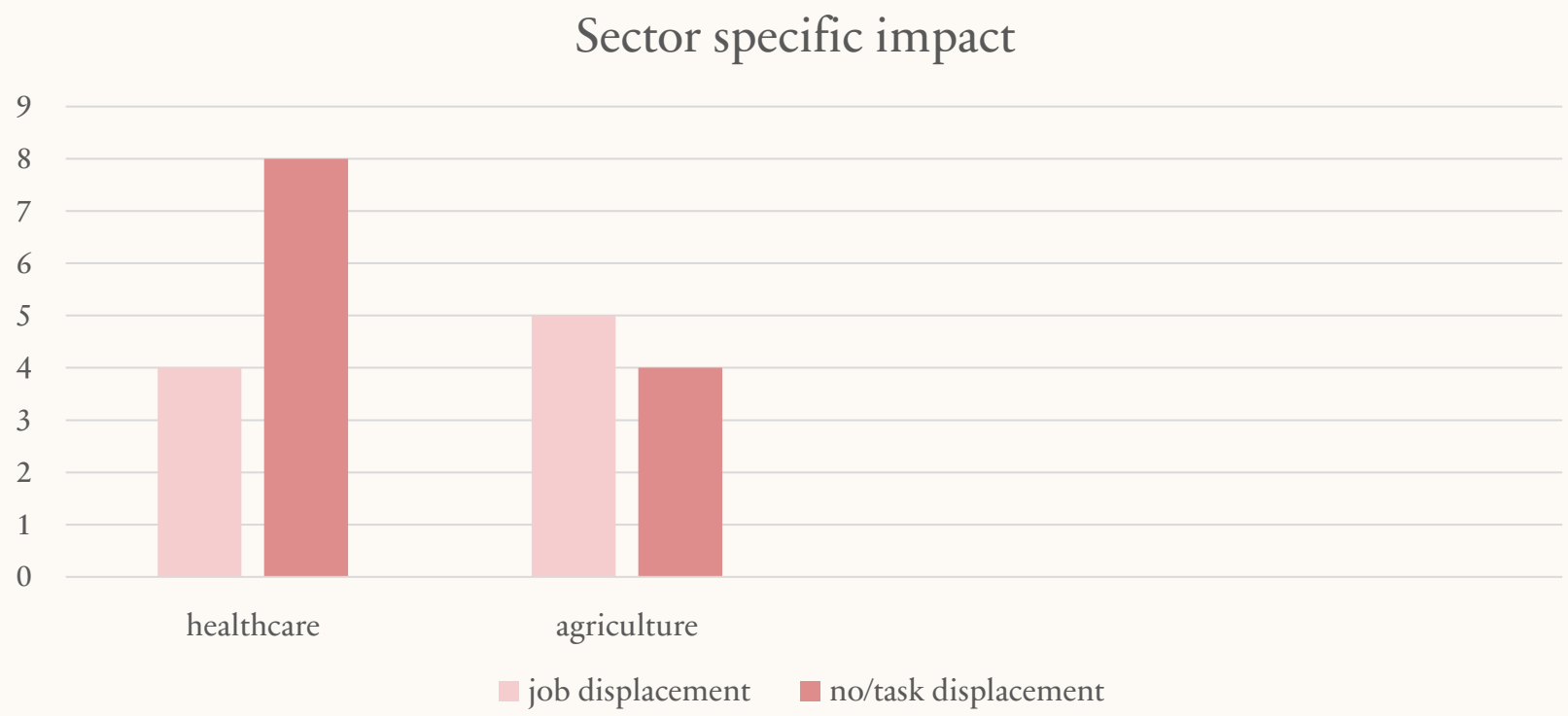
TASK DISPLACEMENT

Use Case	Role	ISCO Skill Level	Economy
Automated X-ray Imaging Device. Sudan Portable system that uses AI to screen for tuberculosis (TB) by interpreting chest X-ray images. [32]	Radiologist	4	low-income
Sophie Bot. Kenya AI powered chatbot offering answers to sexual and reproductive health questions. [33] [34] [35]	Sexual Health Educator	2	lower-middle-income
Tele-health Learning Robot. Cambodia A tele-health robot that enhances health education and tele-consultations in low-resource settings. [36]	Health Educator	3	lower-middle-income
LaLuchy Robotina. Mexico Robot to alleviate loneliness and assist COVID-19 patients by enabling virtual communication and providing movement assistance. [37] [38] [39]	Healthcare Assistant	2	upper-middle-income
Panafricare Clinic AI Agents. Sychelles AI systems to manage patient records, prescribe medication, and assist in clinical examinations. [40]	Healthcare Assistants	2	high-income
Medicine Delivery Robot. Singapore A voice-activated robot delivers medications in hospitals, reducing nurse workloads by saving time on medication rounds. [41]	Assistant Nurse Clinician	2	high-income
Radify AI. South Africa AI system that diagnose medical images. [42] [43] [44]	Radiologist	4	upper-middle-income
Robin the Robot. Armenia A robot providing emotional support to pediatric patients through companionship. [45] [46] [47]	Healthcare Assistant	2	upper-middle-income
