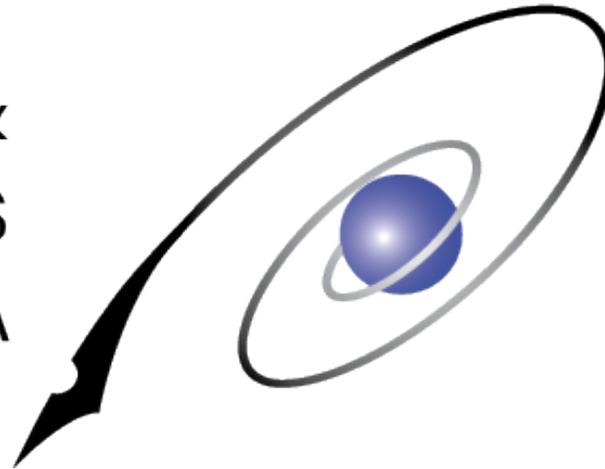


Science Writers & Communicators of Canada 2021 Virtual Conference Poster Session Handbook

Tuesday, June 15, 2021; 2:15 - 4:00 pm

SCIENCE WRITERS &
COMMUNICATORS
OF CANADA



This handbook highlights each poster presenter, providing their Name, Poster Number, Poster Category, Institute, Abstract and Bio. The pdf version of each presenter's poster follows their information. This handbook also explains how the poster session will take place within the gather.town virtual platform. Everyone is strongly encourage to have their cameras turned on during the poster session to best mimic an in-person poster session.

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1 Poster Session Basic Information

The SWCC 2021 Virtual Conference Poster Session will take place in the gather.town online platform on Tuesday, June 15 from 2:15 - 4:00 pm. You can directly join the gather.town space [by clicking this link](#). When you join, please select an avatar and update your name, then enter the area and start walking around using your arrow keys. This is *not* meant to be a gather.town handbook; the gather.town area is open now and will remain open for the full duration of the conference. Please feel free to check it out and get accustomed to the area at any time. You will have had a chance to explore the gather.town area multiple times during the first week of the conference before the poster session. Poster presenters and judges have a dedicated gather.town orientation session during the first week of the conference.

The poster session area is located directly to the right when you enter the gather.town space (there will also be labels on the floor showing you where to go). Figure 1 shows a portion of the poster session area. Each poster is assigned a number: posters 1 through 7 are in the Science Research category and posters 8 through 17 are in the Science Communication category. The poster numbers are displayed in each poster viewing area. The poster numbers are also listed in this handbook. Poster number 8 is the first Science Communication poster, which begins Section 3 of this handbook (posters 1 - 7 correspond to sections 2.1 - 2.7 in the Table of Contents; posters 8 - 17 correspond to sections 3.1 - 3.10 in the Table of Contents). In order to present a poster, presenters will stand in the 'Poster Presenter Pedestal' area. In order to view a poster, conference attendees will need to stand in the corresponding poster's 'Poster Viewing Area'. When you are in this area, a small version of the corresponding poster will appear at the bottom of your screen; press 'x' to view the poster in full-screen. While in full-screen mode, you will be able to view the poster and still see and hear the poster presenter (and they will be able to see and hear you). As long as you remain in the Poster Viewing Area, you will be able to see and hear the poster presenter and their poster, but if you leave this area and move outside of the Poster Viewing Area rectangle, you will no longer be able to see or hear the poster presenter (and vice-versa). In this way, there will be no overlapping audio or video between presenters.

If you have any questions, please send us an email at conference@sciencewriters.ca.

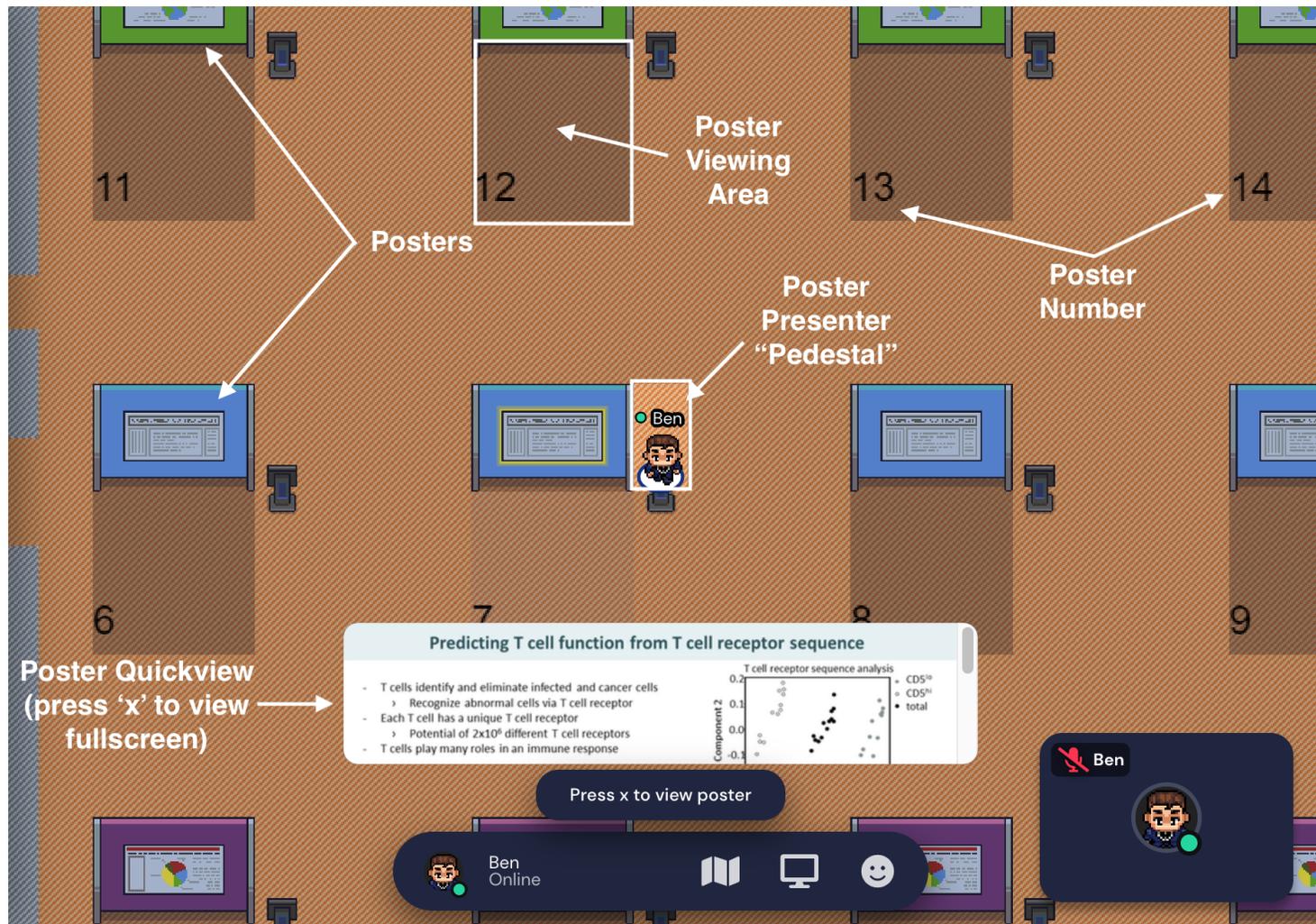


Figure 1: Diagram of the poster area in gather.town.

2 Science Research Posters

2.1 Electrooxidation of Phenols in Raw Materials

Poster Number: 1

Category: Science Research

Author: Stephanie Gao (she/her)

Institute: Trent University

Abstract: The use of phenolic compounds ranges from the industrial sector and agriculture to pharmaceuticals. These compounds may serve as a phenolic precursor to produce raw materials in a wide range of applications. The selective electrochemical oxidation of bulky phenols was recently achieved. Herein, 2,6-diphenylphenol (DPP) was characterized in an aprotic environment using cyclic voltammetry, square-wave voltammetry, and UV-vis spectroscopy. DPP was characterized with an irreversible oxidation. The electrooxidation of DPP by CV and chronoamperometry resulted in the solution colour change and the formation of new products. The product formation was monitored by UV-vis and fluorescence spectroscopy and characterized by mass spectrometry.

Bio: I am a 1st year master student with the Martic Lab at Trent University, Ontario. I recently started learning electrochemistry a few months back and I really enjoy it! There are so many green chemistry applications with this particular field and I am excited to share with everyone how advantageous this technique is.



ELECTROOXIDATION OF PHENOLS IN RAW MATERIALS



Stephanie Gao¹, Dr. Sanela Martić²
Forensic Science², Environmental & Life Sciences¹
Trent University, ON, Canada

Phenols can be both **advantageous** or **disadvantageous** depending on what it is used for!

Example

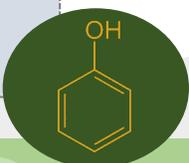


BPA (Bisphenol A) is a contaminant produced when manufacturing plastics. Approximately **7 billion** pounds of BPA waste are produced annually.¹

- Applications in:**
1. Agriculture
 2. Automobile
 3. Cosmetics
 4. and many more!

Phenols are chemical ingredients used in our everyday products!

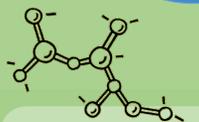
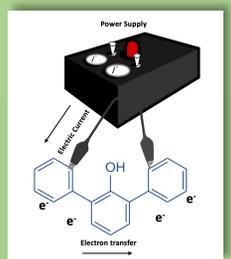
- Plastics
- Resins
- Food
- Antiseptics and more!



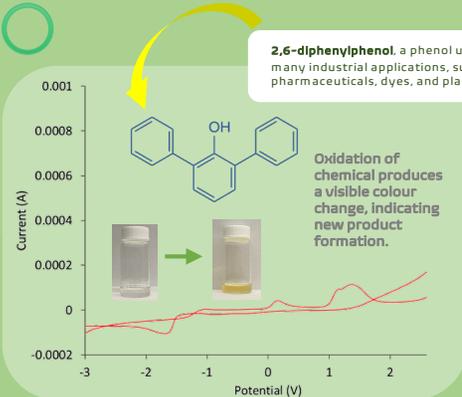
We need a **greener** alternative to streamline chemical production in a sustainable and environmentally friendly way.



Electrochemical Setup



Electrooxidation generates **valuable new C-C bonds** to make new compounds.²



New products become **value-added ingredients** in production of raw materials and chemicals!

Electrochemistry is an emerging field in green chemistry!

Optimization of electrooxidation comes with many advantages!

- ✓ Sustainable Green Chemistry
- ✓ Reusable/Recyclable
- ✓ Product Selectivity
- ✓ Less Waste
- ✓ Time Efficient
- ✓ Cost Efficient



Special thanks to the **Martić Lab** for their generous support and **NSERC** for their funding on this project!

Questions? Email: sanelamartić@trentu.ca

@MartićSanela
@StephGao

References:
(1) *Pediatr Nurs.* 2010 Oct;25(5):400-7.
(2) Zabik, N. L.; Virca, C. N.; McCormick, T. M.; Martić-Milne, S. Selective Electrochemical versus Chemical Oxidation of Bulky Phenol. *J. Phys. Chem. B* 2016, 120 (34), 8914–8924.

2.2 Identifying the Barriers to Hand Hygiene Amongst Hospital Staff

Poster Number: 2

Category: Science Research

Author: Emma Finlayson-Trick (she/her)

Institute: University of British Columbia

Abstract: Pathogens are commonly transmitted on the hands of hospital staff. Consequently, there are hand hygiene guidelines that staff are to follow at least 80% of the time. Staff in the emergency department at Surrey Memorial Hospital have consistently failed to meet the 80% target. Our project aimed to identify why hand hygiene compliance was low, especially during COVID-19. Through observation, survey, and focus groups, we found institutional procedures, staff beliefs, and lack of awareness compromised compliance. We then generated and implemented strategies to increase compliance amongst staff. Following the implementation, hand hygiene compliance remained above 80%, improving patient safety.

Bio: Emma Finlayson-Trick is a third-year medical student at the University of British Columbia (UBC). She holds a graduate degree in microbiology and immunology from Dalhousie University. Emma is currently funded to study the effects of a novel iron supplement on the gut bacteria in Cambodian women. Outside of the lab, she is senior co-editor-in-chief for the UBC Medical Journal. Additionally, Emma is organizing Vancouver's first Soapbox Science event to promote the visibility of women in science. She is also developing a science journalism workshop and science literacy program with local schools. Emma hopes to become an infectious disease specialist.

Identifying the Barriers to Hand Hygiene Amongst Hospital Staff

Emma Finlayson-Trick,¹ Marietta Van Den Berg,² Christine Mackie,³ Ta Chinembiri,² Raymi Komal,² Catherine O'Donnell,² Charlotte Klemencic,³ Anita Van Hove-Burslem,³ Surrey Memorial Hospital Emergency Department Staff³

¹Faculty of Medicine, University of British Columbia, Vancouver, BC; ²Quality Improvement, Surrey Memorial Hospital, Surrey, BC; ³Emergency Department, Surrey Memorial Hospital, Surrey, BC

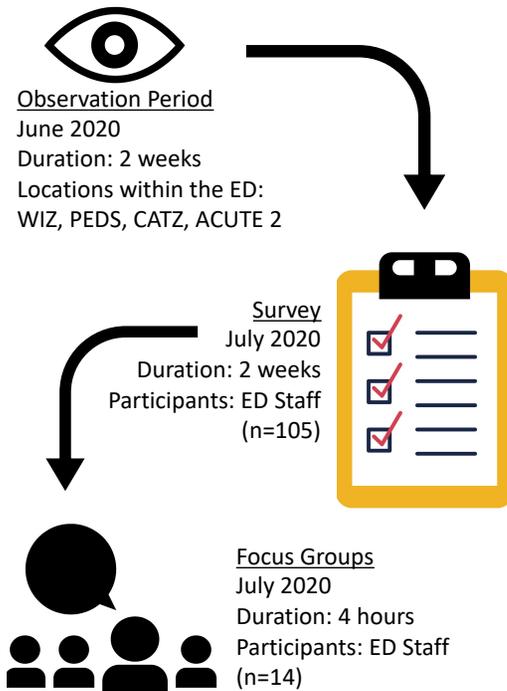
1. BACKGROUND

Hand hygiene compliance (HHC) in the emergency department (ED) at Surrey Memorial Hospital (SMH) has consistently been below the 80% target outlined by the Fraser Health Authority.

2. AIM AND IMPACT

To identify barriers to HHC, thus enabling the development of strategies to improve compliance and patient and staff safety.

3. METHODS



FUNDING

This work was completed as part of the BCPSQC Summer Student Internship Program.

