PERSONALIZED MEDICINE COALITION

March 14, 2025

Faisal D'Souza
Technical Coordinator
National Coordination Office (NCO)
Networking and Information Technology Research and Development Program
National Science Foundation
2415 Eisenhower Avenue
Alexandria, VA 22314

Re: Request for Information on the Development of an Artificial Intelligence (AI) Action Plan

Dear Mr. D'Souza:

The Personalized Medicine Coalition (PMC), a multi-stakeholder group comprising more than 200 institutions from across the health care spectrum, thanks the Trump Administration for the opportunity to provide information on the *Development of Artificial Intelligence (AI) Action Plan*.[1] AI presents opportunities to accelerate personalized medicine drug and diagnostic discovery, foster adoption of personalized medicine approaches, and improve the patient experience with personalized medicine. Implementation of AI can also help address challenges to the clinical adoption of personalized medicine.

The following comments share PMC's *Policy Principles on AI*, outlining recommendations developed in collaboration with PMC's Artificial Intelligence Working Group. In the appendix, we discuss emerging and potential uses of AI in personalized medicine and related challenges for the use of AI in health care that these principles help address. We encourage the Trump Administration to consider these recommendations in developing its *AI Action Plan* and to consider how the challenges and opportunities for AI in health care may be different from other sectors.

Personalized medicine is a rapidly evolving field in which physicians use diagnostic tests and individual details about a person and their health to determine which medical treatments will work best for each patient or use medical interventions to alter molecular mechanisms that impact health. By combining data from diagnostic tests with an individual's medical history, circumstances, and values, health care providers can develop targeted treatment and prevention plans with their patients.

Personalized medicine is helping to shift the patient and provider experiences away from trial-and-error toward a more streamlined process for making clinical decisions, which will lead to improved patient outcomes, a reduction in unnecessary treatment

[1] National Science Foundation. *Request for Information on the Development of an Artificial Intelligence (AI) Action Plan*. https://www.federalregister.gov/d/2025-02305. (accessed March 7, 2025).

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costs, and better patient and provider satisfaction. PMC and its members are leading the way in personalized medicine and in developing evidence showing how patients and the health care system can benefit from appropriate testing and tailored treatment as soon as possible during their clinical experiences.

Statement of Neutrality

PMC's members may present their own responses to OSTP's *Request for Information on the Development of an Artificial Intelligence (AI) Action Plan* and actively advocate for those positions. PMC's response is designed to provide feedback so that the general concept of personalized medicine can advance, and is not intended to impact adversely the ability of individual PMC members, alone or in combination, to submit separate responses to OSTP on this request for information.

Recommendations for Advancing (AI) in Personalized Medicine

PMC advocates for public policies that facilitate broad implementation and uptake of AI to help realize its full potential for improving patient access to personalized medicine and making the health care system more efficient across disease areas. The following principles for regulatory oversight of AI, coverage and reimbursement of AI, and broad implementation of AI are intended to apply across AI-driven tools and technologies that can help advance personalized medicine.

Regulatory Oversight of AI

There are many use cases for AI in health care relevant to personalized medicine and, depending on the use case, developers may be subject to different regulatory requirements, including those of the U.S. Food and Drug Administration (FDA), Office of the National Coordinator for Health Information Technology (ONC), and the Office of Civil Rights (OCR). FDA oversight could include the validation of algorithms that meet the medical device definition. FDA requirements or scientific review expectations may also apply to information generated by AI such as novel markers, real-world evidence, or synthetic data. The right framework for regulatory oversight of AI will ensure confidence in the performance and use of AI and mitigate risks to patients while continuing to foster innovation.

We encourage the Trump Administration to consider the following recommendations for regulatory oversight of AI in health care:

1. **Support risk-based, flexible, and predictable oversight**: To avoid over-regulation and foster continued innovation for AI in health care, regulatory oversight should adopt an appropriate risk-based and flexible approach that ensures predictability. Regulatory oversight should ensure AI models are trained on appropriately validated data by specifying technical standards for the quality and comprehensiveness of training data, standards to improve the comparability of reported results, and be comprehensive enough to apply to various use cases. In developing a risk-based framework for oversight, regulators should consider differing levels of explainability in how AI models arrive at their outputs. Regulators should also allow adaptive regulatory approaches that allow for iterative development and continuous improvement of AI-based tools and technologies.

