Artificial Intelligence in Breast Imaging: Addressing Bias and Policy for Equitable Implementation

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Introduction

- **Artificial intelligence (AI) has demonstrated potential in breast imaging for improving cancer detection and enhancing workflow efficiency.**
- **Despite advances, concerns persist regarding algorithmic bias, potentially widening healthcare disparities among historically underserved populations.**
- **Limited demographic diversity in AI development threatens to amplify existing inequities in breast cancer outcomes.**

Objective

- **To evaluate the extent of demographic bias in AI for breast imaging and recommend policy frameworks for equitable adoption.**

Methodology

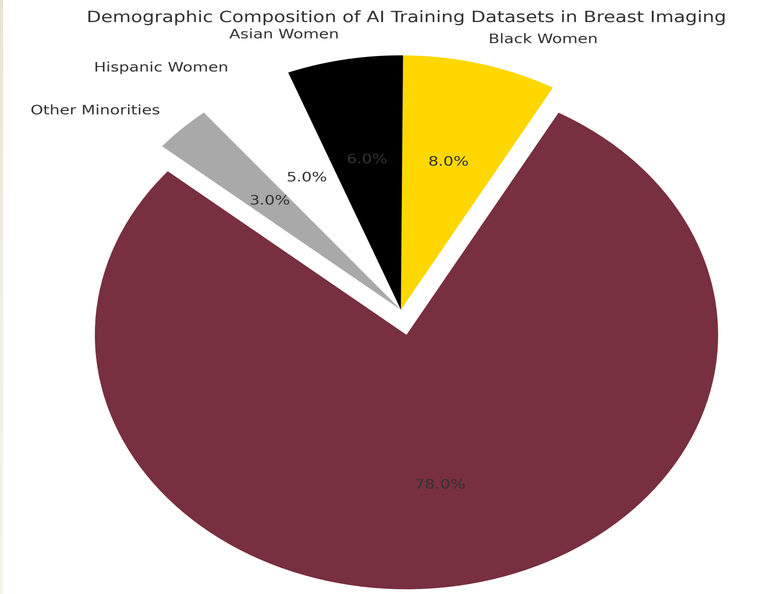
Systematic Review:

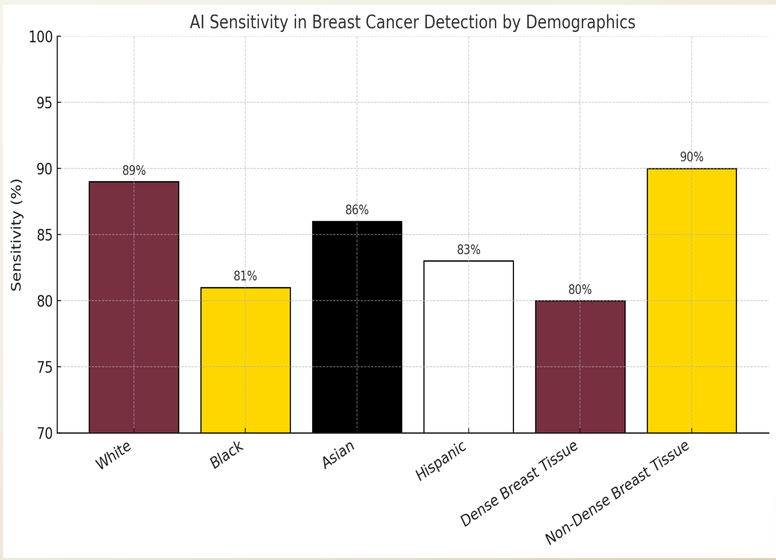
- **Peer-reviewed studies (2019-2024) evaluating AI in breast imaging.**
- **47 studies on AI algorithms for mammography interpretation.**
- **23 policy documents from major radiology and regulatory organizations.**

Focus Areas:

- **Demographic composition of training datasets.**
- **Performance variability across different patient populations.**
- **Regulatory frameworks and guidance on equity.**

Results





Discussion

- **The underrepresentation of diverse demographics in AI training sets risks perpetuating diagnostic inequalities.**
- **Sensitivity disparities could delay diagnosis and worsen outcomes in minority populations.**
- **Current regulatory frameworks lack mandates for equitable validation.**
- **Institutions adopting structured bias testing show promising outcomes in mitigating inequities.**

Study Implications

- **To ensure equitable AI deployment, a standardized framework should be implemented, including:**
  1. **Mandatory Diversity in Training Datasets.**
  2. **Standardized Bias Testing Prior to Deployment.**
  3. **Transparent, Demographic-Specific Performance Reporting.**
  4. **Post-Market Surveillance and Algorithm Auditing.**
- **Implementing these policies can protect vulnerable populations and promote trust in AI-driven breast imaging advancements.**

Conclusion

- **AI in breast imaging holds transformative potential but must be critically assessed for bias.**
- **Without targeted action, AI tools risk amplifying health disparities.**
- **Collaborative regulatory and institutional efforts can ensure AI improves outcomes equitably across all populations.**

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