OPINION | COMMENTARY

AI is helping in the fight against HIV in Dallas

Technology is bridging the awareness gap for life-saving treatment.

By Jacqueline Naeem

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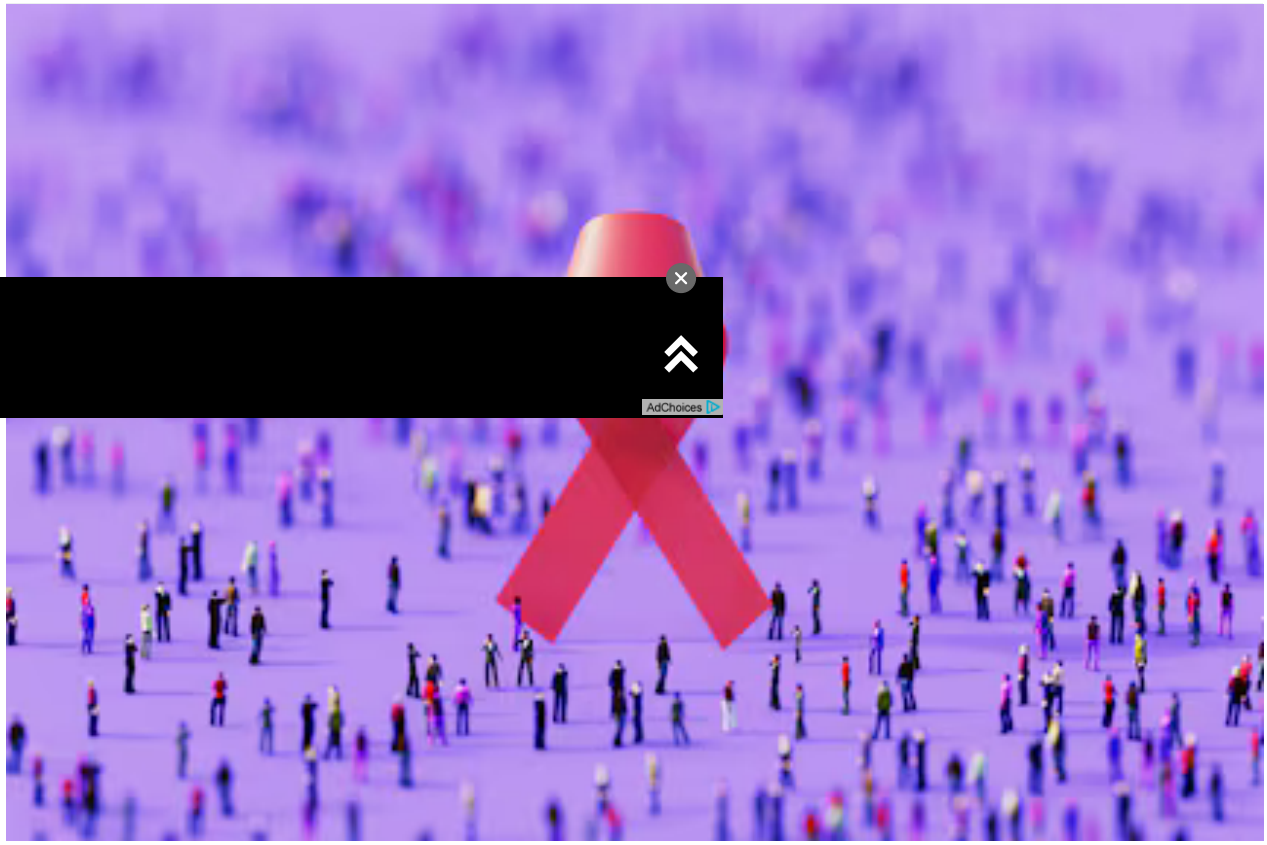

The HIV Detection Model has found hundreds of thousands of patients at risk,

demonstrating that machine learning models can be used for predicting and classifying the risk of HIV using available data, writes Jacqueline Naeem.

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During the last decade, we have seen major breakthroughs in preventing the spread of HIV, and thanks to the hard work of our public health leaders, we are seeing a drop in infections, but challenges still lie ahead.

A preventive strategy, known as pre-exposure prophylaxis, or PrEP, has been highly effective in reducing the risk of HIV infection by up to 99% when taken consistently. Due to its effectiveness, the Centers for Disease Control and Prevention recommends that medical providers counsel and prescribe PrEP to all sexually active patients if they are at risk for HIV infection.

However, despite its efficacy, PrEP remains underutilized, in large part due to a lack of awareness. This is where artificial intelligence has stepped in to significantly advance our HIV prevention efforts.

Through collaborative efforts, we are witnessing improvements in morbidity and mortality associated with HIV due to antiretroviral therapy and the availability of an effective preventive medication. Nationally, the incidence of HIV has decreased from 13.6% in 2017 to 11.3% in 2022, according to the CDC.

However, in Dallas County, we found an opportunity where we could apply our AI-driven modeling to solve a difficult situation. According to HIV.gov, in Dallas County, the HIV incidence rate was 41.4 per 100,000 people in 2022, which is significantly higher than the state average of 17.1 per 100,000 people.

With its position as North Texas' largest safety-net hospital system, Parkland Health serves an extensive population of at-risk patients, creating a vital opportunity to enhance HIV testing and create more awareness to PrEP programs.

Although we knew the mission was clear, the challenge was also great. We have an effective preventive treatment and opportunities to reach candidates, but what we were lacking was a way to identify those candidates in a simple way that could be incorporated into Parkland's workflow.

To address this critical gap, we developed and implemented a predictive model, Parkland Center for Clinical Innovation's HIV Detection AI model, informed by electronic health records data and paired with provider tools to identify and reach out to patients who stand to benefit from this treatment.

The HIV Detection project work began in late 2020. We worked with Parkland to integrate the different platforms and identified a population cohort eligible for HIV risk scoring. In late 2022,

the model went live, using health records to predict the individuals at increased likelihood of acquiring HIV and who may be candidates for PrEP. Once identified, the patients can be offered HIV testing, and if negative, can be offered PrEP.

So far, the HIV Detection Model has found hundreds of thousands of patients at risk, demonstrating that machine learning models can be used for predicting and classifying the risk of HIV using available data.

We see this as a breakthrough. The AI Model has effectively addressed the needs of vulnerable populations and can be implemented in hospital settings with limited resources. We revealed the methods and results of PCCI's HIV Detection AI Model in three peer-reviewed papers released in the past year.

There are opportunities to expand this model to reach even more patients in Dallas County, through an additional project underway with Dallas County Health and Human Services.

Leveraging predictive models within Parkland and Dallas County allows providers to identify individuals at high risk for HIV acquisition and those who are prime candidates for PrEP. By doing so, we can bridge critical gaps in HIV prevention, thereby contributing to the broader goal of reducing HIV incidence in Dallas County.

Jacqueline Naeem is vice president of clinical and social health at the Parkland Center for Clinical Innovation.

By Jacqueline Naeem

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