File No. CI 20-01-29284

THE QUEEN'S BENCH
Winnipeg Centre

APPLICATION UNDER: *The Constitutional Questions Act*, C.C.S.M., c. 180

AND UNDER: The Court of Queen's Bench Rules, M.R. 553/88

IN THE MATTER OF: *The Public Health Act*, C.C.S.M. c. P210

BETWEEN:

GATEWAY BIBLE BAPTIST CHURCH, PEMBINA VALLEY BAPTIST CHURCH, REDEEMING GRACE BIBLE CHURCH, THOMAS REMPEL, GRACE COVENANT CHURCH, SLAVIC BAPTIST CHURCH, CHRISTIAN CHURCH OF MORDEN, BIBLE BAPTIST CHURCH, TOBIAS TISSEN, ROSS MACKAY

Applicants,

– and –

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF MANITOBA and DR. BRENT ROUSSIN in his capacity as CHIEF PUBLIC HEALTH OFFICER OF MANITOBA, and DR. JAZZ ATWAL in his capacity as ACTING DEPUTY CHIEF OFFICER OF HEALTH OF MANITOBA,

Respondents.

AFFIDAVIT OF JOEL KETTNER
SWORN APRIL 1, 2021

D. Jared Brown / Allison Kindle Pejovic / Jay Cameron
#253, 7620 Elbow Drive SW
Calgary, Alberta T2V 1K2
Phone: (416) 975-4043 / (431) 668-4885 / (403) 475-3622
Fax: (587) 352-3233
Email: jbrown@brownlaw.ca / apejovic@jccf.ca / jcameron@jccf.ca

THE QUEEN'S BENCH
Winnipeg Centre

APPLICATION UNDER: *The Constitutional Questions Act*, C.C.S.M., c. 180

AND UNDER: The Court of Queen's Bench Rules, M.R. 553/88

IN THE MATTER OF: *The Public Health Act*, C.C.S.M. c. P210

BETWEEN:

GATEWAY BIBLE BAPTIST CHURCH, PEMBINA VALLEY BAPTIST CHURCH, REDEEMING GRACE BIBLE CHURCH, THOMAS REMPEL, GRACE COVENANT CHURCH, SLAVIC BAPTIST CHURCH, CHRISTIAN CHURCH OF MORDEN, BIBLE BAPTIST CHURCH, TOBIAS TISSEN, ROSS MACKAY

Applicants,

– and –

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF MANITOBA and DR. BRENT ROUSSIN in his capacity as CHIEF PUBLIC HEALTH OFFICER OF MANITOBA, and DR. JAZZ ATWAL in his capacity as ACTING DEPUTY CHIEF OFFICER OF HEALTH OF MANITOBA,

Respondents.

AFFIDAVIT OF JOEL KETTNER

I, JOEL KETTNER of the City of Winnipeg, in the Province of Manitoba,

MAKE OATH AND SAY AS FOLLOWS:

1. I have personal knowledge of the facts and matters hereinafter deposed to by me, except where same are stated to be based upon information and belief, and those I do verily believe to be true.

2. I am an associate professor in the Department of Community Health Sciences at the College of Medicine, University of Manitoba.

3. I hold Canadian Royal College fellowship certifications in Public Health and Preventive Medicine as well as General Surgery. I have a Master of Science in Epidemiology from the London School of Hygiene and Tropical Medicine, University of London, United Kingdom.

4. My previous employments include: Chief Medical Officer of Health and Chief Public Health Officer for the Province of Manitoba (1999-2012), regional medical officer of health in urban, rural and northern parts of Manitoba (1990-1999), and clinical work in general practice, emergency urgent care medicine.

5. As part of my 12-year tenure as Manitoba's chief medical officer of health, I led the Province's public health responses to several outbreaks including the SARS Coronavirus-1 and the H1N1 pandemic influenza.

6. Following the SARS outbreak, I was part of the Canadian delegation to the World Health Organization special meeting in Geneva to develop the fourth edition of the International Health Regulation which introduced the concept, definition, and expectations of countries during a Public Health Emergency of International Concern (PHEIC).

7. I played a leading role at the World Health Organization Pan American Health Organization special H1N1 meeting in Washington DC. In

addition to a plenary presentation describing Manitoba's experience with the first wave, I led a working group to develop guidance for the prevention and treatment of H1N1 in low resourced parts of the world. At that same meeting, I collaborated as an author of the first comprehensive review article of H1N1 influenza published in the New England Journal of Medicine.

8. Following my tenure as chief medical officer of health, I undertook a number of relevant roles and responsibilities including scientific director of the Public Health Agency of Canada's National Collaborating Centre for Infectious Diseases, medical director of the International Centre for Infectious Diseases in Winnipeg, board director of the Canadian Public Health Association, and president of the Public Health Physicians of Canada.

9. Specific relevant roles at the University of Manitoba have included director of the Medical College undergraduate program in Community Health Sciences, and Director of the Masters in Public Health program. I continue to teach public health and epidemiology at the undergraduate, graduate, and post-graduate levels. During this COVID-19 pandemic, I have been active organizing learning events and providing expert opinion and dialogue in a variety of academic and public media platforms.

10. A copy of my curriculum vitae is attached hereto and marked as **Exhibit "A"**.

11. During my tenure as Chief Public Health Officer of Manitoba, the *Public Health Act* was amended to provide the Chief Public Health Officer with the power to take special measures (Section 67(3) in response to a public health emergency). Section 67(2) lists restrictive measures that can

only be taken with the approval of the minister. I was well aware of section 3 of the *Act* and the requirement that someone in my position would have to ensure that any measures taken in response to a public health emergency that infringed rights and freedoms had to be shown to be reasonably necessary. I also was aware that section 3 of the *Act* was consistent with section 1 of the *Charter of Rights and Freedoms*, and that it was up to the Minister of Health and the Chief Public Health Officer to justify to the public the need for such measures.

12. I also, as a physician, knew that I had to abide by the code of ethics of the Manitoba College of Physicians and Surgeons, including taking "all reasonable steps to prevent or minimize harm to the patient; disclose to the patient if there is a risk of harm or if harm has occurred". (Note that in public health medicine "the patient" refers to the population at large.) Other relevant commitments include "recognize the balance of potential benefits and harms associated with any medical act; act to bring about a positive balance of benefits over harms", "always respect the autonomy of the patient", and "promote the well-being of communities and populations by striving to improve health outcomes and access to care, reduce health inequities and disparities in care, and promote social accountability."

13. Technically, I saw a pandemic every year during my tenure as CMHO. It was called Influenza. Some years were worse than others. During my tenure, I can confirm that hospitals and ICUs were often stressed in a similar way to what has been described during the waves of this past year. Surgeries and other medical procedures were often delayed for several weeks. Most nursing homes had "outbreaks" of influenza during one or more flu seasons. How much of the respiratory illness during "flu

season" was attributed to influenza was not known because of the limited number of tests that were done.

14. During the H1N1 influenza pandemic 11 deaths were officially associated with that virus, although it was suspected that in many more deaths that influenza was a contributing cause. Although some infectious diseases specialists recommended the closure of schools, it was judged by me and others that the benefits of that would not outweigh the harms. This was despite the fact that number of reported deaths from influenza in children have exceeded in every previous year the rare reports COVID-19-associated deaths in children. With an understanding that it is very impractical to suppress the spread of a contagious respiratory virus, we focused on general measures such as handwashing, cough etiquette, staying home when sick, limiting exposure to those at highest risk for severe illness (influenza has similar risk factors to COVID-19), obtaining timely care when symptoms are more severe - especially if at high risk, and priorisation of vaccine administration to highest risk groups including Indigenous populations, elderly, and people with significant health conditions. I would describe our usual approach to influenza as focused protection.

15. The Applicants' counsel contacted me about providing expert testimony in response to the evidence provided by Respondents to justify the need for various Covid-19 Public Health Orders. I agreed to provide an expert report with my professional opinion on these matters.

16. A copy of my responding expert report as described above is attached hereto and marked as **Exhibit "B"**.

17. I acknowledge that in preparing this report and providing expert evidence, the Applicants' counsel explained that my role is to assist the court to determine the matters in issue. I further acknowledge that it is my duty to provide evidence that is fair, objective and non-partisan and to opine only on matters that are within my area of expertise. This duty prevails over any obligation that I may owe to any party on whose behalf I am engaged.

18. I make this affidavit *bona fide*.

SWORN before me in the City of Winnipeg, in the Province of Manitoba, on April 1, 2021.

A Commissioner of Oaths in and for the Province of Manitoba
My Commission Expires: July 8/21

JOEL KETTNER

THIS IS **EXHIBIT "A"** TO THE AFFIDAVIT OF JOEL KETTNER affirmed before me at the City of Winnipeg, in the Province of Manitoba, the 1st day of April, 2021.

A Commissioner for Oaths in and for the Province of Manitoba. My commission expires July 8, 2021.

CURRICULUM VITAE

Joel David Kettner
MSc MD FRCSC FRCPC

March 31, 2021

TABLE OF CONTENTS

PERSONAL AND PROFESSIONAL INFORMATION, CONTACT INFORMATION

Home Address:	901-188 Roslyn Road Winnipeg, Manitoba R3L 0G8 Canada
Home Telephone Numbers:	(204) 691-0263 (Winnipeg) (204) 349-2089 (Caddy Lake)
Work Phone Number:	(204) 789-3277 (UM)
Mobile Phone	(204) 805-5551
Work Emails:	joel.kettner@umanitoba.ca jdkettner@me.com
UM Address:	University of Manitoba Dept. of Community Health Sciences College of Medicine, Faculty of Health Sciences University of Manitoba S108C-750 Bannatyne Avenue Winnipeg MB R3E 0W3 (204) 789-3277

Personal History

Date of Birth:	June 23, 1951
Place of Birth:	Minneapolis, Minnesota, U.S.A. (Canadian citizen born abroad)
Citizenship:	Canadian
Marital Status:	Married, six children, seven grandchildren

Places of Residence

1951 – 1955	Minneapolis, Minnesota, U.S.A.
1955 – 1967	Winnipeg, Manitoba, Canada
1967 – 1968	London, England, United Kingdom
1968 – 1985	Winnipeg, Manitoba, Canada
1985 – 1988	London, England, United Kingdom
1988 – present	Winnipeg, Manitoba, Canada

PRESENT EMPLOYMENT

University of Manitoba	Associate Professor, Departments of Community Health Sciences and Surgery (since 1990) Associate Director, Public Health clerkship rotation Postgraduate Medical Education CanMEDS roles advisor, and co-chair, Postgraduate Medical Education Truth and Reconciliation Action Plan Working Group
University of Winnipeg	Adjunct professor, Dept of Indigenous Studies
Self-Employment	Independent consultant Consultant to several organizations with respect to COVID-19. Lead and administrator, WhatsApp chat group for COVID-19 Open Minded Critical Thinkers (physicians from across Canada) Consultant, Advisory Circle, Health Transformation Project, Southern Chief's Organization, Manitoba. Vaccinator, First Nations Communities COVID-19 vaccine project.

