Toronto Dementia Research Alliance

2022

TDRA

www.tdra.utoronto.ca

Toronto Dementia Research Alliance
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Contents

Executive Summary 3
Standardization of Dementia Care 4
Dementia Prevention 5
Investing in Learners 9
Building Research Infrastructure 9
Knowledge Translation 12
Grants Secured and Submissions Under Review by TDRA Research Working Groups in 2022 13
Appendix 1: TDRA Governance Structure 15
Appendix 2: Temerty-Tanz-TDRA Workshop Agenda 16
Appendix 3: TDN Referral and Enrollment Information 17
Appendix 4: Metrics for Advances in Dementia Research Webinars 18
Appendix 5: Key Metrics for TDRA Main Website (www.tdra.utoronto.ca) 19
Appendix 6: Key for TDRA Portal Website (www.portal.tdra.utoronto.ca) 20
Appendix 7: Key Metrics for Twitter 21
Appendix 8: Key Metrics for TDRA's LinkedIn Profile 22
Appendix 9: TDRA Newsletter Analytics 2022 23
Appendix 10: Notable Activity for TDRA's LEAP Council 24
Appendix 11: Research Working Group Members 25

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Executive Summary

In 2022, the TDRA continued on our goal of advancing research toward a treatment for dementia amidst the backdrop of the COVID-19 pandemic. Our network of clinicians, researchers, learners, and persons with lived experience have all contributed to our success, persevering at a time when they and the health system are stretched incredibly thin. In spite of this, progress on initiatives that align with TDRA's two strategic directions **– standardization of dementia care** and **dementia prevention** – has been made.

A major highlight of 2022 to date is the addition of a seventh, albeit familiar partner to the TDRA family: Unity Health Toronto (UHT). Clinicians and researchers at UHT have long-established relationships with investigators in our network, and we are excited to have them re-embedded in TDRA. This cements a core of university-affiliated Toronto hospitals that lead in dementia research and care. We also welcomed Sarah Downey, newly appointed President and CEO of CAMH, to our Executive Committee.

In 2022, three key projects emerging *directly* from TDRA research working groups received external funding for a total of nearly $2 million. The first will optimize a novel non-pharmacological treatment for depression, a key risk factor for dementia. The second focuses on developing a virtual training program that will help caregivers/care partners manage the behavioural symptoms of people living with dementia, understand the realities of caregiving, and ultimately avoid burnout. The third will develop a novel virtual/in-person model of care for efficient diagnosis of cognitive impairment applicable to tertiary memory clinic settings. Other research groups are advancing on their goals: in long-term care, a mechanism is being developed to test different interventions to manage behavioural symptoms of dementia; the memory clinic standardization group is testing AI to predict disease trajectory; and the neuroimaging group is developing a course to support the use of a standardized, robust MRI protocol.

This year, TDRA invested $370,000 **training** and **grants** including a second Brain Medicine Fellowship, an additional three seed grants, and a fellowship for Black and Indigenous learners. TDRA plans to fund two medical students through the Graduate Diploma in Health Research and Comprehensive Research Experience for Medical Students, and has awarded the second Sandra E. Black award for outstanding achievement in clinical dementia research.

TDRA also adds value to our network through supportive infrastructure projects. The Toronto Dementia Network continues to connect people living with dementia to clinical trials at a yield that far exceeds traditional modes of recruitment. A legal working group has been launched that allows lawyers from each of our partner sites to connect and expedite multi-site contracts. This year, we also focused on the importance of EDI in research, hosting two workshops for TDRA investigators in partnership with the University of Toronto.

Although we have grown again this year, TDRA is working together more closely than ever. In late October, we undertook a strategic planning exercise with our stakeholders that will shape the focus of our efforts for the next three years. We will build on our achievements, and continue to enable world-leading research and care in dementia, together.

Standardization of Dementia Care

The TDRA actively seeks opportunities to standardize elements of dementia care using evidence-informed protocols and making them widely available. Taking this approach improves the quality of care, and creates a set of data that are consistent and comparable. Those standardization initiatives are:

1. **Standardized Clinical Cognition MRI Protocol:** A common clinical MRI protocol for dementia was implemented last year at Sunnybrook Health Sciences Centre (Sunnybrook), University Health Network (UHN), and Unity Health Toronto (UHT). Since April 2021, 769 scans have been completed that utilize this protocol (Sunnybrook: 418; UHT: 71; UHN: 280). A CME-accredited course that will provide training to radiologists on how to detect various pathologies is in development for early 2023. This course, led by **Paula Alcaide Leon** and **Carmela Tartaglia** of UHN, and developed in collaboration with the **Joint Department for Medical Imaging (JDMI)** will provide training on how to identify and report on the most common pathologies for dementia detectable by MRI. Once developed, it will improve the quality of the reporting provided to physicians caring for people living with dementia.
   Investigators: **Sandra Black** (Sunnybrook), **Corinne Fischer** (UHT), **Chinthaka Heyn** (Sunnybrook), **David Kim** (CAMH), **Sanjeev Kumar** (CAMH), **Paula Alcaide Leon** (UHN), **Amy Lin** (UHT), **Walter Montanera** (UHT), **Alan Moody** (Sunnybrook), **Chris Scott** (Sunnybrook), **Carmela Tartaglia** (UHN).

2. **Memory Clinic Standardization:** This working group continues to focus on standardizing assessments for people living with dementia, and improving accessibility for the Toronto Cognitive Assessment (TorCA). So far, partnerships have been established to translate the TorCA to six different languages (French, Arabic, Ukrainian, Romanian, Russian, and Spanish). This will make the TorCA a more useful tool for the multitude of ethnicities across the city. This group is also leading two other studies: one that will examine the use of AI to support the diagnosis of dementia, and another that aims to use modeling to improve prognostic confidence (described below). Both will leverage the data collected by this committee on >2000 participants.
   Investigators: **Sandra Black** (Sunnybrook), **Bradley Buchsbaum** (Baycrest), **Howard Chertkow** (Baycrest), **Daniel Felsky** (CAMH), **Morris Freedman** (Baycrest), **Sean Hill** (CAMH), **Sanjeev Kumar** (CAMH), **Ekaterina Rogaeva** (U of T), **Stephen Strother** (Baycrest), **David Tang-Wai** (UHN), **Carmela Tartaglia** (UHN).

   1. *Artificial Intelligence in the Memory Clinic:* Funded in 2021 for $1.68 million, this project will develop artificial intelligence-based approaches to support the diagnosis of dementia. It will build on the work of the Memory Clinic Standardization RWG and data entry from the Memory Clinics standardized assessments is almost complete to start applying AI.
   2. *Improving prognostic confidence in neurodegenerative diseases causing dementia using peripheral biomarkers and integrative modelling*: Also funded in 2021, this project has a budget of $600,000 to develop non-invasive diagnostic and prognostic algorithms in older individuals

presenting with cognitive complaints, to ultimately enable targeted treatment in people with specific underlying disease pathologies. REB submission is under review now.