FoxTac. Ukraine Robotic stretchers for safe medical evacuations in conflict zones, ensuring efficient transport of patients. [48] [49]	Healthcare Assistant	2	upper-middle-income
Montreal's Scale AI. Canada AI platforms which optimize hospital operations across Canada by improving surgery schedules, and managing emergency department queues. [50] [51]	Hospital Administrator	4	high-income
Mazor X Stealth Platform. Australia Robotic surgery platform that aids spine surgeons by analyzing preoperative imaging data, creating personalized plans, and providing guidance. [52] [53] [54])	Surgeon Assistant	4	high-income
MkhulimaGPT. Rwanda Smart chatbot which gives farming advice	Agriculture Extension Worker	2	low-income
MkhulimaGPT. Rwanda Smart chatbot which gives farming advice [55] [56]	Agriculture Extension Worker	2	low-income
uMudhumeni. Zimbabwe Smart chatbot which poses as an agricultural extension worker. [57] [58]	Agriculture Extension Worker	2	lower-middle-income
Plantix. Bangladesh A mobile application for crop disease diagnosis using photos. [59] [60]	Agriculture Extension Worker	2	lower-middle-income
Anton Tech. Botswana AI platform that uses drones to monitor plant pests, diseases, and soil quality. [61] [62]	Agricultural Assistant	2	upper-middle-income
Jeevn AI. Argentina Expert system which provides personalized farming advice. [63]	Farm Advisory Assistant	2	upper-middle-income