EDUCATION and TRAINING

Pre-University

1968 – 1969	St. John's High School, Winnipeg, Canada
1967 – 1968	Woodhouse Grammar School, London, England
1964 – 1967	St. John's High School, Winnipeg, Canada

University – Undergraduate

1972 – 1976	Faculty of Medicine, University of Manitoba, Dean A. Naimark Winnipeg, Canada
1969 – 1971	"Pre-med" Arts & Science" University of Manitoba, Winnipeg, Canada

University – Graduate and Post – Graduate

2000	Medical Assistance in Dying Addictions medicine, opiate agonist therapy
1989 – 1990 (6 months)	Family Medicine Weekly clinics, Family Medicine Centre, University of Manitoba Winnipeg, Canada
1988 – 1990	Community Medicine (now Public Health and Preventive Medicine) Residency, Dept. of Community Health Sciences, Faculty of Medicine University of Manitoba Winnipeg, Canada
1987 – 1988	Clinical Research Fellow, Imperial Cancer Research Fund Colorectoral Cancer Unit, St. Mark's Hospital, London, England
1986 – 1987	Clinical Research Fellow, Hepato- biliary Surgical Unit, Dept. of Surgery, University of London Royal Postgraduate Medical School and Hammersmith Hospital, London, England

1985 – 1986	Master of Science, Epidemiology, Faculty of Medicine, University of London, England, London School of Hygiene and Tropical Medicine
1985	Post – fellowship, Gastrointestinal Endoscopy, Gastrointestinal Surgery and Gastroenterology (Health Sciences Centre and St. Boniface General Hospital, Winnipeg Canada
1979 – 1984	General Surgery Residency, Dept. Faculty of Medicine, University of Manitoba (Health Sciences Centre and St. Boniface General Hospital), Winnipeg, Canada
1977	Extended Internship, Intensive Care (voluntary), Health Sciences Centre and St. Boniface General Hospital, Winnipeg, Canada
1976 – 1977	Rotating Internship, University of Manitoba, Faculty of Medicine (Manitoba Affiliated Teaching Hospitals – Health Sciences Centre and St. Boniface General Hospital, Winnipeg, Canada)

UNIVERSITY DEGREES AND CERTIFICATES

1991	Specialist Certification, Community Medicine (now Public Health and Preventive Medicine), Royal College of Physicians of Canada (FRCPC)
1985	Master of Science in Epidemiology, London School of Hygiene and Tropical Medicine, Faculty of Medicine, University of London, England, (MSc) (MSc Thesis – Epidemiology for Surgeons)
1984	Specialist Certification, General Surgery, Royal College Surgeons of Canada (FRCSC)
1976	Doctor of Medicine (MD), University of Manitoba, Winnipeg, Canada
1976	Licentiate, Medical Council of Canada (LMCC)

FELLOWSHIPS, ACADEMIC PRIZES, DISTINCTIONS AND AWARDS

1991-2020	Nominated for best teacher of the year by undergraduate medical students in most years; most recently for small group teaching, inspiration, innovation, and mentorship by first and second year medical students.
2016	Long Service Award in Recognition and Appreciation of Twenty-five Years of Loyal Service, University of Manitoba.
2012-2014	McArthur Foundation Fellowship (two years), Masters Development Practice program, University of Winnipeg
2012	Nominated for Manitoba Civil Service Excellence Team Award – CPPHO Report on the Health of Manitobans report-team (leader).
2010	Winner of Manitoba Civil Service Excellence Team Award - Manitoba Health Pandemic H1N1 Influenza Incident Command Team (Medical lead)
1987 – 1988	University of Manitoba Faculty Fund Fellowship for studies in the clinical epidemiology of colorectal cancer.
1987 – 1988	Visiting Clinical Research Fellowship, Imperial Cancer Research Fund, UK, to study clinical epidemiology and Screening of colorectal cancer at the ICRF Colorectal Cancer Unit, St. Mark's Hospital, London, England
1985 – 1987	J.H.F. Knight Fellowship (University of London, England) to study epidemiology and screening for colorectal cancer
1985 – 1987	R.S. McLaughlin Foundation Fellowship (University of Manitoba) to study epidemiology and surgery at the University of London, England
1983	Davis and Geck Award for Best Surgical Resident of the Year
1982	Second Prize for paper presented at the American College of Surgeons (Manitoba Chapter), Manitoba
1969 – 1971	Dean's Honour List, both years of Pre-Medicine, Faculty of Science, University of Manitoba

MEDICAL WORK EXPERIENCE

Current	See "Present Employment"
2017	Consultant to Manitoba Keewatinowi Okimakanak, Inc. re northern health clinical transformation
2012-2017	Medical director, International Centre for Infectious Diseases
2012-2015	Director, Master of Public Health program, University of Manitoba
2012-2015	Scientific director, National Collaborating Centre for Infectious Diseases, International Centre for Infectious Diseases.
2012-2014	University of Winnipeg Visiting Professor and Senior Fellow Masters in Development Practice Program Faculty of Graduate Studies
2008-2012	Chief Provincial Public Health Officer of Manitoba
1999 – 2008	Chief Medical Officer of Health Province of Manitoba
1999	Medical Officer of Health Winnipeg Community Health Authority
1995 – 1999	Medical Officer of Health Winnipeg Region, Manitoba
1995 - 1999	Part-time general medical practice and travel clinics, Winnipeg City Clinic, 385 River Avenue, Winnipeg
1995 – 2010	Casual employment as emergency room physician, urgent care physician, and surgical assistant, Seven Oaks General Hospital Concordia General Hospital, Misericordia General Hospital, Grace Hospital, Victoria Hospital
1991 – 1995	Medical Officer of Health Thompson, Norman and Interlake Regions, Manitoba Health
1990	Attending surgeon, Surgical Intensive Care Unit, Health Sciences Centre

1986 – 1988	Locum tenens as senior registrar in Surgery, Hammersmith and St. Mark's Hospitals, London, England
1984 – 1985	Surgical Assistant, Cardiac, Surgery Unit, Health Sciences entre, Winnipeg, Canada
1977 – 1979	Full-time emergency room physician, St. Boniface General Hospital, Winnipeg, Canada

SELECTED CONTINUING PROFESSIONAL DEVELOPMENT

2020	Weekly Dept of Community Health Sciences Colloquia, on-line sessions, webinars, and conferences on topics including medical education and COVID-19.
2019	Many family medicine sessions and teaching development sessions at the University Office of Continuing Professional Development and the Office of Educational and Faculty Development. Annual Scientific Assembly, Manitoba College of Family Physicians, Canadian Conference of Medical Education, Niagara Falls. Canadian Public Health Association annual conference, Ottawa Public Health Physicians of Canada annual Continuing Professional Development Symposium, Ottawa.
2018	Canadian Conference Medical Education, Halifax. Canadian Public Health Association annual meeting, Montreal. Public Health Physicians of Canada annual meeting, Montreal. Weekly Colloquia, Department of Community Health Sciences. CPD sessions, Office of Educational and Faculty Development. Preparation for CAPE (clinical assessment and professional enhancement for re-entry to clinical practice.
2017	Canadian Conference Medical Education, Winnipeg. Canadian Public Health Association annual meeting. Public Health Physicians of Canada annual meeting. Weekly Colloquia, Department of Community Health Sciences.
2015-2016	Canadian Conference Medical Education, Montreal. Canadian Public Health Association Annual Meeting, Toronto. Choosing Wisely symposium, Public Health Physicians of Canada, Toronto. Association of Medical Microbiology and Infectious Diseases Annual Meeting, Vancouver. Annual BIO Conference, San Francisco. Weekly Colloquia, Department of Community Health Sciences and Weekly Medical Microbiology Case Presentations. Peer Mentoring session for instructors of Indigenous health course.
2014	Faculty Development Workshop - Community Health Sciences June 12, 2014
2012	Medical Education Workshops, University of Manitoba Learning Styles in the Classroom Feb 16/12 Teaching Clinical Reasoning April 10/12 Teaching Critical Thinking May 22/12

2012 (most recent)	Basic Life Support Joe Doupe Centre Faculty of Medicine University of Manitoba
2012 (most recent)	Advanced Trauma Life Support University of Manitoba, Winnipeg, Canada
2012 (most recent)	Advanced Cardiac Life Support Canadian Heart and Stroke Foundation, Winnipeg, Canada
2007	Queen's University Executive Leadership Course
1994-1995	Observation and supervised experience in Emergency Medicine, Seven Oaks Hospital, Winnipeg Canada (organized by Dr. Kopelow, Department of Continuing Medical Education)
1993	Clinician's Assessment and Enhancement Program, Department of Continuing Medical Education, Faculty of Medicine, University of Manitoba, Winnipeg, Canada