THEMES AND CHANGE IDEAS

Adherence to hand hygiene is compromised by hospital procedures.



Refill ABHR and soap in a timely manner.

Adjust hand hygiene audit to note specific ED location.



Outsource ABHR/soap refill phone calls to ED volunteers.

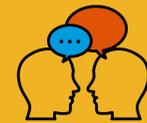
Healthcare workers feel knowledgeable on hand hygiene, but require reminders.



Design posters to remind staff of the importance of hand hygiene.

Adherence to hand hygiene is compromised by staff beliefs.

Show staff the ED is not "clean" with Dodger the *C. difficile*-smelling dog.



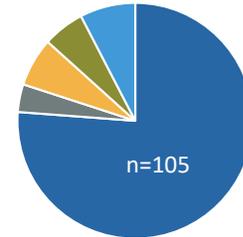
Give staff a chance to talk to hand hygiene auditors to receive feedback and learn about the audit process.



Examine requirements for hand hygiene before glove use.

4. SURVEY RESULTS

- Nurse
- HCA/SSA
- Unit Clerk
- Leadership
- Other



100% were familiar with Fraser Health hand hygiene guidelines

86% felt supported in their efforts to complete hand hygiene

41% were satisfied with the available hand hygiene products

On average, participants rated their hand hygiene compliance 2.6/3

5. QUOTES



6. FUTURE DIRECTIONS

HHC rates in the SMH ED: (project started Jun '20)

Jun '20	Jul '20	Aug '20	Sept '20	Oct '20	Nov '20	Dec '20	Jan '21
44%	80%	82%	84%	81%	75%	80%	81%

Future strategic directions to be determined by Hand Hygiene Think Tank.

2.3 A novel way to detect neurodegenerative diseases using nanomaterials

Poster Number: 3

Category: Science Research

Author: Nayomi Camilus (she/her)

Institute: Trent University

Abstract: Many Canadians suffer from neurodegenerative diseases which are hard to diagnose. Identifying biomarkers allows for the detection of these diseases. Can nanomaterials help detect biomarkers of these debilitating diseases? In my project, I show that carbon dot materials are very sensitive to biomarkers such as tyrosine amino acid analogues. For example, optical properties of carbon dot materials were responsive to nitrotyrosine amino acid, an important biomarker of neurodegeneration. This research highlights the value of applying nanomaterials in biomedical applications towards addressing current health challenges.

Bio: I am a Master's student of the Environmental and Life Sciences program at Trent University where I am conducting research on nanomaterials and biomolecules. I completed my undergraduate studies, specializing in Neuroscience, at the University of Toronto. I am passionate about conducting research and have worked as a research assistant in various projects. My research areas include basic sciences, translational addiction research, visual recognition, and materials research. My passion for research started in high school where I conducted simple experiments like titrations and it intrigued me to continue on. I strive to make a lasting impact through my research.

A NOVEL WAY TO DETECT NEURODEGENERATIVE DISEASES USING NANOMATERIALS

WHAT IS THE PROBLEM?

An estimated

3.6 million

Canadians are living in the community with at least one neurological condition.¹

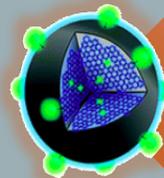
Amino acids:

Tyrosine (Tyr) and its analogues,

phosphotyrosine (pTyr) and nitrotyrosine (nTyr) are potential biomarkers of neurodegenerative diseases.^{2,3}



COMBATTING THE PROBLEM



Can nanomaterials help detect biomarkers of these debilitating diseases?



Carbon dots (CDs), nanomaterials, are water soluble, easy to synthesize, and exhibit low toxicity and desirable properties. Using CDs to detect Tyr and its analogues is advantageous compared to other methods of detection which are tedious, time-consuming and involve expensive instruments.

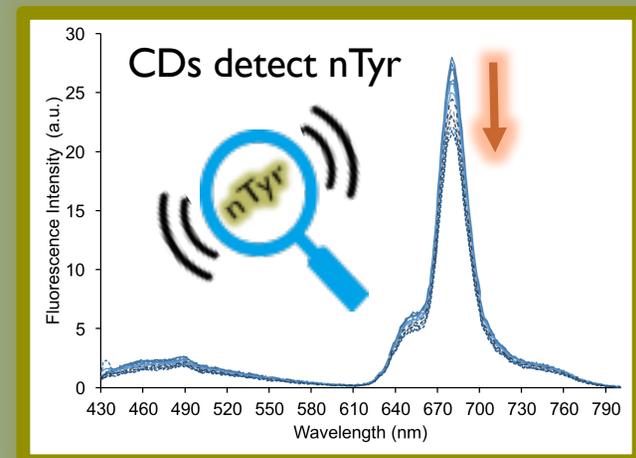
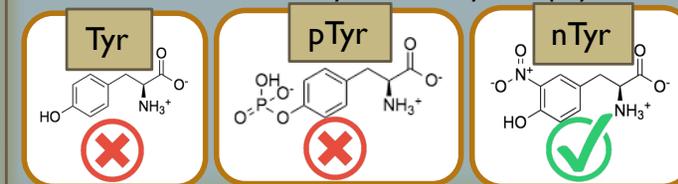
IN THE FUTURE...

Point of care testing of neurodegenerative diseases using CDs



HOW DO CDs WORK?

CDs are selective to nTyr but not Tyr and pTyr.



REFERENCES:

- ¹Canadian Community Health Survey: Neurological conditions prevalence files, 2010/2011.
- ²Wood, J. G. (1991). *Neuroscience letters*, 121(1-2), 12-16.
- ³Bandookwala, M. (2020). *International Journal of Neuroscience*, 130(10), 1047-1062.
- ⁴de Medeiros, T. (2019). *Journal of Materials Chemistry C*, 7(24), 7175-7195

ACKNOWLEDGEMENTS:

I would like to thank Naccache Lab for providing us with carbon dots, Martić Lab for their continuous support and Dr. Sanela Martić for her amazing supervision and guidance in this project. NSERC DG supported this project.

2.4 Exploring antenatal care utilization and intimate partner violence in Benin

Poster Number: 4

Category: Science Research

Author: Dina Idriss-Wheeler (she/her)

Institute: University of Ottawa

Abstract: This study examined the impact of intimate partner violence (IPV) on the utilization of antenatal care (ANC) services in Benin, comparing both the basic four-ANC (4-ANC) visits model and the updated WHO recommended 8-contact-ANC model.

Bio: Dina Idriss-Wheeler is a PhD Candidate in Population Health at the University of Ottawa, exploring the social, political and economic factors impacting access to health services for vulnerable populations in resource-poor settings. As Global Health co-ordinator at McMaster University, she works with the internal team and external partners on educational/research grant submissions and facilitates capacity building activities. As senior research associate at the Nursing Health Services Research Unit (NHSRU), she worked on provincially funded projects on health and safety management systems and workforce integration of internationally educated health professionals.



uOttawa

Exploring antenatal care utilization and intimate partner violence in Benin

Dina Idriss-Wheeler¹, PhD (C) and Dr. Sanni Yaya^{2,3}, PhD

¹Interdisciplinary School of Health Sciences, Faculty of Health Sciences, University of Ottawa, Canada

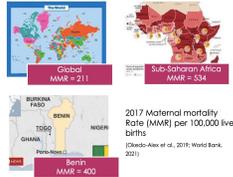
²School of International Development, School of Social Sciences, University of Ottawa, Canada

³The George Institute for Global Health, Imperial College London, UK

Introduction

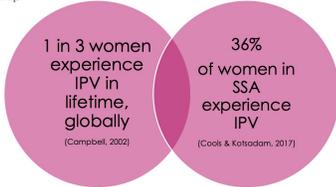
Definition of Antenatal Care (ANC)

- Skilled healthcare from a professional during pregnancy (WHO, 2020)
- Higher frequency of ANC = reduced likelihood of still birth/morbidity (UN, 2020)
- Extensive review of literature and evidence, by WHO, regarding perinatal experience and maternal mortality led to the following change: (WHO, 2014)
 - 2003 WHO four-visit basic model (ANC-4) to the 2016 WHO Eight-contact model (ANC-8).
 - about half (54%) of pregnant women in SSA reached four ANC visits; few reached the recommended minimum 8 contacts. (WHO, 2020; Alenaoui et al., 2018)
 - Quality of health services and distribution across the region was an issue.



Definition of Intimate Partner Violence (IPV)

- Any behaviour that causes physical, psychological or sexual harm to those in the partnership (WHO, 2012)



Factors affecting ANC Utilization (Afi et al., 2010)

- maternal age
- number of living children
- education
- place of residence
- employment/source of income
- decision-making authority (autonomy)
- socio-demographic and economic characteristics of the partner/husband
- religion
- ethnicity

Study Setting - Benin



- West sub-Saharan Africa
- Maternal mortality ratio = 400 per 100,000 live births (World Bank, 2021)
- ~70% of women suffered abuse at least once in lifetime (Ministère de la Famille et de la Solidarité nationale, 2009)
- 24% prevalence of lifetime physical/sexual IPV (UN Women's Global Database on Violence against women, 2020)
- lower 3rd of countries assessed for ANC coverage (Cools and Kotsood, 2017; Ataguba, 2018)
- ~40% of mothers received <4 ANC visits (Samou et al., 2017; Yaya et al., 2018)

Methods

Data Source

- 2017-2018 Benin Demographic Health Survey

Sampling

- 12 administrative regions of Benin; 55 clusters; 26 households randomly selected/cluster (14,435 households)
- 15,928/16,233 females (15-29) interviewed (98%)
- Unit of analysis = Beninese women 15-49
 - 3317 eligible for study (ANC & domestic violence module)
 - final sample (after listwise deletion) = 3084 Beninese women 15-48 years old

Variable Selection

- Dependent Variable
 - ANC-4 visit model
 - ANC-8 contact model
- Main Independent Variable
 - IPV
- Exploratory/control variables affecting ANC
- Statistical analysis
 - Descriptive and inferential statistics
 - Bivariate regression tests
 - Multiple logistic regression

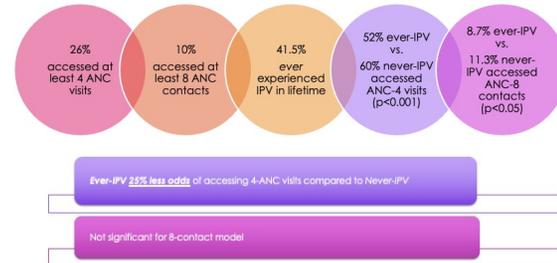
Results

Table 1: Logistic Regression Predicting Utilization of Antenatal Care in Benin (DSB-V, 2017-2018)

Variable (reference group)	At least 4 visits				At least 8 visits			
	Odds Ratio	Stand. Error	Confidence Interval 95%	p-value	Odds Ratio	Stand. Error	Confidence Interval 95%	p-value
Ever Experienced IPV (never IPV)	0.753**	(0.0691)	0.628-0.901	0.002	0.865	(0.129)	0.646-1.159	0.332
Decision making (no decision making)*	1.280*	(0.132)	1.045-1.569	0.017	1.724**	(0.340)	1.170-2.540	0.0059
Age Group (15-24)								
25-34	1.157	(0.144)	0.906-1.477	0.241	1.882**	(0.397)	1.244-2.847	0.002
35-49	1.470*	(0.235)	1.074-2.013	0.016	2.194**	(0.672)	1.315-3.662	0.003
Lives in rural region (urban)	1.075	(0.125)	0.855-1.352	0.537	0.843	(0.142)	0.606-1.173	0.310
Respondent Education (no education)								
Primary	1.262	(0.186)	0.945-1.686	0.114	0.970	(0.187)	0.664-1.418	0.876
Secondary or Higher	3.806	(3.053)	0.788-18.40	0.096	1.313	(0.484)	0.636-2.710	0.461
Wealth Index (poorest)								
Poorer	1.587**	(0.196)	1.245-2.022	0.000	1.301	(0.395)	0.716-2.364	0.387
Middle	1.857**	(0.243)	1.437-2.401	0.000	1.934*	(0.586)	1.067-3.505	0.030
Rich	2.618**	(0.363)	1.994-3.438	0.000	2.618**	(0.749)	1.493-4.592	0.001
Richest	5.490**	(0.951)	3.907-7.714	0.000	5.780**	(1.732)	3.208-10.41	0.000
Respondent Employment								
Working (not working)	0.904	(0.143)	0.662-1.233	0.522	1.100	(0.298)	0.646-1.872	0.725
Paid for work (not paid for work)	1.451**	(0.190)	1.122-1.876	0.005	0.890	(0.229)	0.537-1.476	0.652
Number of ever children (one child)								
2-4 children	0.680**	(0.093)	0.519-0.891	0.005	0.573**	(0.122)	0.377-0.870	0.010
5 or more children	0.589**	(0.108)	0.411-0.846	0.004	0.542*	(0.153)	0.311-0.945	0.031
Religion (Muslim)								
Catholic	1.983**	(0.277)	1.507-2.610	0.000	1.651*	(0.393)	1.034-2.637	0.036
Christian	2.942**	(0.411)	2.236-3.870	0.000	2.838**	(0.626)	1.840-4.378	0.000
Traditional	1.717**	(0.287)	1.237-2.384	0.001	1.549	(0.664)	0.758-3.166	0.230
Other	2.990**	(0.559)	2.072-4.317	0.000	1.863*	(0.674)	1.017-3.412	0.040
No religion	1.687*	(0.350)	1.122-2.537	0.012	2.840**	(1.129)	1.301-6.200	0.009
Husband/Partner Education (no education)								
Primary	1.165	(0.132)	0.932-1.456	0.179	1.440*	(0.253)	1.020-2.033	0.039
Secondary or Higher	1.738*	(0.411)	1.093-2.764	0.020	1.724*	(0.386)	1.110-2.678	0.015
Unknown	1.063	(0.244)	0.677-1.667	0.791	1.079	(0.366)	0.554-2.101	0.824
Husband employed (not employed)	1.066	(0.379)	0.531-2.144	0.856	1.015	(0.602)	0.317-3.252	0.980
Husband Drinks (does not drink)	0.890	(0.0938)	0.723-1.094	0.268	0.980	(0.180)	0.683-1.406	0.912
Wife-beating justified (not justified)	1.077	(0.103)	0.893-1.298	0.439	1.071	(0.164)	0.792-1.447	0.657
Constant	0.273**	(0.108)	0.125-0.594	0.001	0.0144**	(0.010)	0.00389-0.0534	0.000
Observations	3084				3084			

Standard error in parenthesis - *** p < 0.001, ** p < 0.01, * p < 0.05

Results



Ever-IPV 23% less odds of accessing 4-ANC visits compared to Never-IPV

Not significant for 8-contact model

Discussion

- IPV had significant negative impact on ANC-4 utilization for Beninese women – 25% less odds.
 - confirmed by other studies to date (Ononokpono et al., 2014; Tura & Licaze, 2017; Ferdous et al., 2017).
- ANC reduction due to IPV not significant for ANC-8 contact model.
 - other factors have not been considered and path analysis may assist in further investigation.
- Decision making was a predictor of ANC use in Benin for both models.
 - confirmed by other studies (Ghose et al., 2017; Gautam & Jeong, 2019; Siprad et al., 2019).
- Older age increased odds of both ANC-4 & ANC-8.
 - similar to other work (Okedo-Alex et al., 2019).
- Being paid cash for work increased ANC-4 but not ANC-8.
- Poverty was a predictive factor - decreased likelihood of accessing ANC for both ANC-4 & ANC-8.
 - Dansou et al., 2017; Finlayson & Downe, 2013.
- Education, partner & women's employment, husband drinking, and wife beating were not predictive of ANC utilization.
 - Perhaps disaggregation of the types of jobs (high skilled vs low skill/manual labour/precarious jobs) may provide better insight.
 - Path analysis may also shed further light on drinking as it was significant in bivariate analysis.

