Warfighter Health: Leveraging AI for Improved Healthcare Delivery

Summary of Roundtable, hosted by ATARC in partnership with Tradewind on March 2, 2022

In a recent roundtable discussion hosted by the Advanced Technology Academic Research Center (ATARC) in partnership with Tradewind, military health experts, stakeholders and program offices discussed various aspects of leveraging artificial intelligence (AI) technologies in military medicine. Participants shared ideas, challenges, success stories, and emerging best practices of AI in military medicine. The private sector already leverages AI to establish faster diagnosis, provide better treatment plans and improve health, and the U.S. military is looking to harness AI benefits to support warfighter health.

Data Interoperability Factors

A unified approach and standardization of the below elements is crucial to improving data interoperability:

❖ Data collection methods
❖ Data modeling approaches
❖ Agencies' data sharing policies
❖ Data sharing platforms
❖ Access to objective and accurate health data in the context of vital privacy protection rules
❖ Leveraging synthetic data sets to augment real data
❖ Applicability of lab-trained AI models in real world settings

The use of AI in medicine has the potential to improve military service readiness, service member population health, as well as save time and resources. AI has the potential to be a transformative technology in military medicine with numerous applications across all healthcare

disciplines. While some panelists shared recent success using AI in stand-alone cases, discussion was largely centered around various challenges agencies face with data interoperability and the lack of a cohesive vision on how AI should be used in military medicine.

Preponderance of Data

There is a preponderance of data surrounding warfighter health available to both government agencies and the public to run AI models and solve problems. Currently, AI is being utilized by agencies in small scale, specific studies where data biomarkers are collected from the smartphones of warfighter participants in order to detect symptoms of infectious disease and subsequently predict outbreaks among troops. In another use case, digital biomarkers associated with specific maternal and fetal outcomes are being collected during pregnancy. Collected data points are used to build AI models to better predict medical outcomes in multiple scenarios.

Key Challenge – Data Interoperability

As participants of the Roundtable voiced their experience and various challenges with data utilization and sharing, a key theme started to emerge: despite the abundance of data available, military healthcare agencies are challenged by **poor data interoperability**.

Data is currently collected by different methods and kept in disparate systems. There is no standard approach to sharing or modeling data within the military medical field. Roundtable participants concur significant innovation and ingenuity is needed to improve data interoperability between healthcare systems.

Data sharing policies differ from one agency to another and are often restrictive in nature, making the democratization of data near impossible. Panelists suggested creating boilerplate data sharing agreements to increase data accessibility and shareability between government agencies. Standardizing data sharing platforms across military health agencies is a critical component to making data available to the wider medical community, including outside experts and vendors.

Privacy is the hallmark component to accurate and successful data collection and modeling. Medical information is strictly protected for good reason, but agencies continue to have difficulty accessing objective health data with few identifiable factors. As AI technologies advance and third parties become authorized to pull data from patient charts, data sharing policies and platforms will need to be standardized. Concurrently, agencies must continue to educate the importance and safety of AI technologies to lay people and participants.

In order to leverage the capabilities of AI across the whole of government, use cases must be available on open data platforms. Roundtable participants suggested the creation of an AI playbook or guide to contain the details of specific AI modeling use cases, much like publishing the findings of a traditional scientific study. The challenge agencies face is understanding the validity of models in other environments and populations. Agencies need to consider how to validate AI data, which metrics to use, and the statistical uncertainty of a specific model before implementation.

Often, datasets are small and collected through expensive studies controlled by hospital systems. Inflexible rules and strict policies make the use and shareability of the data difficult, which can then stifle innovation. To avoid some of this red tape, the use of synthetic data to augment real data is something to explore.

Also challenging is the fact that android and IOS devices produce different outcomes, which can change the performance of modeling.

Ensuring AI models are trained to perform in real world settings compared with lab settings can be quite difficult. In real world settings, models will encounter new classes that were not part of training sets. Models must be able to detect slight differences in new classes, as it will be forced to choose the next best match in real world situations. AI models should possess the ability to learn new classes quickly in order to be successful in real world application.

Looking Forward

Panelists encourage the military health field to think bigger. Agencies are embarking into unknown technologies without a playbook, which makes this process inherently challenging. Panelists acknowledge advanced technologies present a rare opportunity to redefine healthcare. By thinking more globally and collectively, better healthcare solutions and outcomes are possible for warfighters in the field and at home.

With a preponderance of data and incredible potential for innovation, massive collaboration among agencies and the private sector is critical. Agencies must have a better understanding of current and future best practices to determine what is possible. Immediate action looks like creating a collective roadmap to begin making constructive progress. More agile funding is also a critical way to make room for innovation and ingenuity.

Contact us today to learn more and get involved in the Artificial Intelligence Working Group!