

**National Artificial Intelligence Advisory Committee****Briefing Minutes****April 16, 2024**

The National Artificial Intelligence Advisory Committee (NAIAC) held a virtual public briefing from 2:00 pm – 4:30 pm EST on Tuesday, April 16, 2024. The briefing was recorded and is available online.

**NAIAC Members (speakers only)**

- David Danks
- Ramayya Krishnan
- Haniyeh Mahmoudian
- Trooper Sanders
- Mirian Vogel (Chair)

**NIST Staff Members Present**

- Cheryl Gendron, Designated Federal Officer (DFO)

**Meeting Minutes****Opening Remarks**

- Gendron called the meeting to order at 2:10 pm EST and confirmed that the committee is operating under the Federal Advisory Committee Act. Gendron noted that the meeting is open to the public via livestream and encouraged members of the public to contact NAIAC by emailing [naiac@nist.gov](mailto:naiac@nist.gov).
- Vogel thanked NAIAC members for their service in planning the meeting and thanked the panelists for their participation. Vogel outlined the goal of the meeting, which was to explore ways to use AI to create a more inclusive workforce and advance scientific inquiry.

**Panel One: AI in the Workforce – Considerations for the Public*****Moderator: Trooper Sanders***

- Sanders (Chair, Work and the Workforce WG) thanked the panelists for their participation and noted their breadth of expertise in economic opportunity, mobility, and innovation. Sanders introduced the first panel as an opportunity to consider factors other than skills training that are essential for members of the public to navigate the expanding role of AI in the workforce.

**Invited Briefers**

- **Dr. Ifeoma Ajunwa**, Professor, Emory University School of Law
- **Justin Brown**, Founder, Center for Public Sector AI
- **Michael Ellison**, Founder & CEO, CodePath
- **Dr. Christophe Combemale**, Assistant Research Professor, Carnegie Mellon University

**Presenter Remarks**

- Presenters were invited to give prepared remarks to the Committee. Each presenter's remarks may be viewed in full [in the accompanying recording of the briefing](#).
  - **Ifeoma Ajunwa**, Professor at Emory University School of Law, cautioned that AI hiring tools can replicate historical forms of discrimination in employment markets even as they are often promoted as ways to advance inclusivity, and suggested that audits and federal guidance on use of these tools can help address this risk.
  - **Justin Brown**, Founder of the Center for Public Sector AI, discussed the importance of using emerging AI technologies to improve the efficacy of the government workforce, particularly in health and human services, which can offer transformational routes to address broader nationwide workforce impacts of AI.
  - **Michael Ellison**, Founder and CEO of CodePath, argued that AI will increase entry-level job requirements and thus that integrating technology training into college curricula can offer more workforce opportunities than vocational or skills training. College partnerships with nonprofits can help achieve this integration.
  - **Christophe Combemale**, Assistant Research Professor at Carnegie Mellon University, explained that some forms of AI that could displace workers may be technically feasible but not economically viable. When AI *does* displace workers, it may do so not only directly but also by increasing competition for unaffected jobs.

**Question and Answer Session**

- Sanders thanked the presenters and invited NAIAC members to ask follow-up questions.
  - A member asked what CodePath experiences or lessons could be leveraged to facilitate similar initiatives in other sectors, such as healthcare.
  - A member inquired about job seekers' experiences with automated AI hiring tools and how these experiences can inform federal guiding principles for AI in the workforce.
  - A member noted that some workers and members of the public may not know when AI is being used in the workforce or to make public benefit decisions; the member asked panelists for suggestions about how to encourage transparency in AI use without burdening its users.
  - A member prompted panelists to share novel questions, solutions, or ideas that might invigorate conversations about AI, the workforce, and economic security.

**Panel Two: Leveraging AI to Accelerate Scientific Innovation**

**Moderator:** Ramayya Krishnan, Haniyeh Mahmoudian

- Krishnan (Co-chair, AI Futures WG) thanked panelists and introduced the second panel, which focused on how to responsibly harness AI for scientific discovery.