PROFESSIONAL MEMBERSHIPS, ORGANIZATIONS AND LICENSES

2020	Lead, WhatsApp Chat Group, Open-Minded Critical Thinkers, COVID-19
2013 – 2016	President, Public Health Physicians of Canada.
2012 – present	Member, Board of Directors, Canadian Association of Medical Education Foundation, currently liaison member to the Canadian Medical Education Journal.
2012 – 2015	Executive member, Clinical Teachers Association of Manitoba
2012 – 2014	Member, Board of Directors, Canadian Public Health Association of Canada
1999 – present	Member, Public Health Physicians of Canada, previously National Specialty Society of Community Medicine
1993 - present	Member, College of Family Physicians of Canada
2000 – present	Member, Canadian Association of Medical Education
1991 – present	Fellow of the Royal College of Physicians of Canada (Community Medicine – now Public Health and Preventive Medicine)
1990 – 2012	Assistant Professor, Depts. of Community Medicines, Surgery and Family Medicine, Faculty of Medicine, University of Manitoba
2012 - present	Associate Professor, Depts. of Community Medicines, Surgery and Family Medicine, College of Medicine, Faculty of Health Sciences, University of Manitoba
1990 – present	Member of the Canadian Association of Teachers of Community Health
1988 – present	Member of the Canadian Public Health Association and the Manitoba Public Health Association
1984 – present	Fellow of the Royal College of Surgeons of Canada (General Surgery)
1976 – present	Licentiate of the College of Physicians and Surgeons of Manitoba, Current license, General Practice, with Specialty privileges in General Surgery and Community Medicine

1976 – present	Licentiate of the Medical Council of Canada
1976 – present	Member of the Canadian Medical Association (Manitoba Division)
1976 – present	Member of the Canadian Medical Protective Association

UNIVERSITY AND OTHER ACADEMIC ACTIVITIES

2020	Faculty appointee, Undergraduate Medical Education Financial Award Committee
2018 - 2020	Member, Postgraduate Medical Education Assessments Committee, Professional Curriculum Committee, Education Advisory Committee, Accreditation Working Group, and Competency-based Medical Education Committee.
2019 – present	Chair, Post-graduate Medical Education Truth and Reconciliation Action Plan Working Group
2017 - present	Post-graduate medical education CanMEDs subject advisor
2015 - present	Associate director, Public Health part of Family Medicine/Public Health Clerkship.
2013- 2017	Member, Healthy Campus Advisory Committee, University of Winnipeg.
1991- present	Member (and previous chair), Dept of Community Health Sciences Undergraduate Committee
2012-2015	Director, Master of Public Health program, University of Manitoba
2012-2014	Visiting professor and senior fellow, University of Winnipeg, Masters in Development Practice program, Faculty of Graduate Studies
2012	Promoted to associate professor, University of Manitoba
2012-2015	Elected to University of Manitoba Senate by the Faculty Council of Medicine
2011-2012	Co-chair Curriculum Renewal Task Group on Health systems, Public Health, and Environmental and Occupational Health and member of the Curriculum Renewal Steering Committee, Faculty of Medicine, University of Manitoba

2007-2012	Founding member of the first national Public Health Educators Network, and participant author of its first national on-line learning resource for medical students (The Primer);
1995, 2006, 2010	Member, Search Committees for Head of the Department Community Health Sciences, Department of Community Health Sciences, Faculty of Medicine, University of Manitoba
1992-1994	MSc thesis advisor for Anita Kozyrskyj: Validation of an Electronic Prescription Database in Manitoba: An Opportunity to Evaluate Pharmacist Participation in Drug Utilization Review.
1994 – 1996	Member, Med I and II Curriculum Reform Committee –Core Concepts Block, Faculty of Medicine, University of Manitoba
1994 - 1995	Member, Search Committee for new tenure-track position, Department of Community Health Sciences, Faculty of Medicine, University of Manitoba
1991 – 2011	Member, Executive Committee, Department Community Health Sciences, Faculty of Medicine, University of Manitoba
1991 – 2015	Member, Committee of Evaluation, Faculty of Medicine, University of Manitoba
1991 – 2015	Member, Clerkship Curriculum Committee, Faculty of Medicine, University of Manitoba
1991 – 2011	Director, Undergraduate Program, Department of Community Health Sciences, Faculty of Medicine, University of Manitoba (special teaching responsibilities include Course Director, Line and major clerkship-Family Medicine Community Medicine, graduate course teaching, thesis supervision and teaching and supervision of community medicine residents).

Undergraduate courses taught at University of Manitoba

2015 - present	Small group teaching in the population and public health pre-clerkship and clerkship programs and the Indigenous health longitudinal course, totaling now more than 100 hours per year.
1991- 2014	Average of more than 50 hours per year in undergraduate teaching, including 2-5 lectures and 2-3 tutorials in Population Health and Medicine, including Introduction to Health and Medicine (first lecture to first year medical students), Natural History of Disease and Levels of Prevention, Measurements of Health and Disease, Determinants of Health, Social Responsibility of Physicians; Public Health part of the Family Medicine/Public Health clerkship rotation (8 rotations per year), including orientation, community health status assessment, a "hot" current topic, followed after the rotation by a debrief; Annual summary presentation of Population and public health (invited consistently by 4th year students) as part of the LMCC QE Part I exam review.

Graduate and Postgraduate courses taught at University of Manitoba

2004 – present	Graduate teaching (MPH, MSc and PhD level): Problem Solving in Public Health (formerly Current Topics in Community Medicine 93.7510)
2016 - present	Invited speaker on Population Health and Health Care Organization to surgical residents as part of their Principles of Surgery training program.
2019	Invited speaker, Clinical Investigators Program: Health advocacy and health advocacy research.
1991- 2015	Annual guest teaching of "Principles of Prevention" in Epidemiology I and "Risk Communication" in Epidemiology II
1995-2008	Designer, supervisor, and lecturer in a recurring series of learning sessions in Epidemiology, Statistics, and Critical Appraisal in the PGME Core curriculum for all residents at the Faculty of Medicine;

Graduate Student Supervision

2015-2016	Supervised practicum of MPH student at International Centre for Infectious Diseases and National Collaborating Centre for Infectious Diseases
1994 - 2015	Supervisor for PGME students in Public Health and Preventive Medicine (average one - two per year for one to four month rotations)
2012-2015	Advisor to 13 MPH students, including field placement supervision.
1992-1994	MSc thesis advisor for Anita Kozyrskyj: Validation of an Electronic Prescription Database in Manitoba: An Opportunity to Evaluate Pharmacist Participation in Drug Utilization Review.

Current Research Activities

2013 – present	Health mentor, Grand Challenges Phase 1 Grant (total $100,000) "Improving Maternal and Child Health at the Root through Village Level Biotechnologies" with International Institute of Sustainable Development (co-PI) and CTx Green (P.I.)

SELECTED SERVICES, PROVINCIAL COMMITTEES AND OTHER RELEVANT ACTIVITIES

2012 – present	Member, Manitoba Provincial Vaccine Advisory Committee
2015-2016	Member, planning committee, *Conference to develop a federal framework on Lyme disease, Ottawa, May 15-17, 2016*
1994 – 2018	Examiner, Medical Council of Canada Part II Qualifying Exam
2014 - 2016	Member, Winnipeg Harvest Health and Hunger Committee
2015 - 2016	Member, Advisory committee to the Public Interest Law Committee research study on guaranteed annual income.
2003 – 2015	Statistics Canada Canadian Health Measures Survey Expert Advisory Committee
2013-2015	Member, Public Health Infrastructure Task Group to develop a blueprint for a federated surveillance system in Canada
2006 – 2012	Member of the Advisory Committee, National Collaborating Centre for Infectious Disease
2003 – 2007	Healthy Living Issue Group of the Population Health Promotion Expert Group, Canadian Public Health Network responsible for leading the writing of the Pan-Canadian Healthy Living Strategy,
2006 – 2011	Federal Provincial Territorial Roles & Responsibilities in Pandemic Preparedness and Response Task Group, Public Health Network Council
2006	Member of the selection committee for scientific director, National Collaborating Centre for Infectious Disease
2006 – 2008	Medical Advisory Committee, Health Science Centre, Winnipeg, Manitoba, representing Department of Community Health Sciences
2002 – 2009	Emergency Preparedness Expert Group, Canadian Public Health Network
2002 – 2006	Manitoba member, Federal Provincial Territorial Deputy Ministers of Health Advisory Committee Population Health and Health Security

2002 – 2003	Co-chair, Health Disparities Task Group, Federal Provincial Territorial Deputy Ministers of Health Advisory Committee Population Health and Health Security
2000-2001	Chair, Province of Manitoba Drinking Water Advisory Committee and sole accountable author of Report on Bacterial Safety of Drinking Water In Manitoba
1999 – 2002	Chair, Federal Provincial Territorial Deputy Ministers of Health Advisory Committee on Population Health
1999 – 2012	Council of Chief Medical Officers of Health of Canada (CCMOH)
1995 – 1999	Co-chair, Project Team, Community Health Status Assessments, Epidemiology Unit, Manitoba Health
1995	Participant, Federal-Provincial Working Group/Workshop for present the Prevention of Neural Tube Defects, Manitoba Health and Health Canada, Ottawa
1995	Member, Provincial Committee on Hepatitis A, B and C amongst Winnipeg street-evolved youth
1995 – 1999	Member, core committee to review the Public Health Act of Manitoba
1995	Member, Advisory Committee to the Baby Alert Program
1994 – 1995	Member, Steering Committee for Psychiatric Day Hospital and Community Services in Mental Health for Winnipeg, Manitoba Health
1994 – 1999	Member of the Manitoba Health Communicable Disease Control Surveillance Review Committee and Chairman, Subcommittee on Analysis and Dissemination of Results.
1994 – 1999	Member of the Winnipeg Air Quality Index Committee
1993 – 1995	Member, Provincial Cancer Control Committee and Chair of Subcommittee on Secondary Prevention of Cancer, Manitoba Health
1993-1994	Member, Working Group for Psychogeriatric Services in Winnipeg, Manitoba Health
1993-1994	Member, Committee to Define Core Services for Rural Health Associations, Manitoba Health
1993-1994	Member, Provincial Surgery Committee, Manitoba Health

1993	Participant, national workshop and consensus conference on the training of community medicine specialists, Toronto
1991 – 1995	Member, National Population Health Survey Provincial Advisory Committee, Manitoba Health
1989	Member, Provincial Task Force on Breast Cancer Screening in Manitoba, Manitoba Health
1986-1988	Member, Public Health Alliance of Britain
1985-1988	Member, International Physicians for the Prevention of Nuclear War
1977-1985	President, Progressive Medical Association, Winnipeg
1974-1976	Founding member of "The Community Medicine Group" medical students concerned about social and public health issues
1974-1976	Founding co-editor (with Dr. Brian Postl) of "The Meditoban", medical school student newspaper
1974-1976	Founding board member, NorWest Health Co-op, Winnipeg

PUBLISHED BOOKS

Northover, John M.A., Kettner, Joel D. and Mr. Barry Paraskeva PhD, FRCS. Your Guide to Bowel Cancer (Royal Society of Medicine). A Hodder Arnold Publication, 2007

Northover, John M.A. and Kettner, Joel D. Bowel Cancer: The Facts. New York, Oxford University Press, 1992

SIGNIFICANT REPORTS

Chief Provincial Public Health Officers' "Report on the Health Status of Manitobans 2010: Priorities for Prevention – Everyone, Every Place, Every Day" (published November, 2011)

PUBLISHED PAPERS

- SM Moghadas, M Haworth-Brockman, H Isfeld-Kiely, J Kettner. Improving public health policy through infection transmission modelling: Guidelines for creating a Community of Practice. Can J Infect Dis Med Microbiol 2015;26(X):1-5.

