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October 26, 2018

France A. Córdova, PhD
Director
National Science Foundation
National Coordination Office
2415 Eisenhower Avenue,
Alexandria, VA 22314

Dear Dr. Córdova:

On behalf of the Healthcare Information and Management Systems Society ([HIMSS](http://www.himss.org)), I am pleased to provide our feedback to the National Science Foundation (NSF) on the [Request for Information on Update to the 2016 National Artificial Intelligence Research and Development Strategic Plan](#). HIMSS appreciates the opportunity to leverage our members' expertise in offering feedback on this request for information (RFI), and we look forward to starting a dialogue with the NSF on the potential that artificial intelligence (AI) can provide to healthcare.

As a mission driven non-profit, HIMSS offers a unique depth and breadth of expertise in health innovation, public policy, workforce development, research, and analytics to advise global leaders, stakeholders, and influencers on best practices in health information and technology. Through our innovation companies, HIMSS delivers key insights, education, and engaging events to healthcare providers, governments, and market suppliers, ensuring they have the right information at the point of decision.

As an association, HIMSS encompasses more than 73,000 individual members and 655 corporate members. We partner with hundreds of providers, academic institutions, and health services organizations on strategic initiatives that leverage innovative information and technology. Together, we work to improve health, access, as well as the quality and cost-effectiveness of healthcare. Headquartered in Chicago, Illinois, HIMSS serves the global health information and technology communities with focused operations across North America, Europe, United Kingdom, the Middle East, and Asia Pacific.

HIMSS is supportive of the Strategic Plan and the federal government's efforts to improve the coordination of AI as well as ensure continued U.S. leadership in AI. The priorities developed in 2016 are still very relevant today and provide an actionable framework for identifying the scientific and technological needs in AI that will allow the government to maximize the impact of research and development investments in these technologies.

When HIMSS thinks about the long-term transformational impacts of AI on society and the world, we offer the following points of emphasis for our public comment. These healthcare-focused public policy priorities need to be addressed in order to realize the full potential of AI:

Ensure that Government Policies are Structured for the Expanded Use of AI Technologies

Federal healthcare policy is currently developing several regulatory actions to facilitate more data exchange and ensure healthcare entities are appropriately sharing and consuming data to help deliver better outcomes for patients and transform the healthcare system. For instance, the [21st Century Cures Act \(Public Law 114-255\)](#) and other work underway at the Department of Health and Human Services (HHS) Office of the National Coordinator for Health IT (ONC) and the Centers for Medicare & Medicaid Services (CMS) includes rules and guidance documents under development on the Trusted Exchange Framework and Common Agreement, information blocking, and the MyHealthEData Initiative. When finalized, these measures will likely encourage even greater interoperability and more ubiquitous data collection and exchange across the healthcare continuum.

Moreover, as noted in the Strategic Plan, the depth, quality, and accuracy of the information to be exchanged is vitally important and significantly affects AI performance. As a result, the availability of high-quality datasets is very relevant when discussing minimizing bias in AI processes and needs to be prioritized in all efforts moving forward.

As described in *Strategy 1: Make long-term investments in AI research*, as well as *Strategy 5: Develop shared public datasets and environments for AI training and testing*, HIMSS recommends that the Strategic Plan add language on making strategic investments in two areas critical to the long-term success of AI technologies: healthcare data exchange by aligning government policies with one of the most significant needs of AI advancement—increasing the volume of high-quality AI data available for research and development purposes; and, a workforce appropriately-trained to advance these technologies (discussed more fully later in our comment letter).

If these government policies are properly implemented, they will likely lead to fostering data exchange among all healthcare stakeholders that supports the proliferation of AI technology development. The work of the HHS agencies to advance interoperability should support the longer-term policy goals focused on *exploiting ubiquitous* data to fuel AI's development. HIMSS wants to ensure that all data exchange-related work across government triggers a stronger foundation for AI development.

Overall, fostering the training of healthcare organizations to better manage data processes and capitalizing on the growing expertise will pay dividends in healthcare transformation efforts, and facilitate more robust AI practices across all sectors.

Build an AI Use Case Focused on Relieving Clinician Burden Issues

The healthcare enterprise is primed for greater use of AI technologies to improve care processes and deliver more effective outcomes to patients all while reducing the burden that many current documentation requirements place on clinicians. As *Strategy 2: Develop effective methods for*

human-AI collaboration is implemented, HIMSS encourages NSF to partner with its HHS colleagues to create an AI use case that capitalizes on how the technology can be used to address clinician burden issues.

Much of the work that clinicians face today is unnecessarily burdensome, where burden is defined as clinician activity that does not serve patient interests, does not improve quality or safety, or regardless of intent, is highly inefficient. HIMSS is working with HHS and our healthcare community colleagues to eliminate these unnecessary actions that occur in the course of clinical practice, which will allow clinicians to focus their time on actions that make sense, such as caring for patients and delivering better outcomes. An active partnership with NSF to leverage the advancements from your collective AI initiatives can have a dramatic impact on HHS and the healthcare community's efforts.