3. **Long-Term Care Standardization:** This group developed a preliminary version of a uniform intake form for assessment of neuropsychiatric symptoms of dementia. This form can be completed at the point of care in electronic form, and the data directly captured in a REDCap database. Consultations were held with diverse stakeholders to receive feedback about instituting the standardized intake process. These stakeholders include consultant psychiatrists who provide care for dementia in long-term care homes (LTCH), family doctors who provide general clinical care to LTCH residents, and Behavioural Supports Ontario. Development of the electronic form by the CAMH informatics team is in progress. A research coordinator has joined the team and onboarding of a methods specialist is underway. Next steps are to pilot test the form in a few LTCHs and obtain REB approval for creation of a database for research.
   Investigators: **Amer Burhan** (Ontario Shores), **Peter Derkach** (West Park Healthcare), **Anuroop Duggal** (LEAP), **Corinne Fischer** (UHT), **Morris Freedman** (Baycrest), **Sean Hill** (CAMH), **Andrea Iaboni** (UHN), **Sanjeev Kumar** (CAMH), **Krista Lanctôt** (Sunnybrook), **Clement Ma** (CAMH), **Frank Palmer** (LEAP), **Gillian Strudwick** (CAMH).

4. **Virtual Assessment of Praxis as a Predictor of Basic Activities of Daily Living:** In 2021, this study received $99,932 from the Alzheimer Society Research program to explore whether virtual assessments of praxis are more informative than traditional questionnaires to assess impairments in activities of daily living. This study has recruited 31 participants thus far, and is on track to meet its milestones.
   Investigators: **Malcolm Binns**, (Baycrest), **Sandra Black** (Sunnybrook), **Morris Freedman** (Baycrest), **Sanjeev Kumar** (CAMH), **Tarek Rajji** (CAMH), **Shlomit Rotenberg** (U of T), **David Tang-Wai** (UHN), **Stephen Strother** (Baycrest).

Dementia Prevention

A number of modifiable factors have been identified that contribute to the risk of dementia. TDRA's efforts to advance work in this area focus largely on building capacity in translational research, and on supporting the development of promising ideas through small, targeted grants.

1. **Temerty-Tanz-TDRA Initiative:** In partnership with the Temerty Faculty of Medicine and the Tanz Centre for Research in Neurodegenerative Diseases, TDRA launched a 3-year and $1.05 million initiative focused on exploring the link between dementia and depression. Depression has been identified as a key modifiable risk factor for dementia, and modifiable risk factors account for 40% of dementia cases. There are three elements to this initiative:

   Temerty-Tanz-TDRA Research Fellowships:

i) *Temerty-Tanz-TDRA Brain Medicine Research Fellowship #1:* Eleven applications were received and reviewed by a Selection Committee with representatives from Baycrest, CAMH, Sunnybrook, UHN, and U of T. The Committee selected **Dr. Iryna Palamarchuk**, who started in March 2022, working on a collaborative project between **CAMH** and **Sunnybrook** to assess the use of transcranial alternating current stimulation and focused ultrasound to enhance prefrontal cortical function in older people living with depression or mild cognitive impairment (more information here).

ii) *Temerty-Tanz-TDRA Brain Medicine Research Fellowship #2:* Seven applications were received, and the Committee selected **Dr. Adrian Espiritu**. Dr. Espiritu will be conducting a collaborative project between **Ontario Shores Centre for Mental Health Sciences** and **UHN**. The project will use repetitive transcranial magnetic stimulation (rTMS) as a novel intervention for people living with treatment-resistant late-life depression (TR-LLD) and motor-cognitive risk syndrome.

iii) *Temerty-Tanz-TDRA Post-Doc Research Fellowship:* Thirty-four applications were received and reviewed by a Selection Committee with representation from all TDRA sites. The Committee selected **Dr. Samar Elsheikh**, who will lead a collaborative project between **CAMH** and **Unity Health Toronto** that examines genetic factors that may reveal correlations between response to anti-depressants and cognition in late life.

Temerty-Tanz-TDRA Seed Funding: Awards valued at $70,000 to seed innovative research at the intersection of depression and dementia were launched in June of 2021. Submissions were to be multi-site, or collaborative among basic and clinical sciences. In last year's competition, nine applications were reviewed by a panel of five external reviewers and a member of TDRA's Lived Experience Advisory Partners (LEAP) Council. Those funded projects and their updates are:

i) *Impact of lipopolysaccharide on immune response and cerebral amyloid deposition in older adults with a history of major depressive disorder*
Investigators: **Damien Gallagher** (Sunnybrook), **Ariel Graff-Guerrero** (CAMH)
Update: The laboratory work for the study has been completed, initial analyses conducted, first draft of paper circulated.

ii) *The contribution of cerebrovascular disease to depression in patients with and without Alzheimer's disease*
Investigators: **Angela Golas** (CAMH), **Carmela Tartaglia** (UHN)
Update: The project is in the process of analysing data that have been gathered.

iii) *Assessment of heart rate variability in older adults with lifetime history of depression or mild cognitive impairment*

Investigators: **Jean Chen** (U of T), **Linda Mah** (Baycrest)
Update: A research student has joined the team to lead the project starting fall 2022.

The **second round of the Temerty-Tanz-TDRA Seed Fund competition** closed for submissions on June 30th, 2022.Seven LOIs were invited to submit full applications.. After careful review and scoring by a panel of five external reviewers and two members of LEAP, two projects have been selected for seed funding:

i) *Using machine learning to differentiate Alzheimer's disease from depression*
Investigators: **Jennifer Rabin** (Sunnybrook), **Mary-Pat McAndrews** (UHN)

ii) *The contribution of cerebrovascular disease to depression in patients with and without Alzheimer's disease*
Investigators: **Lorraine Kalia** (Tanz, UofT), **Philip Kim** (Donnelly Centre, UofT), **Suneil Kalia** (UHN), **Clement Hamani** (Sunnybrook)

Temerty-Tanz-TDRA Workshop:
On November 30th, 2022, we hosted the Inaugural Temerty-Tanz-TDRA Workshop, titled 'Discovering the Links between Depression and Dementia'. The Workshop provided an opportunity for all fellows and seed funding awardees to present on their progress, and to learn from their peers. The Workshop also featured two international keynote speakers- Dr. Olusola Ajilore and Dr. Stafford Lightman- who are experts in the field of depression and dementia research.