- Mahmud S, Hammond G, Elliott L, Hilderman T, Kurbis C, Caetano P, Van Caeseele P, Kettner J, Dawood M. Effectiveness of the pandemic H1N1 influenza vaccines against laboratory-confirmed H1N1 infections: population-based case-control study. **Vaccine**. 2011 Oct 19;29(45):7975-81. Epub 2011 Aug 30.

- Writing Committee of the WHO Consultation on Clinical Aspects of Pandemic (H1N1) 2009 Influenza, Bautista E, Chotpitayasunondh T, Gao Z, Harper SA, Shaw M, Uyeki TM, Zaki SR, Hayden FG, Hui DS, Kettner JD, Kumar A, Lim M, Shindo N, Penn C, Nicholson KG. Clinical aspects of pandemic 2009 influenza A (H1N1) virus infection. Review. **N Engl J Med**. 2010 May 6;362(18):1708-19.

- Zarychanski R, Stuart TL, Kumar A, Doucette S, Elliott L, Kettner J, Plummer F. Correlates of severe disease in patients with 2009 pandemic influenza (H1N1) virus infection. **CMAJ**. 2010 Feb 23; 182(3): 257-64. Epub 2010 Jan 21, 2010

- Verne J, Kettner J, Mant D *et al.* Self-administered faecal occult blood tests do not increase compliance with screening for colorectal cancer: results of a randomized controlled trial. **Eur J Cancer Prev** 1993; Jul: 301-305

- Yassi A, Kettner J, Hammond, G *et al.* Effectiveness and costs-benefit of an Influenza Vaccine Program for Healthcare Workers. **Can J In Dis** 1991: 101-108;

- Kettner, JD, Whatrup C, Verne JE *et al.* Is there a preference for different ways of performing faecal occult blood tests? **Int J. Colorectal Dis** 1990; May:82-86;

PUBLISHED ABSTRACTS

Kettner JD, Whatrup C, Miller K. A comparative study of three patient approach methods for faecal occult b1000 testing in a North London general practice. Coloproctology. 1988;10:129

Kettner JD, Whatrup C, Young K. A within-person comparison of efficacy and individual preference for two methods of faecal occult blood detection. Coloproctology 1988;10:123

Kettner JD, Whatrup C, Miller K *et al.* Evaluation of new faecal occult blood test-a comparison of individual preference and efficacy using Early Detector and Haemoccult. Theoretical Surgery 1987;2:82

Kettner JD, Whatrup C, Miller K *et al.* A randomized trail of invitation methods for occult blood screening. Theoretical Surgery 1987;2:81-82

Kettner J, Paetkau D, Slykerman L *et al.* Effect of treatment on cardiac performance when right ventricular afterload is gradually increased in dogs. Critical Care Medicine 1983; II;3:217

Paetkau D, Kettner J, Girling L, Slykerman L, Prewitt RM. What is the appropriate therapy to maintain cardiac output as pulmonary vascular resistance increases? Anacsthesiology, 57;3:A-56, September, 1982

PUBLISHED LETTERS

Kettner, J. Quebec's Public Health Cuts Canadian Journal of Public Health 2015:106:3 March/April.

Scholefield JH, Kettner, JD, Northover JMA. Papillomavirus infection and progress to abnormal cervical smears. Lancet, 1988:i:1405;

Scholefield JH, Kettner, JD, Northover JMA. Problems with anal cancer demographics. Diseases of the Colon and Rectum; 1988:31:10:831;

Kettner JD, Mant D, Northover JMA. Ethics of preventive medicine. Lancet; 1988;ii:44-45;

Kettner Joel and Northover, JM. Screening for colorectal cancer, Lancet 1986;i:562-563;

Kettner Joel and Northover, JM. Occult-blood screening, Lancet 1986;ii:110;

PRESENTATIONS, WEBINARS AND OTHER SCHOLARLY AND EDUCATIONAL ACTIVITIES

2016 Planning consultant and facilitator, NCCID-York University Workshop on Mathematical Modelling in Public Health Infectious Diseases, York University, Toronto, October 3-4, 2016

2016 Guest (as Infectious Diseases Public Health specialist) on This Hour Has 22 Minutes, CBC Television.

2016 Member of scientific planning committee, Lyme Disease symposium, May 15-17, 2016, Ottawa.

Public Health 2016 (annual conference of the Canadian Public Health Association)

- Member, Conference Scientific Planning Committee
- Welcoming remarks on behalf of the Public Health Physicians of Canada at the opening ceremony
- Organized and participated in a panel discussion on "Public Health Inspectors, Public Health Nurses, and Public Health Physicians As Leaders: A Candid Conversation about Collaboration and Change "

Moderator, and member of the scientific planning committee, International Centre for Infectious Diseases National Grand Rounds:

- February 18, 2016: *Zika virus - What to Know, What to Do*, University of Manitoba, in collaboration with the Dept of Community Health Sciences Bold Ideas Colloquium Series.

Moderator, and member of the scientific planning committee, International Centre for Infectious Diseases International Webinars:

- December 1, 2016: *Difficult-to-treat Gram Negative Pathogens*
- November 8, 2016: *The Burden and Preventability of Non-respiratory Complications of Influenza in Older Adults*
- October 27, 2016: *Antibacterial Resistance in Gram-Negatives: Prevalence, risk factors, and impact of inappropriate therapy*
- October 13, 2016: *Pneumococcal Immunization for Older Adults.*
- August 17, 2016: *Pneumococcal conjugate vaccines for infants: What have we learned since their introduction?*
- June 22, 2016: *HPV Immunization Programs: What is the advantage of including males?*
- February 25, 2016: *Vaccine Hesitancy: What is it, Why is it, What to do about it?*
- January 13, 2016: *Mind your T's and Q's - What do we know about today's influenza vaccine options?* (moderator) and speaker: *Today's Menu of Vaccine Choices – the Basics and the New Ingredients*

2017 Radio interview re: legal age of marijuana purchase and use in Manitoba.

2015-2016	Radio, Television, and Media interviews on subjects including Ebola, ZikaVirus, Malathion, Influenza.
2015-2016	Designer, moderator, and speaker of ICID National Grand Rounds (Influenza vaccine for under 2 year olds, Influenza vaccine choices for seniors, Zika virus) and webinars (e.g. HPV vaccine, new vaccine options including quadrivalent, pneumococcal disease)
2015-2016	Co-chair (International Centre for Infectious Diseases/National Foundation for Infectious Diseases) of scientific planning committee and chair of international advisory committee for an accredited on-line learning module produced by MDBriefcase on *Seasonal Influenza in Older Adults: Immunization Challenges and Options for Vaccination Strategies*

2015:

Moderator, and member of the scientific planning committee, International Centre for Infectious Diseases National Grand Rounds:

- December 17, 2015: *Influenza Vaccines for Adults Over 65: Evaluating the Evidence,* University of Manitoba Medical College
- October 27, 2015: *Flu Vaccines for Little Kids – What's New, What's True*, University of Toronto

Moderator, and member of the scientific planning committee, International Centre for Infectious Diseases International Webinars:

- May 6, 2015: *Males and HPV: Burden of Disease and Prevention through Immunization*

November 25, 2015: Invited speaker, Public Health Physicians of Canada Residents' national educational webinar series: *Life After Residency.*

Lyme Disease Best Brains Exchange in Ottawa, June, 2015.

Chaired panel discussion at annual meeting of CHVI RD Alliance Coordinating Office at Canadian Association of HIV Research annual meeting, Toronto, 2015.

DCHS Colloquium presentation on the NCCID program: with Ms. Margaret Haworth Brockman: Ebola Virus Disease and other Challenges and Opportunities for the NCCID

Activities at Public Health 2015 (annual conference of the Canadian Public Health Association)

- Welcoming remarks on behalf of the Public Health Physicians of Canada at the opening ceremony
- Organized and chaired a panel discussion on "The ebola outbreak: What have we learned that we didn't know before?"

- Facilitated a workshop on Burden of Illness in Infectious Diseases

Association of Medical Microbiology and Infectious Diseases annual conference, Charlottetown, May, 2015.