Conclusion

Maternal health policy makers and service providers in Benin can appropriately plan effective policies that target underlying causes associated with decreased ANC use.

Violence and oppression of women is associated with underutilization of ANC and increased odds of negative maternal health outcomes.

Refer to Published manuscript for more information and full Reference list: Idriss-Wheeler, D., & Yaya, S. (2021). Exploring antenatal care utilization and intimate partner violence in Benin—Are lives at stake? BMC Public Health, 21(1), 1-10. <https://doi.org/10.1186/s12889-021-10884-9>

2.5 Utility of Psychophysiological Metrics in Guiding Treatment of Trauma Symptoms

Poster Number: 5

Category: Science Research

Author: Michelle Yang (she/her)

Institute: McGill University and Douglas Mental Health University Institute

Abstract: The reliability of gold standard symptom assessment of post-traumatic stress disorder (PTSD) can be compromised by memory, emotional or cultural bias. The use of psychophysiological measures may complement psychometrics in tracking changes during treatment in physiological response and emotion regulation. In this systematic review, we integrate knowledge about the correlation between psychometric and psychophysiological measures in 22 prospective studies with trauma-focused cognitive, exposure, pharmacological and other interventions. Our objective was to determine how physiological resting states and reactivity pre- vs. post-intervention corresponded to the effect of intervention on PTSD symptoms. Trends towards normalizing physiological resting states and arousal, as measured before and after treatment, were seen to correlate with a psychometric recovery. In patients with significant changes in trauma symptoms, pre- vs. post-treatment resting heart rate (HR), HR reactivity to trauma cues and skin conductance decreased, and heart rate variability increased. Electromyography could measure adaptive decreases in startle responses to exposure content. Both blood pressure raw values and reactivity decreased post-treatment following cognitive therapy. Additional longitudinal studies are needed to explore standard testing paradigms that can be used for psychophysiological measures, and the corresponding cut-off levels that can indicate healthy and abnormal treatment response levels. The current findings stress a need for the development of a psychophysiological methodology that is feasible and reliable during experimental and clinical procedures to elucidate the effects of trauma intervention on emotional processing.

Bio: Michelle Yang received her BSc in Psychology from McGill University, Montreal. Her research is focused on enhancing resilience in vulnerable populations through innovative means. She has worked at the Douglas Mental Health University Institute researching the integration of psychophysiological technology in Virtual Reality (VR) exposure treatment for post-traumatic stress in Canadian Indigenous groups. Currently, Michelle is completing her MSc in Interdisciplinary Health Sciences at the University of Ottawa, and is conducting qualitative research on pandemic experiences of people with mobility disability. She is also undertaking mixed-methods research at the Telfer School of Management on leadership behaviors in health care centers during the COVID-19 pandemic.

Utility of Psychophysiological Metrics in Guiding Treatment of Trauma Symptoms: A Systematic Review

Michelle Yang^{1,3}, Noor Mady^{2,3},
Oti Linnaranta^{2,3,4}

¹Department of Psychology, McGill University, Montreal, QC, Canada
²Department of Psychiatry, McGill University, Montreal, QC, Canada
³Douglas Mental Health University Institute, Verdun, QC, Canada
⁴Finnish Institute for Health and Welfare (THL), Helsinki, Finland

Introduction

- Psychophysiological correlates of fear conditioning have indicated autonomic dysfunction in PTSD patients. However, memory biases and declarative memory dysfunction may confound response to trauma evaluation.
- Physiological responses may instead be used as an objective indicator of dynamic emotional changes.

Methods

- A systematic review was conducted in PubMed, PsychInfo, and Medline databases for randomized controlled trials and longitudinal studies from inception to July 2019.
- Three levels of search terms were used: (Post-traumatic Stress Disorder) AND (Psychophysiological measurement) AND (Treatment outcomes)

Aim

- Evaluate the utility and reliability of psychophysiological markers as trauma intervention outcome measures

Use in psychotherapy

- Psychophysiological measures are a promising objective index of PTSD treatment response that can help verify clinical impressions and self-reports
- Real-time temporal tracking can detect habituation and adverse reactions, and identify specific components of intervention and subgroups of therapy responders
- Baseline and initial cue-activated reactivity can predict treatment response
- Further research is needed to confirm clinical utility of psychophysiological measures, provide valid response cut-offs, and reduce measurement error from data processing.

Limitations

- Caveats to using ambulatory devices: Motion artifacts, trade off between sampling frequency and structural design
- Unevaluated variables and biological differences that cannot be accounted for prior to intervention

Results

↓ Heart Rate (BPM/IBI)

- ↓ Resting HR and HR reactivity to trauma cues following treatment
- Between-group differences in changes in HR reactivity and resting HR
- Fig. 1: ↓ HR at post-treatment and follow up

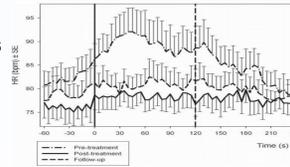


Figure 1: Sack et al., 2007

↑ Heart Rate Variability (SDNN/Hz)

- Lower HRV than range for healthy adults at pre-treatment
- ↑ resting and recovery HRV following treatment
- Fig. 2: ↑ HF-HRV associated with ↓ PTSD symptoms more in the RSA biofeedback group

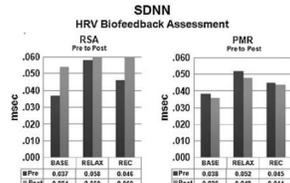


Figure 2: Zucker et al., 2009

↓ Electrodermal Activity/Skin Conductance (µS)

- ↓ SC levels following treatment
- Between-group differences in changes in SC reactivity
- Fig. 3: ↓ EMG, HR, startle probe, and SC reactivity to VR scenes following treatment

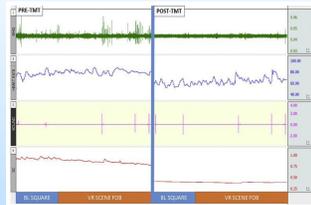


Figure 3: Loucks et al., 2019

↓ Electromyography startle response (µV)

- ↓ EMG reactivity following treatment
- Between-group differences in changes in startle response
- Fig. 4: Intervention group saw greater changes in CAPS as measured by EMG

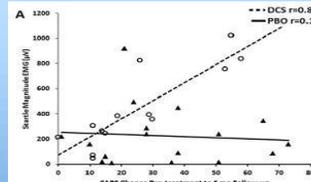


Figure 4: Norrholm et al., 2016

↓ (Systolic/Diastolic) Blood Pressure (mmHg)

- ↓ resting BP and BP reactivity following treatment
- Between-group differences in changes in resting BP and BP reactivity
- Fig. 5: Significant between-group differences in changes in SBP

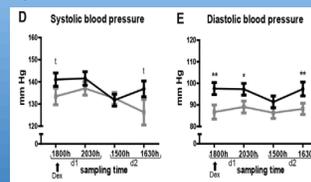


Figure 5: Schubert et al., 2019

Concordance with symptom improvement

- Improvements in resting HRV, HR (difference in means and reactivity), SC reactivity, EMG, and SBP correlated with reduced CAPS and PCL scores
- Fig. 6: Larger increases in HF-HRV (normalized) correlated with greater changes in CAPS-8

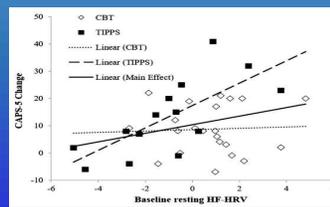


Figure 6: Soder et al., 2019

Table 1: Summary of Findings

	Purpose	Intervention population	Intervention	Measure	Measurement results	Concordance with symptom measures
Zucker et al., 2009	Assess feasibility of RSA biofeedback	19 participants with PTSD symptoms	RSA biofeedback; PMR	HRV (SDNN) HR (BPM)	RSA group > PMR group: ↑ baseline SDNN at baseline; ↓ Resting HR at baseline and recovery	RSA group: ↑HRV corresponded with ↓ PTSD symptoms
Bouras et al., 2019	Assess whether frontline treatments for PTSD may alleviate cardiovascular risk	71 Active duty soldiers	Prolonged exposure therapy	HR	↓ HR reactivity at POST (between group difference) ↓ Baseline HR at POST	No significant correlation with CAPS-IV
Sack et al., 2007	Determine utility of EMDR in reducing psychophysiological reactions	16 participants with PTSD	EMDR	RSA HR	↓ HR (between group difference) ↓ HR and ↑ RSA at POST follow-up	ΔHR and RSA correlated with ΔPTSD symptoms
Norrholm et al., 2015	Examine predictive utility of psychophysiological responses in VRET	13 combat veterans with PTSD	VRET + D-cycloserine (DSC)	HR SC	DCS group: ↓ EMG and SCR; no ΔHR	DCS group: only EMG corresponded with ΔPTSD symptoms
Wisco et al., 2016	Investigate phases of physiological arousal in PTSD exposure treatment	22 participants with PTSD	Virtual Exposure Therapy (VET)	HR (IBI)	↑ IBI (Initial fear activation) ↑ IBI (Within-session-change) No IBI (Between-session-change)	Only IBI at initial fear activation predicted ΔPTSD symptoms
Issartes et al., 2019	Test therapeutic fear extinction effects of mPFC deep transcranial magnetic stimulation for PTSD	9 PTSD patients with PTSD	mPFC DTMS + Exposure	SC (µS) HR (BPM)	↓ HR at POST	HR correlated with CAPS-II at POST
Loucks et al., 2019	Examine feasibility of VRE for MST-related PTSD	15 Veterans who experienced MST-related trauma	VRET	SC (µS) HR (BPM) EMG (µV)	↓ HR at POST	No significant correlation with CAPS-5 or PCL-5
Carlson et al., 1998	Compare the efficacy of EMDR with other PTSD interventions	23 combat veterans with PTSD	EMDR or Biofeedback-Assisted Relaxation	HR EMG (µV) SCL (µS)	↓ HR and EMG at POST and follow-up (all) ↓ SCL at POST and follow-up (EXP)	Δ physiological measures corresponded with ↓ PTSD symptoms
Renfrew et al., 1999	Evaluate the role of eye movement desensitization in PTSD treatments	23 participants with PTSD + intrusive symptoms	EMD	HR (BPM)	↓ HR at POST and follow-up	↓ BPM corresponded with ↓ SUD and PTSD symptoms
Hoge et al., 2010	Investigate the efficacy of propranolol in reducing the development of PTSD	21 ER patients with acute psychological trauma	Propranolol	SC (µS) HR (BPM) EMG (µV)	↓ HR, EMG, and SC (high adherence group)	↓ HR (high-adherence group) corresponded with ↓ PTSD probability
Majewska-Keller et al., 2019	Examine changes in psychophysiological indices following trauma-focused prolonged exposure treatment	189 Post-9/11 veterans or military service members with primary PTSD	Prolonged exposure therapy	SC (µS) HR (BPM) EMG (µV)	↓ HR, EMG	No significant correlation with PCL-5
Wangell et al., 2015	Examine physiological reactivity in a trauma imagery task	35 combat veterans	Prolonged Exposure (PE) Therapy	HR (BPM) SC (µS)	↓ HR and SC at POST	Δ HR and SC corresponded with Δ PTSD symptoms
Dunna et al., 2012	Examine effectiveness of TF-CBT for WAD + PTSD	13 participants with Whiplash-associated disorders (WAD) + PTSD	Cognitive Behavioural Therapy (TF-CBT)	HR (BPM) SBP and DBP (mmHg)	↓ HR (EXP) at POST ↓ SBP (EXP) at follow-up	↓ Physiological responses corresponded with ↓ PTSD symptom severity
Schubert et al., 2019	Assess the stability of the Dexamethasone suppression test (DST) outcome during PTSD treatment	25 PTSD patients	DST + Integrative trauma-focused CBT (ITF-CBT)	BP (mmHg) HR (BPM)	↓ SBP at 2/4 assessment points ↓ DBP at last assessment point	↓ BP correlated with ↓ PTSD symptoms
van't Wout-Frank et al., 2018	Examine feasibility of simultaneous transcranial direct current stimulation (tDCS) application during VR	12 veterans with PTSD	VRET + tDCS or VRET	SCR (µS)	No significant ↓ HR ↓ SCR (VRET + tDCS) > ↓ SCR (VRET)	↓ SCR corresponded with ↓ PTSD symptom severity
Teitelor et al., 2017	Explore the use neurotechnology to impact PTSD symptomatology	19 participants with PTSD symptoms	High-resolution, relational, resonance-based, electroencephalic mirroring (HIRREM)	HF-HRV (SDNN) BRS (mmHg)	↑ SDNN and BRS	↑ HRV and BRS correlated with ↓ PTSD symptoms
Ramasamy et al., 2015	Investigate the effects of escitalopram on cardiac vagal function in PTSD	11 veterans with PTSD + comorbid depression	Open-label trial of escitalopram	High Frequency HRV (HF-HRV) and QT interval variability (QTVi)	↓ resting HR-HRV and ↑ resting QTVi	Direction of ΔHRV and QTVi does not correspond with direction of ΔPTSD symptoms
Rothbaum et al., 2003	A case study on Virtual Reality Exposure Therapy	A Vietnam veteran with PTSD	VRET	HR (BPM) SC (µS) SBP and DBP (mm)	↓ HR, SC, and SBP at POST	↓ HR corresponded with ↓ SUDS and PTSD symptoms
Reyes et al., 2014	Determine if a HRV biofeedback intervention can reduce PTSD severity in post-9/11 service members	11 Veterans at a transition residence for combat veterans	HRV Biofeedback	HRV (Hz)	↓ LF-HRV at POST	No significant correlation with PCL-5
Soder et al., 2019	Investigate utility of baseline resting HF-HRV in predicting PTSD symptoms and substance use outcomes following PTSD treatment	14 Patients with comorbid SUD and PTSD	TIPSS	HF-HRV (Hz)	↓ HF-HRV	HF-HRV correlated with CAPS-5 at POST
Tucker et al., 2000	Assess the treatment of fluvoxamine for PTSD	17 participants with PTSD	Open-label fluvoxamine	HR (bpm) SBP (mmHg) DBP (mmHg)	↓ HR, SBP, and DBP	SBP and HR levels correlated with PTSD symptom scores at POST
Wahbeh et al., 2016	Evaluate the effect of components of meditation on mechanistic pathways of PTSD	27 Combat veterans with PTSD	Mindful Meditation	HRV (SDNN)	↓ HRV	No significant correlation with PCL