### Invited Briefers

- **Dr. Jean-Paul Chretien**, Program Manager, Defense Advanced Research Projects Agency (DARPA)
- **Dr. Surya Ganguli**, Associate Professor, Stanford University
- **Dr. Susan Gregurick**, Associate Director for Data Science and Director of the Office of Data Science Strategy, National Institutes of Health (NIH)
- **Dr. Michael Jordan**, Pehong Chen Distinguished Professor, University of California, Berkeley
- **Mr. James Swanson**, Executive Vice President & Chief Information Officer, Johnson & Johnson

### Presenter Remarks

- Presenters were invited to give prepared remarks to the Committee. Each presenter's remarks may be viewed in full in the [accompanying recording of the briefing](#).
  - **Jean-Paul Chretien**, Program Manager at the Defense Advanced Research Projects Agency, described the DARPA Triage Challenge, which uses computational physiology simulators to develop synthetic datasets and invites researchers to use these datasets to develop AI-enhanced technologies that can improve detection of life-threatening injuries during mass casualty events, such as combat and natural disasters.
  - **Surya Ganguli**, Associate Professor at Stanford University, called for public investment in open-source AI models developed by academic and nonprofit institutions and careful approaches to AI regulation; these steps can maximize the potential for AI to improve hypothesis generation and clinical interventions, such as brain-machine technology interfaces and pharmaceutical drugs.
  - **Susan Gregurick**, Associate Director for Data Science and Director of the Office of Data Science Strategy at NIH, described three of NIH's AI research resources: (1) the Bridge to Artificial Intelligence (Bridge2AI) Consortium creates ethically-sourced datasets to accelerate AI-based biomedical and behavioral research; (2) the Artificial Intelligence/Machine Learning Consortium to Advance Health Equity and Researcher Diversity (AIM-AHEAD) Program engages historically underrepresented communities in AI and ML research; and (3) the National Artificial Intelligence Research Resource (NAIRR) Pilot connects researchers and educators to AI and ML datasets, software, and training.
  - **Michael Jordan**, Pehong Chen Distinguished Professor at the University of California, Berkeley, suggested that harnessing the benefits of AI requires conceptualizing AI not as a singular "intelligence" but as one component of a larger and inevitably uncertain system. This conceptualization helps account for inaccuracies in AI-based synthetic data as well as the need for a social science and economic approach to AI models.

- **James Swanson**, Executive Vice President and Chief Information Officer at Johnson & Johnson, described AI-based healthcare advances and suggested several ways to support an AI research ecosystem: (1) apply existing regulatory frameworks to *outcomes* rather than *technologies*, (2) foster international harmonization, and (3) develop infrastructure for data access and privacy and workforce investments.

### Question and Answer Session

- Mahmoudian thanked the speakers for their comments and invited NAIAC members to ask follow-up questions.
  - A member asked speakers how AI could be leveraged to overcome gaps in research and innovation on women's health.
  - A member asked participants to share their thoughts on shaping policy recommendations that adopt a systems approach to AI.
  - A member asked how AI researchers can foster closer collaboration with social scientists, public health experts, and other groups that are not traditionally included in conversations about AI.
  - A member asked participants to comment on any barriers that are unrelated to data or compute that should be addressed to best propel the use of AI in the pursuit of science.

### Closing Comments

- Vogel thanked NAIAC members for their work in assembling the briefing, and thanked panelists for their time and expertise.
- Gendron thanked NAIAC members and panelists for their participation and directed participants to the [NAIAC website](#) for a recording of the day's briefings and to subscribe to the NAIAC mailing list. Gendron noted that two public comments had been received during the briefing and encouraged members of the public to submit additional comments and questions by email to [naiac@nist.gov](mailto:naiac@nist.gov). Gendron also announced that NAIAC's next public meeting will be held on May 2. Gendron concluded the Public Briefing at 4:32 pm EST.

**National Artificial Intelligence Advisory Committee****Public Comments****April 16, 2024**

The National Artificial Intelligence Advisory Committee (NAIAC) held a virtual public meeting on Tuesday, April 16, 2024. The meeting was recorded and is available online. The following pages contain public and additional speaker comments received and connected to this meeting.



Policy White Paper

# Advancing the promise of data science in healthcare to improve lives

**Johnson&Johnson**

Worldwide Government Affairs & Policy



# The world is at an inflection point; there is an urgent need to address both emerging and longstanding healthcare challenges with new insights and solutions.

The field of data science has recently exploded. Data science combines expertise in specific fields such as life sciences with concepts from statistics, mathematics, and computer science to turn structured and unstructured data into insights. Data science is an increasingly important strategic capability to meet healthcare needs by driving innovation in science and technology, increasing healthcare access, delivering personalized information and care, and preparing for the next global public health crisis.