- Poster presentation: AMR, Public Health, and Knowledge Translation: A Forward Approach

2014	Reviewer of research proposals for CIHR SPOR projects, Institutes of Population and Public Health and Health Services Delivery.
2013-2014	Member, scientific planning committee, Consensus Conference on Antimicrobial Resistant Organisms, University of and Institute of Health Economics, June 18-20, 2014
2014	Invited speaker, Consensus Conference on Antimicrobial Resistant Organisms, University of Alberta Institute of Health Economics, June 18-20, 2014: "What is surveillance? What is screening? How are they related?"
2014	Series of four public lectures at the University of Winnipeg on Public Health in the 21st Century: - *Public Health Unpacked: What is it? Who needs it?* - *Priorities for Prevention in Manitoba: our Provincial Profile* - *Public Health ahead: What are the Possibilities? How can we prevent the threats that we do not see or know?* - *Power, Process, and Public Policy: The Peculiar Ethics and Politics of Public Health and its relationship to Sustainable Development.*
2013-2014	National webinars for Public Health and Preventive Medicine residents and public health physicians hosted by the National Collaborating Centres for Public Health. Topic: - "Treatment as Prevention" with Drs. A. Ronald and J. Montaner - " Knowledge Translation for Emerging Diseases"
2013	Options (VIII) for the Control of Influenza, September 5-9, Capetown, South Africa - Paper: Rapid Knowledge Translation during the 2009 influenza pandemic - Poster: A project to translate and exchange knowledge towards more effective, efficient and equitable public health and primary care strategies for influenza and influenza-like illness (ILI) in Canada. JD Kettner, E Cheuk
2013	Innovation in Medicine and Health Care, University of Piraeus, Piraeus, Greece - Paper: Knowledge Translation for Emerging Infectious Diseases: Challenges and Opportunities

2013	University of Winnipeg Summer Institute Course: Hosted a morning session and presented a lecture on "Principles of prevention of infectious and chronic diseases"
2014	Series of four public lectures on public health, University of Winnipeg.
2012	Surgery Grand Rounds: "A Surgeon's Career in Public Health – the Long and the Short of It"
2003-2011	Annual lecture (most years) at "Bug Day" including SARS, "Little Bugs in the Big Picture", H1N1, and tuberculosis.
2010	National Collaborating Centre for Public Health, Making Connections, Opening Ceremony and plenary, keynote speaker, and co-presenter with Dr. Pat Martens on partnerships between government and university in public health policy setting, Summer Institute of the National Collaborating Centres of Canada
2010	The Manitoba College of Family Physicians, 52 Annual Scientific Assembly, key note speaker: H1N1 De-Brief
2010	Doctors Manitoba, Western Conference of Provincial/Territorial Medical Association, "*How to Survive a Pandemic –What have we learned?*"
2010	International College of Dentists Annual meeting, Winnipeg. *Public Health and the H1N1 Pandemic Influenza*
2009	Continuing Medical Education, Mini Medical School, University of Manitoba 2009;
2009	Presented on H1N1 for disadvantaged populations and led a practice guidelines consensus session at the Pan-American Health Organization of the World Health Organization consultation conference in October, 2009 in Washington, D.C.,
2008	Mini-university lecture on what on public health and evidence for the news
2007-2013	Annual lecture on *Issues and Trends in Public Health* at Red River Community College Issues and Trends in Health course taught by Jim Hayes as part of the Health management course for employees in regional health authorities
2007	Plenary speaker and panel discussant: Ethical issues in the practice of public health. The First Canadian Roundtable on Public Health: Exploring the Foundations, Montreal, Quebec.

CONTRACTED AND OTHER REPORTS

Manitoba Health Provincial Health Indicators, member of Working Group. 1999. https://www.gov.mb.ca/health/documents/ind-all.pdf

Kettner, Joel D. Community Health Status Assessment, Waterhen First nation; 1993 (for Waterhen First Nation, Manitoba)

Kettner, Joel D. and Postl, B Community Health Status Assessment: a tool to understand and improve the health of Aboriginal communities: 1991 (Northern Health Research Unit for Medical Services Branch, Health Canada)

Kettner, Joel D. Community Health Status Assessment, Cross Lake, Manitoba; 1989 (for Medical Services Branch, Health Canada)

INVITED REVIEWS

2017- 2021: Canadian Journal of Public Health

2018-2021: Canadian Journal of Medical Education

SELECTED MEDIA, COVID 19

Winnipeg Free Press panel, Dec 10, 2020
https://www.youtube.com/watch?v=9l52CWsUGTE

Toronto Caribbean interview, November 26, 2020
https://www.youtube.com/watch?v=cpjk53umB_0&feature=emb_title

CBC West of Centre panel discussion
Circuit Breakers and Personal Freedom, November 12, 2020.
https://www.cbc.ca/listen/cbc-podcasts/407-west-of-centre/episode/15808413-circuit-breakers-and-personal-freedom

Open letter to first ministers, July 29, 2020
https://healthydebate.ca/opinions/an-open-letter-to-pm-covid19

Opinion piece CBC Manitoba, July 25, 2020
A new normal, or new abnormal? Change in direction needed on COVID-19 response
https://www.cbc.ca/news/canada/manitoba/joel-kettner-opinion-covid-19-response-1.5654062

Letter to the editor, Winnipeg Free Press, June, 27, 2020
https://www.winnipegfreepress.com/search/?keywords=clergy+kettner&searchSubmitted=y&sortBy=-startDate

Cross-country Check-up, March 15, 2020.
https://www.cbc.ca/listen/live-radio/1-13-cross-country-checkup/clip/15765826-march-15-2020-is-enough-done-slow-covid-19

THIS IS **EXHIBIT "B"** TO THE AFFIDAVIT OF JOEL KETTNER affirmed before me at the City of Winnipeg, in the Province of Manitoba, the 1st day of April, 2021.

A Commissioner for Oaths in and for the Province of Manitoba. My commission expires July 8, 2021.

RESPONDING EXPERT REPORT ON THE COVID-19 PANDEMIC RESPONSE IN MANITOBA

JOEL KETTNER M.D.

April 1, 2021

Introduction

This report is in response to the affidavits of the Respondents. From a public health perspective, and as the former Chief Public Health Officer of Manitoba, it is my view that the Respondents' affidavits do not include sufficient justification or evidence to show that the restrictions on places of worship and public gatherings have been no greater than is reasonably necessary to respond to the COVID-19 threat to public health.

To meet the requirements of good public health practice, the Manitoba Public Health Act, and the Canadian Charter of Rights and Freedoms, public health officials are required to show that the severity of the threat has justified the restrictive interventions, that the effectiveness and benefits of the interventions have sufficiently outweighed the harms, and that there were no alternative strategies that would have been less restrictive, equally or more effective, and less harmful.

These requirements are not only about rights and freedoms, important as those are from an ethical and legal perspective. These requirements are about good public health practice to maximize benefit of interventions while minimizing harms, especially for those that are disadvantaged. It is about evidence-based and rational decision-making for optimal outcomes.

Principles of a public health approach to a communicable disease outbreak

A viral respiratory illness outbreak with pandemic transmission is a complex biological and social phenomenon. Decision-making by public health officials and governments – especially in an emergent and evolving situation – is challenging.

The importance of a plan and strategy

To meet this challenge, public health practitioners are expected to develop and implement a comprehensive, effective, efficient, and equitable strategy that is based on evidence, reason, and fairness.

Neither a previous nor current Manitoba plan or strategy for COVID-19 or any other respiratory virus public health emergency has been included in any of the affidavits or exhibits of the Respondents. Nor has an overall plan or strategy been made available to the public.

The strategy should be developed on the foundation of an appropriate and current response plan. The plan should include a framework for action to assess the severity of the threat, to set clear short-term and long-term goals and objectives, to survey the most relevant data, and to

guide rational, ethical, fair, and evidence-based decision-making. It should be able to monitor in real time outcomes from the disease as well as the beneficial and harmful effects of interventions. The prepared plans and current strategies should be shared transparently with the public for the purpose of achieving informed engagement and consultation, establishing and/or maintaining trust and understanding, and optimizing the effectiveness.

These expectations are reflected in the recently released Auditor-General's report.

> Section 8.1 of the Auditor-General's 2021 report on Pandemic Preparedness, Surveillance, and Border Control Measures states:
>
> "This audit is important because a well-planned and informed public health response is crucial to limiting the spread and public health impact of an infectious disease during a pandemic. In particular, timely and comprehensive surveillance information is needed to direct public health efforts."[1]

Both the preparedness plan and the strategies should be explainable and comprehendible to government officials that adopt it, health professionals, the media, and all members and organizations of the public.

A plan and strategy are important because that is the document that sets out in an accountable and transparent way the broad goals and specific measurable objectives of the response. Although goals are referred to in various parts of the Respondent's affidavits, no specific measurable objectives were found.

Without stated goals and specific measurable objectives, interventions cannot be rationally selected and surveillance and evaluation cannot be operationally relevant. The response plan would be expected to contain the methods of surveillance, definitions and protocols for assessing the frequency and severity of cases, processes for assessing and prioritizing types of exposures and settings for transmission of infection, and ways of systematically monitoring and evaluating the effectiveness, benefits, and harms of interventions – not only for the disease of interest but for all other causes of morbidity and mortality, including the social, economic, and other determinants of health.

Without a plan with measurable objectives, the large amounts of data and information contained in the Respondents' affidavits have not shown in a quantified and comprehendible way that the severity of the threat of COVID-19 has justified the restrictive interventions, nor have they shown that the effectiveness and benefits of the interventions have sufficiently outweighed the harms.

---

[1] https://www.oag-bvg.gc.ca/internet/English/parl_oag_202103_03_e_43785.html#hd3c

Roussin's Affidavit at paragraphs 54, 56 and exhibits 9 and 10 accurately sets out the principles that underlie the ethics of public health, the principles to guide in the justification of public health intervention, and the five main building blocks of public health practice. Of particular note is the document referred to in exhibit 10 of Roussin's Affidavit – Public Health: A Conceptual Framework. It states "Prior to taking action on a specific issue, *a risk assessment is necessary to estimate the nature and likelihood of negative health outcomes in individuals*." (emphasis added) With regard to effectiveness, it is stated on page 12 that "Outcome evaluations measure progress in the program's targeted public health challenge, and may include short-, intermediate-, and long-term results, that are also based on quantitative and qualitative data."

