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NIHCM: THE POWER AND PROMISE OF AI FOR HEALTH EQUITY

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BLUE CROSS HAS BEEN FOCUSED ON HEALTH EQUITY FOR DECADES

The Blue Cross Blue Shield of Massachusetts Foundation and our work with accounts addressing racial/ethnic inequities shows that we have long centered on equity. However, more needed to be done to have a real systemic impact.

Since its founding in 2001, the Foundation has lifted health equity issues, regularly issuing agenda-setting reports. The Foundation's leadership on policy options was critical during Massachusetts health care reform, which was a significant leap forward for health equity in the Commonwealth.

From the Foundation's first annual report, 2003. STAFF L-R: Sarah Kerr Iselin, Barbara Bergman, Mabel Barahona, Celeste Reid Lee, and Andrew Dreyfus.

BCBSMA Foundation's publications:

https://www.bluecrossmafoundation.org/sites/g/files/csphws2101/files/2020-09/AnnualReport20012002.pdf

THIS FOCUS ON EQUITY SHOWS UP IN OUR AI STRATEGY AS WELL

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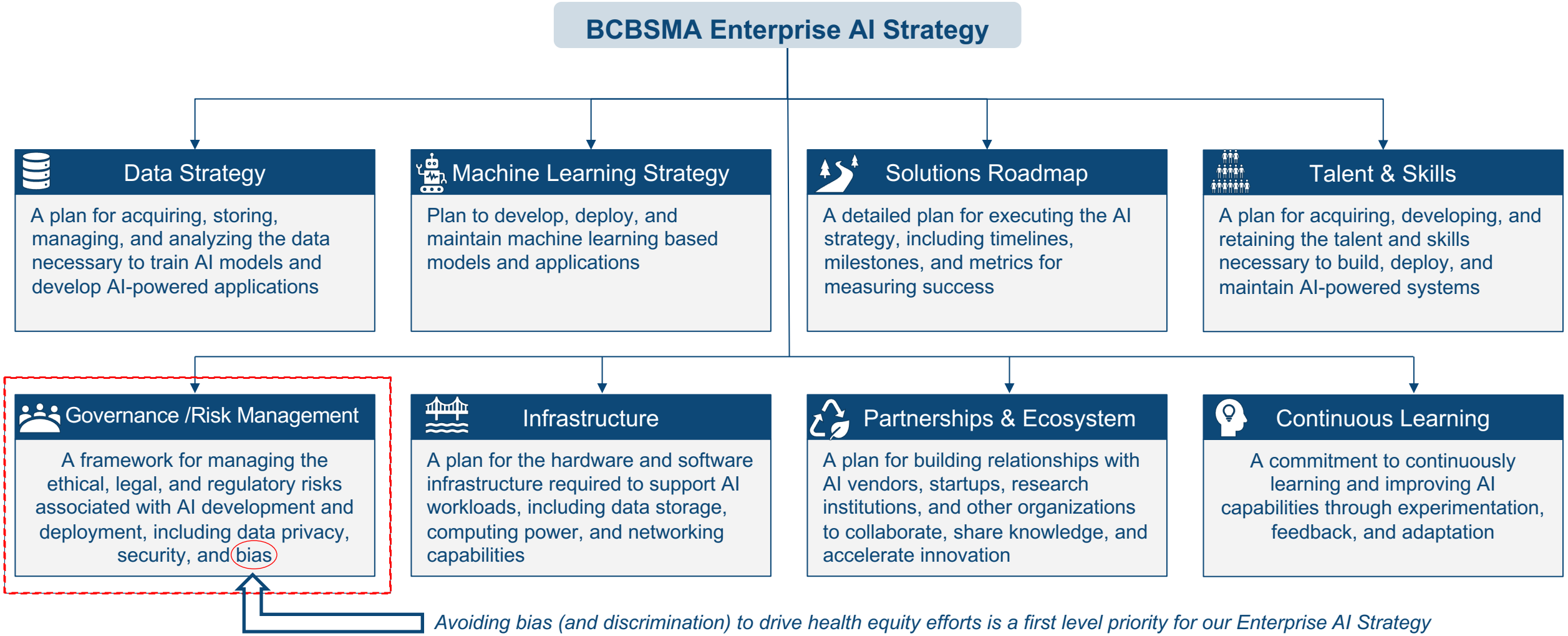
Driving Equity, and focusing on elimination of bias and discrimination is rooted in how we aim to utilize AI capabilities to advance our mission to "**Show up for everyone like they are the only one**"



Avoiding bias (and discrimination) to drive health equity efforts is a first level priority for our Enterprise AI Strategy

OUR STANCE TOWARDS "MUST-AVOID" OUTCOMES - #1 IS DISCRIMINATION AND BIAS

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Artificial Intelligence Risk Tolerance Statements

Must Avoid Outcomes

By establishing these risk tolerance statements, we aim to ensure that the use of AI at BCBSMA aligns with our commitments to data security and privacy, effective and affordable care, quality, and equity. These statements are intended to guide our decision-making and risk management processes to mitigate potential risks and maximize the benefits of AI in our operations.