The Workshop was accredited by the Royal College of Physicians and Surgeons, which allowed eligible clinicians to earn Continuing Medical Education credits for their participation. This year's Workshop was also granted $4,000 CAD in additional sponsorship funding through the Ontario Brain Institute's Event Funding Program.

We hosted the Workshop at the Hart House, University of Toronto. There were 79 attendees, with the majority of the audience comprised of researchers and scientists. In evaluation forms, most participants agreed that learning objectives were met, and that Workshop content was relevant to their discipline, met their expectations, was well-organized, and provided adequate opportunities to interact with their peers. Participants also found the Workshop to be accessible and inclusive, and some indicated that they will consider changes in their current practice as a result of their learnings. For example, considering sex/gender analysis and stress measure methods, or giving extra thought to the timing of treatments/interventions. This will be the first of two Workshops, and we look forward to the second Workshop scheduled for 2024. See **appendix 2** for Workshop agenda.

2. **KCNI-Tanz-TDRA Project:** In a collaborative effort that brought together a team of scientists from across CAMH Krembil Centre for Neuroinformatics (KCNI), the Tanz Centre for Research in Neurodegenerative Diseases, and the TDRA, funding was secured in 2021 ($600,000) to develop non-invasive diagnostic and prognostic algorithms - based on biomarkers and supported by AI - in older individuals presenting with cognitive complaints. The aim of this project is to better diagnose neurodegenerative diseases and ultimately enable targeted treatment in people with specific underlying disease pathologies.
   Investigators: **Daniel Felsky** (CAMH/KCNI), **Morris Freedman** (Baycrest/TDRA), **Ekaterina Rogaeva** (UHN/Tanz), **David Tang-Wai** (UHN/TDRA), **Carmela Tartaglia** (UHN/Tanz)
   Updates: A protocol has been developed and is undergoing REB review.

3. **Focused Ultrasound (FUS) – transcranial Alternating Current Stimulation (tACS) Project:** This externally funded ($500,000) collaborative project between Sunnybrook and CAMH will test the effects of two non-invasive stimulation methods – focused ultrasound (FUS) and transcranial alternating current stimulation – on enhancing working memory in older adults. It will assess whether the combined stimulation with result in synergistic effects.
   Investigators: **Kullervo Hynynen** (Sunnybrook), **Tarek Rajji** (CAMH), **Abhishek Datta** (Soterix Medical)
   Updates: The study recently received REB approval at CAMH and is pending Sunnybrook REB and Health Canada approvals.

4. **Levetiracetam to modulate hippocampal hyperactivity in a population at risk (ALEVIATE):** This study, funded for $1.4 million by the Weston Brain Institute in 2021, aims to explore what could be a promising biomarker present in the prodromal stages of dementia, and test a possible treatment. Excess activation of the hippocampus in persons with normal cognition carrying an ApoE4 gene - compared to the level of activation in non-ApoE4 carriers – is thought to contribute to progression of disease. Aleviate aims to characterize and describe this excess activation, and test levetiracetam's ability to quell elevated activation, and potentially preserve the hippocampus.
   Investigators: **Sandra Black** (lead applicant, Sunnybrook), **Arnold Bakker** (Johns Hopkins University), **Howard Chertkow** (Baycrest), **Morris Freedman** (Baycrest), **Maged Goubran** (Sunnybrook), **Nathan Herrmann** (Sunnybrook), **Alex Kiss** (Sunnybrook), **Sanjeev Kumar** (CAMH), **Ben Lam** (Sunnybrook), **Krista Lanctôt** (Sunnybrook), **Mario Masellis** (Sunnybrook), **Mary Pat McAndrews** (UHN), **Sara Mitchell** (Sunnybrook), **Luca Pisterzi** (CAMH), **Jennifer Rabin** (Sunnybrook), **Tarek Rajji** (CAMH), **Joel Ramirez** (Sunnybrook), **Pedro Rosa Neto** (Douglas Hospital Research Centre), **Antonia Strafella** (UHN), **David Tang-Wai** (UHN), **Carmela Tartaglia** (UHN), **K. Uludag** (UHN), **Neil Vasdev** (CAMH), **Don Weaver** (UHN), **Richard Wennberg** (UHN), **Katherine Zukotynski** (McMaster University).
   Updates: The first phase of this study is underway, and the first participant has been enrolled..

Investing in Learners

TDRA aims to build capacity in dementia research and care by facilitating training opportunities for the next generation of leaders through our network of world-leading clinicians and researchers. The programs and learners funded this year include:

1. **CREMS Summer Students**: This program provides medical students the opportunity to lead a summer research project. In 2022, TDRA funded half of the stipend of **Elizabeth Boyd**, who worked with **Krista Lanctôt** at Sunnybrook. Elizabeth examined MRI data from the COMPASS-ND study to determine the association between grey matter atrophy and neuropsychiatric symptoms underlying neurodegenerative processes.

2. **GDipHR Program:** Over 20 months, medical students in this program take graduate-level courses and lead a research project. TDRA funded half the stipend of **Shreya Jha**, who is working with **Sanjeev Kumar** at CAMH on abnormal cortical excitability in dementia and its association with brain metabolites and clinical symptoms using TMS-EEG and Magnetic Resonance spectroscopy. An abstract was submitted to Psychosomatic Medicine's special edition on Geroscience and the manuscript is being written. TDRA is planning to fund up to two additional GDipHR students for 2023.

3. **MITO2i-TDRA Fellowship***:* The Mitochondrial Innovation Initiative (MITO2i) and TDRA have partnered to co-fund a fellowship focusing on the role of the mitochondria in dementia. **Neda Rashidi-Ranjbar**, under the supervision of **Tom Schweizer** and **Corinne Fischer** at Unity Health Toronto, is leading a study that investigates the efficacy of photobiomodulation, a form of light therapy, in the treatment of mild cognitive impairment. Health Canada approval has been obtained and the study is in the process of obtaining final REB approval. Recruitment will begin this fall.

4. **Sandra E. Black Award in Clinical Dementia Research:** The recipient of the 2022 Sandra E. Black Award is **Durjoy Lahiri**, who is under the supervision of **Howard Chertkow** at Baycrest. Durjoy's research focuses on amyloid negative and positive individuals and their clinical trajectory, neuroimaging features, and novel blood-based biomarkers. He is also working on neuromodulation therapy in people living with degenerative aphasias.

5. **Supporting Black and Indigenous learners:** This year, TDRA launched a postdoc fellowship to address the historical under representation of Black and Indigenous students in research. Upon meeting with the Black Research Network and Indigenous leaders, this fellowship is being re-structured and launched as two scholarships at the graduate (*i.e.,* MSc or PhD) level. To support the scholarship awardees, TDRA is also assembling community-specific mentorship networks, and seeking out supervisors who have strong backgrounds in EDI and reconciliation.