2. **Reflect a total product lifecycle approach:** To assess potential benefits and risks to patients comprehensively, regulatory oversight should consider a product's total product lifecycle, from evidence generation and commercialization, to use by patients and doctors to make health care decisions. This approach could include the use of real-world monitoring to identify and address issues or challenges that may emerge with implementation of AI, as well as identify realized benefits that could expand a product's utility and permissible uses.

3. **Promote cohesive and harmonized regulatory frameworks:** The adoption of disjointed frameworks for regulatory oversight will make it difficult for AI developers to manage compliance with quality and privacy controls. Regulatory oversight should be appropriate to the technology and harmonized with other regulatory frameworks the AI may be subject to, including both domestic and global regulatory frameworks, but only to the extent that such harmonization would benefit rather than inhibit innovation and broader adoption. Duplicative, overlapping, and conflicting jurisdiction of regulatory authorities should be eliminated and avoided.

4. **Provide clarity on responsibility for data governance:** Regulation should provide guidance on who is responsible for managing and analyzing data in a way that is standardized and harmonized. Clarity in data governance and interoperability for AI tools and technologies is needed to help scale and facilitate their use in stratifying patients for personalized medicine.

5. **Clarify robust and transparent processes for AI-related data privacy and security:** To facilitate trust and accountability over how AI is developed and deployed for personalized medicine purposes, prescribed processes regarding the use, disclosure, confidentiality, integrity, and availability of patient data should be transparent and robust. This can include, for example, considerations for how to obtain informed consent when it is required; clarification of when it is not required; how to securely transfer individuals' personal health information with encryption; and how to mitigate threats to cybersecurity and data integrity.

6. **Mitigate biases in AI:** Developers and regulators of AI should prioritize efforts to ensure training data is reflective of the intended population, mitigate bias, and account for disparities and other shortcomings in health data throughout the product development lifecycle. AI algorithms should be transparent in the data they are trained on, and regulators should test for biases that could impact their real-world implementation.

7. **Ensure responsible regulatory agencies are adequately resourced:** To effectively regulate AI-based products, responsible regulatory agencies may need additional expertise and funding. Such agencies, including but not limited to the FDA, should receive the resources necessary to support staffing and technological capabilities related to oversight of AI.

Coverage & Reimbursement of AI

Existing coverage and reimbursement policies can stifle innovation and create utilization barriers for digital health technologies and diagnostic tools that are already available for patients. PMC advocates for modernized coverage and reimbursement policies that foster transparency in evidence requirements and provide timelier patient access to new technologies that promise to improve patient care. In certain cases, legislation may also be required to facilitate appropriate coverage and reimbursement. Currently, the

absence of a formalized reimbursement pathway and consistent payment policy forces providers to weigh the benefits of investing in AI against unpredictable policy changes.

We encourage the Trump Administration to consider the following recommendations for coverage and reimbursement of AI in health care:

8. **Provide timelier patient access to new technologies through expedited coverage pathways:** Stringent evidence requirements can delay coverage and reimbursement for novel technologies. A temporary-to-permanent coverage pathway should be established that facilitates clinical use and evidence collection for novel AI tools. This could be achieved, for example, by establishing a pathway through legislation that expedites Medicare coverage for novel AI-driven diagnostic tools and digital health technologies.

9. **Enable coverage through new or existing Medicare benefit categories:** Novel digital health tools and AI applications are not covered under Medicare when they do not fall into a defined benefit category. CMS should adopt a flexible approach when making benefit category determinations. Congress should also establish a new Medicare benefit category for digital health tools and authorize CMS to cover AI-driven technologies, including AI tools used for screening purposes.

10. **Provide timely and adequate reimbursement**: To incentivize the clinical adoption of AI tools and technologies advancing personalized medicine, reimbursement should sufficiently capture the value and costs of integrating and using AI technologies in clinical settings. Reimbursement levels should be sufficient to support product developers' investment in clinical utility studies that may be necessary to justify coverage and providers' investment in AI's clinical integration. Where appropriate, CMS could leverage existing payment mechanisms, such as a new technology add-on payment, or develop new payment or quality incentives to provide timely and adequate reimbursement.

