



Annual Report

January 1, 2022 – June 30, 2023















Knowledge Mobilization and Public Engagement 7











Our goal is to empower our diverse community of clinicians, engineers, public health experts and scientists to advance innovative infectious disease research and create rapid research response capacity to control emerging pathogens before they become established as a global pandemic.

Launched in January 2022, the Emerging and Pandemic Infections Consortium (EPIC) was born

out of a desire to better integrate research and expertise across the University of Toronto and the city's major hospital research institutes to respond quickly and effectively to infectious disease threats. The COVID-19 pandemic demonstrated what could be achieved when interdisciplinary teams work together towards a common goal.

Building on that momentum, EPIC set out to harness the partnerships, expertise and infrastructure established amongst its partner institutions to combat COVID-19 and use those as a foundation to create a stronger, more dynamic ecosystem of collaboration.

In our first year, we aimed to reinforce the research collaborations forged during the COVID-19 pandemic and amplify the impact of the infectious disease research community through our project and training funding supports. Looking ahead, we will continue to build research response capacity and accelerate research in emerging infectious diseases, ensuring Canada's health security and supporting other communities in need around the world.



148 Faculty members

Trainee members 85

Partner institutions 6

University divisions 8

Industry and government 13 agency partners

SickKids

Sinai Lunenfeld-Tanenbaum Health Research Institute













Our aspirational goals

Respond rapidly, effectively and equitably to emerging infectious threats through our highly connected and nimble research ecosystem.

- 2 Advance excellence and diversity in the next generation of research leaders through immersive multidisciplinary learning experiences.
- 3 Accelerate discovery and translation of scientific innovations that reduce the burden of infectious diseases across affected communities.

To achieve these goals, we will rely on the following five cross-cutting enablers:



Multidisciplinary and transformative research designed to have maximum impact An active and vibrant training environment that prioritizes collaboration and diversity Partnerships with industry, policy-makers and public health driven by shared values and goals



leadership to engage stakeholders across sectors and within the public

infrastructure providing essential infectious disease research capacity

Our Commitment to Equity, Diversity and Inclusion

A diverse and inclusive research ecosystem is fundamental to innovation, from the questions we ask to the methods we use to the ideas and solutions that we generate. In our first year, we sought to develop processes that embed equity, diversity and inclusion (EDI) as core values to guide our scientific programming, events, communications, leadership and approach to training and mentorship.

From funding program development to application review to event planning, we are employing strategies to try to address disparities in research and to foster an environment where people with diverse perspectives are valued and can thrive. These strategies include:



Understanding our community

By collecting anonymized, self-reported demographic data from applicants to our funding programs, we are capturing a baseline measurement of who is applying for EPIC funding. These data will inform planning for future competitions, including ensuring communications about our programs are reaching diverse research groups.



Addressing unconscious bias

All EPIC leadership and review panel members are required to have completed unconscious bias training within the last year from a reputable organization.



Reviewing for inclusive excellence

Through the incorporation of standardized evaluation rubrics and feedback tools, we are setting clear expectations for applicants and reviewers in each of our funding competitions. In cases where the demographics of the awardees do not match that of the applicant pool, a "bias-interrupter" will facilitate additional assessments by the review panel or steering committee to reflect on inclusive excellence.

Prioritized programs

To attra ecosyst Student have als

To attract and retain diverse talent in the infectious disease research ecosystem, we created targeted supports like our Inspire Summer Studentships for Black and Indigenous undergraduate students. We have also prioritized support for early career investigators within each of our funding competitions.



Transparency

To enhance accountability, we will publicly share funding processes as well as other relevant information, such as the demographics of our review panels. We will ensure that evaluation rubrics are available to all applicants in our competitions so that expectations for fundable proposals are clear. These processes and information will be published on our website and updated on a regular basis

Timeline of Key Achievements

July

2022

Launched an mpox rapid research response with over \$1.1M in committed funding (\$250,000 from EPIC and \$875,000 in matched funding from EPIC partners)

November

Received a \$35 million grant from Canada Foundation for Innovation for the renewal of the Toronto High Containment Facility (THCF)

Co-hosted a research symposium on antimicrobial resistance with bioMérieux that drew over 250 attendees from across Canada



February

Launched \$1.9 million in research and training supports to advance innovative, interdisciplinary research on infectious diseases