Building Research Infrastructure

Administrative and operational hurdles in clinical and multi-site research initiatives can cause significant delays and they are often not unique. TDRA is working across sites to develop harmonized solutions to pressing issues, and build infrastructure to fill gaps that impact progress.

1. **Adding Efficiency to Research Contracts:** A legal Research Working Group has been assembled with legal representation from Baycrest, CAMH, Ontario Shores, Sunnybrook, UHN, UHT, and the University. The group meets monthly to work towards building solutions that add efficiency to the review of legal agreements. This group has helped expedite the agreement outlining shared ownership for the TorCA, and will next develop a licensing agreement for the TorCA, which will support partnerships with external groups supporting translations of the TorCA.

2. **Supporting Recruitment to Research Studies:** TDRA has partnered with the Alzheimer Society of Toronto (AST) to help connect the public with research through two new initiatives.

   Listing Research on the Toronto Dementia Network: The Toronto Dementia Network (TDN) is a site operated by the AST that lists services such as respite care, nursing, transportation and other forms of support. On July 29, 2021, a section was added that lists plain-language descriptions of research studies led by members of the TDRA community. Individuals can indicate their interest in a specific study and be connected to the research team. If they cannot find a study, they can choose to be triaged to a study through a defined process based on information they enter (ex., preferred location, intervention vs observations, age, etc.). A process to equitably triage these potential participants was developed with input from all TDRA sites.

   Thirty-two studies are currently listed on the TDN website. To date, the mechanism has yielded 76 referrals to studies in the TDRA network, including 21 who are enrolled or completed. See **appendix 3** for details**.**

   Webinar Series: Advances in Dementia Research: Hosted in partnership with AST, this series features bi-monthly,plain-language webinars delivered by TDRA-affiliated researchers. Researchers are encouraged to provide an overview of a research topic in dementia, and to discuss a related study that is actively recruiting and listed on the TDN. The webinars are open to anyone, allowing members of the public to engage directly with researchers. To date, eight webinars have been hosted, leading to 7 referrals to studies (**see appendix 4**).

3. **Partnership with the Alzheimer Society of Ontario:**
   TDRA has engaged in a strategic partnership with the Alzheimer Society of Ontario (ASO) to advance opportunities to scale and spread some of our initiatives related to the standardization of dementia care. Preliminary discussions have identified a number of areas of alignment, including pathways to support primary care with the diagnosis and management of dementia, and steps that can be taken to make the health system in general more friendly to people living with dementia.

ASO and TDRA will also cross-promote and amplify relevant initiatives and messaging (on social media and otherwise). The research section of the ASO website now features information on TDRA and links to our website, the TDN, and the Advance in Dementia Research webinar series.

4. **Coordinating & Increasing Access to Resources, Data and Biosamples***:* TDRA aims to identify opportunities for consolidation, streamlining, and optimization of resources. To enable this, we have taken steps to harmonize protocols, and identify sources of data and biosamples among our partners and beyond that may be accessed for research.

   Standard Operating Procedures (SOPs) for the Collection and Storage of Samples: Two sets of SOPs have been created with partners from across sites to facilitate sharing of resources—one for the collection and processing of plasma, serum, and buffy coat for biomarker analysis, and another for the collection of blood samples for downstream genomic and mitochondrial DNA extraction. The standardization of these would aid in the future collective sharing and analysis of samples. The SOPs were added to TDRA's portal site on July 14th, 2022. Since then, the page where they are hosted has been viewed 417 times, and TDRA-H001-Blood Separation has been downloaded once.

   Virtual Biobank and Data Repository: The TDRA is launching a page on its portal to help investigators find and access data and samples from other studies that are available for request. This will include not only studies in Toronto, but from national and international dementia research initiatives as well. The studies listed on this site will continue to grow in number, and serve as a resource that will save investigators the time and cost of collecting data and samples, and potentially spark novel collaborations.

5. **Open Science:** To support the accessibility of data and to encourage its use, TDRA is collating a set of principles to support the practice of open science among its community of researchers. Researchers who adopt the common standards listed above will be encouraged to make their data available based on these principles, which will acknowledge the producers of the data. An outline has been established for 1) TDRA Open Science Principles, and 2) TDRA Informed Consent Form (for participants in open science research). These will be populated based on existing documents (from the CAMH BrainHealth Databank and the Rotman Research Institute) and researcher expertise.

6. **Equity, Diversity, and Inclusion (EDI) in Research Design Workshops:** In partnership with the EDI Office at the University of Toronto, TDRA hosted two EDI workshops (June 2nd and September 7th, 2022) for researchers in the TDRA community. The first workshop explored the historical ways in which research has done harm through discriminatory and oppressive means, and reviewed considerations for EDI throughout the research development process. The second workshop offered more practical guidance on how to embed EDI in research projects effectively. Video recordings and slides from both Workshops are available for download on TDRA's portal site.

7. **Interactions with TASHN:** TDRA was invited to provide an overview of our activities to two TASHN working groups. At the TAHSN-R group, efforts to streamline the legal review process were discussed, which gave impetus to the creation of a formal working group that now meets regularly. Our intentions to support equity, diversity and inclusion in training and education were discussed with the TAHSN-E group. TDRA also connected with a communications contact on each TAHSN team for ongoing cross-promotion and amplification of messaging. TASHN contacts have been helpful in promoting TDRA's bimonthly webinar series, news items, and events. In turn, TDRA shares and amplifies TASHN content on social media and otherwise when relevant.

Knowledge Translation

TDRA aims to inform its broad range of stakeholders (*i.e.*, people with lived experience, researchers, learners, decision-makers, and donors) of ongoing progress through several knowledge products, as well as opportunities to share information. They include:

1. **TDRA Website:** TDRA's website is our main knowledge translation product, hosting information about our organization, TDRA research and tools, plain language dementia-related resources, news, and events. TDRA also hosts two blogs: *Scientist Explains Series*, which offers plain-language summaries of key topics in dementia, and the *TDRA Spotlight Series*, which provides plain-language overviews of the work led by a TDRA researcher. Website content is clearly organized for different audiences. Our main website links to the TDRA Portal site, where our standardized tools for clinicians and researchers (e.g., TorCA, SOPs, BNA-SF) are hosted behind a login wall. See **appendices 5 and 6** for website analytics.

2. **Social Media:** TDRA operates Twitter and LinkedIn accounts that aim to extend the reach of knowledge products to broader audiences, provide platforms to promote upcoming opportunities/events, and drive traffic to the website. Overtime, TDRA's social media presence has been steadily growing. See **appendices 7 and 8** for social media analytics.