*Every day, Johnson & Johnson works to confront the most complex healthcare challenges of our time. Data science offers remarkable opportunities to advance this commitment. Whether it's powering our research, driving digital innovation in care delivery, or connecting healthcare ecosystems, practitioners, and patients, data science brings us closer to realizing health equity, and changing the trajectory of health for humanity.*

## Joaquin Duato

Chairman of the Board and Chief Executive Officer,  
Johnson & Johnson

By 2025, healthcare information alone will represent 36% of the global total volume of data.<sup>1</sup> However, there are great challenges such as data integration and the establishment of reliable and unbiased analytics processes that turn data into answers to key questions that can help us tackle healthcare needs. The key is leveraging the “tremendous potential in connecting [the] data and embedding higher-quality, more efficient, and increasingly predictive decision-making tools.”<sup>2</sup>

The digital revolution has been fostered by lessons from the COVID-19 pandemic and the advancement and synergies between life sciences and data science, including new uses of big data, increased computer power, and advancement in both algorithms and artificial intelligence (AI). From the most developed markets to low-to-middle-income countries, data science can bring significant benefits. But policy reforms are needed to help realize its full potential for **societies** and **economies**, **healthcare systems**, **providers**, and most importantly, **patients**. These opportunities include:

- Improving access to care so that everyone can benefit from quality healthcare services that they need, when they need them, regardless of where they live.
- Enabling efficient health systems to deliver value-based care through optimized service delivery and fast and accurate disease diagnosis.
- Connecting across the healthcare ecosystem to increase collaboration, leading to greater healthcare provider resilience and a better patient experience.
- Fostering precision medicine by personalizing care, improving patient outcomes, and delivering innovative healthcare solutions that serve unmet patient needs.



1. RBC Capital Markets, "The Healthcare Data Explosion – The Convergence of Healthcare and Technology," found at [https://www.rbccm.com/en/gib/healthcare/episode/the\\_healthcare\\_data\\_explosion](https://www.rbccm.com/en/gib/healthcare/episode/the_healthcare_data_explosion)

2. Johnson & Johnson: Bettering Health Through Tech in a New COVID-19 World," found at <https://deloitte.wsj.com/cio/2020/04/28/johnson-johnson-bettering-health-through-tech-in-a-new-covid-19-world/>

# Policy opportunities in data science applications for healthcare

Public policy can enable consistent regulatory frameworks across international borders that foster responsible data access and use by ensuring the construction of robust and efficient data ecosystems. The data architecture we build today will be the infrastructure that supports future innovations for improved health and wellbeing. Building this digital healthcare ecosystem will require clear and coherent policies across borders that remove unnecessary barriers to data access and utilization for good while respecting and protecting personal data. This data-driven revolution can only be realized if we base our progress on a culture of ethics, collaboration, respect, and accountability, where literacy, skills, and access help us all master the possibilities offered by data science.

Polymakers are uniquely positioned to help unlock the potential for data science in healthcare. COVID-19 has been a leading example showing how it is possible to construct a conducive environment for innovation through public-private partnership, novel collaboration models, and collective engagement. Public policy can help in the construction of trustworthy data ecosystems if focused on these foundational pillars by governments across the world:

## 01 Harmonization, privacy, security, and legal certainty:

We advocate for strong policies that support the access, use, and sharing of health data that are both foundational to public trust and promote sustainable health data ecosystems. We call for policies that address:

- The need for implementation of privacy safeguards in a manner that is proportional to the risks and sensitivity of the data, and takes into account existing regulatory protections that apply to personal health information.
- The current fragmentation of data protection and localization practices – those country-specific rules requiring data to stay local, preventing cross-border data flows – with diverse classifications for sensitive data. We call for clear, harmonized rules on permitted national and international data access, sharing, and use that protect patient privacy and provide for a predictable legal framework where stakeholders, including civil society, are involved through public consultation. These rules should apply to access and use of data in the delivery of healthcare as well as in research and innovation.
- The need for more shared data assets. We encourage public and private efforts enabling responsible data sharing which would comprise a data ecosystem in healthcare. Our own commitments include participation in the [European Health Data Space](#) and participation in the [Yale Open Data Access \(YODA\) Project](#). By responsibly sharing our data, we aim to pave the way for better healthcare data sharing practices to improve health outcomes for the greatest number of people.
- The need for standardized data security. We call for a robust health data security framework, including obligations for critical infrastructure, network, and information systems, as well as minimum required security standards in the healthcare sector, such as protecting hospitals and health systems. Such a framework requires global cooperation to harmonize standards for improved security and data control, which can also drive innovation for the healthcare sector.





## 02 Connectivity, interoperability, and standards:

We need **federated FAIR<sup>3</sup> (Findable, Accessible, Interoperable, Re-usable) health data ecosystems** where appropriate access to data by individuals, industry, healthcare providers, and researchers is enabled.