These statements describe outcomes which BCBSMA will **avoid** at all costs.

Discrimination and Bias

We have a zero-tolerance policy for any AI system that exhibits discriminatory behavior or bias based on protected characteristics such as race, gender, age, or disability.

We will actively monitor and mitigate bias in our AI algorithms to ensure fair and equitable outcomes for all individuals.

POTENTIAL POSITIVE AND NEGATIVE IMPACTS OF AI ON HEALTHCARE AND ITS CONSTITUENTS

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AI has incredible potential to create a positive impact in healthcare. We also need to balance this promise and potential against potential negative impacts

Potential Positive Impact of AI on Healthcare

1. **Improved Access to Care:** AI can help **increase access** to healthcare for **underserved populations** by providing **virtual consultations**, **diagnosis**, and **remote monitoring**.
2. **Personalized Medicine:** AI algorithms can analyze vast amounts of data to **tailor treatment plans** for **individuals** based on their **specific needs** and genetic makeup.
3. **Early Detection and Prevention:** AI can assist in **early detection** of diseases and **predicting** potential **health risks**, leading to **timely interventions** and **prevention** strategies.
4. **Efficiency and Cost Savings:** AI can **streamline** administrative processes, **enhance** diagnostic **accuracy**, and **optimize** resource **allocation**, leading to **improved** healthcare **delivery** and **cost-effectiveness**.

Potential Negative Impact of AI on Healthcare

1. **Bias and Inequality:** AI algorithms may **unintentionally perpetuate bias** in healthcare by **reflecting** existing **disparities** in **data**, potentially **worsening** health inequities.
2. **Privacy Concerns:** AI technologies **collect** and **analyze sensitive** health data, raising concerns about data security, privacy breaches, and patient consent.
3. **Skills Gap and Job Displacement:** The implementation of AI in healthcare may lead to job **displacement** for healthcare workers with traditional roles, creating a need for **retraining** and **upskilling**.
4. **Ethical and Legal Implications:** AI technologies raise **ethical** dilemmas related to patient autonomy, informed consent, and **accountability** for algorithmic decisions, which need to be addressed to ensure **equitable** healthcare delivery.

Overall, while AI has the **potential** to **significantly improve health equity** by enhancing healthcare **access**, **personalizing** treatment, and **optimizing** resources, careful consideration of potential **risks** and **ethical concerns** is essential to ensure its **responsible** and **equitable** implementation in the healthcare industry.

EXAMPLES OF POTENTIAL ALGORITHMIC BIAS IN HEALTHCARE DELIVERY

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Examples below highlight the importance of addressing biases in healthcare delivery focused algorithms to ensure equitable diagnosis and treatment for all patients, regardless of their demographic characteristics.

Type	Examples
Cardiovascular Disease Risk Assessment	Certain cardiovascular disease (CVD) risk assessment algorithms may show racial or ethnic biases. For example, a Circulation study revealed that a widely-used CVD risk calculator tends to overestimate risk for African Americans compared to Caucasians, potentially resulting in treatment disparities.
Pain Management Algorithms	Pain management algorithms may demonstrate biases based on patient demographics. Research indicates that these algorithms may suggest less aggressive pain management for minority patients compared to white patients, contributing to treatment and outcome disparities.
Glaucoma Diagnosis	Glaucoma diagnosis AI algorithms may display racial biases. A JAMA Ophthalmology study found that certain AI systems for glaucoma diagnosis were less accurate when assessing images of the optic nerve head in African American patients compared to Caucasian patients. This could potentially result in disparities in diagnosis and treatment.
Breast Cancer Screening	Breast cancer screening algorithms may display biases related to factors like breast density and ethnicity. Research indicates that AI systems interpreting mammograms may be less accurate in detecting breast cancer in women with dense breast tissue, disproportionately impacting specific demographic groups. Furthermore, biases in training data could lead to disparities in the accuracy of breast cancer detection among different racial or ethnic groups.
Mental Health Diagnosis and Treatment	Algorithms used in mental health diagnosis and treatment planning may exhibit biases based on factors such as socioeconomic status and cultural background. Studies have shown that AI-based mental health assessment tools may be less accurate in diagnosing conditions like depression and anxiety in individuals from minority or marginalized communities, potentially leading to disparities in access to appropriate treatment and support services.