Abbreviations

BRS: Baroreflex Sensitivity
CBT: Cognitive Behavioural Therapy
CON: Control group
EDA: Electrodermal Activity
EMD(R): Eye movement desensitization (and reprocessing)
EXP: Experimental group
HR/HRV: Heart Rate/Heart Rate Variability
MST: Military Sexual Trauma
TIPSS: Treatment of Intended PTSD and Substance Use
mPFC DTMS: Medial Prefrontal Cortex Deep Transcranial Magnetic Stimulation
IBI: Interbeat Interval
POST: Post-treatment
PRE: Pre-treatment
RSA: Respiratory Sinus Arrhythmia
SBP/DBP: Systolic/Diastolic blood pressure
SCR/SCL: Skin Conductance Response/Level
SDNN: Standard deviation of all normal-to-normal RR intervals
SUDS: Subjective Units of Distress Scale
VRET: Virtual Reality Exposure Therapy
PCL(C-/5-/5-S): PTSD Checklist - Civilian Version/- for DSM-5/-Specific Version
CAPS-(IV-/5) Clinician-Administered PTSD Scale (for DSM-IV-/5)

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2.6 Natural pH Indicators and Their Sensitivities to pH

Poster Number: 6

Category: Science Research

Author: Nimrit Sidhu (she/her)

Institute: University of British Columbia

Abstract: Anthocyanins are compounds found in plant foods, which fluctuate in colouration upon undergoing redox reactions. This property has been used to create and modify pH indicators. This study analyzes the sensitivities of seven anthocyanin-containing foods as pH indicators, based on whether colour deviance is displayed between solutions with test-ingredients possessing a pH difference of 0.5 (range from pH 2-9). All foods displayed significant color deviance between solutions of 0.5 difference in pH. The results obtained provide insight into household foods which can serve as sustainable alternatives to laboratory pH indicators, while showcasing the strength of home-based science exploration.

Bio: Nimrit Sidhu is a recent graduate from the University of British Columbia (Vancouver), having obtained her Bachelor of Science Degree with a Major in Biology in May 2021. She is passionate about clinical, laboratory and home-based research, and strongly believes in lifelong learning. She is currently working as an Intern with the BC Patient Safety and Quality Council, where she collaborates with a multidisciplinary team of professionals to research methods to reduce harm for acute patients in Fraser Health facilities. A motivated and ambitious individual, she hopes to pursue a career in medicine and serve as a global medical volunteer.

Natural pH Indicators and Their Sensitivities to pH



Nimrit Sidhu, The University of British Columbia

Background and Objective

Anthocyanins are a type of colourful compounds commonly found in pigmented plant foods. They are a subset of flavonoids, a class of hydroxylated polyphenolic molecules naturally present in many fruits, vegetables and grains. Anthocyanins are prone to different redox reactions depending on solution pH. These varying protonated and deprotonated states result in differing colours of the compound at specific pHs. This colour-changing property highlights the potential for anthocyanin-containing foods to be used as natural pH indicators.

The aim of this study was to investigate how six common anthocyanin-containing foods behave when exposed to household aqueous solutions of various pH levels (pH 2-9), and if they are sensitive to pH differences of 0.5, as gauged by their ability to display contrasting colours between solutions of such pH difference.



Fig 2. Six different anthocyanin-containing foods used for analysis. Top from left: Red cabbage, blackberries, plums. Bottom from left: Raspberries, black grapes, blueberries.

Methods

1. Pigmented solutions of Red Cabbage, Blackberries, Blueberries, Plums, Black Grapes and Raspberries were obtained by chopping each food, saturating each with hot water in separate pots for 30 minutes and then straining and filtering solution.
2. Pigmented solution from each food was added to plastic cups, with seven cups per food, for a total of 42 cups.
3. For each food, one cup of solution was kept as control. For the six other cups for each food, 1 teaspoon of lemon juice (pH=2), vinegar (pH=2.5), homogenized milk (pH=6.5), Evian water (pH=7), baking soda (pH=8.5), and egg white (pH=9) was added, with one test ingredient per cup.
4. Resultant colours of solutions were analyzed for each food.

Results

- Red Cabbage, Blackberries, Blueberries, Plums, Black Grapes and Raspberries all displayed contrasting colours between solutions with a pH difference of 0.5 (lemon juice and vinegar solutions; homogenized milk and Evian water solutions; baking soda and egg white solutions).
- Red cabbage displayed the most distinct colour difference across the pH spectrum.

Discussion

The ability of all foods analyzed to display a colour difference between solutions with pH difference=0.5 across the pH scale reveals their potential to detect pH to high accuracy. This allows for the inference that each of these foods have the ability to be effective natural pH indicators.

Red cabbage solution was most opaque and pigmented, implying that it contained the greatest concentration of anthocyanin. This could account for why this food displayed the most pronounced colour difference across the pH spectrum.

A limitation of this study is that observer bias may be present, since the detection of colour is subjective. Also, only one replicate was included.

Anthocyanin Food	pH				
	2	2.5	6.5	7	8.5
Red Cabbage	Red	Pink	Purple	Blue	Dark Blue
Blackberries	Dark Purple	Purple	Dark Purple	Dark Purple	Dark Purple
Blueberries	Dark Purple				
Plums	Red	Red	Red	Red	Red
Black Grapes	Red	Red	Red	Red	Red
Raspberries	Red	Red	Red	Red	Red

Fig 3. Visual portrayal of the colours observed for each food's pigmented solution upon addition of ingredients with varying pH.

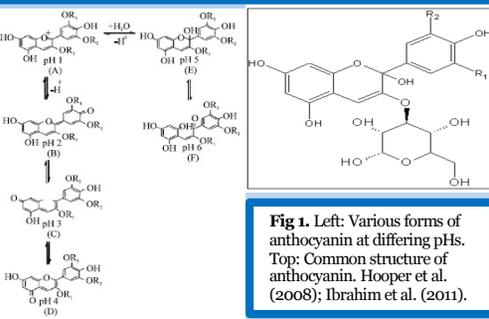
Conclusion

Results demonstrate that red cabbage, blackberries, blueberries, plums, black grapes and raspberries are sensitive to pH differences of 0.5 for the range of the pH spectrum analyzed. This provides insight into household foods which can serve as sustainable alternatives to laboratory pH indicators, while showcasing the strength of home-based science exploration.

Further analyses could explore the colour deviance of these foods with and between pHs over the rest of the spectrum.

Acknowledgements

It is acknowledged that this experiment was conducted on the traditional and unceded territories of the Musqueam peoples. I would like to thank the BIO 342 teaching team from UBC for their support.



2.7 Predicting T cell function from T cell receptor sequence

Poster Number: 7

Category: Science Research

Author: Ève Mallet Gauthier (she/her)

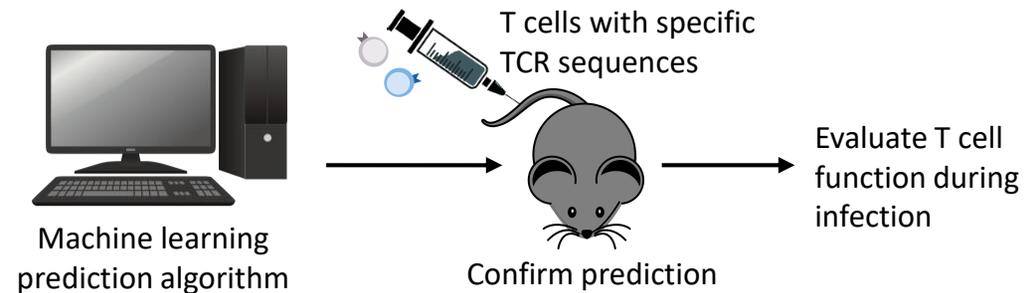
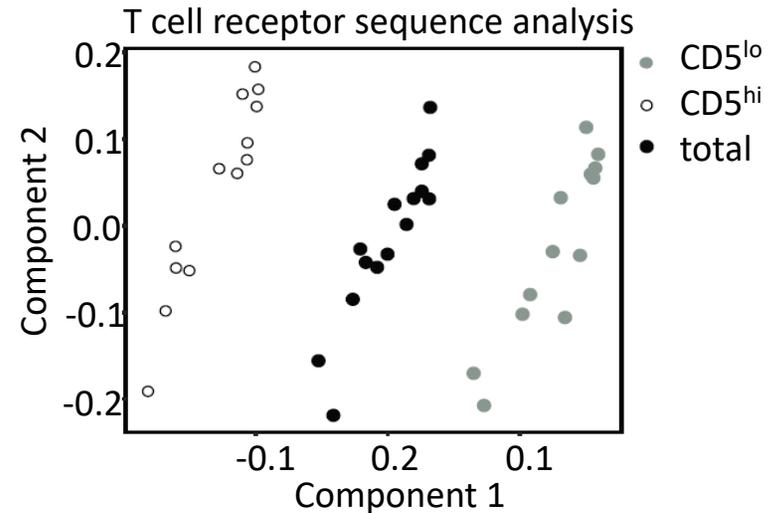
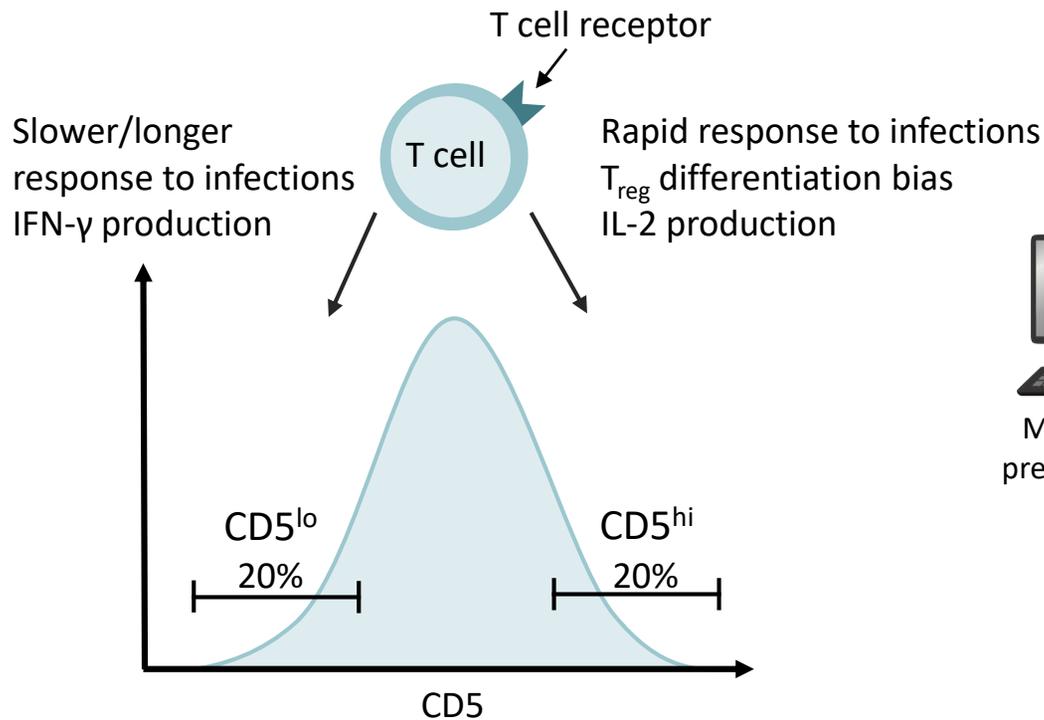
Institute: Université de Montréal

Abstract: T cells eliminate infected cells by recognizing small protein fragments from invaders through their T cell receptor. Each T cell has a unique version of this receptor. It is thought that every T cell have the same potential to contribute different parts of an immune response. However, it is becoming increasingly clear that T cells vary in pre-existing biases for certain skills prior to their deployment for an immune response. We aim to predict the function of individual T cells based on the sequence of its T cell receptor and apply this knowledge to the development of T cell therapies.

Bio: Ève Mallet Gauthier completed her undergraduate studies in biochemistry and molecular biology at the Université de Moncton. Through the COOP program, she had the opportunity to work in several laboratories, each with a distinct research focus. During these internships, she discovered her interest in immunology. Ève Mallet Gauthier is currently working on her master's degree in immunology at the Université de Montréal in the lab of Dr. Heather Melichar at the Maisonneuve-Rosemont Hospital Research Center. Her master's project focuses on the development of T cells.

Predicting T cell function from T cell receptor sequence

- T cells identify and eliminate infected and cancer cells
 - › Recognize abnormal cells via T cell receptor
- Each T cell has a unique T cell receptor
 - › Potential of 2×10^6 different T cell receptors
- T cells play many roles in an immune response



Conclusions:

- Link TCR sequence and T cell function
- Potential application: adoptive T cell therapy

3 Science Communication Posters

3.1 Public Perception of Nanotechnology

Poster Number: 8

Category: Science Communication

Author: Ankita Rathore (she/her)

Institute: CSIR-NISCAIR, New Delhi

Abstract: Nanotechnology is an innovative emerging technology that has many proven applications and holds a lots of potential in many sectors. At the same time, the general public's lack of awareness about nanotechnology might polarize risk perception about this technology. Public discourse and up-stream engagement are necessary for policy making and responsible development of any emerging technology. This poster presents a systematic review of factors influencing public perception and their attitude towards nanotechnology during 2001-2020. We found that several interdependent factors, namely- knowledge, media representation, trust in science, religiosity, and demographics, can polarize the risk-benefit perception of this emerging technology.

Bio: Ankita Rathore is presently a PhD student at National Institute of Science Communication and Information Sciences (NISCAIR), New Delhi, India. Her research focuses on the public perception of nanotechnology in India and the factors influencing the risk perception of this emerging technology.