3. **E-Newsletter:** TDRA launched a monthly e-newsletter for our community in February 2022. The newsletter features a researcher spotlight, announcements, information about upcoming events and current training opportunities, and a plain language summary of a recently published study that features TDRA authors. We have 442 current subscribers and have published 10 editions to-date. Our subscriber list has consistently grown since the newsletter's launch, and we gain many new subscribers via our Advances in Dementia Research webinar series, where we ask about subscription to our newsletter during registration.. See **appendix 9** for newsletter analytics.

4. **Lived Experience Advisory Partners (LEAP) Council:** TDRA is pleased and fortunate to have a very engaged LEAP council, which maintains the lived experience perspective across all initiatives.

Importantly, this year, our council named changed to reflect TDRA's move toward the use of person-centered language. This move was prompted and guided by LEAP members, and was accomplished via focus-groups and surveys. To ensure they have the opportunity to contribute, efforts are being made to have a LEAP member join each of the Research Working Groups (RWGs), as well as the Scientific Advisory Committee and the Research Operations Committee; in total, 10 TDRA committees/groups have LEAP representation. See **appendix 10** for notable LEAP contributions throughout 2022.

Grants Secured and Submissions Under Review by TDRA Research Working Groups in 2022

TDRA has created theme-based working Research Working Groups and brought together researchers – many who had not worked together previously – to develop ideas into funding proposals or lead key initiatives. Several of these RWGs were successful in submitting joint grants together and many in securing external funding in 2021. Below is a list of funded projects and grant submissions currently under review. For a full list of the RWGs, see **Appendix 11.**

Peer-Reviewed Grants Received:

1. Agency: Bell Let's Talk & Brain Canada
   Amount: $950,000
   Title: Optimization of Prefrontal Theta-Burst Stimulation to Treat Depression: A Bench to First-in-Human Study
   Description: This project will be a true translational neuroscience project that will optimize the parameters of theta-beta stimulation (TBS), a novel treatment for depression, to induce neuroplasticity in preclinical animal models of depression and then apply these discoveries to compare the new TBS to the old form of TBS in inducing neuroplasticity in people living with depression. Enhancing neuroplasticity in depression, a high risk condition for dementia, could not only improve depression outcomes but also reduce dementia risk. The contract is in the final stage of being finalized.
   Investigators: **T. Rajji** (PI, CAMH), **G. Collingridge** (PI, Tanz), **E. Lambe** (PI, U of T), **S. Sockalingam** (PI, KT)

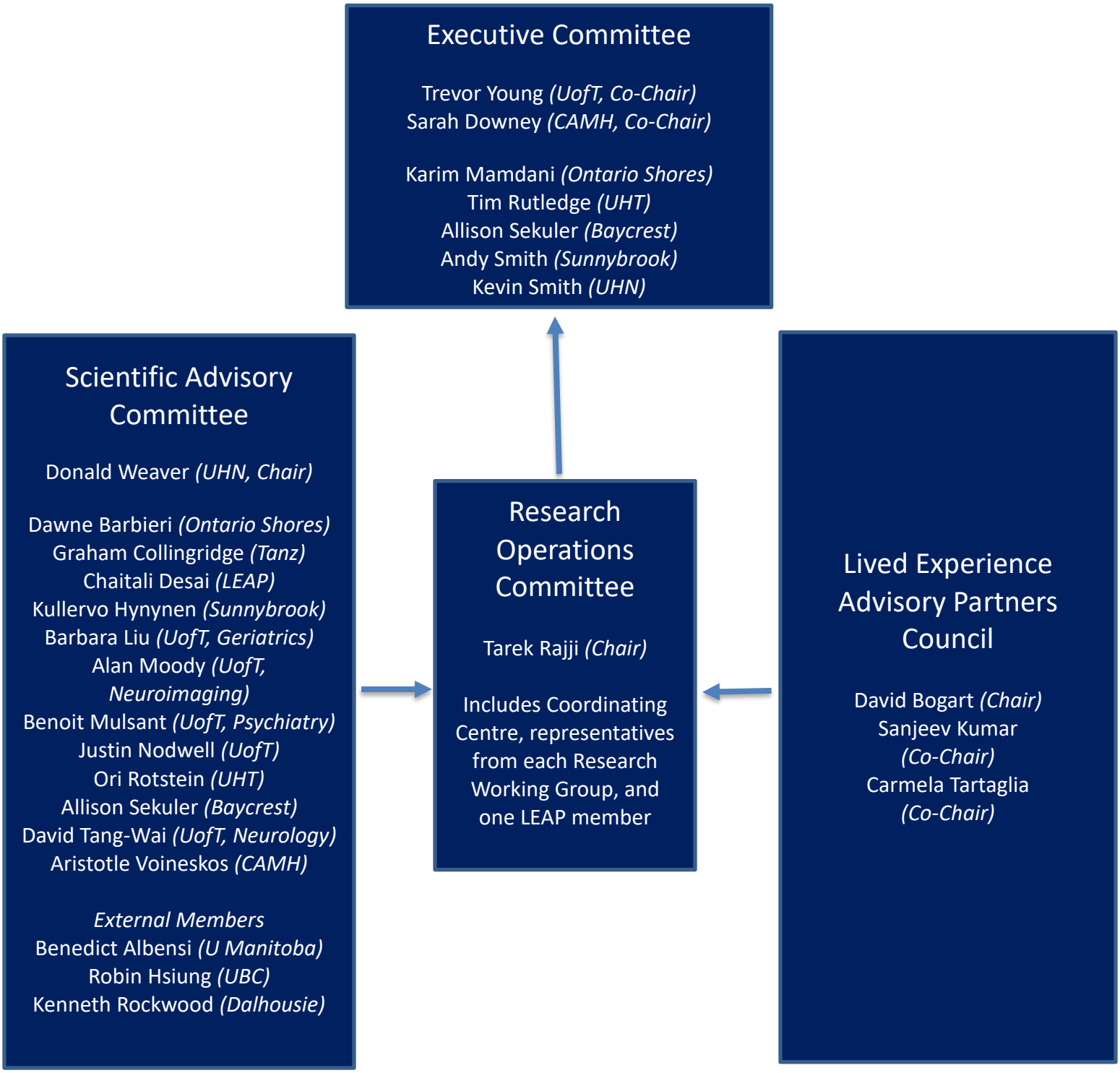
2. Agency: Jointly funded by the Canadian Institutes of Health Research (CIHR) Institute of Aging and the National Research Council (NRC)
   Amount: $546,204
   Title: Dementia Caregivers Skills Training Through Virtual Reality Simulation (VR-SIM CARERS)
   Description: To build an immersive virtual reality (VR) training environment for caregivers/care partners to be directly in touch with the realities of caregiving, and safely practice communications and behavioural management of people living with dementia; and to conduct a quasi-experimental, non-randomized, comparison study to ascertain effectiveness of VR-based

caregiver training in improving empathy, competence and caregiver resilience, and reducing depression and stress in dementia family caregivers.
Investigators: **R. Beleno** (AGE WELL), **A. Burhan** (lead applicant, OS), **M. Chiu** (co-lead applicant, OS), , **K. Kokorelias** (UHN), **T. Rajji** (CAMH), **I. Rubinstein** (U of T), **J. Sadavoy** (Sinai), **A. Shnall** (Baycrest), **M. Smith** (NRC), **J. Zabukovec** (OS), **L. Zhu** (OS)