These research examples and studies underscore the need for ongoing research, development, and validation of AI systems to mitigate biases and promote fairness in healthcare delivery.

EXAMPLES OF POTENTIAL ALGORITHMIC BIAS IN HEALTHCARE COVERAGE

Examples below examples highlight the potential for biases to exist in healthcare insurer-driven AI algorithms

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Type	Examples
Coverage Denial Bias:	Insurer-driven AI algorithms may exhibit biases in coverage eligibility, leading to disparities in healthcare claims approval. For example, cost-saving algorithms may disproportionately deny coverage for treatments linked to chronic or rare diseases, impacting individuals' health outcomes.
Risk Adjustment Bias:	AI algorithms used for risk adjustment in insurance plans may introduce biases related to factors such as age, gender, or socioeconomic status, leading to underestimation or overestimation of healthcare risk for specific demographic groups. This can result in inequities in resource allocation and premium pricing.
Provider Network Bias	Insurer-driven AI algorithms for provider network determination and reimbursement rates may favor certain healthcare providers, leading to disparities in access to high-quality care. This can present challenges for individuals in underserved or rural areas in accessing affordable and accessible healthcare services.
Treatment Authorization Bias	AI algorithms authorizing medical treatments may favor cost-effective or conservative approaches, potentially causing delays or denials in treatment authorization for patients needing specialized or experimental interventions. This bias can impact health outcomes and quality of life, especially for those requiring specialized care.
Pharmacy Benefit Bias	Insurer-driven AI algorithms managing pharmacy benefits may introduce biases in medication coverage and pricing. For instance, algorithms prioritizing generic medications over brand-name drugs or neglecting individual patient preferences and medical needs could lead to suboptimal treatment outcomes, especially for individuals with complex medical conditions or unique medication requirements.
Network Adequacy Bias	AI algorithms assessing network adequacy may demonstrate biases in determining the availability and accessibility of healthcare services within insurance networks. This can lead to disparities in access to specialty care, mental health services, or preventive screenings, especially for individuals in underserved communities or rural areas, impacting their ability to receive timely and appropriate healthcare

These examples underscore the importance of ongoing evaluation, transparency, and accountability in algorithmic decision-making to ensure equitable access to quality healthcare for all individuals.

OUR APPROACH TO MITIGATING POTENTIAL AI-DRIVEN BIAS IN HEALTHCARE *[WORK IN PROGRESS]*

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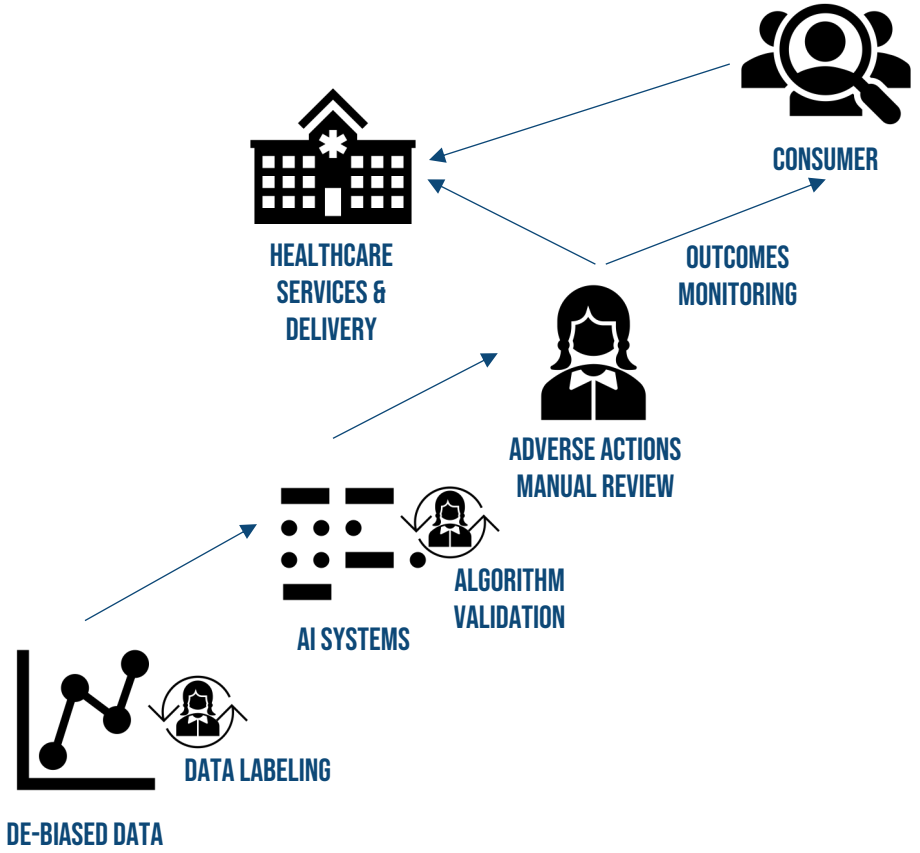
'Human in the loop' approach to developing, testing, validating, deploying and monitoring AI systems

Deploying a "human in the loop" approach to implementing AI in a health insurer's operations offers numerous benefits.