- Connectivity and interoperability are key to data-based innovation, data-driven solutions, and delivery in healthcare. Public investment in healthcare data infrastructure and connectivity must ensure that no patient is left behind (e.g., broadband networks and hospital data infrastructure) in order to overcome the digital divide. We also call for more inclusiveness and representativeness in data pools and approaches that address structural discrimination. To increase effectiveness, the design of these data-driven solutions should take users and their technological environment into consideration. It should also provide adapted approaches (e.g., digital solutions optimized for mobile phones).
- Data science depends on the availability of a sufficient volume of high-quality data.

We need **healthcare data ecosystems based on federated network approaches<sup>4</sup>**, which are inclusive and benefit from individual, private sector, and public healthcare data based on the qualification of data relative to the FAIR model.

- A critical step is to ensure data systems are interoperable by encouraging the adoption of existing open technical and data exchange formats<sup>5</sup> for Electronic Health/Medical (semantic) standards for all health-related data such as clinical data, including high-dimensional (e.g., -omics) data, or patient-generated healthcare data.



## 03 Evidence-driven healthcare ecosystems:

Data collected in real-life settings (Real-World Data, or RWD) can help drive new understandings of value and generate insights (Real-World Evidence, or RWE). This can support healthcare decision-makers faced with varied data needs from pre- to post-market and the challenge of utilizing different forms of technology and treatments in the context of finite healthcare budgets. An explosion of genetic, lifestyle, and environmental data will help researchers, innovators, health care providers, public health officials, and others to draw new inferences and accelerate interventions. This can include a range of routinely collected data from electronic health records, hospital databases, electronic registries, and administrative insurance claims; to wearables, applications (or “apps”), and device-generated data, among other sources. Greater trust and acceptability of RWD/RWE<sup>6</sup> will enable the shift toward value-based healthcare models and systems and improved regulatory decision-making, enabled by:

- Regulatory agency coordination and guidance to scale up initiatives that support the use of RWE and connected databases to inform decision making.
- Policy measures fostering the quality and integrity as well as the aggregation of RWD (e.g., responsiveness to treatment, diet, exercise, co-morbidities, and co-treatments) joined, categorized, and used in the context of RWE, sharing back with HCPs and individuals the potential links between disparate data sets.
- Using RWE to understand the value of healthcare solutions and to innovate in our approaches to review and regulate products throughout their life cycle, including assessing their safety and efficacy.



3. Wilkinson, Mark D, et al, "The FAIR Guiding Principles for scientific data management and stewardship," Scientific Data, March 15, 2016, found at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4792175/>

4. For an example of Federated Data Network, please visit:

[https://portal.honeur.org/documents/20126/0/HONEUR\\_Brochure.pdf](https://portal.honeur.org/documents/20126/0/HONEUR_Brochure.pdf)

5. Examples include OMOP (part of OHDSI) and FIHR, among others

6. RWE: Evidence created by addressing specific research questions through the scientific analysis of RWD

## 04 Inclusiveness and empowerment for all:

### Investments in a skilled, diverse healthcare workforce

Healthcare professionals need to have a thorough understanding of data science for healthcare systems to effectively guide patients. We support policies to empower and diversify both the data science and provider workforce, support educational advancement, and drive access to the full range of healthcare providers to reduce health inequities and ensure that all have access to innovations, such as:

- Training diverse healthcare professionals to read, analyze, and interpret data is essential to increase efficiency of care, achieve better outcomes, increase equity, and help patients understand and consider their care options. Healthcare workforce planning and education are important tools for policymakers to anticipate future skills shortages and take remedial action in education and training policies early on.
- Diversifying the data science and technology workforce and increasing training in the field for underrepresented minorities is critical for bias reduction and inclusivity in data ecosystems. We also need more life science education and training programs for data scientists to improve the application and customization of data science to healthcare needs.
- Workforce skilling via lifelong learning programs and university education, equipping the workforce with the reskilling and continued learning opportunities required to embrace ongoing technological developments to maximize the positive impact of data science. For example, investments to enhance the digital skills of healthcare professionals (HCPs) could be done through pre-certification by medical societies and advancement of AI curricula for both HCPs and hospital managers.
- Provider education on implicit bias, racial, and other disparities, and culturally appropriate approaches in healthcare and communication with patients. Diverse participation throughout is needed, from the analysis of available data to those working directly with patients, to assure that the algorithms used to interpret data minimize bias from preconceived beliefs or misrepresentative data.