11. **Leverage AI to measure and improve the quality of health care:** Quality measures and value-based care models present opportunities to incentivize the delivery of higher-quality health care throughout a patient's diagnosis and treatment journey. CMS should integrate and leverage AI to improve data capture and analysis under existing value-based care models and quality improvement programs, especially models and measures relevant to improving the delivery of or patients' experiences with personalized medicine.

12. **Structure value-based payment models to incentivize the use of AI-driven tools or diagnostics:** As CMS continues to shift away from traditional fee-for-service reimbursement towards value-based payment models, it will be critical to consider different ways that AI products and services improve patient outcomes, consider which payment models would effectively capture the value of those improvements, and eliminate current impediments for certain entities to participate in value-based care models (e.g. exclusion of laboratories from value-based care models due to anti-kickback safe harbor exclusions).

13. **Ensure CMS is adequately resourced to clarify evidence requirements:** Transparency and predictability in evidence requirements can streamline the development of evidence necessary to obtain coverage and reimbursement. Policymakers should provide CMS and other federally-

funded health plans with adequate resources to systematically review emerging evidence and proactively clarify coverage and reimbursement requirements for AI tools and services.

Broad Implementation of AI

Public policies must facilitate broad implementation and uptake of AI to help realize its full potential for improving patient access to personalized medicine and making the health care system more efficient. PMC advocates for federal studies, demonstration projects, or programs through entities that can support implementation and help generate evidence on the value of integrating AI into health care.

We encourage the Trump administration to consider the following recommendations for broader implementation of AI in health care:

14. **Generate evidence on the value of integrating AI into health care:** Policymakers should support studies that generate evidence on the value of integrating AI into healthcare. For example, this could include:
    a. Studies showing cost-savings generated by the adoption of AI in personalized medicine;
    a. Studies on the clinical utility of novel markers developed using AI (e.g., digital biomarkers) and the impact of their use on product development timelines;
    b. Studies on the clinical utility of AI-driven diagnostic tools and technologies; or
    c. Studies evaluating the impacts of AI on improving patient care, reducing physician burdens, and lowering health care costs, which could facilitate quality improvement activities or the development of best practices.

15. **Examine challenges and solutions for implementing AI in health care:** Policymakers should support federal studies, demonstration projects, or programs that examine challenges and provide solutions to integrating AI in health care, including considerations related to interoperability, data storage, data sharing, scalability, patient privacy, real-world performance monitoring, and preventing health disparities.

16. **Build capacity for implementation of AI in community health settings:** Policymakers should support programs and partnerships that facilitate the integration of AI in community health settings. This should include, for example, planning or capacity grants that provide an on-ramp for under-resourced institutions to develop the infrastructure needed to implement AI and be eligible for downstream implementation grants or payment incentives around AI. This could include, for example, the data storage and processing infrastructure needed to run AI applications and promote interoperability.

17. **Develop data sets to test and assure the quality of AI implemented at-scale:** Policymakers should support the development of large-scale data sets that improve public and private entities' ability to assess the quality of AI systems and understand how AI systems can both work and fail at-scale. These data sets can be used to test for potential failures due to bias or missing information, assess the comparability of reported results across AI applications, and, thus, help ensure AI is implemented fairly across society.

18. **Facilitate the use of AI in clinical trials:** To support the implementation of AI in clinical trials for participant enrollment and stratification, policymakers should support the development of

best practices, public-private partnerships, and provision of resources to providers. Best practices could clarify how to use AI for matching patients to trials, optimizing treatment approaches, tracking disease progression through analysis of real-world data, stratifying patients based on biomarker and genetic factors, improving diagnostic capabilities, measuring treatment efficacy, and/or measuring adverse events identification and reporting. Policymakers should also consider opportunities to provide resources to health care systems or providers as part of clinical trial costs for implementing AI tools and technologies.

19. **Develop best practices for expert human oversight of AI:** Depending on biases in how data may be trained and used, AI has the potential to exacerbate barriers that patients can face in accessing personalized medicine, including barriers created by prior authorization. To ensure health care decisions appropriately reflect individual patients' needs and preferences, the use of AI in health care decision-making must support and supplement, not supplant, human decision-making, patient preferences, and clinician knowledge. Policymakers should support the development of best practices for the level of expert human oversight needed in health care decisions made by providers and payers using AI.