Public Perception of Nanotechnology

Ankita Rathore and G Mahesh
CSIR- National Institute of Science Communication and Information Resources, New Delhi, India

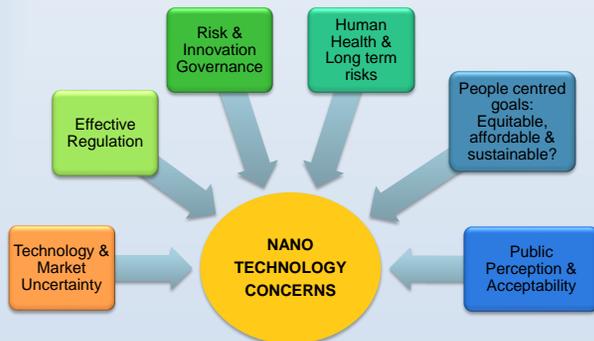


ABSTRACT

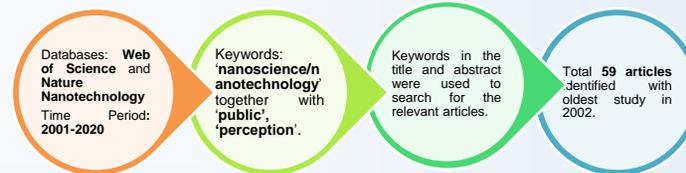
Nanotechnology is an emerging technology that has many proven applications and holds lots of potential in many sectors. At the same time, the general public's lack of awareness about nanotechnology might polarize risk perception about this technology. Public discourse and up-stream engagement are necessary for policymaking and responsible development of any emerging technology. While emerging countries have now joined the discussion on the public perception of emerging technologies just like the developed countries, yet there has been no research comparing the nanotechnology perception among developing and developed nations. This research presents a systematic review of factors influencing public perception and their attitude towards nanotechnology in developed and developing countries based on research papers published during 2001-2020. The factors include risk-benefit, knowledge, trust in science, religiosity, demographics and media representation of nanotechnology (newspaper coverage and social media).

OBJECTIVES

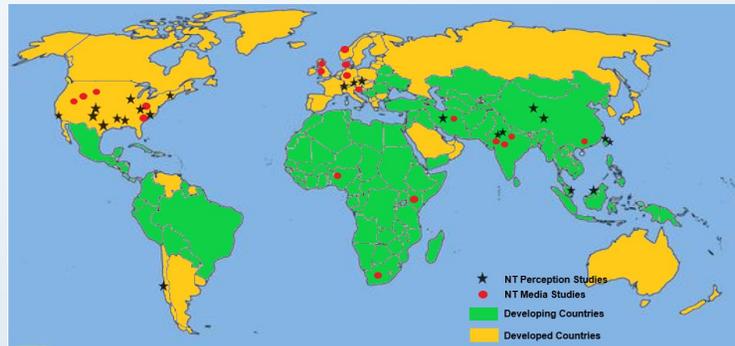
- To find out the factors influencing public perception of nanotechnology by reviewing literature from 2001-2020.
- To compare these factors across developed and developing countries to ascertain the differences in nanotechnology perception.



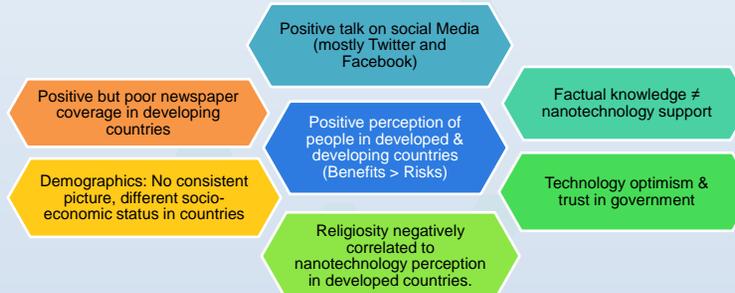
METHODOLOGY



RESULTS



Nanotechnology (NT) perception and media studies in developed and developing countries during 2001-2020



DISCUSSION

Public perception of nanotechnology is influenced by several complex factors and an upstream public engagement is needed to influence policymaking for an informed public discourse of this emerging technology. Following table summarises factors important for public acceptability of nanotechnology.

Responsible Technological Development	• To ensure equitable sharing of cost, benefits and responsibility among different stakeholders.
Risk Governance Policy	• Governance with respect to the context of risk related decision-making, with sole focus to minimize harmful effects of technologies.
Nanotechnology Regulation & Ethics	• To anticipate and mitigate adverse implications and unintended consequences.
Public Engagement & Societal Dialogue	• Local community based solutions. Scientists and communication experts collaboration to resonate with public's worldview.

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Contact: rathore.ankita024@gmail.com @ankitarathore02

3.2 Quality Improvement Project Using Existing Data: Exploring Unmet Needs Contributing to Requests for Medical Assistance in Dying (MAID)

Poster Number: 9

Category: Science Communication

Author: Alice Kong (she/her)

Institute: University of Saskatchewan

Abstract: The federal government passed Bill C-14 in 2016 to allow Medical Assistance in Dying (MAID). To explore patient characteristics and potentially unmet needs underlying the request for MAID, we undertook a quality improvement project to explore MAID patients assessed by Saskatoon-based clinicians from 2016 through 2020. We found that many factors are associated with patients initiating discussion about MAID. More detailed investigation of characteristics of patients applying for MAID, as well as the reasons and potentially unmet needs precipitating the request for MAID may be necessary to ensure optimal end-of-life care in Saskatchewan.

Bio: I graduated from University of Regina with Psychology and Biology degree. I am a first year medical student at University of Saskatchewan.

Quality Improvement Project Using Existing Data: Exploring Unmet Needs Contributing to Requests for Medical Assistance in Dying (MAID)

Alice Kong¹, Dr. Lilian Thorpe^{1,2,3}, Dr. Bonnie Janzen³, Dr. Hyun Lim³, Dr. Robert Weiler^{1,4}
 College of Medicine¹, Departments of Psychiatry², Community Health and Epidemiology³, Department of Anesthesiology⁴

Abstract

Background: Since the federal government passed Bill C-14, the number of Canadians receiving Medical Assistance in Dying (MAID) has increased each year. Although MAID has expanded end-of-life options, concerns have been raised that inadequate access to supportive services might be the precipitant for this increase. To explore this further, we undertook a quality improvement project to explore patient characteristics and potentially unmet needs underlying the request for MAID in patients assessed by Saskatoon-based clinicians.

Method: We reviewed charts from 432 patients who contacted Saskatoon-based MAID assessors from September 2016 through July 2020. Demographics, health information, stated reasons for requesting MAID, as well as unmet needs at the time of their contact were extracted and entered into an Excel file. Descriptive analysis as well as multivariate Cox-regression statistical analysis was performed.

Results: We found that of 442 patients who made an initial contact, 318 were deemed to be eligible for MAID and 192 patients received MAID. The largest proportion of MAID contacts were from patients residing in large urban population centres. Contacts also predominantly resided in higher income neighborhoods. Cancer was the underlying health condition most strongly predicting time to MAID, and this was more pronounced in women. The majority of the patients had access to palliative or disability care, and this access was not predictive of time to MAID. Cox regression also suggested that the main underlying condition at the time of initial contact was overall the strongest predictor of progression to MAID.

Interpretation: Many factors are associated with patients initiating discussion about MAID, some of which include socioeconomic factors as well as the expected underlying physical illnesses such as cancer. Access to palliative or other supportive care does not seem to be as significant as the underlying illness. Patients living in more populous regions and those from higher social economic strata are more likely to have the knowledge and supports to initiate discussion of this more recently available end-of-life choice.

Future study: More detailed investigation of characteristics of patients applying for MAID, as well as the reasons and potentially unmet needs precipitating the request for MAID may be necessary to ensure optimal end-of-life care in Saskatchewan. However, including Saskatchewan MAID contacts beyond the Saskatoon area might result in a more representative assessment of this overall and more generalizable outcomes for all Saskatchewan residents.

Introduction

The federal government passed Bill C-14 in June 2016 allowing Medical Assistance in Dying (MAID) in Canada. The number of individuals requesting MAID has increased each year, resulting in 13,946 MAID deaths in Canada and 250 MAID deaths in Saskatchewan between 2016 and 2019¹. To meet the criteria for MAID in Canada, individuals must be mentally competent, eligible for receiving health services in Canada, make a request for MAID without external pressure, be 18 years of age or older, have an irremediable condition, including foreseeable death, and be able to give informed consent².

While MAID has expanded end-of-life options, there have been concerns that vulnerable individuals who lack financial and social support or access to palliative care may be more likely to request MAID^{3,4}. However, one study found that patients who received palliative care were twice as likely to request MAID compared to those who did not receive palliative care. According to this study, this was likely due to the palliative care patients' higher levels of distress, depression and other negative emotions⁵. Many previous studies have suggested that individuals' social or economic factors are less likely to contribute to individuals' decision to request MAID such as the wish to avoid dependency, concern for control, desire to die at home and concerns about the lack of ability to care for oneself in the future^{6,7}. This finding suggests that patients' discomfort and poor quality of life are stronger predictors in the request for MAID than their concern about external factors such as financial burden, lack of accessibility to healthcare services, and other physical symptoms, pain, etc^{8,9}. However, some of the previous case studies conducted in the U.S. did indicate a lack of social support, hopelessness and limited access to healthcare were possible reasons for requesting MAID^{10,11}.

Another study found that differences in patients who request MAID depend on the countries they reside in, as well as the different environments, norms and available care. Among patients who chose to die through MAID, 91% of those in Oregon (U.S.) reported loss of autonomy as one of the top reasons for their requests, while only 53% of those in British Columbia (Canada) reported that as a top reason for their MAID request¹².

Unmet needs of individuals requesting MAID have been more thoroughly tracked in Canada since November 2018 when reporting guidelines became more standardized. However, even after November 2018, variations in interviewing and assessing patients who have requested MAID may have resulted in regional and other measured differences in unmet patient needs. Because more complete and accurate knowledge about the reasons and the unmet needs most responsible for the request for MAID and/or receiving MAID might result in practical improvements to end of life care, it is crucial to study this in a patient data set with a fairly uniform pattern of information acquisition and recording, such as ours in a University-based assessor practice.

Objectives

1. What are the characteristics (demographic, geographic, underlying illness, access and provision of palliative care, etc.) of patients applying for, and then receiving MAID?
2. What are the unmet needs most responsible for MAID requests?

Methods

This quality improvement study involved accessing data from patients who contacted Saskatoon-based MAID clinicians. Patient characteristics such as demographic information, geographic location, underlying illness, accessibility to palliative care and/or disability care, rural-urban coding of residence, distance to the nearest major health centre, marital status, highest educational attainment, type of residence and location of the MAID assessment were extracted (Table 1). The first half of the patient's postal code was used to find the mean neighborhood income and to ascertain whether the income was above or below the Saskatchewan median income (Figure 1). Data extraction strategies to determine the major reasons for the MAID request and unmet needs most responsible for it were developed with two physicians involved with the MAID program, one epidemiologist, one statistician, a family support member and a patient advisor (Figure 2).

Data were extracted and tabulated. Patients who requested MAID but did not receive it were compared with patients who requested and received MAID. Once all the information was collected, multivariate Cox-regression statistical analyses for time to MAID were performed, using the standard SPSS statistical software package, V25 (IBM, Armonk, NY, USA).

Results

Data consisted of records from 432 patients. Four-hundred and two MAID assessments were completed of which 318 were found eligible for MAID. Among the 318 eligible patients, 192 received MAID, 86 died without MAID and 40 were still alive at the end of this study (Figure 3). There were more males (60%) than females (40%) and only 5 patients (1.6%) stated that they lacked access to palliative care (Table 1). The most commonly documented medical condition was cancer (55%), followed by other conditions such as organ failure, frequent bone fractures, etc (16%), neurological diseases (13%), cardiovascular diseases (9%) and respiratory diseases (7%). The majority of patients were married (79%), had children (74%) and had key support systems comprising of close family members, such as spouse and/or children (74%) (Table 1).

Among the 432 contacts between June 2016 and July 2020, the majority of patients were from large urban population centres (62%), followed by small/medium population centres (23%) and rural areas (15%) (Figure 4). Although patients who resided in rural areas were overall less likely to contact MAID assessors, the percentage of rural contacts has slowly increased from 5% in 2016 to 8% in 2017, 10% in 2018 to 13% in 2019 (Figure 4).

More MAID contacts resided in neighborhoods higher in income than the Saskatchewan median (58%). (Figure 5) This was most noticeable in 2016 (80%), and decreased in 2017 (58%), but again rose to 60% in 2018 and 2019 (58%) (Figure 5). This was also true for patients who were female (80%) and those who were male (60%) (Figure 5).

The most common reasons documented for requesting MAID were inadequate control of pain (60%), loss of ability to make meaningful (44%) and difficulty in breathing (40%), while less common reasons included feeling futile (5%), having financial stress (6%) and feeling a lack of purpose in life (6%) (Figure 2). Among the reasons documented for requesting MAID, the most common ones were physical, whereas fewer were nonphysical, such as poor quality of life or the fear of a difficult death (Figure 2). Among patients who were eligible for MAID, the mean number of days between initial contact and death was 52 days in individuals who received MAID but 79 days in those who died without MAID. Of individuals who were ineligible and died, the mean number of days between initial contact and death was 139 days. Of the 192 eligible cases, 89 cases deaths occurred less than 10 days after the initial contact because of likely loss of capacity to consent (Table 1). A majority of eligible patients received MAID at a healthcare facility (61%), followed by home or a nursing home (37%), while the location of their death for 2% of the patients who received MAID was unclear from the chart review (Table 1).

We used multivariate Cox-regression analysis to explore the relationship between baseline variables and time from initial contact to MAID (Table 2, 3). As there was an interaction between sex and age, analysis was done separately for males and females. In women the age at first contact was not statistically significant in predicting progression to MAID, whereas in men this was a significant predictor (Table 2). Another difference between the sexes concerned the ability to consume food; this was a major predictor of MAID outcome in females but not for males. However, the ability to consume food was excluded from the Cox regression as it was not considered to be valuable information that was assessed in a standardized way. In males, receiving their MAID assessment in a hospital setting, such as in an acute care or supportive care facility, significantly predicted progression to MAID (Table 3).

For both female and male patients, cancer was the main underlying medical condition was the strongest predictor of MAID and this was more pronounced in women (Table 2, 3). Access to palliative care, lack of social support, inadequate pain management, shortness of breath, poor quality of life, a perceived burden on family or financial stress were not statistically significant predictors of MAID.