Further, we know that we face tremendous shortages of frontline healthcare workers, something that is expected to continue<sup>7</sup>. If we include healthcare workers as a critical group when designing, deploying, and assessing solutions, and have broad, sustainable funding from governments, we can use data science to support the healthcare workforce, including their work experience and resiliency, and improve outcomes for all members of the ecosystem.

### Investments in digital access and literacy

Digital access and literacy are critical to ensure citizens and patients are empowered to manage their own data, understand the benefits of data science, and have the tools to make informed decisions.

- This should extend to both the use and the governance of digital health technologies. This can help the public understand the benefits of data and appropriate data sharing, and the ramifications of safety and ethical frameworks.
- This will be critical to overcome the “digital divide,” bridging socio-demographic disparities, such as gender, race and ethnicity, age, and geography, so that populations who might benefit the most from data applications are both involved in, and have access to, these developments. Allowing various populations to participate will help enable data generation that simultaneously improves the authenticity of data sets and the inclusivity of data-driven insights.



7. “Health Workforce,” World Health Organization, found at <https://www.who.int/health-topics/health-workforce#tab=tab1>



# Data science enables our commitment to improve the trajectory of health for humanity

At Johnson & Johnson, we embrace using data science to drive improvements in healthcare and reflect Our Credo commitments, which begin with our responsibility to patients, doctors, and nurses. These are fundamental principles which can enable a trustworthy data science ecosystem.

## Innovations in data and technology must lead to new benefits for both patients and healthcare providers

By tearing down silos and connecting previously segregated information, data science opens new horizons to deliver better medicines, diagnostics, medical technologies. From using real-world studies and external control arms for clinical trials, to digital twins<sup>8</sup> improving the quality and efficiency in our supply chain, to predictive analytics to improve HCP experiences and patient outcomes, to digital surgery, Johnson & Johnson has made significant progress in integrating and maximizing the use of data science:

- Data science is becoming an essential part of how we design clinical trials, select clinical trial sites, and recruit patients. By applying AI and machine learning to real-world data, we're able to increase our understanding of patients impacted by diseases, enabling us to determine which patients could potentially benefit the most from specific medicines, and then designing clinical trials and geographically siting them to meet those needs. This also helps ensure our trials are diverse and representative, with the goal of accelerating clinical development and bringing the latest scientific innovations to those in need faster. We are starting to scale this approach across our portfolio.
- We are also developing and deploying digital solutions that support patient care and experience before, during, and after surgery, helping medical intervention to be smarter, less invasive, and more personalized. These solutions leverage data analytics to provide better insights to surgical teams, enable remote care, improve workflows, and predict and reduce variability of outcomes.
- Catching lung cancer early can make all the difference for a patient's prognosis. Yet detecting lung cancer early can be difficult. Symptoms such as persistent cough for fatigue can be vague, and not everyone has access to screening resources to find the disease early, when it is most treatable. Our data scientists are working to help reduce delays in diagnoses. Through the company's [Lung Cancer Initiative \(LCI\)](#), researchers are harnessing data and technology to help doctors identify and treat lung cancer before it progresses.

8. According to Gartner, a digital twin is a digital representation of a real-world entity or system. The implementation of a digital twin is an encapsulated software object or model that mirrors a unique physical object, process, organization, person or other abstraction



# Data science for healthcare requires respect for human relationships and a commitment to earning trust, starting at the very earliest stages of design

For Johnson & Johnson, we approach data science in an ethical, compliant, and secure manner, as we understand that public trust is the cornerstone of unleashing the potential of data science and achieving a truly patient-centric experience in the healthcare ecosystem. For instance, we continue to work with our businesses to integrate privacy and information security controls into designated data-driven initiatives (including data science, clinical operations, digital surgery and robotics, and e-commerce) and implement key standardized processes across Johnson & Johnson, designed to consistently support the rights of patients for the management of their personal data. Through our Information Security and Risk Management organization, we safeguard the Company's networks, systems, products and information against evolving cyber threats to ensure the availability of critical systems and prevent unintended or unauthorized access to both business and personal information. We have obtained ISO 27001 certifications for multiple products, including products from both our MedTech and Innovative Medicines business segments. This helps to increase confidence that cybersecurity controls are in place to safeguard the confidentiality and integrity of data. Respecting the patient and healthcare provider, using the data in an appropriate and secure manner, and ensuring data will be handled responsibly and ethically through the entire process is essential, and especially critical, given the sensitive and confidential nature of healthcare data.