- **Ethics:** By integrating human oversight and expertise alongside AI systems, insurers can ensure greater accuracy, reliability, and ethical decision-making in their processes.
- **Context:** Human experts can provide valuable context, interpret results, and intervene when necessary to correct biases or errors in AI algorithms. This approach enhances transparency and accountability, as decisions made by AI systems are subject to human review and validation.
- **Trust:** Additionally, incorporating human input fosters trust among stakeholders, including policyholders, healthcare providers, and regulatory bodies, by demonstrating a commitment to responsible and fair AI deployment in healthcare insurance practices.



Overall, the "human in the loop" approach enables health insurers to leverage the efficiency and insights of AI technology while maintaining human oversight to uphold ethical standards and ensure equitable outcomes for all stakeholders.

METHODS FOR MITIGATING POTENTIAL AI-DRIVEN BIAS IN HEALTHCARE *[WORK IN PROGRESS]*

Addressing Bias in AI for Equitable Healthcare

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Category	Explanation	Remediation
Racial, Gender, Ethnic Bias	Biases in AI algorithms can result from skewed or unrepresentative training data, leading to disparities in diagnosis, treatment recommendations, and healthcare access based on race, gender, ethnicity, or other demographic factors.	Collect **diverse and representative training data**, employ **algorithmic fairness techniques** (e.g., fairness-aware machine learning).
Socioeconomic Bias	AI systems may inadvertently perpetuate disparities in healthcare access and quality based on socioeconomic status, resulting in unequal treatment and outcomes for individuals from different socioeconomic backgrounds.	Incorporate **socioeconomic factors** into algorithm design, implement **policies** to address **social determinants of health**.
Accessibility Bias	Lack of consideration for individuals with disabilities in AI healthcare systems may lead to accessibility barriers, limiting their ability to benefit from digital healthcare solutions and exacerbating healthcare disparities.	Ensure **compliance** with **accessibility** standards (e.g., WCAG), involve individuals with **disabilities** in the **design** and **testing** of AI systems.
Language and Cultural Bias	AI algorithms may exhibit biases in language processing and cultural understanding, leading to misinterpretation of patient data and inadequate healthcare interventions for individuals from diverse linguistic and cultural backgrounds.	Develop **multilingual** and **culturally sensitive** AI systems, involve **linguists** and **cultural experts** in **data collection** and **algorithm development**.
Confirmation Bias	AI systems trained on biased datasets may reinforce existing biases and stereotypes in healthcare decision-making, leading to confirmation bias and potentially overlooking important diagnostic or treatment considerations.	Regularly **audit** and **update training data** to mitigate biases, encourage **diverse perspectives** in algorithm development and **decision-making** processes.

BUILDING ETHICAL AI FOR INCLUSIVE HEALTHCARE *[WORK IN PROGRESS]*

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Bias mitigation in AI healthcare is essential for fostering a healthcare ecosystem that is equitable, reliable, and ethically sound.

Focus Area	Mitigation Methods
Data Diversity and Representation	• Emphasize diverse datasets to avoid underrepresentation. • Inclusive data collection reflecting the demographics of the population.
Transparent Algorithms	• Develop transparent AI models to understand decision-making processes. • Encourage the use of interpretable algorithms for accountability.
Continuous Monitoring and Evaluation	• Implement ongoing assessments to identify and rectify biases. • Regularly evaluate model performance across diverse demographic groups.
Ethical AI Governance	• Advocate for comprehensive policies and ethical guidelines. • Establish diverse AI ethics committee(s) to oversee healthcare AI development.
Community Involvement	• Involve communities in AI development to provide insights and address concerns. • Foster collaborations to ensure cultural sensitivity in healthcare AI.
Education and Training	• Prioritize education on bias awareness for AI developers and healthcare professionals. • Training programs to enhance understanding of ethical AI implementation.

By prioritizing bias mitigation efforts, we can harness the full potential of AI technologies to advance healthcare delivery, improve patient outcomes, and promote health equity for all.