Characteristics	Contacted MAID Assessor (N=432)	Received MAID Assessment (N=402)	Did Not Receive MAID Assessment (N=30)	Eligible (N=318)*	Ineligible (N=84)*
Intervention				Received MAID (N=192)	Did not receive MAID (N=86)
Average age (range)	72 (23-105)	73 (23-105)	67 (42-92)	74 (23-99)	73 (41-105)
Median	73	73	67	74	73
Sex, N (%)					
Male	246 (60)	229 (57)	17 (57)	108 (55)	54 (65)
Female	186 (43)	173 (43)	13 (43)	84 (44)	31 (37)
Main underlying condition, N (%)					
Cancer	236 (55)	219 (54)	18 (60)	127 (65)	52 (62)
Neurodegenerative	55 (13)	52 (13)	3 (10)	22 (11)	8 (10)
Cardiovascular	39 (9)	38 (9)	1 (3)	16 (8)	9 (10)
Respiratory	31 (7)	29 (8)	2 (7)	11 (6)	7 (8)
Other	71 (16)	67 (17)	4 (13)	16 (8)	6 (8)
Marital Status, N (%)					
Married	220 (51)	207 (51)	13 (43)	103 (54)	51 (59)
Divorced/separated	62 (14)	60 (15)	2 (7)	28 (15)	12 (14)
Widowed	87 (20)	82 (20)	5 (17)	43 (22)	14 (16)
Never married	31 (7)	28 (7)	3 (10)	10 (5)	7 (8)
Unknown	32 (7)	25 (6)	7 (23)	8 (4)	2 (2)
Children, N (%)					
Yes	343(79)	326 (81)	17 (57)	164 (85)	72 (84)
No	49 (11)	45 (11)	4 (13)	20 (10)	9 (9)
Unknown	40 (10)	31 (8)	9 (30)	8 (4)	7 (7)
Key support, N (%)					
Spouse	186 (43)	176 (44)	10 (33)	86 (45)	49 (57)
Children	135 (31)	131 (33)	4 (13)	68 (35)	22 (26)
Parental/other	49 (11)	41 (10)	8 (27)	16 (8)	6 (7)
No support	23 (5)	23 (6)	0 (0)	10 (5)	5 (6)
Unknown	6 (1)	6 (2)	0 (0)	3 (1)	1 (1)
Rural/urban coding of patients' residence, N (%)					
Large	64 (15)	62 (15)	2 (7)	37 (19)	8 (9)
Medium	28 (7)	29 (7)	0 (0)	14 (7)	6 (7)
Small	11 (3)	10 (3)	1 (3)	5 (3)	2 (2)
Unknown	8 (2)	7 (2)	1 (3)	4 (2)	2 (2)
# of days between initial contact and death [†]					
Mean (range)	56 (0-1093)	57 (0-1093)	81 (0-3466)	52 (0-825)	73 (0-696)
Median	79	73	45	57	45
Location patient received MAID, N (%)					
Hospital				118 (61)	
Home/nursing home/personal care home				171 (87)	
Unknown				9 (5)	

Table 1. Descriptive analysis of patient contacts between June 2016 and July 2020

* All data was collected from patient contacts between June 2016 and July 2020
[†] Includes all completed, closed, and cases in progress
[‡] Includes only completed cases
[§] Includes only MAID cases

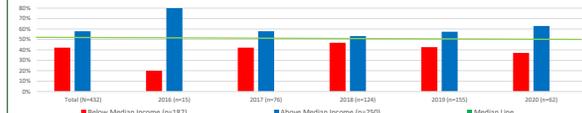


Figure 1. Patients' median neighborhood income[§]

* All data was collected from patient contacts between June 2016 and July 2020
[†] Includes all completed, closed, and cases in progress

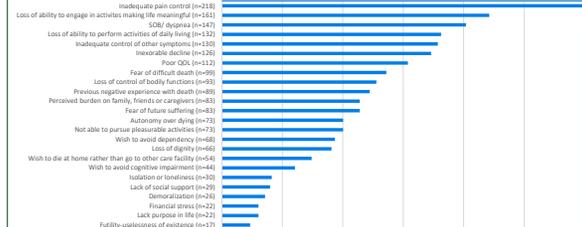


Figure 2. Patients' reasons for requesting MAID (N=364)[§] and unmet needs (N=122)

* All data was collected from patient contacts between June 2016 and July 2020
[†] Includes all completed, closed, and cases in progress
[‡] Cases were not included if the assessment was not documented
[§] Symptoms/types of suffering significant to a MAID request were not limited to one reason

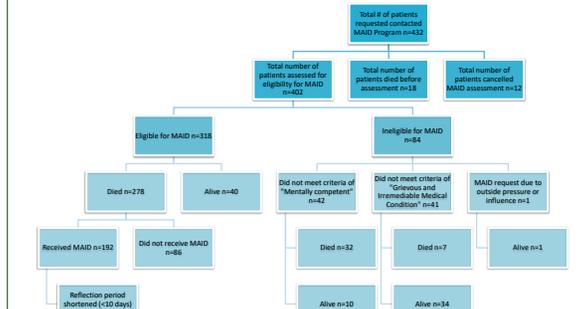


Figure 3. Study flow chart (N=432)[§]

* All data was collected from patient contacts between June 2016 and July 2020
[†] Includes all completed, closed, and cases in progress

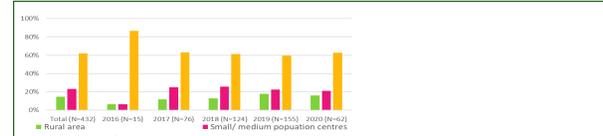


Figure 4. Patients' residence at the time of initial contact (N=432)[§]

* All data was collected from patient contacts between June 2016 and July 2020
[†] Includes all completed, closed, and cases in progress

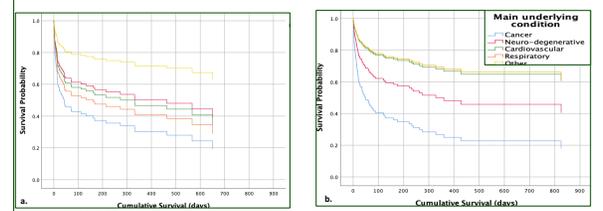


Figure 7. Survival probability for time to MAID

a. Males by main underlying condition. b. Females by main underlying condition.

Variable	Hazard Ratio (HR)	P Value	95% CI for HR
Age at first contact	1.024066	0.003752	1.008-1.042
Main underlying condition			
Cancer	0.016792		
Neurodegenerative	0.509281	0.020332	0.269-1.120
Cardiovascular	0.434664	0.163642	0.346-1.196
Respiratory	0.748950	0.453405	0.352-1.595
Other	0.276115	0.001761	0.129-0.586
Location Type at First Assessment			
Acute care	0.000629		
Private home/care	0.450825	0.000256	0.294-0.691
Supportive living	1.083855	0.91817	0.247-4.748
Long term care	0.309509	0.197485	0.183-1.422
Other	0.075934	0.000562	0.030-0.532

Table 2. Multivariate Cox-regression analysis of time to MAID (Males)

Variable	Hazard Ratio (HR)	P Value	95% CI for HR
Age	1.001370	0.899068	0.986-1.017
Main underlying condition			
Cancer	0.000571		
Neurodegenerative	0.526127	0.000118	0.277-1.000
Cardiovascular	0.292282	0.001396	0.201-0.961
Respiratory	0.278664	0.031869	0.087-0.895
Other	0.000566	0.000562	0.137-0.570

Table 3. Multivariate Cox-regression analysis of time to MAID (Females)

Limitations

The main limitation of this data analysis was that standardized questions were not asked and documented in all of the interviews. Therefore, findings may under-represent or over-represent unmet needs underlying the MAID request. Another limitation of this research is that all the data were collected by a Saskatoon-based physician, leading to an under-representation of patients from areas that are far away from Saskatoon.

Discussion

The author had originally expected that the most common reasons for requesting MAID would be somewhat similar to the findings from previous studies conducted in the US, such as financial burden, lack of access to better healthcare services or social support, loss of autonomy or poor quality of life, limited, poor quality of life and loss of ability to engage in meaningful activities were among the top unmet needs that contributed to the requests for MAID in Canada. However, uncontrollable physical symptoms – such as pain, shortness of breath and other unpleasant symptoms like difficulty in eating and/or drinking or poor appetite – were among the most common reasons documented in patients requesting MAID. The relationship between the level of physical discomfort and MAID requests may also be explained through the multivariate analysis, where underlying conditions such as cancer for both female and male patients were a strong predictor for an earlier death. Lack of social support was one of the least common unmet needs charted, and this may be because most of the patients were married, had children and had close family members, such as their spouse and children, in key support roles. These supporters likely facilitated the earlier person making the initial contact with a MAID assessor, so those without family or social supports may have been less likely to hear about medical assistance in dying as an end-of-life choice.

Lately, concern has been raised about whether individuals who are at a social and financial disadvantage will be more likely to receive MAID. This was not supported, as a majority of those who contacted Saskatoon-based clinicians resided in higher income neighborhood areas and had access to palliative care. We suspect that more advantaged individuals are more likely to use MAID as they are better able to navigate available healthcare services.

Conclusions

Concerns have been raised that inadequate access to supportive services might be the precipitant for the MAID requests, but this was not found in our research. In particular, access to palliative or other supportive care was not as significant as the underlying illness. Patients living in more populous regions and those from higher social economic strata are more likely to have the knowledge and supports to initiate discussion of this more recently available end-of-life choice.

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Acknowledgements

This study was supported by the College of Medicine, 2020 Dean's Summer Student Research Projects, University of Saskatchewan.

3.3 Teaching Relapse Prevention using Visual Communication: Key Design Considerations for Low-Literacy Service Users

Poster Number: 10

Category: Science Communication

Author: Shan Grewal (he/him)

Institute: Western University

Abstract: Lower education and health literacy levels among many addiction treatment service users poses communication barriers in addiction treatment. Providing information visually has been shown to benefit comprehension, so we sought to develop a visual resource to enhance understanding of Marlatt's Relapse Prevention model. Five key design elements - content, cognitive load, writing style, organization, and color - were analyzed to create a specialized visual. The evidence-based visual incorporates actionable ideas from Marlatt's Relapse Prevention model while minimizing cognitive load, efficiently incorporating text, organizing information and utilizing colour to improve readability. Our work shows how visual communication can address knowledge translation barriers.

Bio: Shan is an undergraduate Medical Sciences student at Western University specializing in Biochemistry. During the summer of 2020, he was a research intern at the scientific illustration company Designs that Cell, diverting from his Biochemistry background to explore how visual communication can be applied to substance misuse treatment. He discovered a real need for improved communication strategies in addiction treatment, and tailored his research project to addressing educational barriers among service users. Understanding the importance of knowledge translation as an aspiring scientist and communicator, Shan hopes to continue seeking new ways to help others learn.

Background

Educational Barriers in Alcohol Misuse Treatment:

- 80% of Ontarians reported consuming alcohol in 2017¹
- Over 47,000 Ontarians use addiction treatment services in a year²
 - 40% of service users have not completed high school²
 - 23% of service users have no post-secondary education²

Marlatt's Relapse Prevention Model:

- Relapse is influenced by many contextual factors (e.g. lifestyle balance, coping strategies, outcome expectancies) centered around high-risk situations³
- Counsellors who effectively communicate relapse prevention concepts can reduce relapse occurrence⁴

Objective

To develop a new visual educational resource to enhance understanding of Marlatt's Relapse Prevention model among those seeking treatment for alcohol dependency

Methods

Five key design elements were analyzed to create a highly-specialized visual

1. Content
2. Cognitive Load
3. Writing Style
4. Organization
5. Colour

Results

Content: Selecting Information

- Select only main ideas to include in illustration⁴
- Focus on actionable information⁵
- Avoid detailed explanations of scientific theories⁵

Reduce Cognitive Load

- People with poor literacy skills have less working memory than those with higher literacy⁶
- Visual designs must minimize strain on cognitive resources
 - Keep designs simple
 - Remove unnecessary words

Use Text Efficiently

- Text can supplement visual information and help avoid misunderstandings of illustrations⁷
 - Keep captions close to corresponding image⁵
 - Avoid jargon⁸
 - Write in an active voice⁸

Organization and Layout

- Organize information in "boxes"⁹
- Use headings written in a conversational style⁵
- Arrows guide attention¹⁰

Simple Colour Scheme

- No more than 3-5 colours¹²
- Monochromatic colour scheme offers uniform look



Conclusions

- Visual communication is an effective bridge between individuals with low educational backgrounds or literacy skills and the complex health information they need for their wellbeing
- The elements of content, cognitive load reduction, writing style, organization, and color work together to make a visual coherent
 - Designing for low literacy viewers adds an extra layer of consideration to each element

Next steps:

- Get feedback from addiction counsellors to improve visual
- Encourage others to take these strategies and apply them to Cognitive-Behavioural Therapy or 12-Step Programs

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3.4 Why create SciArt? Investigating science artists' goals and professional journeys

Poster Number: 11

Category: Science Communication

Author: Alice Fleerackers (she/her) (research conducted with Paige Jarreau & Julia Krolik)

Institute: Simon Fraser University, ScholCommLab

Abstract: Science Art ('SciArt') is a fast-growing form of visual expression that draws inspiration from science. While SciArt is increasingly used in science communication as a way to make content more engaging or accessible, relatively little is known about science artists themselves. Why do they become involved in SciArt? What do they hope to achieve through their work? This project addresses these questions through a qualitative analysis of interviews with 131 practicing science artists drawn from the blog of the Canadian nonprofit, Art the Science. We identify a diversity of goals for creating SciArt, only some of which involve communicating science.

Bio: Alice Fleerackers is a freelance writer and researcher specializing in online science communication. Currently, she is a researcher and lab manager at the ScholCommLab, the Research Officer at Art the Science, and a Science in Society Editor at Science Borealis. She is also pursuing a PhD at Simon Fraser University, where she is exploring how uncertain health science is communicated online. With a background in psychology and publishing, Alice is passionate about bringing research into everyday life. She's contributed to outlets such as the Globe and Mail, the National Post, and Nautilus, covering everything from the psychology of cat video addiction to the science behind astrological belief.

Why create SciArt?

Research: Alice Fleerackers, Paige Jarreau, Julia Krolik

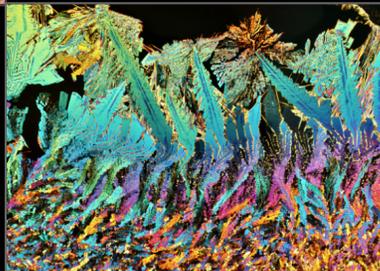


For some science artists, it's about **communicating science**.
But it can also be a way to...