Johnson & Johnson is fully committed to protecting the privacy of those who entrust us with their personal information. In addition to all the laws that apply to our operating companies' handling of personal information, we also maintain global privacy policies to which all our businesses worldwide must adhere. Our policies reflect our commitment to fair and transparent information practices.<sup>9</sup>

Our teams are guided by Our Credo and [Business Code of Conduct](#), an [Ethical Code for the Conduct of Research and Development](#), our [white paper on AI & Ethics](#) and commitments to [Diversity, Equity and Inclusion](#). Our bioethical principles include transparency, integrity, and respect for the rights and welfare of all persons and for championing ethical decision-making and policies. We are a leader in initiatives to improve clinical trial data transparency through the Yale University Open Data Access (YODA) Project—a data-sharing model that provides a fair and unbiased approach for assessing external requests for the use of data from the Johnson & Johnson Family of Companies.

## Diversity, equity, and inclusion (DE&I) are critical to achieving optimal outcomes in data science

Recognizing and understanding the rich diversity of patients is critical in designing and implementing data ecosystems. The use of data and approach to data science must be sensitive to historic and structural discrimination, both in the data and in those who analyze it, which is particularly important for predictive modeling. Constant vigilance is needed to identify and address the potential for bias or underrepresentation in data sets and to ensure diversity in data science teams. This will ensure a diversity of viewpoints and help mitigate unconscious bias.

Our commitments also extend to promoting diversity and empowering those who are underrepresented in data education and careers, including women. We have been driving a WiSTEM<sup>2</sup>D initiative (Women in Science, Technology, Engineering, Mathematics, Manufacturing and Design) since 2015, where we have selected female STEM<sup>2</sup>D tenure-track professors who are making key STEM<sup>2</sup>D discoveries and shaping the future of tomorrow as part of our ongoing [WiSTEM<sup>2</sup>D Scholars Award Program](#).<sup>10</sup>



9. Please see here our positions on [privacy](#) and [information security](#)

10. Johnson & Johnson Health for Humanity Report, found at <https://healthforhumanityreport.jnj.com/our-employees/employee-engagement> and "What WiSTEM<sup>2</sup>D Is—and Why It Matters," found at <https://www.jnj.com/wistem2d>





## Together, data science will allow us to go further than ever before

At Johnson & Johnson, we recognize the power and promise of data science in healthcare and believe this is a collective, collaborative effort. We value our role as collaborator and innovator in healthcare, contributing new ideas, solutions, technology, partnerships, and perspectives on data science policy. We are focused on increasing engagement and collective action with patients, providers, and policymakers to raise the understanding on how harnessing the potential of data science in healthcare can help everyone.

With so much untapped yet critical potential, an open conversation about data science in healthcare is crucial. We are committed to continuing the dialogue and collaboration, igniting policy changes for the good of patients and our society.

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# Doing the Right Thing: AI and Ethics

***At Johnson & Johnson we aspire to use artificial intelligence (AI) in an ethical way, with Our Credo and our Code of Business Conduct as our inspiration and roadmap.***

AI and machine learning play an increasingly important role in delivering excellence at Johnson & Johnson. AI is helping to drive socially beneficial innovations and new ways of helping those we serve live healthier lives. For instance, it is used in drug development, robotic-assisted surgery, commercial activities, chatbots and smart manufacturing in our supply chain.

Our ethical foundation for using AI—based on the principles of ***Fairness, Privacy, Security, Responsibility*** and ***Transparency***—is embedded in how our employees work every day and is reflected in our [Position on Ethics and Compliance](#) and in a wide range of voluntary disclosures (see our [Position on Transparency](#) and our [Position on Data Privacy](#)).

It also rests firmly on [Our Credo](#), which challenges and inspires our employees to put the needs and well-being of those we serve first, and on our [Code of Business Conduct](#), which provides guidance regarding ensuring an open and honest work environment.

## Fairness in AI

We believe that for AI to be fair, it must treat Our Credo stakeholders—the patients, doctors and nurses, mothers and fathers, communities, employees and shareholders—in an equitable manner. We aim to include fair practices through each step of the AI lifecycle, from development to deployment.

We aspire to identify data sources that are diverse and appropriate for the use case and represent the intended audience as we move along the AI lifecycle. And we strive to understand the methods by which data sets are collected and how external influences, such as biases that exist in healthcare, may affect them.