20. **Educate and raise awareness among stakeholders:** Enhancing stakeholders' skills and awareness needed for implementation of AI could improve uptake of AI. Policymakers should support efforts to educate and provide training to health care providers and other health care professionals, oversight bodies, regulators, and payers on implementing AI.

21. **Ensure NIH and ARPA-H are adequately resourced:** Basic and translational research conducted by NIH and ARPA-H will play a critical role in advancing progress in the use of AI in health care and personalized medicine. The President's budget request and Congressional appropriators should include a robust base budget for each of these agencies to sustain the momentum of current and prospective research projects on AI, while not supplanting funding for other areas of research equally important to advancing personalized medicine.

Conclusion

PMC appreciates OSTP's and the Trump Administration's interest in advancing the United States' leadership in AI and securing a brighter future for all Americans. We look forward to working with you to develop an *AI Action Plan* that considers the future role of AI in health and personalized medicine. If you have any questions about the content of this letter, please contact me at cbens@personalizedmedicinecoalition.org, or David Davenport, PMC's Director of Public and Science Policy, at ddavenport@personalizedmedicinecoalition.org.

Sincerely,

Cynthia A. Bens
Senior Vice President, Public Policy

Appendix: Artificial Intelligence (AI) in Personalized Medicine

I. Uses of AI in Personalized Medicine

AI has the opportunity to accelerate personalized medicine drug and diagnostic discovery, foster adoption of personalized medicine approaches, and improve the patient experience with personalized medicine. Experts in PMC's Artificial Intelligence Working Group have identified the following emerging and potential future uses of AI in health care to highlight its importance to personalized medicine.

A. Advance clinical research and the development of medical products and services by:

1. **Supporting faster identification and assessment of novel measures, biomarkers, or clinical endpoints**
2. **Informing enhanced statistical analysis and study design options**
3. **Screening or pre-screening patients more efficiently**
4. **Collecting, managing, and analyzing data, such as genomic, imaging or other information; real-world data (RWD); data from digital health technologies (DHTs); or in silico clinical trials, in ways that support stratifying clinical trial participants (i.e. enrichment strategies)**
5. **Improving the experience of trial participants to promote retention and representativeness, such as through DHTs, decentralized trials, or enhanced methods for participants to receive information about a study**

Advances in personalized medicine are driven by improvements in our understanding of the molecular basis of a disease. Applying this knowledge may propel more efficient development of new treatments, technologies, and services. By administering and processing vast amounts of genomic, imaging, RWD, and other information, AI can be used to identify unique molecular patterns, genetic mutations, radiographic patterns, and histopathologic features that are associated with a disease, which can then be developed as diagnostic, prognostic, and predictive biomarkers. AI can also assess novel biomarkers or clinical endpoints that enable more precise patient risk stratification in clinical trial designs for new treatments. For example, Quibim is using AI and MRI imaging biomarker profiles in prostate cancer to predict responses to androgen deprivation therapy (ADT) and stratify patients at risk for biochemical relapse; the tool has the potential to become an imaging-based companion diagnostic tool. AI can enhance capabilities of diagnostic tools in not just cancer, but also rare and other diseases.

By helping to screen and pre-screen patients for clinical trials and predict their responses to therapies more efficiently, AI can speed trial enrollment and improve the design and efficacy of clinical studies, thereby reducing the time and cost required to complete clinical trials, as well as improving patient care. AI has the potential to improve the reliability of Phase 1 studies through RWD and in-silico clinical trials with synthetic control arms, predict and identify trends in adverse events earlier, and optimize dosage adjustments. For example, Lilly's Magnol.AI™ platform is leveraging wearable sensors to monitor treatment efficacy in clinical trials in real time, which can provide a better understanding of a patient's disease journey. In addition to accelerating trial timelines by obtaining more detailed efficacy and safety data faster, AI-enabled platforms can help developers understand how certain patient populations respond to a product and design products to maximize beneficial patient outcomes.