Vanessa Barragão

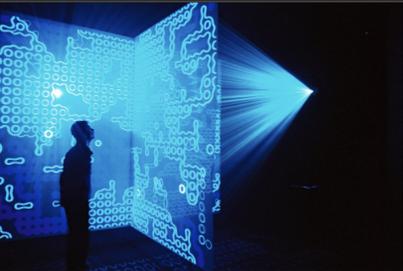
... take joy in
the process of
working creatively



Vance Williams

... reveal beauty and
hidden worlds

... reflect, question,
and **critique**



Jon McCormack

... **inspire and**
engage audiences



Okunola Jeyifous

... and so
much more

The problem:

“SciArt”—art inspired by science—is often used as a way to make science more engaging and accessible. But little is known about the goals of science artists, which means their priorities are sometimes overlooked in collaborations with scientists or science communicators.

The questions:

Why do science artists become involved in SciArt?
What do they hope to achieve through their work?

The approach:

We analyzed interviews with 131 science artists that we gathered from the blog of the Canadian nonprofit, Art the Science. Through a close reading, we identified common patterns or “themes” in these artists’ reflections.

3.5 Improving Prenatal Care for Indigenous Women Using Trauma-Informed Care: A Quality Improvement Initiative

Poster Number: 12

Category: Science Communication

Author: Darren Lee (he/him)

Institute: University of British Columbia

Abstract: Background: Adverse Childhood Experiences (ACEs) are traumatizing negative events that occur before the age of 18 which can include: abuse, neglect, and household dysfunction. Trauma-informed care (TIC) is a method used to address ACEs through fostering resilience in patients.

Bio: We're undergraduate and alumni students from the University of British Columbia. Our collaboration in public health studies have brought us together to focus on adverse childhood experiences (ACEs) and trauma-informed care (TIC) for Indigenous women in maternity centres. Indigenous patients face racism and discriminations in healthcare, lowering health outcomes for Indigenous population, especially for Indigenous women. Our work is an attempt at improving this healthcare issue through implementation of ACEs questionnaires & TIC.

Improving Prenatal Care for Indigenous Women Using Trauma-Informed Care: A Quality Improvement Initiative

Taewoong Chae, Alexa Dakinewich, Rachel Horng, Darren Lee, Danny Liu

INTRODUCTION

- Indigenous-specific racial stereotyping and discrimination stemming from colonial history is common and widespread in healthcare.
- Poor maternal care weakens the intergenerational cycle for Indigenous peoples.
- Indigenous women are more vulnerable to higher ACE scores and are more likely to exhibit distrust towards healthcare workers.

BACKGROUND

Adverse Childhood Experiences (ACEs): ACEs are traumatizing negative events that occur before the age of 18 which can include: abuse, neglect, and household dysfunction.

ACE International Questionnaire (ACE-IQ): Used to measure ACEs in all countries, scored from 0-10. Higher ACE scores are correlated with a greater risk of health issues in adulthood.

Trauma-Informed Care (TIC): Trauma-informed care (TIC) is a method used to address ACEs through fostering resilience in patients.

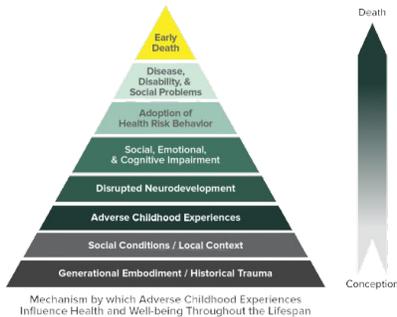


Figure 1. The ACE Pyramid. ACEs can negatively impact neurodevelopment, self-regulation, and overall life-span. (Centers for Disease Control and Prevention, n.d.)

OBJECTIVES

The major objectives of implementing an Indigenous-specific TIC intervention in maternity wards is to proactively address maternal stress related to ACEs and to foster more cultural-safety within the patient-provider relationship.

Indigenous women have disproportionately negative interactions within the Canadian healthcare system which negatively affects health outcomes (Turpel-Lafond 2020). Alongside consistent negative healthcare experiences, Indigenous demographics have unique social determinants of health stemming from colonial violence. The long term health consequences of prolonged stress and adversity in childhood are well documented. However, current ACE questionnaires lack questions which address collective cultural trauma (for example: the residential school system and the Sixties Scoop). Incorporating Indigenous-specific ACE questionnaires into maternity care aims to identify, record, and treat ACE-related stress in expecting Indigenous patients.

METHODS

Target Population: Indigenous women at a hospital maternity clinic

Intervention Timeline: ~ 1 year

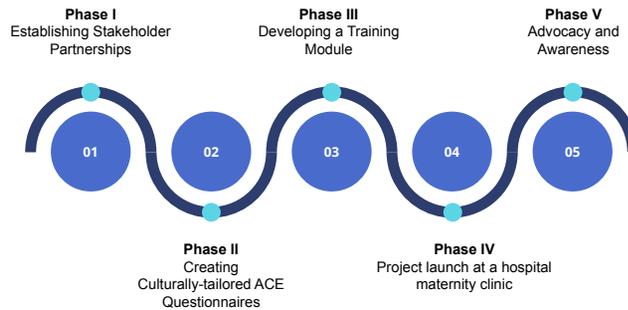


Figure 2. Intervention Timeline. The 5 phases of the intervention.

Performance Evaluation: Patient-reported experience measures (PREMs) surveys will be given to participants to gauge the efficacy of the intervention. PREMs surveys will be given at the 20-week (midpoint) appointment and the 6-week postpartum (final) appointment. A successful intervention will lead to increased patient-provider satisfaction as indicated by the PREMs survey.

BUDGET

	Cost	Rationale
Social Media Campaign	\$3,500	<ul style="list-style-type: none"> • 50 social media posts • \$300-\$600 boosted post ad spending (approx. 8 boosted posts) • Social media management (comment monitoring, performance analysis)
Labour Costs	\$150,000	<ul style="list-style-type: none"> • Salary + benefits for hired positions (trauma-informed care champion, training module consultants) who will train and supervise care providers

LIMITATIONS

- Study examines correlational effects to evaluate the external validity of ACE, TIC, and health.
- There was a lack of literature and past works in implementing TIC in maternal centres for Indigenous women.
- Has a higher labour cost; relies on grant funding.

FUTURE DIRECTIONS

- Implementation of the intervention in a new context, location, or target population

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ACKNOWLEDGEMENTS

- We would like to acknowledge that the University of British Columbia is located on the traditional, ancestral, and unceded territory of the xwmaḡkwəyem (Musqueam) People.
- Dr. David Birnbaum
- The University of British Columbia



3.6 Shifting Baselines: Failing to Remember Avian Species Compositions

Poster Number: 13

Category: Science Communication

Author: Simrat Mahil (she/her)

Institute: University of British Columbia

Abstract: Shifting baseline occurs when an obtained measurement is used to replace a previous baseline that has either been forgotten or undocumented due to a tendency to analyze the most recent data when making decisions regarding the foreseeable future. Relying on data in this way risks a loss of perspective and consciousness regarding the true extent of change experienced over time and an acceptance of current conditions as normal. In an environmental context, shifting baseline describes an increasing tolerance for gradual environmental degradation whereby inappropriate baselines are set when outlining conservation efforts. Avian species compositions are continually impacted by this phenomenon.

Bio: Simrat is a fourth-year undergraduate student at The University of British Columbia studying Biology. She is interested in ecosystem ecology and ornithology. After graduation, she hopes to pursue a Masters degree in Ecology and Evolutionary Biology while maintaining a focus on bird systems. She is passionate about climate change and sustainable development and hopes to secure a job working in this field one day. She likes to snowboard, go for runs, and tend to her cats in her free time.

Shifting Baselines: Failing to Remember Avian Species Compositions

Simrat Mahil, The University of British Columbia

Introduction

Ongoing environmental changes, including deforestation and other anthropogenic activity are rapidly deteriorating the natural biodiversity of various ecosystems worldwide. The damage is not fully recognized due to generational and personal amnesia. These factors allow new generations to form their own interpretation of what constitutes a 'natural environment,' leading to an acceptance of new conditions and forgetting previous ones (Soga et al., 2018). I will argue that the composition of avian species and resulting community structure has drastically changed over several decades without much notice.

Shifting Baseline

A shifting baseline occurs when a measurement, usually one depicting a desirable quantity is obtained and used to replace a previous baseline that has been either forgotten or undocumented (Soga et al., 2018). Relying on data in this way risks a loss of perspective and consciousness of the true extent of change experienced over time and an acceptance of current situations as normal. The continual downgrade of normal or desirable conditions is termed shifting baseline syndrome (SBS). It describes an increasing tolerance for gradual environmental degradation whereby inappropriate baselines are set when outlining future actions. The identification of SBS in a biological system requires that; a biological change be present within a system and that any perceived change must be consistent with accompanying data. With this, we can determine how SBS occurred:

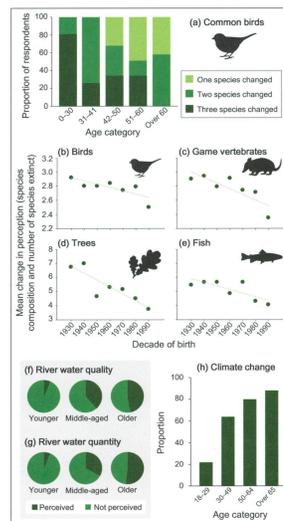
1. Generational amnesia: disappearance of knowledge in younger generations, likely due to the absence of intergenerational communication.
2. Personal amnesia: individuals forget past experiences and understand current circumstances as normal and unchanged.

Generational and Personal Amnesia

The collection of accurate biodiversity assessment data for a region allows for a thorough comprehension of current environmental circumstances needed to establish informed and promising conservation targets (Papworth et al., 2009; Soga et al., 2018). In evaluating ecological issues such as bird population, the age-related difference in perception results in shifting demands on conservation initiatives as younger generations express a lesser need for action (Jones et al., 2020). Both generational and personal amnesia contributes to the divergent perceptions between younger and older generations. The difference in biological data evinces a definite abundance shift throughout the lifetime. However, the difference between perceived and real change demonstrates personal amnesia, where the individuals forget past conditions of avian community structure (Jones et al., 2020).

Shifting Baseline Syndrome (Soga et al., 2018)

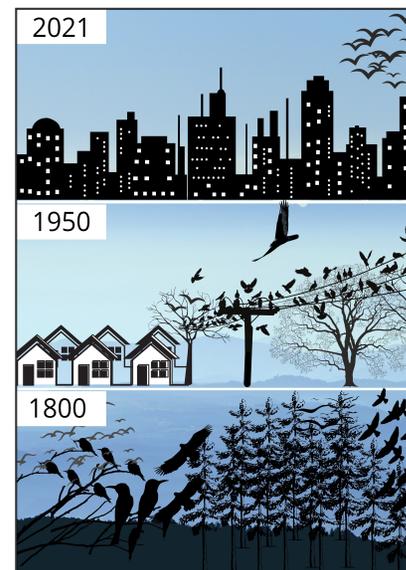
Accumulated empirical evidence on the development of SBS from multiple studies.



Careful Assessment

Numerous issues arise due to changes in the abundance and richness of bird species, for example, the degradation of entire ecosystems and the reduction of ecosystem function for economic purposes (Soga et al., 2018). Degradation may counterintuitively increase species richness as the environment changes in a way that favours the colonization of new species without removing existing species (Kondoh, 2001). Hence, the misleading rise in species richness could lead to delayed and unsuitable conservation targets. In the late stages of ecosystem degradation, the composition of avian species will have changed entirely, and numerous previous species will have disappeared and been replaced by other species (Kondoh, 2001). If the abundance and diversity of species are reduced, entire ecosystems could collapse.

Changes in avian species composition through time.



Implications

The role of avian communities is critical. For instance, birds act as both predators and pollinators, with a well-established, mutualistic relationship between pollinator birds and existing plant species (Dellinger et al., 2019). For plants with specified pollinators, the effects on specific bird species affect the plants negatively. Thus, addressing SBS is crucial to preventing the undesirable ramifications of altered avian species composition in surrounding habitats.

Conclusion

Policymaking could be an effective solution but addresses issues only temporarily as the loss of information of previous conditions will perpetuate over time. Instead, greater quantities of historical data and accurate recording of past conditions must be preserved and incorporated into textbooks and research materials. We must actively recall historical baselines by encouraging communication between older and younger generations.

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Acknowledgement

It is acknowledged that this paper was written on the traditional and unceded territories of the Musqueam peoples. I would like to thank Dr. Daniel Pauly and Amy Liu for their support.

3.7 Communicating Science on YouTube: an Overview of Common Practices

Poster Number: 14

Category: Science Communication

Author: Karine Akopian (she/her)

Institute: KU Leuven

Abstract: YouTube is an increasingly popular venue for science communication, however, very little research provides a structured description of the approaches science communicators use to make their videos more attractive to their audience. In this study, we created a list of strategies used by science communicators on YouTube that increase viewers' engagement and attractiveness of videos. The list of these approaches is based on video content analysis and findings of previous research in the fields of communication sciences and psychology. Some of the main strategies we describe are: use of background music, visualization, simplified language, storytelling and others.

Bio: Aspiring science communicator and almost a graduate of Communication Sciences at KU Leuven (Belgium) with a BSc in Psychology. I've volunteered at SWCC and PCST and worked for popular science platforms Serious Science and Systemny Blok.



For detailed results

Communicating Science on YouTube: an Overview of Common Practices

Karine Akopian

Masters' student at Digital Media and Society, KU Leuven
akopiankarinaa@gmail.com

KU LEUVEN

Theoretical Framework

- Scientific concepts are easier to understand when they are **illustrated** [1].
- **Storytelling** is crucial for the success of science videos on YouTube [2].
- **Simple language** and little jargon help make scientific ideas easy to understand [3].
- **Humour** can create stronger associations and recollection of information [4].

Method

- 12 videos
- Video content analysis
- Deductive + inductive coding (holistic + provisional)
- Preliminary codes: visualisation, storytelling, simple language, humour

'The smallest type of infinity is countable infinity. The number of hours in forever.'

Figure 2. Example of adapted language

Research question

What practices and strategies are used in science communication videos on YouTube to make them more attractive and engaging for viewers?



Figure 1. Visualisation. Use of accent text in *Crash Course Black American History Preview* by Crash Course

Results

We identified 26 codes, grouped in 11 categories that make up 5 main approaches:

1. Visualisation (Fig. 1)
2. Storytelling
3. Adapted Language and Presentation (Fig. 2)
4. Interaction and Emotional Connection
5. Audio

3.8 Youth Science Under Lockdown

Poster Number: 15

Category: Science Communication

Author: Emily Lind (she/her)

Institute: Queen's University and the Canadian Science Fair Journal

Abstract: One of the groups most impacted by the COVID-19 lockdown has been pre-secondary school students, who have faced major disruptions to their education during the last year. My organization, the Canadian Science Fair Journal, has worked to alleviate some of the experiential learning losses this year by working closely with students to publish their research digitally via formal papers and YouTube videos. We have also expanded to provide COVID-specific teaching resources in the form of a special edition, and interviews with COVID researchers both young and old. In my poster, I want to show case how young scientists can participate in discourse surrounding COVID-19, and how this can subsequently help them to feel empowered in the face of tremendous adversity.