Throughout this process, we seek to proactively identify any bias in the data, and we utilize the latest advancements in technology to improve the robustness of our models. By seeking to proactively understand the data sets used and by asking the right questions, we can work to correct bias when we

identify it, mitigate its impact when correction is not reasonably possible, or discontinue an analysis when needed or appropriate.

To remain true to Our Credo, we look to have human experts involved throughout the AI lifecycle and controls in place to monitor model outputs. Our AI models are also intended to be “explainable,” so that how a model makes decisions is understood and we can identify when and why it may produce biased results. When it is not possible to fully explain how an AI model works, we seek to design and monitor the AI model proactively so we can overcome and minimize potential bias. When possible, we strive to capture performance metrics and check performance differences to determine their potential real-world impact on the patients and customers we serve.

We also acknowledge that the characteristics of data sets may change over time (called "drift"). This may require us to reexamine the data for new insights and evolve our models. Our attention to bias, transparency and security helps us monitor and understand the potential for drift and how to manage it.

By understanding the limitations of data, by training our models, and by facilitating human review, we strive to deliver AI-embedded solutions and products for the benefit of our patients and customers.

## Respecting the Right to Privacy

Respecting and protecting an individual’s right to privacy is at the core of how we do business. Although AI has driven significant breakthroughs in drug discovery, precision medicine, manufacturing and diagnostics, realizing its true potential requires careful governance and a steadfast adherence to privacy and data protection laws. The responsible use of data and the importance of privacy are embedded in our [Code of Business Conduct](#) and our [Position on Data Privacy](#).

The exponential growth of data, connectivity and computing power, coupled with an increased use of AI, requires an increasingly diligent approach to safeguarding privacy. To build and sustain the trust of the stakeholders who rely on us, it is essential that we not only comply with legal and regulatory requirements, but that we also ensure the following:

- We operate transparently;
- We store data in a secure environment with controlled access;
- Our employees are trained in Privacy and Information Security; and
- We only collect and use the personal information that is necessary and relevant for our purpose and ensure proper consents, notices and disclosures are secured or provided to individuals.

These commitments can be found in our public [Position on Data Privacy](#), and updates to this commitment are contained in our annual [Health for Humanity Report](#).

## Securing AI

Across Johnson & Johnson, we work diligently to safeguard our networks and systems against evolving cyber threats and to deter unintended or unauthorized access to business and personal information.

We secure elements of the AI lifecycle in accordance with relevant laws and regulations, and our employees use strategies, innovations and information assets in line with our policies and approved processes. Our commitment to protecting information assets and business integrity is spelled out in our [Position on Information Security](#).

## Using AI Responsibly

Our commitment to Our Credo stakeholders guides our efforts to ensure that AI is inclusive and generates consistent and reliable benefits.

It is critical, for example, that healthcare professionals (HCPs) are free to make appropriate care recommendations in the best interest of their patients; AI should assist and not hinder this process. As an employer, we have a duty to our employees to make sure AI does not interfere with fostering an inclusive and safe working environment. And, as we look beyond our walls, we expect our external partners to follow high legal and ethical standards when collaborating with Johnson & Johnson in developing and deploying AI.

In using AI, we have an obligation to be good stewards of data sets and bring the appropriate level of scrutiny—both human and digital—to maximize the quality of outputs. We should be mindful of potential bias and gaps in our data. We should look to ensure the validity of our data sources, and we should follow appropriate collection and use practices.

We believe in clear accountability throughout the AI lifecycle, supported by robust [quality assurance](#) mechanisms, and we seek to deploy AI in a [safe and secure environment](#).

## Making AI Transparent

Our Credo stakeholders are at the core of what we do and how we operate. That's why we do our utmost to be transparent. For example, in the [Janssen U.S. Transparency Report](#), we outline many of our transparency initiatives.

When leveraging AI tools, transparency is essential in building trust with HCPs, patients and customers in all areas of our business. Building upon our [established framework](#), such as Compliance, Operational, Finance and Cybersecurity, we seek to ensure there are adequate processes in place for data collection,

management, curation and transformation, including how a model is built, used and monitored—all with the goal of making the unexplainable more explainable. Where the unknown creates confusion and suspicion, we believe appropriate transparency brings clarity and understanding of the AI tool's benefits and limitations.

## A Final Word

AI is a key component of the future of healthcare. The question is no longer *whether* AI will be used in the development, commercialization and delivery of future medicines and medical technologies, but *how* it will be used. The principles of fairness, privacy, security, responsibility and transparency guide our work with AI so that throughout the AI lifecycle, our employees operate with the highest levels of integrity required by Our Credo and our Code of Business Conduct. With these principles as our guide, we believe that AI will continue to play a central role in bringing life-saving medicines, technology and quality healthcare to patients and customers around the globe.