Received a \$120,000 gift from GlaxoSmithKline to establish the GSK EPIC Convergence Postdoctoral Fellowship in Antimicrobial Resistance

March

Launched the Canadian Hub for Health Intelligence and Innovation in Infectious Diseases (HI3) with \$2 million in funding from the Canada Biomedical Research Fund

May

Launched a three-part public speaker series on climate change and infectious diseases in partnership with Climate Positive Energy and the Institute for Pandemics that had

over 258 attendees

June

Cohosted the annual U of T Infectious Diseases and Microbiology Research Day with the Division of Infectious Diseases and MicrobeTO that drew over 275 attendees







peer-reviewed publications to which EPIC directly contributed peer-reviewed publications from our community where our members were lead author awards and honours for our faculty members

9

⊕⁺ 13

international conference presentations to which EPIC directly contributed

In 2021, U of T ranked first in Canada and fifth globally in the number of publications related to COVID-19.

Leading the way in high containment research

The Toronto High Containment Facility (THCF) supports the research of our faculty members in infectious diseases, immunology, genomics and engineering.

The THCF is the largest containment level 3 lab in the province. A cornerstone of EPIC's research community, it is equipped to allow researchers to study high-risk pathogens, such as SARS-CoV-2, HIV and the bacteria that causes tuberculosis, in a safe and secure way.



During the COVID-19 pandemic, the THCF played a critical role in accelerating key research breakthroughs that guided the pandemic response in Ontario and Canada – including becoming the first lab in Canada, and among the first in the world, to isolate the novel coronavirus in March 2020, an effort led by Sunnybrook researchers **Samira Mubareka** and **Rob Kozak**.

The THCF has continued to play a key role in supporting EPIC members' research over the last 18 months. Notably, it contributed to a study co-led by Mubareka published in *Nature Microbiology* that describes a <u>highly divergent variant of SARS-CoV-2 in white-tailed deer and the first</u> <u>evidence of deer-to-human transmission</u>. The facility also enabled preclinical evaluation of a new SARS-CoV-2 mRNA vaccine candidate from Providence Therapeutics. The study, which was led by **Mario Ostrowski** (Unity Health) and published in *Science Advances*, was instrumental in Providence Therapeutics receiving Health Canada approval to conduct a phase 2 clinical trial to assess their vaccine candidate in humans.

The Toronto High Containment Facility at a glance



15 U of T-based groups

industry-led projects

3 projects engaging government agencies





AN EPIC SUCCESS STORY Mobilizing against mpox

The global mpox outbreak in 2022 was unprecedented in the amount of local transmission seen in countries where the disease is not endemic.

A week after the first mpox case was detected in Toronto in May 2022, EPIC and its hospital partners, including Sunnybrook Research Institute, Unity Health Toronto and the University Health Network, came together to mount a <u>rapid research response to the global mpox</u> outbreak. The response was led by:

Darrell Tan and **Sharmistha Mishra** (Unity Health) along with co-investigators **Adrienne Chan** and **Rob Kozak** (Sunnybrook), **Allison McGeer** (Sinai Health), **Mario Ostrowski** (Unity Health) and **Sharon Walmsley** (UHN).

Over \$1.1 million in funding was committed to support projects including:

- An observational cohort study to better understand disease symptoms
- Modelling studies to look at disease transmission and the impact of varying vaccine distribution
- Transmission studies to understand surface, aerosol, pre-symptomatic and asymptomatic transmission

A central component of the research response was meaningful engagement with the gay, bisexual and men who have sex with men community who were most impacted by the outbreak as well as with community partners.

The work is already having an impact:



Consultations with public health leaders and policymakers to inform vaccine prioritization and outbreak response strategies



A soon-to-be launched online image atlas featuring images of mpox lesions on different skin tones to reduce stigma and facilitate faster diagnoses



Over \$4.8 million in leveraged funding, including <u>a \$3.5</u> <u>million team grant to launch the Canada-Africa Mpox</u> Partnership with researchers in Nigeria

Knowledge Mobilization and Public Engagement

8

31

research and public engagement events

stories published on our website highlighting our members and activities stories reshared on Temerty Faculty of Medicine and U of T News websites

21000+

page views on our stories





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8 media stories in print, radio, TV and the web **1,008 followers** on Twitter **228 followers** on LinkedIn

349 subscribers to the newsletter

AN EPIC SUCCESS STORY

Bringing people together to address antimicrobial resistance

In November 2022, EPIC partnered with diagnostics industry leader bioMérieux to jointly host a research symposium on Canadian perspectives on antimicrobial resistance: where we are now and looking ahead. The event featured 13 speakers from across Canada, including EPIC members **Rob Kozak** (Sunnybrook), **Karen Maxwell** (U of T), **Susan Poutanen** (Sinai Health/UHN) and **Nikki Weckman** (U of T), and drew over 250 attendees.

