

Introduction to 98th volume of the University of Toronto Medical Journal Issue on Vaccines and Immunity

Yuliya Lytvyn, PhD^{1,2}; Maleeha A. Qazi, PhD^{1,2}

¹ University of Toronto Medical Journal, University of Toronto Medical Society, Toronto, Ontario

² Temerty Faculty of Medicine, University of Toronto, Toronto, Ontario

The immune system is a complex network of organs vital for protection against viruses and diseases. It has, therefore, been a topic of high importance during the current coronavirus disease 2019 (COVID-19) pandemic. Substantial worldwide efforts have been made to understand the immune response that leads to the complications of the acute respiratory syndrome associated with morbidity and mortality of COVID-19 as well as long-term effects of infection. Such focused collective efforts resulted in the development of effective vaccines at unimaginably rapid pace, including vaccines with the novel mRNA technology. The first hurdle now standing between the lifesaving vaccines and the public are challenges with strategic and equitable distribution of a limited supply during a public health crisis. So far, vaccine demand has been far exceeding the supply that has generally limited people's choice of which vaccine they will receive. The gaps in access are exaggerated in vulnerable populations and in the developing countries, which face significant hurdles in getting access to any vaccination. As the world leaders in public health develop distribution strategies, as of June 19, 2021, 2.5 billion doses have been given worldwide and just under 10% of the world population is fully vaccinated. While the COVID-19 case numbers began to significantly decline in countries with rapid vaccine distribution, the next challenge of supply exceeding demand may emerge without reaching the expected herd immunity of roughly 80% of the population being vaccinated.¹ At that point incentives for immunity strategies may be developed. The journey of developing and administering COVID-19 vaccinations is not yet over, with emergence of multiple variants worldwide and reports of vaccine breakthroughs.² As the real-world experience with vaccination accumulates, more information becomes evident in regard to immunogenicity, immunospecificity and effectiveness against arising variants. Consequently, booster vaccinations are now being investigated to continue the pandemic management strategy.

For our issue on Vaccines and Immunity, the UTMJ invited Dr. Daniel Buchman, a bioethicist and a family physician at CAMH to comment on equitable vaccine distribution, especially as it pertains to individuals with mental health illnesses. This commentary educates how people with mental illnesses experience structural vulnerability and how effective and ethical vaccine responses can be inclusive of this group. Additional commentaries in this issue focus on equitable vaccine distribution and the role health care practitioners play in advocacy and decision-making processes. Dr. Jerome Singh, Adjunct Professor of Clinical Public Health at the Dalla Lana School of Public Health, University of Toronto, describes the important role the Global South can play in the development of vaccines against COVID-19 and through inclusion of its population in vaccine trials. Next, Dr. Shima Shakory, a resident physician in

the department of Public Health and Preventive Medicine at the University of Toronto describes vaccine prioritization strategies in Canada and the challenges faced in immunizing the most vulnerable.

UTMJ also had the privilege to interview several highly respected leaders in the fields of immunology research, infectious disease, vaccine development, and distribution. Interviewees shared their insights into the strategies with understanding the immune system mechanisms involved in a COVID-19 infection, the pathway to developing vaccines, the challenges of distribution, and future perspectives. Dr. Maria Major, a medical field advisor for Pfizer Vaccines with 26 years of experience in the field, shared the journey, approval process and challenges of development of the Pfizer vaccine for COVID-19 from inception to today and into the future steps. Dr. Joel Lexchin, an emergency physician at the University Health Network, a consultant to numerous influential organizations such as World Health Organization, and an outspoken critic of the pharmaceutical industry and the way Health Canada regulates drugs, discussed how the pharmaceutical industry impacts medical education and practice. Next, UTMJ spoke to Dr. Charu Kaushic, the Scientific Director of the Canadian Institutes of Health Research (CIHR)- Institute of Infection and Immunity and Chair of GloPID-R, the global consortium of funders in pandemic preparedness and emergency response research. In her interview, she describes her first-hand experience in CIHR's research response to the pandemic and her work on Canada's COVID-19 National Immunity Task Force. The UTMJ team also interviewed Dr. Tania Watts, an immunology researcher with a leadership role serving as a member of the COVID-19 advisory group for Ontario, where she has helped to educate and inform the public on scientific advances regarding SARS-CoV-2 vaccines and immunity. Dr. Watt's research focuses on the immune responses to viruses such as influenza, HIV, and most recently, SARS-CoV-2. In her interview with UTMJ, she discusses her recent research in SARS-CoV-2 immunity and the novel inducible T cell co-stimulation pathway that contributes to T cell activation that her team helped uncover using samples from recently recovered COVID-19 patients. Finally, the UTMJ also interviewed Dr. Isaac Bogoch, a general internist and an infectious disease physician at the Toronto General Hospital, who has been at the forefront of sharing COVID-19 related scientific information and advances with the general public. He sits on the Government of Ontario's Ministers' COVID-19 Vaccine Distribution Task Force and discusses the processes and challenges of vaccine distribution.

The UTMJ takes pride in supporting manuscript submission by trainees all over the world. In this issue, Carlos Khalil and Rachel Goldfarb from the Department of Medicine, received the first prize trainee submission award. Their co-authored paper, entitled



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“HIV risk in African, Caribbean and Black youth: perceptions of community leaders in the Windsor-Sussex Region,” conducted individual interviews with 12 community leaders and 2 focus groups with individuals who had deep connections to the Windsor ACB community and its youth to assess community leaders’ perceptions of HIV risk in ACB youth in Windsor, Ontario. The solutions proposed in this study may enable community leaders, policy-makers, and parents to limit the risk factors that lead to elevated HIV rates in ACB youth and promote positive and safe sexual behavior.

This is the third and final issue of the University of Toronto Medical Journal’s 98th volume. We would like to sincerely thank our dedicated editorial team for all the hard work that went into preparing this issue and all past issues. We are grateful for the patrons and faculty that continue to support the University of Toronto Medical Journal and the authors that have allowed us to showcase their important work and provided insight into the vaccines and immunity in the current COVID-19 pandemic. We hope that you find this issue informative and thought-provoking.

References

1. Volpp KG, Cannuscio CC. Incentives for Immunity - Strategies for Increasing Covid-19 Vaccine Uptake. *N Engl J Med*. 2021 May 26. doi: 10.1056/NEJMp2107719. Epub ahead of print. PMID: 34038633.
2. Hacısuleyman E, Hale C, Saito Y, Blachere NE, Bergh M, Conlon EG, Schaefer-Babajew DJ, DaSilva J, Muecksch F, Gaebler C, Lifton R, Nussenzweig MC, Hatziioannou T, Bieniasz PD, Darnell RB. Vaccine Breakthrough Infections with SARS-CoV-2 Variants. *N Engl J Med*. 2021 Jun 10;384(23):2212-2218. doi: 10.1056/NEJMoa2105000. Epub 2021 Apr 21. PMID: 33882219; PMCID: PMC8117968.