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# Artificial Intelligence Could Help Reduce HIV Among Homeless Youths

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Thousands of teenagers sleep on the streets every night in Canada, and spreading awareness about how they can avoid contracting viruses like HIV is no easy task. Artificial intelligence could help by singling out teens most likely to influence their peers.

PSINET, the algorithm in question, uses information about the friend networks of homeless youth, collected by staff at shelters, to map their social connections and predict which kids are the most likely to influence their friends.

Relationships between the homeless are likely to be transient and fleeting at times, the algorithm's developers note, making a certain amount of built-in uncertainty (<http://motherboard.vice.com/read/the-problem-solving-ai-of-the-future-will-be-on-your-phone>) about the strength of the relationships in the network necessary for the algorithm to work.

PSINET was developed by researchers at the University of Southern California's School of Social Work, and they presented a paper outlining their approach (<http://teamcore.usc.edu/papers/2015/IAAI15.pdf>) at last week's Association for the Advancement of Artificial Intelligence conference (<http://www.aaai.org/Conferences/AAAI/aaai15.php>) in Austin, Texas.

HIV, also known as Human Immunodeficiency Virus (<http://motherboard.vice.com/tag/hiv>), attacks the body's immune system and leaves it vulnerable to chronic illnesses. Overall rates of HIV infection among homeless youth in Canada are currently lower overall than other segments of the population, according to a 2014 study (<http://www.ohtn.on.ca/Pages/Knowledge-Exchange/Rapid-Responses/Documents/RR81-HIV-Prevalence-Street-Youth.pdf>) by the Ontario HIV Treatment Network (<http://www.ohtn.on.ca/>) (OHTN). However, among First Nations homeless youth, the rates of HIV infection are believed to be much higher (<http://www.cfenet.ubc.ca/publications/high-prevalence-hiv-infection-among-homeless-and-street-involved-aboriginal-youth>).

Regardless of the current rate of infection, homeless youths in Canada may face a high risk of contracting HIV in general, according to the Public Health Agency of Canada (<http://www.phac-aspc.gc.ca/aids-sida/publication/epi/2010/4-eng.php>), due to risky behaviours like unsafe drug use.

“The algorithm could be very useful.”

According to Jean Bacon, Director of Health Policy for the OHTN, PSINET could be useful for Canadian drop-in centers and organizations dedicated to ending homelessness and HIV in the homeless community.

“The algorithm could be very useful in trying to identify the homeless youth who are connected to the greatest number of other youth and who have influence with their peers,” Bacon told me. “It could help target prevention programs and get information to the individuals most likely to share it with others.”

Two-hundred thousand Canadians experience homelessness every year, and 30,000 are on the street on any given night, according to a widely cited 2013 study (<http://www.homelesshub.ca/SOHC2014>) by the Canadian Observatory of Homelessness (<http://www.homelesshub.ca/CanadianObservatoryOnHomelessness>). In addition, 50,000 people are crashing on couches and floors for lack of somewhere—anywhere—else to go. Twenty percent of homeless people in Canada are youth between the ages of 16 and 24.

“HIV and other sexual health education is part of outreach programs for homeless youth,” said Bacon. “There’s a particular focus on peer-based outreach, which is consistent with the theory behind the algorithm: that youth are best able to reach other youth.”

By targeting the youth with the highest odds of influencing their peers about sexual health and HIV safety, the researchers claim that simulations running the algorithm through its paces showed a 60 percent increase in the spread of information over traditional word of mouth

campaigns.

“It is a big jump from computer simulations to testing our algorithm with real people.”

PSINET hasn't been implemented yet, but the USC researchers are working with My Friend's Place (<http://myfriendsplace.org/>), a youth drop-in center in Los Angeles, to do just that. With simulations as the only evidence for the algorithm's effectiveness so far, a real-world deployment would test its mettle, according to Amulya Yadav, a PhD student in the computer science department at USC who co-authored the algorithm.

“It is a big jump from computer simulations to testing our algorithm with real people,” explained Yadav. “We may find out that our algorithm does not account for a real-world complication which we did not think of. This is why it is doubly important to test out our algorithm in the real world with real people.”

According to Tobi Cohen, a representative of the Office of the Privacy Commissioner of Canada ([https://www.priv.gc.ca/index\\_e.asp](https://www.priv.gc.ca/index_e.asp)) (OPC), the federal privacy watchdog has no jurisdiction over non-profits, but shelters that adopt predictive algorithms should be wary of privacy best practices ([https://www.priv.gc.ca/information/pub/guide\\_org\\_e.pdf](https://www.priv.gc.ca/information/pub/guide_org_e.pdf))—after all, not many people are likely to be stoked on learning that their social networks are being tracked, even to raise awareness. These include acquiring consent from participants and allowing them to challenge the accuracy of the information the algorithm spits out.

Despite these caveats, if Bacon's response is indicative at all of the wider reception algorithms would receive at drop in centers around in Canada, it might not be too long before artificial intelligence is helping them, too.

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