From the clinical perspectives of frontline pharmacists and medical microbiologists to the research advances shared by fundamental researchers, the talks highlighted the need for collaborative, interdisciplinary approaches to tackling this urgent global health challenge. Notably, several speakers underscored the importance of AMR through a One Health lens.

The day ended with an urgent call-to-action for creative solutions to raise the profile of AMR in the public consciousness and among policymakers to boost support for research and measures to tackle AMR and to implement policies that limit its impact.



Funding and Partnerships

\$3.0 million

distributed in funding through three project-based and six trainee programs and the mpox rapid research



in **leveraged funding**, including \$**35 million** to revitalize the Toronto High Containment Facility and **over \$4.8 million** to

response

build on projects from the mpox rapid research response



Advance innovative and collaborative research

Inform policies and drug and vaccine development Support trainee development Contribute to EPIC's long-term sustainability

AN EPIC SUCCESS STORY

Federal funding to enhance pandemic preparedness

Thanks to the leadership of EPIC and our faculty members, U of T received two significant federal investments that will help accelerate critical infectious disease research and allow Canada to respond more quickly, effectively and equitably to future pandemics.

In November 2022, CFI announced a **\$35 million** investment to revitalize the Toronto High Containment Facility (THCF). This research infrastructure funding will support the modernization and expansion of the THCF so that there is increased research capacity to work with emerging and re-emerging pathogens and to maintain existing projects during future pandemics.

In March 2023, U of T became the home for the **Canadian Hub for Health Intelligence and Innovation in Infectious Diseases (HI3)**, an idea borne out of EPIC. The hub brings together over 80 partners in a collaborative, multi-disciplinary and multi-sector coalition that will support a robust domestic pipeline of life-saving vaccines and therapeutics targeting existing and emerging infectious threats.



One of our main goals is to develop an inclusive and multidisciplinary training environment that empowers excellence in the next generation of research leaders. Over the past 18 months, we launched six funding opportunities that specifically support trainees:



Inspire Summer Studentships for third-year Black and Indigenous undergraduate students to undertake infectious disease research



Doctoral Awards to support doctoral students engaged in infectious disease research



Future Leaders Prizes to celebrate PhD graduates who have completed an excellent infectious diseasefocused thesis and demonstrated leadership



Convergence Postdoctoral Fellowships to support postdoctoral fellows who are bringing together two distinct research disciplines to address an infectious disease-related question



Career Transition Awards to provide funding to postdoctoral fellows and research associates who are ready to lead an independent, small-scale project



Researcher Mobility Awards to support doctoral students and postdoctoral fellows in undertaking research training or completing collaborative fieldwork outside of Toronto

We have also partnered with <u>MicrobeTO</u>, a U of T-based networking hub for infectious diseasefocused trainees, to cohost a social event for trainees and a monthly student seminar series. These trainee-only events provide a safe environment for students to network, discuss their research and build new connections for collaboration. Since January 2022, these events have engaged roughly 93 trainees.

AN EPIC SUCCESS STORY Afia Amoako

Doctoral Award recipient **Afia Amoako** is applying a person-centred lens to examine the unequal landscape of the COVID-19 pandemic in Toronto.

Working with **David Fisman** at the Dalla Lana School of Public Health, her doctoral research aims to combine spatial and mathematical modelling methods with contact tracing, laboratory testing and census data to provide a deeper, more nuanced understanding of how people living in this city experienced COVID-19.



Her project focuses on the first two years of the pandemic when access to PCR testing was more widely available. To capture the missing details about the people affected by COVID-19, Amoako is using data from the 2021 census and the Ontario Marginalization Index, a tool that combines a wide range of demographic indicators to quantify different

dimensions of marginalization including poverty and housing.

Amoako hopes that her research will lay a foundation for how research on infectious diseases can and should adopt a person-centred approach.

"We cannot do research on infectious diseases without talking about the diversity of people who are being impacted. There has to be a discussion about people's diverse experiences – that is what I really want to achieve through my work."