To that end, the demands placed on clinicians could be addressed through greater use of AI technologies. With additional research, AI can be brought right into the clinical practice workflow to improve clinicians' management and use of the increasing amount of clinical data to them.

There are significant unintended consequences that documentation requirements have had on electronic health record (EHR) usability with what should be digestible information about a patient encapsulated in a clinical note. These notes are often providing only minimal value to collaborating clinicians given the extreme length of some notes that are used to justify payment or the medical necessity of a service instead of being used to derive benefit for other practitioners or to improve the patient experience. For example, researchers are currently testing the use of AI to parse the voluminous data in a clinical note to bring the right, succinct information directly to the patient's bedside for help in determining what is most pertinent to treating the patient during that specific encounter.

In addition, AI can be leveraged to address clinician burden in several other ways, from assessing risk to the development of more extensive clinical decision support and radiology tools to aid in diagnosing patients. HIMSS agrees with the thesis in the Strategic Plan that rather than replace humans, most AI systems will collaborate with humans to achieve optimal performance. Therefore, more research is needed to create effective interactions between humans and AI systems. HIMSS supports the idea of advancing a use case focused on alleviating clinician burden issues, to advance further study and refinement of AI technologies.

Safeguarding Data is a Fundamental Piece of AI Systems and Needs to be Prioritized

As described in *Strategy 4: Ensure the safety and security of AI systems*, before AI systems are in widespread use, assurances are needed that the systems will operate safely and securely, in a controlled, well-defined, and well-understood manner. HIMSS is committed to helping our nation's AI enterprise succeed in this endeavor and we want to contribute the experiences of the health IT community to help determine the path forward.

Healthcare entities have learned a significant amount about cybersecurity awareness over the last decade. Because cybersecurity is so dependent on all the players in the networked industry, even organizations that put robust cybersecurity policies and software in place remain vulnerable due

to connections with less-secure providers. HIMSS advocates for the development of a healthcare community-wide support program focused on cybersecurity needs such as software, hardware, training, and tools for cybersecurity risk identification as well as threat assessment—where larger health systems or providers have the option to support their smaller, affiliated clinicians with these services.

As such a program is only as strong as its weakest link, we also recommend that a special emphasis be placed on operational support (such as IT assistance and other skilled services) to aid smaller organizations with full deployment and regular maintenance of these cybersecurity solutions. NSF should investigate the establishment of a cybersecurity support program across all industries to ensure that as AI technologies evolve, secure data infrastructure plans are in place, and provide the assurances that the community needs to produce greater utilization of the technologies.

Cultivate the Development of a Robust Health IT Workforce to Help Advance AI

As previously discussed, a trained workforce is a necessary condition for the growth and proliferation of AI technologies. In *Strategy 7: Better understand the national AI research & development workforce needs*, NSF recognizes that advances in AI will require a strong community of AI researchers as well as an understanding of current and future research and development workforce demands in AI. HIMSS has long championed the nurturing of a stronger health IT workforce, and we would like to build on our efforts to reinforce the idea of building a stronger community of AI researchers, data scientists, and informaticists to help the entire field grow.

The development of the health IT workforce as well as the broader research infrastructure has to be prioritized for the impact each can bring to AI technologies, as well as healthcare delivery improvements and efforts to promote better, more efficient care delivery. As the broader shift to value-based care continues, the reliance on data analytics and the data sciences will continue to grow. However, the efforts of HIMSS and the entire community to support growth in the health IT workforce has faced challenges.

In the [2018 HIMSS Leadership and Workforce Survey](#), all respondents were asked to characterize their organization's current IT staffing occupancy. The findings suggest the demand for health IT workers is strong as evidenced by the fact that only 24 percent of Vendors/Consultant organizations and 56 percent of Provider organizations claim they are fully-staffed. In addition, the survey identified the recruitment and development of IT workers as a primary challenge for providers.

A knowledge base and understanding of AI technologies across the entire community is critical to push the field forward. HIMSS recommends that NSF work with HHS to consider providing greater training and career development opportunities to support a highly-trained health IT workforce that would include education on AI technologies, with the option of deeper learning on AI for those seeking careers in the developer or vendor space. We commit to working with NSF and HHS to fulfill this need and continue our support of the work of the community in fostering the development of AI technology tools in addition to our specific health IT work—such as toward the push to value-based care delivery models.

As more biomedical data becomes digitized, through EHRs and other health IT applications, the ability to integrate clinical knowledge with biomedical and other digital data becomes critically important in support of broader care transformation. Any increase in support for the health IT workforce has to be accompanied by a concomitant increase in support for the AI-related workforce.

HIMSS is committed to being a valuable and collaborative resource to NSF to help reach the full potential that AI can provide to healthcare. We welcome the opportunity to meet with you and your team to discuss our comments in more depth. Please do not hesitate to contact [Jeff Coughlin](#), Senior Director, Federal & State Affairs, at 703.562.8824, or [Eli Fleet](#), Director, Federal Affairs, at 703.562.8834, with questions or for more information.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Harold F. Wolf III". The signature is fluid and cursive, with a long horizontal line extending from the end of the name.

Harold F. Wolf III, FHIMSS
President & CEO