**From:** [Michael Spezio](#)  
**To:** [naiaac](#)  
**Subject:** Questions in response to the Public Meeting on 16 April 2024 (AI Futures Working Group)  
**Date:** Tuesday, April 16, 2024 4:31:15 PM

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Prof. Surya Ganguli wants the government to stay out of regulating startups using health AI data and approaches. But startups are small and are typically far less responsive to communities via reputational damage, and they often act less responsibly and less transparently, features that tend to continue when those startups become giants. Early on they usually have no HR department, let alone departments or expertise groups that can guide ethical and legal uses of health data in AI development and deployment. They have little incentive to audit their work and little money to do so. They move fast and break things and people. Society is littered with things that startups have broken, especially in their first years of working (e.g., Uber) even though the devices/machines they create can work remarkably well. Startups tend to prioritize their machines to the exclusion of everyone else. So would the AI Futures Working Group please focus on how startups will ensure that they will



not move fast and break things anymore, such as requiring them to engage in external auditing such as occurs in the insurance industry for actuarial practices and in numerous industries that need this for environmental practices?

Prof. Surya Ganguli makes startling claims about the capabilities of neuroscience (thought implantation to cure disorders, for example) that are not at all warranted by the current evidence. Can the Working Group please reflect on being more measured and less extravagantly outlandish in discussing the accomplishments of the sciences it works in? Being wildly optimistic does not convey a seriousness in relation to the science, nor does it elicit trust.

Prof. Michael Jordan's presentation was the most deeply insightful and meaningful and rigorous of all of the presentations. He makes the good point about the lack of understanding of the probability of error in GPT models. Another way of saying this is that there is no understanding of which claims are trustworthy,

provisionally trustworthy, and untrustworthy.  
How will The AI Futures Working Group  
develop models of trustworthy AI as it develops  
AI-driven models of healthcare?

Wouldn't alpha-fold be precise rather than  
accurate? If it is hitting a narrow area without  
being correct, or not even being able to estimate  
the probability of being wrong, that would not  
be accuracy, but precision, right? It's a small  
point, but if alpha-fold is accurate without being  
trustworthy, that would be hard to reconcile.

Prof. Jordan's presentation made some good  
points about requiring economic thinking. But  
that thinking generally assumes that money or  
similar material gain is universally similarly  
valued. The rational or subjective utility theories  
of human persons are terrible. They can work  
well for incentivizing companies or business  
sectors, but not for people. Can the Working  
Group please engage some better models in  
thinking through human values and priorities  
that really matter to real people? Economists are

bad social scientists in relation to health priorities and how people hold their lives and loved ones, and even their communities, close.

Dr. James Swanson and J&J want a global effort to define privacy for people regarding their data and their health. He justifies this request on the basis of for-profit considerations, to ensure global fluidity and ease of operations for a global company like J&J. Could the Working Group please reflect and publicly communicate how the Advisory Committee is balancing the interests and rights of US citizens and residents against the interests of very large, profitable, global corporations that want things to be easier for them? J&J is represented on the Advisory Committee, but who is representing the people of CA, NY, AR, MS, AL, GE, MT, etc.? I'm just not clear if the directors of public health in these states and if the attorneys general of these states have as much of a voice as companies like J&J. The Working Group and more broadly the NAIAC seek to make recommendations according to the needs and future thriving of US

citizens and residents, I would have thought.

As Prof. Jordan said, ethics is not the exclusive domain of moral philosophers. Additionally, scholars who are brought in to provide ethical guidance and who do not have a background in or who do not understand the technologies they are asked to engage will largely fail. They don't have experience in applying their ethical guidance in highly demanding guidance of technologies. There will be a lot of interesting conversations and enjoyable sessions, but little in the way of insightful ethical guidance will result. Similarly, ethics modules in engineering and science curricula absent clear instruction in critical valuational thinking will do nothing to aid those students when they are facing real dilemmas with real consequences for real people. Could the Working Group and the NIH please think more carefully about engaging scholars with real technological expertise and training as well as in applied ethics teaching and practice, to change the siloing of education for AI?

Thank you for looking these over and for your time in sharing your work with the public today.

All best,

Michael Spezio

Senior Visiting Fellow, Center of Theological Inquiry, Princeton NJ

Associate Professor of Psychology, Data Science & Neuroscience, Scripps College, Claremont CA  
(all views are my own)