Bio: Emily Lind is the Managing Editor for The Canadian Science Fair Journal, which publishes projects by pre-university students via a peer-reviewed mentorship process. Emily is passionate about science communication and interdisciplinary research. She is an MSc candidate in Biochemistry at Queen's University. Her thesis investigates type II antifreeze proteins in the context of horizontal gene transfer. In addition to receiving a BScH in Biochemistry with Distinction, Emily earned a BA in Religious Studies and certificates in Gender Studies, Entrepreneurship and French. Her writing has been recognized by the Global Undergraduate Awards. You can reach Emily at 14eeml@queensu.ca or editors@csfjournal.com.

YOUTH SCIENCE UNDER LOCKDOWN

EMILY LIND, MANAGING EDITOR OF *THE CANADIAN SCIENCE FAIR JOURNAL*



DIGITAL SCIENCE COMMUNICATION FIGHTS PANDEMIC BLUES

BACKGROUND

The March 2020 lockdown dramatically impacted youth science in Canada. Existent digital science communication platforms like CSFJ filled the gap in STEM education, providing mentorship and hope.

What factors enabled CSFJ to rapidly address this problem?

TOOLS FOR SUCCESS

Fully Digital Mentorship

- Pre-existing socially distanced system
- Consistent supervision and follow-up
- 97.25% publication retention rate

Capitalization on Trends

- Creation of a Lockdown Special Edition
- Digital presentation practice opportunities
- Interviews with prominent COVID scientists

RECOMMENDATIONS

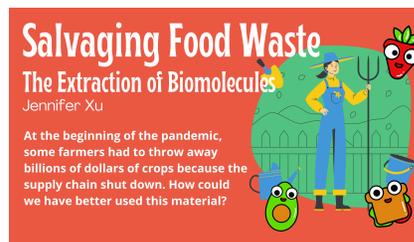
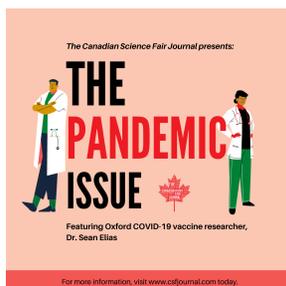
- Management of digital SciComm initiatives requires consistent supervision.
- Interdisciplinary approaches to SciComm maximizes user engagement.
- Continual innovation creates beneficial opportunities for key stakeholders.
- Capitalizing on work-from-home orders can increase productivity with long-distance, digital mentorship.

THE LOCKDOWN EDITION

Many students found this year overwhelming. There always seemed to be more problems than solutions in the face of the pandemic, and it was easy to feel powerless in the face of such chaos.

To inspire students to believe in their ability to enact change, CSFJ published a special Lockdown Edition of the journal. Papers written before the March Lockdown were presented in a new context:

How can previously conducted student research be used now to combat the negative impact of COVID-19 at large?



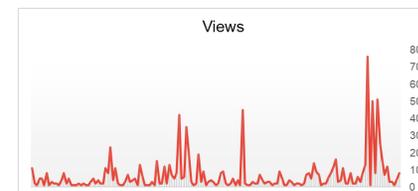
A broad range of papers were selected for the Special Edition. The goal of the issue was to inspire creative problem solving to address the unforeseen consequences of COVID-19 lockdowns. Papers addressed social distancing, mental health, food resources, public reaction to viruses, and sanitation.

COVID INTERVIEWS

CSFJ interviewed student and professional COVID-19 scientists. After connecting via LinkedIn, CSFJ interviewed **Anika Chebrolu**, winner of the **Discovery Education 3M Young Scientist Challenge**. Using connections at Oxford University, we interviewed **Dr. Sean Elias**, an **AstraZeneca vaccine researcher**.



CSFJ CONNECT



This year, students were challenged to present their work digitally. To help them succeed, CSFJ created **CSFJ Connect**. Student-authors create three-minute presentations of their work in a stress-free environment. Viewership spiked with each video and climbed during publication.

3.9 Where now? The need for a caesarean birth request care pathway in Canada

Poster Number: 16

Category: Science Communication

Author: Pauline McDonagh Hull (she/her)

Institute: University of Calgary

Abstract: Three years ago, the Society of Obstetricians and Gynecologists of Canada published guidance for women who want to choose a caesarean birth: following an unbiased discussion of the risks and benefits, doctors can choose to agree or decline requests. If agreed, the caesarean can be scheduled for after 39+0 weeks. If not, the woman's care should be referred or transferred. In practice, this does not always happen, and searching for a new doctor, especially late in pregnancy, causes untold stress. A consistent, equitable care pathway is needed to ensure all women have information about, and access to, a planned caesarean birth.

Bio: Pauline McDonagh Hull is a graduate student in the University of Calgary's Department of Community Health Sciences, and works as a research assistant in the Cumming School of Medicine. She is an author and journalist, having previously worked as a producer with BBC Television News for five years. She is also director of the voluntary organisation Caesarean Birth, which represents and supports pregnant women, is a stakeholder for National Institute for Health and Care Excellence (NICE) guidelines and quality standards, and works with other organisations and charities to improve health outcomes in maternity care.

Identifying the need for a caesarean birth request care pathway in Canada: a literature review

Pauline McDonagh Hull PGCE PGDip (BJTC)¹, Julia Imanoff RN, MN, PNC(C)² University of Calgary

¹Department of Community Health Sciences, Cumming School of Medicine, ²Faculty of Nursing

BACKGROUND



Society of Obstetricians and Gynecologists of Canada (SOGC) care pathway, 2018

The SOGC pathway guidance

- A woman can choose a caesarean birth plan following an unbiased discussion of risks and benefits with maternal health providers.
- A doctor can choose to agree or decline a woman's request.
- If agreed, the birth date should be planned for after 39+0 weeks.
- If not, the doctor is responsible for referring the woman for a second opinion or transferring her maternity care.

Our research interest

What does this guidance look like in clinical practice? Do formal care pathways exist? Do doctors, nurses and midwives receive training on the latest evidence? When a request is declined, is the woman's care always referred or transferred?

METHODS

We searched CINAHL, Medline and PubMed databases to examine relevant care pathways (terms included caesarean, primary, primiparous, nulliparous, pathway, decision, tool, aid). We reviewed Canadian provincial information, and (since similar guidance was first published there ten years ago) UK National Health Service (NHS) hospital literature, to identify specific caesarean birth request care pathways.

DISCUSSION

Pathways do not always include agreeing to a caesarean birth

The literature search found specific primary request care pathways in the UK. Some of these did not include caesarean birth as one of the possible pathway outcomes; only vaginal birth, further discussion or referral.

Requests are frequently diverted through mental health clinics

Pathways often included anxiety, tokophobia, trauma or disorder as reasons for a request, and advised referrals to mental health specialists. One pathway declined any request without "underlying anxiety issues".

Decisions can be delayed until very late in pregnancy

Some pathways indicated that responses to requests occur at 33-36 weeks, increasing stress and uncertainty throughout the pregnancy, and leaving women very little time to find a new doctor or hospital (especially unaided).

Information is not always clear or is inconsistent with SOGC guidance

The SOGC public website did not answer a direct "yes" to "Can I choose to have a C-section?", and some provincial websites presented contradictory messaging (e.g. "C-section should only be done for medical reasons").

Unrestricted caesarean birth choice support is evident in some settings

Literature produced by one hospital in the UK included "You would like one" and "Your choice" as reasons women may request a caesarean birth, highlighting variability in how clinical guidance is interpreted.



LEGAL PRECEDENT

A UK landmark Supreme Court judgment in 2015 (Montgomery) ruled women should be entitled "to forgo the joys of natural childbirth in order to avoid some not insignificant risks to herself or her baby. She cannot force her doctor to offer treatment which he or she considers futile or inappropriate. But she is at least entitled to the information which will enable her to take a proper part in that decision."

Rules of the Road: Right-of-Way



"The principal choice is between vaginal delivery and caesarean section."

"The medical profession must respect her choice".



Abstract is published in the May 2021 Journal of Obstetrics and Gynaecology Canada (JOGC). [Scan QR code above](#)

Poster (with references and pathway examples) is presented at the June 2021 SOGC conference. [Scan QR code below](#)



Develop a consistent, equitable, caesarean birth request care pathway

Ensure all women know the pathway exists

Mary Jane Howland Photography

3.10 Evaluating the Portrayal of COVID-19 Preprint Publications in the News

Poster Number: 17

Category: Science Communication

Author: Zoya Adeel (she/her)

Institute: McMaster University

Abstract: News outlets extensively reported preliminary research from COVID-19 preprints during the pandemic, marking an unprecedented shift in journalistic practice. Based on rising reports of misinformation, we were interested in evaluating the news coverage of COVID-19 preprints in Canada and the USA. Using a retrospective content analysis, we observed that over half of the news articles did not accurately frame preliminary findings, identify study limitations, or cite reputable sources. Early data also suggests that the reporting practices of non-science educated journalists' exceeded science-educated journalists. This work has important implications as scientific misconceptions can have far-reaching consequences to individual and public health.

Bio: Zoya Adeel is a fourth-year student at McMaster University's School of Interdisciplinary Science. Her diverse research interests in qualitative discourse and clinical science stem from her desire to gain multidisciplinary exposure. At McMaster, her research decomposes the media's role in communicating critical science. Zoya also taught undergraduate students foundational science communication principles as a teaching assistant. At Sunnybrook Health Sciences Centre, she applies her practical experience from working at the Critical Care Unit while researching the efficacy of SDD antibiotics and Vitamin C in ICU patients. In the future, she intends to pursue a doctorate degree in clinical sciences.

Evaluating the Portrayal of COVID-19 Preprint Publications in the News

Zoya Adeel¹ and Dr. Katie Moisse¹
¹McMaster University



Introduction

Background: Peer review is a critical process that ensures accurate and high-quality science. During the COVID-19 pandemic, research has been conducted at an unprecedented rate. To rapidly disseminate data and foster scientific collaboration, many researchers shared their preliminary findings on online preprint repositories, such as BioRxiv¹.

The byproduct: Due to the public crisis, experts and the lay audience required COVID-19 information urgently. News articles extensively reported on COVID-19 preprints, marking an unprecedented shift in journalistic practice¹.

Study rationale: Previous research has highlighted the misrepresentative coverage of COVID-19 preprints¹. The public relies on the news to inform their public health practices². Due to rising reports of misinformation, we were interested expanding on these findings and evaluating the online news coverage of COVID-19 preprints.

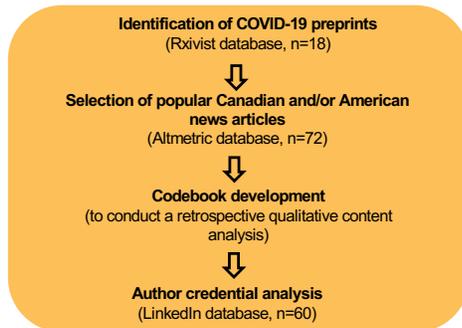
Primary Objectives:

1. Assess the framing of preliminary COVID-19 data.
2. Track the identification of study limitations.
3. Map the employment of credible sources, with respect to preliminary data.

Secondary Objective:

1. Examine the relationship with journalists' postsecondary credentials with reporting scientific uncertainty, limitations, and credible sources.

Methods and Materials



Results

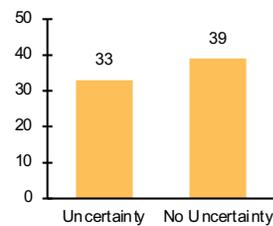


Figure 1: Framing of scientific uncertainty in news articles covering COVID-19 preprints (n=72)

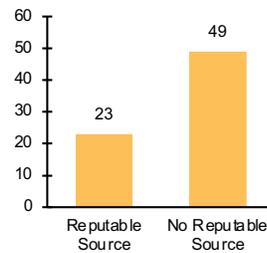


Figure 2: Employment of reputable sources in news articles covering COVID-19 preprints (n=72)

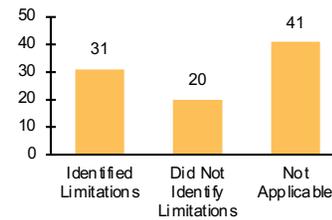


Figure 3: Identification of study limitations in news articles covering COVID-19 preprints (n=72)

Table 1: Journalist credential trends associated with portraying uncertainty, employing reputable sources, and identifying study limitations (n=60)

	Primary Parameters		
	Framed Uncertainty	Employed Reputable Sources	Identified Study Limitations
Science Educated Journalists	50.00%	39.29%	52.63%
Non-Science Educated Journalists	52.77%	21.87%	66.67%

Discussion

Primary Objective Findings: More than half of the news articles did not accurately frame the uncertain nature of the COVID-19 preprint findings. Overwhelmingly, more than half of the news articles did not employ reputable sources to corroborate COVID-19 preprint data. Interestingly, preprints that explicitly identified its experimental limitations were more likely to be relayed in the news articles. Preprints that did not explicitly identify limitations did not see limitations indicated in the news, considered Not Applicable as per Figure 3.

Secondary Objective Findings: Non-science educated journalists more often accurately framed preliminary findings and identified study limitations. Science journalists more often employed reputable sources.

Implications: This study identifies opportunities to improve scientific journalistic practices. It also highlights that scientists should uphold a higher standard of sharing research. Based on our findings, we recommend:

1. A universal standard for reporting scientific data in the news.
2. A correspondent FAQ or lay summary, in place of press release for preprints, to increase accessibility to journalists.
3. Formal science communication training for science-educated journalists.
4. Explicitly stated limitations in preprint reports.

Conclusions

Key Takeaways: Evidence of misrepresentative framing of non-peer reviewed scientific data and a lack of reputable sources for corroboration. Non-scientist journalists showed a higher likelihood of reporting limitations and the uncertain nature of preliminary data.

Limitations: The study was confounded by a small data set, in both the number of news articles and preprint publications. There was no statistical analysis conducted. It was also limited to publicly available data self-reported by journalists on LinkedIn.

Next Steps: A systematic approach is required to evaluate a larger sample size over a longer period of time.

Acknowledgements

I would like to express the utmost appreciation and gratitude to my advisor, Dr. Katie Moisse, for her continuous encouragement, guidance, and valuable input that made this project possible.

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