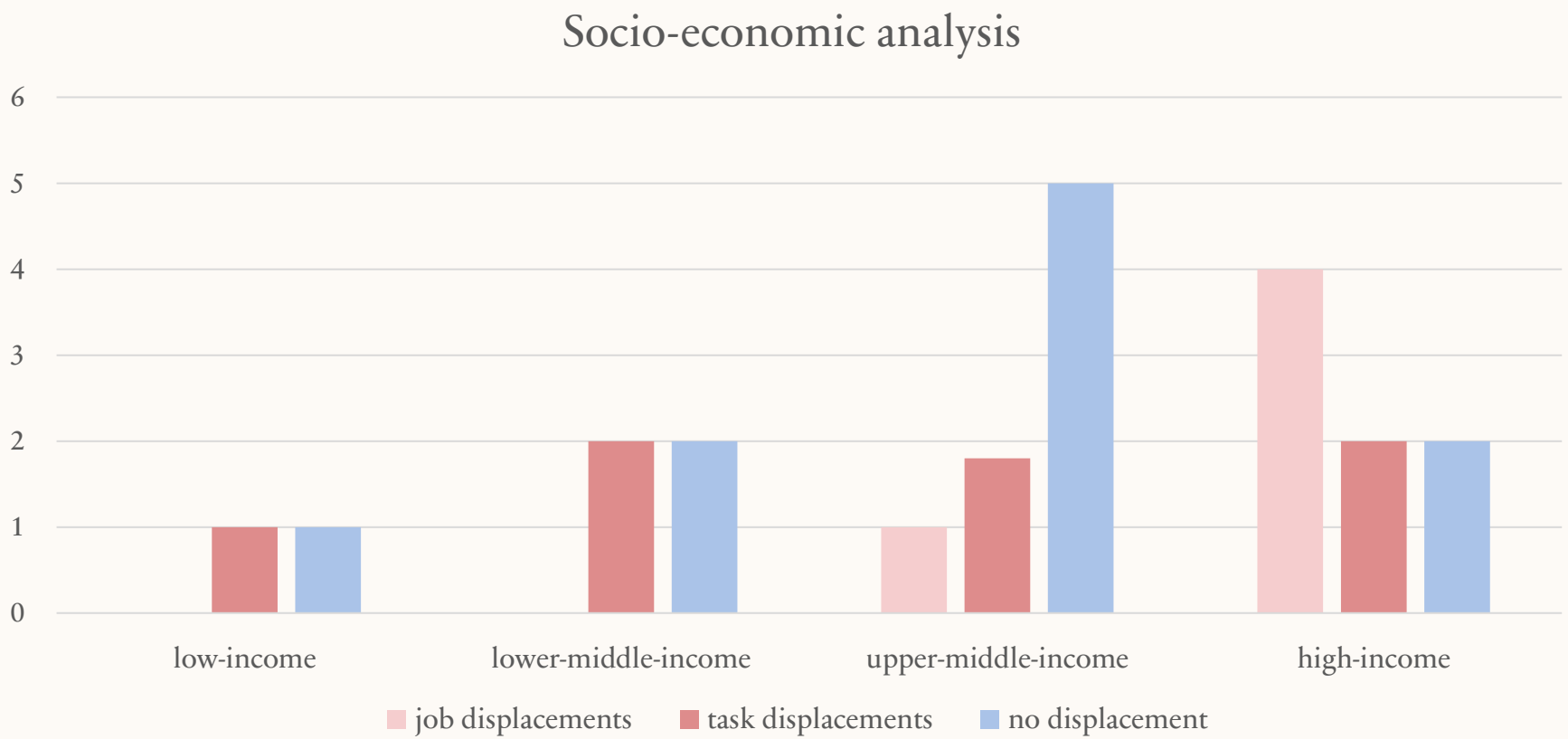
RESULTS (JOB VS TASK DISPLACEMENT)



RESULTS (SECTOR SPECIFIC)



RESULTS (SOCIO ECONOMIC)



CONCLUSION

- The research shows that AI reshapes tasks within jobs by automating repetitive processes while preserving human roles in complex decision-making and critical thinking, with deployment strategies differing between high- and low-income countries.

RECOMMENDATIONS

- Policymakers and stakeholders should invest in targeted education and training programs to equip workers with the skills necessary to adapt to AI-driven changes.
  - Emphasis should be placed on re-skilling and up-skilling initiatives for middle-skill workers who are most vulnerable to task displacement, with a focus on technical literacy, data-driven decision-making, and AI-assisted processes.
- Governments and organizations in low- and middle-income countries should prioritize the development and deployment of AI tools that augment human efforts rather than replace them.
  - Partnerships between the private sector, academia, and international organizations can help foster innovation and improve access to AI technologies in undeserved regions

FUTURE WORK

- This research was limited in that it only analyzed case studies from the agriculture and healthcare sectors only.
  - Further research should focus on granular, longitudinal studies for each sector to gain a better understanding of the long-term trends and impacts of AI on job displacement and creation.
- The analysis was limited in examining granular demographic impacts, such as gender and age, yet these factors likely mediate how different workforce segments experience AI adoption.
  - Future research should prioritize these granular demographic impacts and analyzing how AI adoption affects vulnerable subgroups across economic contexts. This enables targeted policy interventions.

THANK YOU

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