Enrolling sufficient participants in clinical trials has been an ongoing challenge for product developers. AI tools can help streamline the process for providers to identify matching trials for patients, or provide patients an accessible mechanism to identify trials they can discuss with their provider. Identifying and engaging participants facing health care disparities is also a challenge. By utilizing AI algorithms to analyze public trial registries or other medical record platforms, providers and researchers can establish advanced capabilities to screen, assess, identify, enroll, and retain trial participants. For example, AI can promote broader participant enrollment by screening patients for eligibility, extracting protocols through natural language processing, identifying clinical trial sites, and providing internal and external support service tools. Streamlining these processes, optimizing trial designs, and improving the experience of trial participants can make clinical trials more accessible to all patient populations.

B. Improve health care decision-making and patient care by:

6. **Ensuring appropriate diagnostics are ordered in a timely manner**
7. **Advancing techniques to help patients and clinicians understand test results**
8. **Ensuring results from diagnostics are used appropriately**
9. **Identifying targeted treatment options**
10. **Identifying candidates for enrollment in clinical trials**
11. **Facilitating timelier patient education and communication, such as about treatment options**
12. **Monitoring a patient's treatment journey, such as treatment adherence, progression, or signs or recurrence**
13. **Aiding patients' management of their health care, such as supporting patients' identification of appropriate providers, scheduling appointments, and connection to peer navigators**
14. **Tracking quality measures within health systems relevant to improving personalized medicine throughout a patient's diagnosis and treatment journey, including quality measures related to the above**

Personalized medicine is helping to shift the patient and provider experiences in favor of more streamlined approaches to disease diagnosis, prevention, and treatment, which will lead to improved patient outcomes, a reduction in unnecessary treatment costs, and better patient and provider satisfaction. Facilitating patient access to personalized medicine through AI can lead to earlier diagnosis and health care intervention and help personalized medicine to achieve this vision for patients and the health care system. Barriers to the clinical adoption of personalized medicine, however, persist. Implementation of AI can help address these barriers.

Providers must manage complex and rapidly changing information in science and medicine. By helping clinicians select appropriate diagnostic tests, interpret the results, and consider relevant targeted treatment options in a timely manner, AI-driven clinical decision support tools may help enhance the clinical use of diagnostics, facilitate more accurate and timely diagnosis, and improve treatment selection based on how a patient may respond. AI-driven tools are already available to analyze biomarkers and therapies for cancer patients, and additional tools are being developed to provide real-time insights for doctors based on a patient's clinical profile. In the future, with appropriate validation and patient safeguards, generative AI tools could facilitate timelier patient education and communication by helping patients to understand information about their diagnosis, genetic profile, and treatment options.

AI can also improve patient care by automatically analyzing patient data to match individuals with suitable trials. Better patient-trial matching can ensure patients have the greatest chance at finding a treatment that works best for them. Although multiple companies currently offer tools to assist in matching patients to clinical trials, their utility likely varies. In the future, AI could integrate real-time data from wearable devices and EHRs to dynamically match patients to trials as their health status evolves.

By identifying sophisticated, latent patterns across multiple datasets, such as a patient's genetic and genomic information, family history, social determinants of health, and other information contained in their electronic health record, AI can provide a comprehensive understanding of a patient's condition. AI can thus enable more accurate risk prediction, help tailor patient monitoring, and improve prevention and early intervention strategies for at-risk individuals. For example, enhanced surveillance and more precise risk assessments of possible genetic disorders can help identify high-risk patients or families who would benefit from genetic counseling and personalized medicine.

II. Challenges in the Development and Use of AI

AI has applications in pre-clinical and clinical settings. PMC's focus is on ensuring the right framework for AI is used throughout the total product lifecycle, from evidence generation and commercialization, to use by patients and doctors to make health care decisions. In developing frameworks for regulatory oversight, coverage and reimbursement, or implementation of AI in health care, certain cross-cutting technical policy challenges will need to be considered.

Regulatory Oversight

AI tools rely on large amounts of data from various sources. These data sources can vary in their quality and representativeness. When AI algorithms are neither created nor validated using the same dataset, this creates challenges for regulatory bodies like the FDA to compare and consistently evaluate tools. The sensitivity of an AI tool may not be comparable across applications, and AI models can have differing levels of explainability, or transparency into the reasoning behind the model's output. Regulation of the training data may also be in the purview of other agencies. This lack of standardization can complicate and lead to inconsistencies in regulatory oversight, since it is difficult to establish clear benchmarks for AI performance across different applications. To facilitate predictable regulatory oversight and build trust in the quality of AI technologies when used in real-world clinical settings, collaborative efforts are needed to create comprehensive and standardized datasets – representative of all patient populations – for training and validating AI algorithms, including tests for biases that could impact real-world implementation across different health care settings.

