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## Using Artificial Intelligence Technology for Social Determinants and Risk Factors Surveillance

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### Session topic area

Data science methods: machine learning in risk factor surveillance

### Overall objectives or goal

#### Background

Decades of research have shown that factors such as living conditions, and not just medical treatments and lifestyles, are strongly associated with the health of individuals and populations. These distal factors (social, economic, cultural and environmental) are collectively called the social determinants of health (SDOH), and affect health inequities (i.e. differences in health outcomes that are avoidable, unfair and unjust). Gathering data on both risk factors (biomedical/clinical) and SDOH is of the utmost importance to quantify their contribution in disease causation at individual and population levels.

Social determinants of health and biomedical/clinical risk factors surveillance (collectively termed as “risk factor surveillance”) refers to the monitoring of distal and proximal factors that impact the health of individuals and populations and health equity. It offers the opportunity to “forecast” population health, potential disease incidence, and guide intervention programs to prevent disease manifestation. However, current risk factor surveillance data is limited in geographical representation, completion, and content and time. Identifying novel methods of collecting risk factors and SDOH data can allow for opportunities for population health and disease forecasting using high quality, nationally-representative, real-time data.

Recent breakthroughs in artificial intelligence (AI), such as speech and image recognition, offers new opportunities to develop novel methods to collect risk factor information at individual levels. Meanwhile, we can use intelligent computer systems to process vast amount of data and turn those data into actionable information and knowledge for improving population health.

#### Collaborative Session Objective

Through a CIHR-funded project, we are assembling a team of national and international experts including stakeholders, pub-

lic health officers/physicians, and researchers, who will identify key gaps in risk factor surveillance and data collection technologies. Resulting projects will focus on using AI for risk factor surveillance, for the ultimate purpose of monitoring population health, guiding intervention programs, and preventing disease. Our projects will focus on discovering and refining innovative methods in data collection, management, as well as assessment of data quality (i.e. selection bias). We will engage scientists and knowledge users from the inception of the ideas to ensure the relevancy of the final projects. This project aims to link medical records, clinical information, and SDOH data, to alter the way we conduct surveillance and work with big data.

#### Facilitators involved; home institutions

Dr. Vineet Saini, University of Calgary; Alberta Health Services

Dr. Mingkai Peng, University of Calgary

Dr. Hude Quan, University of Calgary; World Health Organization Collaborating Centre for Classification, Measurement and Standardization

#### Intended output or outcome

1. Identify AI technologies for use in risk factor surveillance; innovative methods in data collection, management, as well as assessment of data quality (i.e. selection bias); uses for new data sources in improving health equity.
2. Create partnerships between national and international experts in risk factor surveillance