Further, in the Objectives of Training in the Specialty of Public Health and Preventive Medicine – exhibit 9 of Roussin's Affidavit - there are objectives of training pertaining to risk assessment. Of note are:
5.1.1.1. Characterize the hazard identified, *both quantitively and qualitatively*.
5.1.2. Integrate hazard identification, characterization, and *assessment into an estimate of the adverse events likely to occur in a population*, based on a hazard found in that population. (emphasis added)

What must be concluded and emphasized from these excerpts from paragraphs 54 and 56 and exhibits 9 and 10 of Roussin's Affidavit, is that none of the five principles that guide sound decision-making and none of the four principles to guide in the justification of public health intervention can be applied or met without quantitative estimates of risk and quantitative estimates of intervention effectiveness. For risk assessment, this includes estimations of likelihoods (probabilities), and degrees of risk (i.e. severity). For effectiveness of interventions, this includes measurements and estimations of quantitative outcomes that are relevant to the objectives and targets of the program. Valid and comparable quantitative estimates of risk and valid quantitative estimates of effectiveness are fundamental to the process of demonstrating that public health interventions are proportional to the threat and reasonably necessary. These include basic epidemiology descriptors and indicators such as probabilities, rates, ratios, and proportions. Accurate estimates of these quantitative measures are necessary but not sufficient for reasonable decision-making. The numbers must be analysed to assess their validity, relevance, meaning, and use.

Some examples of the quantitative estimates which would be expected to be found in the Respondents' affidavits but were not, are listed here:

- **Probabilities of event occurrence.** For example, statements that "COVID-19 has been proven to be highly communicable and contagious among people" and "... certain settings...have led to a higher risk of transmission"[2] are not meaningful or useful unless accompanied by quantitative estimates of absolute risk (probability) of transmission.

[2] Roussin's affidavit, Paragraph 27

- **Incidence rates of cases with appropriate numerators, denominators, and time periods, stratified by relevant characteristics.** For example, rather than only the crude number of cases in each region or a cluster, it is necessary to describe the proportion of the population affected, whether that be demographic, geographical, or setting type. Without information that includes relevant denominators, the numbers may seem disproportionately large either in absolute or relative terms – and cannot be compared in a meaningful way.

- **Population-based rates of hospitalizations and deaths, stratified by relevant characteristics.** For example, rather than a list of deaths by age and sex[3], it is necessary - as has been done in other provinces – to calculate actual rates of mortality and fatality, using denominators of population size and case counts, respectively, stratified by age, and health conditions, and other relevant factors. Without information that includes relevant denominators, the numbers may seem disproportionately large either in absolute or relative terms – and cannot be compared in a meaningful way. Stratification – e.g. age-specific rates provide objective information about the size of risk differences between people of different ages.

- **Ratios of probabilities of events associated with the disease or outcomes of interventions.** These are necessary for the purposes of valid comparisons. For example, listing the number of cases associated with each of "ten clusters associated with attendance at faith-based events"[4] does not provide sufficient data for a risk assessment. At the very least there should be an estimation of a denominator such as the number of Manitobans that attend a place of worship during the relevant time period. More relevant, an assessment of the effectiveness of closing places of worship should be based on the estimated ratio of the probability of getting infected per week with one or two hours of church attendance in comparison with the probability of getting infected per week without church attendance.

- **Proportions are a way to compare events or characteristics and to put them into better perspective.** For example, rather than merely counting the number of cases associated with attendance at faith-based events[5], additional information such as the total number of cases would help to put the numbers in perspective. It is not clear over what time period these data have been collected, but 172 "primary" cases and 30 "secondary" cases were identified in 10 "clusters" between August 2020 and February 2021. Assuming that the church exposures were their sources of transmission, and using all cases in Manitoba until January 14, 2021[6] as the denominator, the data provided represents an estimate of 202/26954 = 0.7% or, equivalently, one church-associated case per 133 of all Manitoba cases. Based on the data provided, one per 2500 Manitobans

[3] Loeppky affidavit, exhibit B, page 16-33
[4] Loeppky's affidavit, Paragraph 14
[5] Loeppky's affidavit,
[6] Loeppky's affidavit, exhibit B page 1.

that attend a worship setting at least once per month, have been identified as a case during the past year.

To achieve the general public health goals of optimizing health of the population, public health decisions must consider many dimensions. The decisions about public health interventions must consider short-term and long-term benefits and harms for society as a whole. These considerations must include all matters pertaining to health. Even when one specific disease becomes the focus of attention, they must consider the morbidity and mortality from all diseases and injury, especially when interventions for one disease may increase the rates or severity of other conditions. These considerations must also include causes and risk factors of all diseases and injuries; these factors are often referred to as social, educational, and economic determinants of health.

Assessment of the Public Health Response.

In order to respond to the Respondents' explanation of and justification for the impugned Public Health Orders, the following questions will be answered with specific reference to the Respondents' affidavits:

1. Has the PCR test and have the PCR test results – and other information - been used in a reasonable and reliable way to accurately estimate the frequency of infections, fatality-rate of infections, hospitalizations, deaths, and years of life lost attributable to COVID-19 and to justify the reasonable necessity of restrictions of rights and freedoms, including quarantine and isolation?

2. Have the public health orders which have restricted rights and freedoms of people at very low risk for severe illness or death been shown to be reasonably necessary, fair, and sufficiently effective to protect those at higher risk and to maintain hospital capacity for all Manitobans?

3. Has it been shown reasonably by the Respondents by use of valid models and other methods that alternative less restrictive strategies could not have achieved better health outcomes with less harm?

4. Have the Respondents demonstrated how they have ensured that the restrictions of their policies have been no greater than reasonably necessary by anticipating, considering, estimating, and surveilling the observed health and social harms of the restrictions, including their impact on all determinants of health?

5. Have the Respondents reasonably explained their estimation of the absolute (actual) and relative risk of transmission of COVID-19 causally associated with attending church services?

Approach to address these questions

Section three of the Manitoba Public Health Act – an act that was revised during my tenure as chief medical officer of health - states

> "If the exercise of a power under this Act restricts rights or freedoms, the restriction must be no greater than is reasonably necessary, in the circumstances, to respond to a health hazard, a communicable disease, a public health emergency or any other threat to public health."

This wording is consistent with Section One of the Canadian Charter of Rights of Freedoms which states:

> The Canadian Charter of Rights and Freedoms guarantees the rights and freedoms set out in it subject only to such reasonable limits prescribed by law as can be demonstrably justified in a free and democratic society.

At the time when the new Manitoba Public Health Act was proclaimed in 2009 the onus then fell on the Minister of Health and the Chief Provincial Public Health Officer to justify the need for such measures. The Act has not changed; it is still the onus and responsibility of the government and the chief provincial health officer to explain the need for the restrictions that have been implemented in the past year.

The Respondents' affidavits lack the necessary evidence to demonstrate they met the standard required from a public health perspective in section three of the Act, that the restrictions have been reasonably necessary to respond to the circulation of the respiratory virus SARS-CoV-2 . The basis for this opinion is that the goals and objectives of the strategy have not been adequately described, that the size of the actual threat from COVID-19 has not been reasonably estimated, that the effectiveness of the restrictions have not been reasonably demonstrated, that the harms resulting from these interventions have not been adequately described, and that alternative, less restrictive, and less harmful interventions have not been transparently considered.

Public health interventions – especially restrictive ones of the kind we have seen during the past year – can only be justified if the size of threat is big enough, the interventions are effective enough, and the harms from the interventions are small enough. Without reasonably accurate estimates of these three factors, and without an adequate explanation of why there were no less restrictive and harmful interventions that could have been used to achieve the goals and objectives, the Respondents have not met the public health standard set out in section three of the Act.

1. Response to Dr. Roussin and Dr. Bullard - Has the PCR test and have the PCR test results – and other methods - been used in a reasonable and reliable way to estimate accurately frequency of infections, fatality-rate of infections, hospitalizations, deaths, and years of life lost attributable to COVID-19 and to justify the reasonable necessity of restrictions of rights and freedoms, including quarantine and isolation?

It is appropriate that this this should be the first question to address. As stated, some of the fundamental requirements of communicable disease public health response are the case definitions, surveillance, and analysis of data needed to understand the frequency, severity, transmission, and impact of the disease as well as to monitor the trends and impacts of interventions.

For most outbreaks, laboratory testing has played an important role for some of these. In this outbreak, laboratory testing – primarily using the PCR test – has been the basis for all of them.

For this reason, it is important to explore fully not only the accuracy and validity of the test, but how the test has been interpreted and used.

PCR tests: What they tell us; what they do not tell us

This is a very important issue, because descriptions of COVID-19 disease frequency, severity and death have been based mostly on results of the PCR test.

The PCR test is considered quite accurate with respect to identifying the presence of a long enough chain of amino acids to confirm whether the type of virus being tested for is in the sample.

Paragraph of 10 Bullard's Affidavit states that "the RT-PCR test is the most accurate test available for identifying cases of SARS-COV-2". It is important to distinguish the meaning and definition of the terms SARS-COV-2 and COVID-19. SARS-COV-2 is the name given to the coronavirus, first identified in Wuhan, China. COVID-19 is the name given to the disease that is caused by a SARS-COV-2 infection. Infection in this context means that the virus has actually invaded cells and multiplied within the person, whether symptoms have resulted or not. It is important to clarify that the mere finding of genetic material of SARS-COV-2 in a sample from the back of the nose of a person does not necessarily mean that the person is infected, had, has or will have symptoms, or should be classified as a "case" of COVID-19. That would depend on case definition, not the mere identification of genetic material of a virus.

PCR tests: Cycle thresholds (Ct)

The cycle threshold describes the number of cycles of amplification needed to strengthen a weak signal to enable the identification of the amino acid sequence of the virus being tested for. It is an indicator of how much genetic material is present in the sample. The higher the Ct to obtain a positive signal, the lower the volume of genetic material in the sample. The Ct number would be expected to be documented by the Lab for every positive test result.

The interpretation of this number is important and it is agreed that the higher the Ct, the less likely it is that the person is infectious at the time that the sample was obtained. It is also agreed that the longer the period of time since the beginning of symptoms, the less likely it is that a positive PCR test will correctly identify the presence of viable, replicable, infectious virus. It is also agreed that a PCR test can be positive several weeks or months after a symptomatic or asymptomatic infection has resolved. These observations have been verified by many microbiologists and laboratories including Drs. Bullard and Van Caeseele at the Manitoba Cadham Provincial Laboratory (CPL), whose published study (the "Bullard et al Study") is referred to on line 142 of the report of Drs. Bullard and Van Caeseele (the "Bullard/Van Caeseele Report") (Exhibit C to Bullard's Affidavit).