Institutionally-funded Grants:

1. Agency: Baycrest
   Amount: $450,000
   Title: Hybrid-Virtual Cognitive Program to Detect Cognitive Decline Across the Full Spectrum of Impairment and Shorten Memory Clinic Waitlists
   Description: This study will develop a novel model of care for efficient and brief diagnosis of cognitive impairment applicable to tertiary memory clinic settings and that can be applied virtually or in-person.
   Investigators: **S. Black** (Sunnybrook), **B. Buchsbaum** (Baycrest), **H. Chertkow** (Baycrest), **D. Felsky** (CAMH), **C. Fischer** (UHT), **M. Freedman** (Baycrest), **S. Hill** (CAMH), **S. Kumar** (CAMH), **E. Rogaeva** (U of T), **S. Strother** (Baycrest), **D. Tang-Wai** (UHN), **C. Tartaglia** (UHN)

Appendix 1: TDRA Governance Structure



Appendix 2: Temerty-Tanz-TDRA Workshop Agenda

TEMERTY-TANZ-TDRA WORKSHOP NOVEMBER 30th, 2022		
TIME (ET)	**SESSION**	**CHAIR/PRESENTER**
8:00 am	Registration, Breakfast, and Networking	-
8:30 am	Introduction/Welcome Notes	Dean Trevor Young
8:40 am	Temerty-Tanz-TDRA Initiative	Dr. Graham Collingridge Dr. Tarek Rajji
SESSION 1: KEYNOTE SPEAKER		
9:10 am	Session Introduction	Dr. Tarek Rajji
9:15 am	A tale of two risk factors in 3D: Diabetes, depression, and dementia	Dr. Olusola Ajilore
10:00 am	Q&A	Dr. Tarek Rajji
10:15 am	Coffee Break	
SESSION 2: SEED FUND AWARDEES		
10:30 am	Session Introduction	Dr. Tarek Rajji
10:35 am	Impact of lipopolysaccharide on immune response and cerebral amyloid deposition in older adults with a history of major depressive disorder	Dr. Damien Gallagher
10:55 am	Discussion	Dr. Tarek Rajji
11:15 am	The contribution of cerebrovascular disease to depression in patients with and without Alzheimer's disease	Dr. Carmela Tartaglia
11:35 am	Discussion	Dr. Tarek Rajji
11:55 am	Assessment of heart rate variability in older adults with lifetime history of depression or mild cognitive impairment	Dr. Linda Mah
12:15 pm	Discussion	Dr. Tarek Rajji
12:35 pm	Lunch	
SESSION 3: KEYNOTE SPEAKER		
1:30 pm	Session Introduction	Dr. Graham Collingridge
1:35 pm	Cross-talk between glucocorticoid hormones and both memory and emotional state	Dr. Stafford Lightman
2:20 pm	Q&A	Dr. Graham Collingridge
2:35 pm	Coffee Break	
SESSION 4: BRAIN MEDICINE AND POST-DOC RESEARCH FELLOWS		
2:50 pm	Session Introduction	Dr. Graham Collingridge
2:55 pm	Transcranial alternating current stimulation and focused ultrasound to engage theta-gamma coupling and enhance working memory in patients with mild cognitive impairment	Dr. Iryna Palamarchuk
3:15 pm	Discussion	Dr. Graham Collingridge
3:35 pm	The potential for non-invasive brain stimulation to modify motoric cognitive risk syndrome in treatment-resistant late life depression: A feasibility pilot study	Dr. Adrian Espiritu
3:55 pm	Discussion	Dr. Graham Collingridge
4:15 pm	Investigating polygenicity of antidepressant response and cognitive domains in late-life depression	Dr. Samar Elsheikh
4:35 pm	Discussion	Dr. Graham Collingridge
4:55 pm	Closing Remarks	Dr. Graham Collingridge

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Appendix 3: TDN Referral and Enrollment Information

		Total		Specific		Non-specific	
	# Studies	# Referred	# Enrolled + Completed	# Referred	# Enrolled + Completed	# Referred	# Enrolled + Completed
Total	41	76	21	48	13	28	8

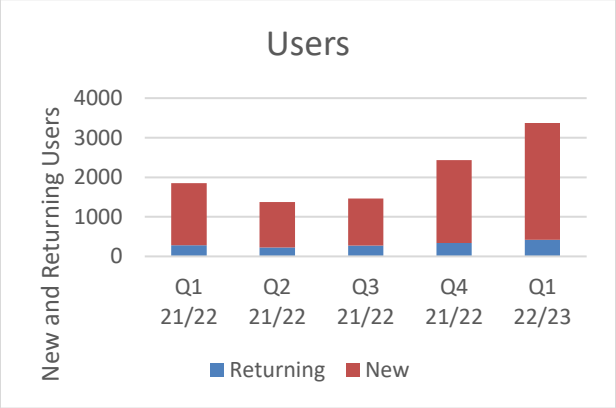
Appendix 4: Metrics for Advances in Dementia Research Webinars

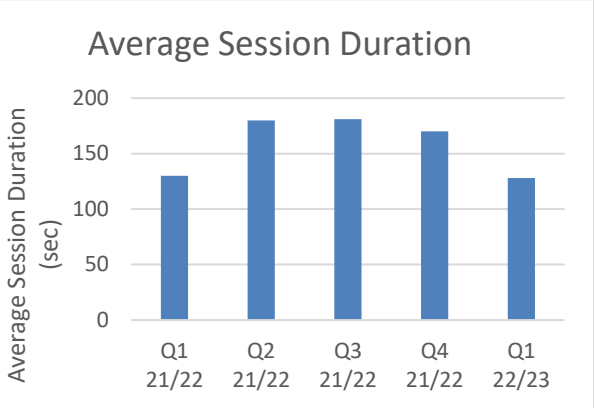
Date	Topic	Speaker(s)	Attendees	Referrals
14-Sep-21	Driving & Dementia	Dr. Mark Rapoport/Dr. Gary Naglie	45	0
17-Nov-21	Agitation in Dementia	Dr. Sanjeev Kumar	70	1
11-Jan-22	Diagnosis & Self-Care	Dr. Richard Swartz	50	3
24-Mar-22	Diversity in Risk & Protective Factors	Dr. Ho Yu	55	0
24-May-22	Non-Invasive Brain Stimulation	Dr. Tarek Rajji	43	0
12-Jul-22	Sleep, Cognitive Impairment & Stroke	Dr. Mark Boulos	36	N/A*
27-Sept-22	Novel Drug Treatments for Agitation in Dementia	Dr. Krista Lanctot	68	0
17-Nov-22	Complexity of Aging & Dementia	Dr. Sandra Black	67	3