For some AI tools, like generative AI, the technology's training data and decision-making process can be opaque. Training data must be reflective of the intended population and product developers must take steps to address bias and account for limitations in health data throughout the product's lifecycle. Clear regulatory process and frameworks that establish or clarify technical standards for the quality and representativeness of training data, result reporting, data governance, data sharing, data privacy, data security, transparency, bias mitigation, and informed consent where required will be essential to set consistent expectations for developers and build trust among providers and patients in the real-world use of AI. Real-world monitoring can also help track biases and other issues that may emerge with implementation of AI, as well as document benefits that could support broader implementation.

Coverage and Reimbursement

To recoup investment in developing AI technologies and to provide health systems with adequate resources to adopt them, reimbursement must sufficiently capture the costs associated with developing and implementing AI tools in healthcare. Coverage and reimbursement policies, however, often lag behind technological advancements, and it can be challenging for novel technologies to develop evidence demonstrating clinical utility and/or cost-effectiveness given the time and resources needed to conduct studies. The level of evidence needed to obtain coverage and reimbursement can also be unclear and vary from payer to payer.

Coverage and reimbursement policies for AI tools can also vary depending on the type of technology, such as AI-driven in vitro diagnostic tests, companion diagnostic tests, software as a medical device (SaMD), or digital health tools. Under Medicare, coverage for AI-driven genetic tests varies by the type of test and indication. Digital health tools may not fall into a defined Medicare benefit category and, therefore, be ineligible for Medicare coverage and reimbursement. Coverage and reimbursement may also not be available for AI tools used for clinical trial matching. Without other incentives, lack of reimbursement for adopting these tools could exacerbate existing challenges with enrolling smaller patient populations and patients from under-resourced communities in clinical trials.

Existing reimbursement policies may also be inadequate to account for the unique investment needed to develop AI tools and their value to patients and society. Although eligible for coverage under Medicare, some AI technologies may be subject to bundled payment, such as certain AI-driven SaMD tools. Bundled payment – which provides a single, comprehensive payment covering all of the services involved in a patient's episode of care – may not fully account for the cost of adopting the AI tool or the developer's investment in conducting clinical utility studies to justify coverage and reimbursement. For some technologies, such as AI-driven imaging tests that are validated as SaMD, it is unclear whether Medicare would reimburse these algorithms separately. Modernized coverage and reimbursement policies that foster transparency, predictability, and adequate reimbursement can provide timelier patient access to new AI technologies.

Real-World Implementation

Resource and capacity constraints, a lack of awareness, uncertainties around value or best practices, and existing health care access challenges all pose potential barriers to the broad implementation and uptake of AI. Public policies that provide capacity-building resources to under-resourced institutions, raise awareness and provide training to health care providers, or support studies generating best practices or evidence on the value of integrating AI can collectively help AI realize its full potential for improving patient access to personalized medicine. Public-private collaborations can also help develop solutions for integrating and maximizing the use of AI across disease states, patient populations, and health care settings.

AI applications are more likely to be implemented in large, well-resourced academic medical centers. Providing resources that incentivize implementation of novel AI technologies across various health care settings can help ensure that patients in under-resourced communities are able to benefit. Cloud-based AI platforms can also offer potential solutions by making advanced AI tools more accessible in smaller or rural facilities with limited resources. Achieving widespread availability of AI tools regardless of geography and facility type can help avoid exacerbating existing health care access barriers.

In addition, human-related biases and biased data can seep into algorithms during deployment that lead to treatment recommendations that are inaccurate or worsen health disparities. AI models should be designed to mitigate algorithmic bias throughout their product lifecycle. Since AI can come to false conclusions, AI tools should be used to support, and not supplant, human decision-making. Human oversight, transparency in how and when AI algorithms are used, and other bias mitigation strategies can help ensure health care decisions appropriately reflect individual patients' needs and preferences.

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