Lines 85-86 of of the Bullard/Van Caeseele Report dated February 24, 2021 states that the current test at CPL uses a maximum of 40 cycles of amplification (Ct). This means that if it takes 40 or less cycles before a positive signal is produced, the test result is considered positive.

The Bullard et al Study cited in the Bullard/Van Caeseele Report was published in *Clinical Infectious Diseases* on 22 May 2020[7]. It compared PCR test results with the results of virus cultures, a reasonable gold standard that they used to determine the presence of viable, replicable and potentially infectious virus in the samples submitted to the lab.

The fourth line of the Results section of the abstract of the Bullard et al Study, states that "there was no growth in samples with a Ct > 24 or an STT (symptom onset to test) of greater than eight days".

With respect to Ct levels, the Bullard et al Study stated that "there was no growth in samples with a Ct greater than 25."

In the Discussion part of the Bullard et al Study, the authors discuss the implication of their observations for public health policy issues, including unnecessary isolation. They concluded that "These data, if confirmed, may help guide isolation, contact tracing, and testing guidelines."

One way to confirm these data, would be to compare them with epidemiological evidence. Despite this suggestion in the Bullard et al Study of 10 months ago, no epidemiological evidence

[7] https://academic.oup.com/cid/article/71/10/2663/5842165

has been cited in any of the Respondents' affidavits. Analysis of even a sample of the data from contact tracing of 34,000 cases could have provided reasonable estimates of the rates of transmission to contacts stratified by Ct levels and stratified by the numbers of days between onset of symptoms and the taking of the sample.

If this information is known, why hasn't it been previously made available and why hasn't it been included in any of the affidavits? If it is not known, why were these questions not prioritized to ensure that unnecessary isolations and quarantines were avoided? Either way,
this data is important to establish whether the impositions caused by isolation and quarantine have been reasonably necessary.

In other words, imposing quarantine on people whose contact with the index (primary) case occurred eight or more days after the onset of symptoms in the index case and their Ct was > 25 would be an unreasonable interference with their autonomy. This is because of the negligible probably that the index case was infected at the time of contact. Current knowledge that the probability of infectiousness is negligible more than eight days after the onset of symptoms means that it is not reasonable to isolate a case for more than eight days after the onset of symptoms, especially if their symptoms have resolved or are resolving. The latter circumstances – presence of symptoms after eight days - could be reviewed on a case by case basis.

PCR tests: How they have been used for surveillance and case definition?

A confirmed case is defined by the Respondents as "a person with a laboratory confirmation of infection with the virus that causes COVID-19 performed at a community, hospital or reference laboratory (NML or a provincial public health laboratory) running a validated assay. This consists of detection of at least one specific gene target by a NAAT assay (e.g. real-time PCR or nucleic acid sequencing)".[8]

Paragraph 10 of the Bullard/Van Caeseele Report states that "Regardless of the particular Ct value, a positive RT-PCR result represents a true positive case of the SARS-Cov-2 virus." This statement cannot be interpreted without defining "a true positive case". Tests do not normally "represent" or equal a case. The use of test results is one criterion of case definitions. Other criteria include clinical (e.g. onset and type of symptoms, clinical signs, diagnostic tests) and epidemiological (e.g. contact history, type and settings of exposure, occupations, travel). These are the criteria used to define the case categories – typically four types, namely possible, suspect, probable, and confirmed. Manitoba Health's case definitions are posted on their website.

Paragraph 12 of the Bullard/Van Caeseele Report states "From a public health perspective, it is important to identify and report all positive cases of SARS-CoV-2, regardless of the Ct value." It should be clarified that it is not normally the role of a lab to "report cases" to Public Health. The

[8] https://www.gov.mb.ca/health/publichealth/surveillance/covid-19/resources/Notes.html

lab's role is to report test results, which in this case should include the Ct level with each positive result. The product insert for the cobas SARS-COV-2 in vitro test, used by the Cadham Provincial Lab as a PCR test, states "Results should only be interpreted in conjunction with information available from clinical evaluation of the patient and patient history."[9] The product insert for Aptima SARS-CoV-2, also used by that lab, states "A positive result indicates the detection of nucleic acid from the relevant virus. Nucleic acid may persist even after the virus is no longer viable."[10] Whether it is the practice of the lab to report Ct levels for each test has not been stated. (The importance of this will be discussed further in the next question.)

PCR tests: How they have been used for quarantine and isolation decisions?

Based on the data from the Bullard et al Study and others, there would be little reason to isolate persons who have had a positive test with a Ct > 25 or when their test was done more than eight days after the onset of symptoms. This is because of the negligible probability of being infectious to others. Manitoba's policy has been mandatory isolation for 14 days after a positive PCR, regardless of the Ct level or the duration of time since symptoms.

Based on data provided in the Bullard/Van Caeseele Report beginning at line 193, more than 40% of 5852 positive PCR tests had a Ct value greater than 25; 25% had a Ct value greater than 30. There is no reference to a report containing these data or other relevant information. For example, there are no data about the time since onset of symptoms or what has been learned through contact tracing about transmission of infection from these cases.

Nonetheless, using the findings from the published Bullard et al Study, the best estimate of the proportion of PCR-positive persons that were not infectious at the time of testing is 40%.

There is no detailed data of the number of cases and contacts that have been required to self-isolate or self-quarantine, respectively. Based on government policy 34,000 Manitobans have had to self-isolate for 14 days and several more than that have had to self-quarantine. What proportion of those have been unnecessary because of the very low probability that the cases have been infectious? At 40% of PCR positive tests with a Ct > 25, a reasonable estimate would be 34,000 X .4 = 14,000 cases and 40% of all contacts. From an operational public health perspective, a more appropriate measure of specificity, using these data with a false-positive rate of 40%, should be 60% - not 99.9%.

The Bullard/Van Caeseele Report argues at lines 157 – 170 that despite the fact that "higher Ct values are associated with a lower likelihood of growing SARS-CoV-2 in cell culture, this cannot rule (sic) that the person was or was not infectious at the time of sample collection." This statement can be made about any test. Public health policy should not be made on the basis of possibilities; it should be based on probabilities. If it is not important to determine how well a PCR test result correlates with infectiousness, why did Drs. Bullard and Van Caeseele conduct

[9] Qualitative assay for use on the cobas® 6800/8800 Systems product insert **09179909001-02EN Doc Rev 2.0** p.18
[10] Aptima SARS-CoV-2 Panther System AW-21677-001 REV. 0002

their study at all and why did they conclude that their findings "may help guide isolation, contact tracing, and testing guidelines"?

At line 70, the Bullard/Van Caeseele Report states that no single PCR Ct value "in isolation can be used to determine infectiousness of a case and must be interpreted in the overall clinical context". If that is true, what is the protocol to make that interpretation? How have the results of that interpretation been used to make decisions about isolation, contact tracing, and quarantine? Where is the report to describe the outcomes from those interpretations? This information would be expected to be included in the Respondents' affidavits to meet the public health standard required by section 3 of the Act to justify the public health interventions. Without this information, one cannot determine if the isolations and quarantines imposed have reasonably necessary.

PCR tests: How they have been used for counting cases, hospital diagnoses, death certification and estimation of premature death and potential years of life lost?

Cases

According to information provided in the Respondents' affidavits, Manitoba Health's case definitions include two categories- probable or confirmed[11].

A probable case must have:

- clinical symptoms compatible with an acute respiratory illness,
- meet exposure criteria,
- and have an inconclusive or no test result.

One type of "inconclusive" result is called "indeterminate" and "is defined as a late amplification signal in a real-time PCR reaction at a predetermined high cycle threshold value". It is further stated that in these situations, "when clinically relevant" – other test methods that are "equally or more sensitive" should be used or another sample should be obtained.

A definition of that "high cycle value" referred to in the case definition has not been found.

A confirmed case has only one criterion – a positive test result at a lab running a validated assay. There are no clinical, epidemiological or exposure criteria.

The Respondents have not provided a breakdown between probable and confirmed cases. What proportion of all cases, all hospitalized cases, all ICU cases, and all deaths are probable cases - i.e. those cases without a positive PCR test. In those probable cases, a judgment must be exercised with respect to clinical, epidemiological, and laboratory criteria.

[11] https://www.gov.mb.ca/health/publichealth/surveillance/covid-19/resources/Notes.html

By disaggregating (splitting) data, more understanding can be gained than when it is aggregated (lumped). How many of the nursing home deaths have been confirmed cases (with a positive PCR) and how many have been probable cases (e.g. untested, but in a pch with an "outbreak")? These disaggregated results can enable analysis about under or over-diagnosing COVID-19 and under- or over-attributing deaths to COVID-19.

Similarly, disaggregating PCR test results by level of Ct can help us learn from and manage cases and contacts with different likelihoods of infectiousness.

However, if Ct information is not linked to positive test results or to other clinical information such as case or contact status, outbreaks, hospitalization, or death, little can be monitored or learned about the importance of Ct levels.

For example, observation and analysis of the frequency of infections amongst contacts could be stratified by the Ct level of the index case test. This would provide Manitoba-specific information about transmission which could be used to adjust policies regarding isolation and quarantine that would enable them to be least restrictive and most effective at reducing spread. In addition to the increased autonomy, less work would be missed, including health care workers.

Similarly, more information about the Ct level and onset of symptoms would better delineate the probability of active infection in a hospitalized patient or PCH resident. This could guide policies about isolation and quarantine in those settings.

Apparently the Respondents do not have possession of Ct values or access to death certificates or medical files. It also seems that real-time tracking and monitoring of the outcomes associated with the contact tracing program has not occurred or the results are not available for sharing.

Apparently, "specific information about hospitalization, ICU, and deaths of individuals who isolated after contact tracing is not readily available." These data are needed to analyze and better understand what settings and types of exposures were associated with severe cases. This information could be used for more evidence and risk-based strategies for more focused protection. It can also be used to evaluate the effectiveness of strategies to interrupt transmission. This was the reply to a request for the following data:
a) the proportion of traced contacts that became symptomatic during their quarantine period,
b) the proportion of traced contacts that tested positive for COVID-19 during their quarantine period,
c) the proportion of symptomatic contacts that were hospitalized, needed ICU, or died,
d) the estimated number and rate of prevented hospitalizations, ICU admissions or deaths attributable to contact tracing, quarantine and isolation.

