NATIONAL ACADEMY OF MEDICINE

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING IN HEALTH AND HEALTH CARE

NAM Strategic Initiative on Health Data as a Core Utility for the Common Good

Activity: An NAM working group of leaders in artificial intelligence (AI) and machine learning (ML) in health and health care working together to explore opportunities, issues, and concerns in the expanded application of the technologies to health improvement interventions.

Compelling aim: *To accelerate the appropriate development, adoption, and use of valid, reliable, and sustainable AI and ML models for transformative progress in health and health care.* This aim will be achieved by identifying and evaluating obstacles in developing, validating, implementing, and monitoring the use of AI and ML algorithms in clinical settings; understanding those barriers; and engaging relevant stakeholders in solutions, including policy makers, payers, regulatory authorities, clinicians, health systems leaders, product developers, and others responsible for AI implementation.

Issue: By learning from data continuously generated as part of the clinical care experience, AI and ML have the ability to inform the decision-making capacities of patients, clinicians, and others. However, a number of challenges exist to the adoption of AI/ML models within health care settings. Current challenges include those related to data quality and access; appropriate oversight and regulatory processes for evaluating algorithms; facilitating the integration of algorithms into the clinical workflow; understanding approaches for improving the explainability or interpretability of algorithms for end-users; identifying methods for engaging clinicians, patients, and other end-users in prioritizing, developing, integrating, and evaluating the impact of these algorithms on the doctor-patient relationship; and considering the potential for AI and ML to enhance equity or reinforce inequity.

Approach: From the November 2017 multi-stakeholder discussion of the National Academy of Medicine's (NAM) Digital Learning Collaborative, participants formulated a list of the practical challenges to the advancement and application of AI and ML in health care and formed a working group charged with discussing approaches to these challenges, including AI applications, methods for development, validation, and deployment in clinical settings; and regulatory and other policy considerations. The working group convenes at noon on the first Wednesday of each month, co-chaired by Michael Matheny of Vanderbilt University and Sonoo Thadaney of Stanford University.

Deliverables: The working group will develop an NAM Special Publication describing the promise, development, deployment, and use of AI/ML models in health care settings. The chapters will be authored by members of the working group in partnership with other experts as needed, and each chapter will be directed toward a specific stakeholder community to ensure that the final product is informative to all relevant stakeholders. The resulting NAM Special Publication will be widely disseminated through multiple channels to ensure uptake and impact.

Related NAM work: *Accelerating Medical Evidence Generation and Use: Summary of a Meeting Series (2017); Clinician Engagement for Continuous Learning (2017); Revisiting the Common Rule and Continuous Improvement in Health Care: A Learning Health System Perspective (2015); Integrating Research and Practice: Health System Leaders Working Toward High-Value Care (2014); Clinical Data as a Basic Staple for Health Learning (2011); Redesigning the Clinical Effectiveness Research Paradigm (2010); Leadership Commitments to Improve Value in Healthcare (2009)*

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Artificial Intelligence & Machine Learning in Health & Health Care

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*Michael Matheny and Sonoo Thadaney serve as the co-chairs of this initiative.

The National Academy of Medicine (NAM) is one of the three Academies constituting the National Academies of Sciences, Engineering, and Medicine (the National Academies). Working together under the 1863 NAS Congressional Charter signed by President Abraham Lincoln, the Academies are called upon to serve as the adviser to the government and the nation to solve complex problems and inform public policy decisions. Presidential Executive Orders have defined the special relationship of the Academy to Government and cited its unique capacity to marshal scientific expertise of the highest caliber for independent, objective, and trusted advice. The NAM (formerly the Institute of Medicine) was established in 1970 to advise the nation on issues of health, medicine, and biomedical science.

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