**ENCHANT Study that was presented stopped recruiting*

Appendix 5: Key Metrics for TDRA Main Website (www.tdra.utoronto.ca)

New and Returning Users to the TDRA Website (left), and Average Session Duration (right) from Q1 FY 2021-2022 to Q1 FY 2022-2023





Comparison Website Metrics for Q4 FY 2021-2022 and Q1 FY 2022-2023

Metric	Q4 2021-2022 FY (June 1-Aug 31 2022)	Q1 2022-2023 FY (Sept 1-Nov 30 2022)	% Change
Returning users	336	422	25.6
New users	2,098	2,952	40.7
Average session duration	2 minutes 50 seconds	2 minutes 8 seconds	-24.7

All analytics include CAMH's IP address (our internal traffic/use of the website)

Metric Glossary:

1. Returning users: Users who have visited the website before.
2. New users: Users visiting the website for the first time on a specific device (e.g., if you visit from your desktop and then again from mobile, you are recorded as two users).
3. Average session duration: Amount of time measured from the moment a user lands on the website until the session ends (i.e., user exits the website or is inactive for a predetermined amount of time). A session includes all the interactions a user has with the website (e.g., visiting pages, downloading pdfs, completing a form, etc.).

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Appendix 6: Key Metrics for TDRA Portal Website (www.portal.tdra.utoronto.ca)

TDRA Portal User Registrations 2022

Month	Registrations	Approvals
Jan-22	4	4
Feb-22	3	3
Mar-22	9	9
Apr-22	4	4
May-22	9	9
Jun-22	3	3
Jul-22	6	6
Aug-22	6	4
Sep-22	5	5
Oct-22	10	9
Nov-22	14	11

Top Portal Downloads (Q4 FY 2021-2022 & Q1 2022-2023)

Tool	Downloads	Country
TorCA Testing Material	32	26 Canada, 2 India, 1 Australia, 1 Italy, 1 Poland, 1 Romania
TorCA Manual	26	21 Canada, 2 India, 1 Italy, 1 Poland, 1 Romania
BNA-SF	13	11 Canada, 1 Poland, 1 Romania

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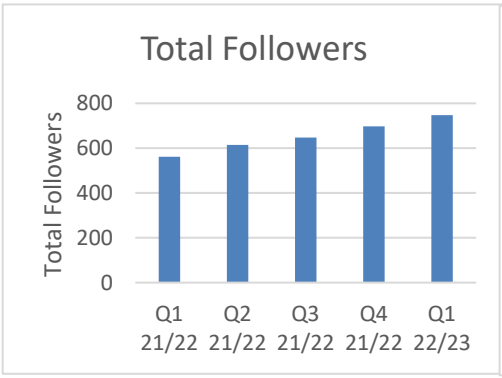
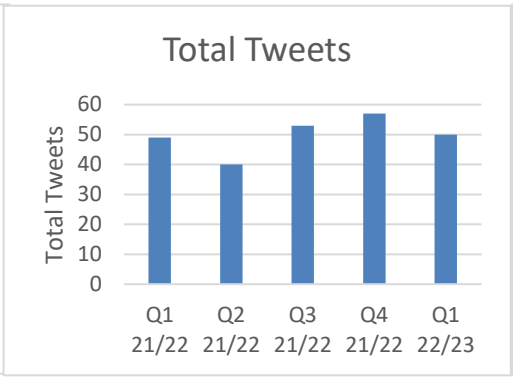
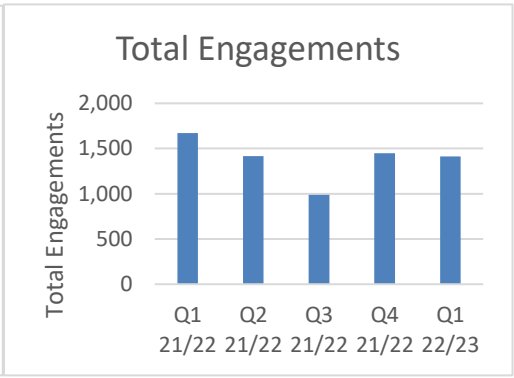
Appendix 7: Key Metrics for Twitter

Total Twitter Followers (left), Tweets (middle), and Engagements (right) from Q4 FY 2021-2022 to Q1 FY 2022-2023







Comparison of Twitter Metrics for Q4 FY 2021-2022 and Q1 FY 2022-2023

Metric	Q4 2021-2022 FY (June 1-Aug 31 2022)	Q1 2022-2023 FY (Sept 1-Nov 30 2022)	% Change
Total followers	698	747	7.0
Total tweets (excluding retweets/ quote re-tweets)	57	50	-12.3
Total engagements	1,450	1,413	-2.6

Metric Glossary

1. Total followers: Total number of Twitter user accounts that follow the TDRA account.
2. Total Tweets: Number of times the TDRA has posted an original Tweet on the TDRA Twitter account (*i.e.,* excluding re-tweets).
3. Total engagements: Total number of times that Twitter user accounts interacted with TDRA Tweets. This includes clicks anywhere on the Tweet (e.g., Retweets, replies, follows, likes, links, cards, hashtags, embedded media, username, profile photo, Tweet expansion).

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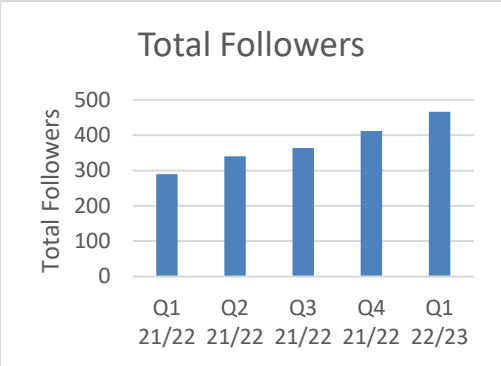
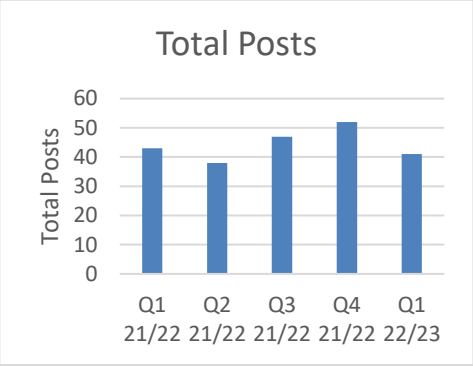
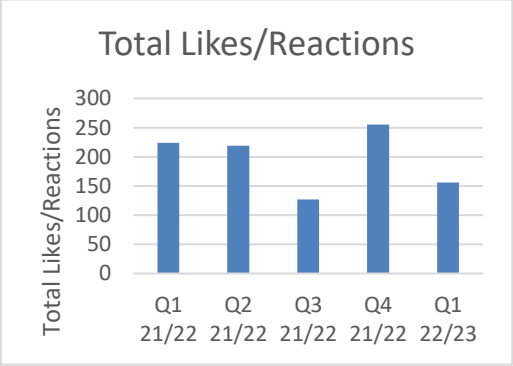
Appendix 8: Key Metrics for TDRA's LinkedIn Profile

Total LinkedIn Followers (left), Posts (middle), and Likes/Reactions (right) from Q4 FY 2021-2022 to Q1 FY 2022-2023







Comparison of LinkedIn Metrics for Q4 FY 2021-2022 and Q1 FY 2022-2023

Metric	Q4 2021-2022 FY (June 1-Aug 31 2022)	Q1 2022-2023 FY (Sept 1-Nov 30 2022)	% Change
Total followers	412	466	13.1
Total posts	52	41	-21.2
Total post likes/reactions	255	156	-38.8

Metric Glossary:

1. Total followers: Total number of LinkedIn user accounts that follow the TDRA account.
2. Total posts: Number of times the TDRA made an original post on the TDRA LinkedIn page (i.e., excluding shares).
3. Total post likes/reactions: Total number of times LinkedIn user accounts liked or used an available LinkedIn reaction on TRDA posts.

Appendix 9: TDRA Newsletter Analytics 2022

Metrics	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Industry Comparison
Open Rate (%)	45.8	44.7	42.7	39.2	37.8	41	41.8	51.2	52.3	46.0	38.0
Click Rate (%)	9.5	13.5	10	3.5	5.2	6.6	4.4	12.7	16.7	6.4	5.8
Unsubscribe rate (%)	0	0	0	0	0	0	0	0.26	0.0	0.0	0.4
New subscribers	0	4	4	6	3	5	5	92	3	48	N/A

Metric Glossary:

1. Open Rate: The number of emails opened by your audience divided by the total number of emails sent out, given they were successfully delivered.
2. Click Rate: Percentage that tells you how many successfully delivered campaigns registered at least one click (on any link).
3. Unsubscribe Rate: The number of people who opted out of your emails divided by the number of people who got the email.
4. New subscribers: New individuals who sign up to receive the newsletter.
5. Industry comparisons are based on Medical, Dental & Health Care category using MailChimp.

Appendix 10: Notable Activity for TDRA's LEAP Council

- Added 2 organizational members (CAMH) and 1 caregiver/care partner to the LEAP council.
- Updated TDRA Terminology: 'person living with dementia' and 'caregiver/care partner' are now used as standard across TDRA communications in place of 'patient' and 'caregiver'. This update was initiated by members of the LEAP council who highlighted the need to be mindful of the distinction between disease and identity. The new terms were established through a series of focus groups and a survey. Definitions for these terms were drafted in collaboration with LEAP members; these definitions are featured on TDRA's website.
- Council name change: In line with TDRA's move toward the use of person-centered language, the council name changed from 'Patient and Family Advisory Council' to 'Lived Experience Advisory Partners Council'. This name better reflects the diverse members of the council, and was decided via two focus-groups. .
- Reviewed and provided feedback on a promotional and an instructional video for the TDN website.
- Provided suggestions for TDRA's Scientist Explains blog series.
- Reviewed and provided feedback on a prototype of TDRA's industry-sponsored studies database.
- LEAP member initiated a collaboration between TDRA neurotechnology RWG and other researchers on a CIHR grant; the application was approved and the study will examine the utility of assistive technology product and service bundles for dementia management in Canada.
- LEAP member initiated a collaboration with the leader of TDRA's Caregiving RWG to work on a project focused on facilitating the social connectedness of young caregivers/care partners of people living with dementia.
- Two LEAP members participated in the review of Seed Fund Award applications in November 2022. Both members reviewed and scored seven applications based on the impact they expected the projects to have on people living with dementia and their families.
- Two LEAP members reviewed and provided feedback on two questionnaires (pre and post) developed to capture the impact/effect of getting a diagnosis after a PET amyloid scan.

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Appendix 11: Research Working Group Members

Basic Science Graham Collingridge Chaitali Desai John Georgiou Evelyn Lambe Tarek Rajji	**Memory Clinics Standardization** Sandra Black Bradley Buchsbaum Howard Chertkow Morris Freedman Sean Hill Sanjeev Kumar Tarek Rajji Stephen Strother David Tang-Wai
Caregiving Mary Chiu Kristina Kokorelias Kari Quinn-Humphrey Joel Sadavoy Adriana Shnall Sophie Soklaridis Lynn Zhu	**Neuroimaging** Sandra Black David Bogart Corinne Fischer Sanjeev Kumar Alan Moody Christopher Scott Carmela Tartaglia
EEG Sanjeev Kumar Paul Lea Andrew Lim Mary McAndrews Tarek Rajji Eugenie Roudaia Allison Sekuler Richard Wennberg	**Neuropathology** Andrew Gao Julia Keith Gabor Kovacs David Munoz
Fluid Biomarkers Ana Andreazza Fang Liu Joanne McLaurin Walter Swardfager Carmela Tartaglia Erica Vieira	**Neuropsychology** Jennifer Rabin Mary-Pat McAndrews Melanie Cohn Keera Fishman Susan Vandermorris.
Genetics James Kennedy Mario Masellis Ekaterina Rogaeva	**Neurostimulation** Howard Chertkow Kullervo Hynynen Suneil Kalia Sanjeev Kumar Nir Lipsman Jed Meltzer Tarek Rajji
Long-Term Care Peter Derkach Anuroop Duggal Corinne Fischer Morris Freedman Sanjeev Kumar Krista Lanctot Frank Palmer Gillian Strudwick Clement Ma	**Neurotechnology** Amer Burhan Chaitali Desai Andrea Iaboni Andrew Lim Abhishek Pratap Allison Sekuler
	Open Science Bradley Buchsbaum Sean Hill Paul Lea Donna Rose-Addis