Hospital diagnoses

Accurate classification of hospitalized patients is important. Two goals of the Respondents' strategy as Roussin states are to reduce severe disease and to maintain hospital capacity.

Therefore, it is critical to know which hospitalized patients have been admitted because of infection with SARS-CoV-2.

Page 8 of Exhibit E of Loeppky's Affidavit shows a table that includes hospitalizations. How is it determined that the reason for admission is a COVID infection?

The following excerpt is from the Provincial Respiratory Surveillance Report COVID-19 Technical Notes[12]

> "COVID-19 Associated Severe Outcome
> Hospitalizations and ICU submissions in COVID-19 cases are extracted from the provincial data system, Admission, Discharge and Transmission. ***Due to a need for timely reporting, hospitalizations and ICU submissions do not need to be directly attributed to COVID-19. Instead an association to a positive COVID-19 laboratory result is sufficient.*** Duplicate submissions for the same patient within the same illness episode are excluded. In this report, only Manitoba residents are included. ICU admissions are also included in hospitalizations."

These instructions indicate that the daily counts of hospitalized patients with a diagnosis of COVID-19 include all patients that have had a positive PCR test regardless of their clinical diagnosis and regardless of whether their admission is "directly attributable to COVID-19". What proportion of hospitalized patients had a mild or asymptomatic infection with SARS-CoV-2 within the previous weeks or months? A positive PCR test at that time or at the time of admission to hospital would be sufficient to count their admission as a COVID-19 case. Furthermore, a patient that has symptoms compatible with COVID-19 (e.g. symptoms of a common cold) and has been exposed to a setting with a cluster or outbreak meets the criteria of a probable case. An outbreak in a nursing home or other high risk setting is defined as one or more confirmed cases.[13] Without validation by clinical investigation, it has not been determined what proportion of hospitalizations should be attributed to COVID-19 and to what extent the count is an overestimation.

Cause of death

The same problem exists with respect to accuracy of ascertaining the cause of death. Manitoba's guidance for surveillance of deaths is consistent with recommendations of the World Health Organization and the U.S. Centers for Disease Control which significantly changed the rules and protocols for determining cause of death for confirmed or probable cases of COVID-19.[14]

Before these changes, standard protocols for determining cause of death – i.e. the underlying cause of death – have been based on the WHO International Classification of Diseases guidelines.

---

[12] https://www.gov.mb.ca/health/publichealth/surveillance/covid-19/resources/Notes.html
[13] https://manitoba.ca/asset_library/en/coronavirus/interim_guidance.pdf
[14] https://www.who.int/classifications/icd/Guidelines_Cause_of_Death_COVID-19.pdf

The modifications of the protocol, now direct medical death certifiers to name COVID-19 as the underlying cause of death unless there is an obvious cause for which COVID-19 could not have been even a contributing cause. Compare this with the following excerpt from the WHO ICD-10 2016 guidance for assigning any type of pneumonia as the immediate cause of death while listing as the underlying cause conditions that impair the immune system, wasting diseases, paralysis, dementia, and many other chronic conditions that are common in elderly people, especially those that are most vulnerable in personal care homes. In other words, before the revised death certificate protocols, death with pneumonia – of any known or unknown virus or bacterium - in a 90 year old person with severe dementia and wasting would be certified as dementia/wasting as the underlying cause of death and pneumonia (e.g. COVID-19) as the immediate cause of death. It would be have been coded as dementia – not COVID – as the cause of death.

Before March 20, 2020, these are WHO guidelines for classifying pneumonia as the immediate cause of death, not the underlying cause of death.

> Pneumonia. Consider Dependence syndrome due to use of alcohol (F10.2) as the obvious cause of Lobar pneumonia, unspecified (J18.1). Consider conditions that impair the immune system, wasting diseases (such as malignant neoplasms and malnutrition), diseases causing paralysis (such as cerebral haemorrhage and thrombosis), serious respiratory conditions, communicable diseases, conditions that affect the process of swallowing, other diseases that limit the ability to care for oneself, including dementia and degenerative diseases of the nervous system, poisoning and serious injuries (grade 1–4 according to the injury priority list in Annex 7.7) as obvious causes of any pneumonia (J12–J18, J69.0 and J69.8).[15]

The Respondents' affidavits reveal that Manitoba defines a COVID death for surveillance as a death resulting from a clinically compatible illness, unless there is a clear alternative cause of death that cannot be related to COVID disease (e.g. trauma). There should be no period of complete recovery* from COVID-19 between illness and death.

*Recovery in this context means no residual effects or complications from COVID-19, and does not refer to the status of "recovered", which refers to clients who are off isolation or precautions and are no longer considered infectious.

In April, 2020, both the World Health Organization[16] and the Centers for Disease Control and Prevention announced the very same changes in the protocols for filling out a death certificate and determining the underlying cause of death. What follows is the explanation of why and how the protocol for determining the cause of death has changed. Italics are mine for emphasis.

---

[15] https://icd.who.int/browse10/Content/statichtml/ICD10Volume2_en_2016.pdf
[16] https://www.who.int/classifications/icd/Guidelines_Cause_of_Death_COVID-19.pdf

"ICD-10 Cause of Death coding of COVID-19 Certifiers use a range of terms to describe COVID-19 as a cause of death, a sample can be found in the annex of this document.

Although both categories, U07.1 (COVID-19, virus identified) and U07.2 (COVID-19, virus not identified) are suitable for cause of death coding, it is recognized that in many countries detail as to the laboratory confirmation of COVID-19 will NOT be reported on the death certificate. *In the absence of this detail, it is recommended, for mortality purposes only, to code COVID-19 provisionally to U07.1* unless it is stated as "probable" or "suspected".

The international rules and guidelines for selecting the underlying cause of death for statistical tabulation apply when COVID-19 is reported on a death certificate *but, given the intense public health requirements for data*, COVID-19 is not considered as due to, or as an obvious consequence of, anything else in analogy to the coding rules applied for INFLUENZA.

Further to this, there is no provision in the classification to link COVID-19 to other causes or modify its coding in any way. With reference to section 4.2.3 of volume 2 of ICD-10, the *purpose of mortality classification (coding) is to produce the most useful cause of death statistics possible*. Thus, whether a sequence is listed as 'rejected' or 'accepted' may reflect interests of importance for public health *rather than what is acceptable from a purely medical point of view. Therefore, always apply these instructions, whether they can be considered medically correct or not.* Individual countries should not correct what is COVID-19 - GUIDELINES FOR DEATH CERTIFICATION AND CODING assumed to be an error, since changes at the national level will lead to data that are less comparable to data from other countries, and thus less useful for analysis. *A manual plausibility check is recommended for certificates where COVID-19 is reported, in particular for certificates where COVID-19 was reported but not selected as the underlying cause of death for statistical tabulation.*"

A striking example of a new protocol, unprecedented in Manitoba (even during pandemic H1N1 or other influenza outbreaks) is the guidance for obtaining a nasopharyngeal sample from every deceased person – including those that only have "very mild" symptoms compatible with COVID-19. Depending on the circumstances of the setting, such a case might be classified as a probable case if the PCR test is negative or, regardless of the circumstances of the setting, a confirmed case if the PCR test result is positive. Either way, the death would be classified as a COVID-19 death – even if the symptoms of COVID are "very mild". The protocol follows.

Testing Individuals After Death In the interest of identifying all deaths related to COVID-19 and to better understand the burden of disease in Manitoba, collection of a post-mortem nasopharyngeal (NP) swab for COVID-19 testing should be considered if the following are true: Part A: Prior testing 1) The deceased did not have a NP swab positive for COVID-19 prior to death OR 2) The deceased did not have two or more NP swabs

> negative for COVID-19 in the past week AND Part B: Symptoms or cause of death 1) Death was preceded by influenza-like illness (ILI), upper or lower respiratory tract infection, or any symptoms compatible with COVID-19, even if very mild OR 2) Cause of death is unclear If a previous swab was positive, no further testing is required.[17]

The Respondents' affidavits do not comment on this change of rules or protocols to identify underlying causes of death – or the implications for accurate estimating of the attribution of deaths to COVID-19. For example, there is no information on the proportion of deaths attributed to COVID-19 in personal care homes in which pneumonia has been the immediate cause of death but has not been identified in the death certificate as the underlying cause of death. What proportion of "COVID-19 deaths" in PCH's have occurred in residents that have been classified as probable cases without a positive lab test for SARS-CoV-2? (See above for "hospital diagnosis".)

On page 16 of Loeppky's affidavit, *Table 2. Deaths due to COVID-19 in Manitoba* is a misnomer because there is no description of how it was established that COVID-19 was the underlying cause of death. As shown above, the definition of a "death due to COVID-19" is "A death resulting from a clinically compatible illness, unless there is a clear alternative cause of death that cannot be related to COVID disease (e.g. trauma). How was it established that there was a "clinically compatible illness"?

Manitoba's guidelines state:

> "To understand risk factors for severe outcomes, for all deaths related to COVID-19 ensure complete documentation of underlying illnesses (in risk factors), and, if known, the cause of death and any contributing factors. For deaths under the age of 65 years, when underlying illness is unknown, regional Medical Officers of Health should follow-up with the attending physician to obtain further information."

The Respondents' affidavits do not provide information to describe how many deaths under the age of 65 were followed up with the attending physician and/or the findings and conclusions from such follow-up. If all deaths are counted as equal with respect to estimating burden of illness, why is this policy limited to deaths under the age of 65? Without this kind of information, it is not possible to have an accurate estimate of the severity of any cause of respiratory infection or to compare them with other pneumonia-associated deaths such as influenza.

For example, has a 90 year old frail person with dementia, a weak cough reflex, who frequently aspirates, dies from pneumonia, and has had a positive PCR test (of any Ct level and of any duration since the onset of symptoms), been listed as a "death due to COVID-19"? In fact, even without a positive PCR test, the probable case definition includes anyone with a "clinically compatible illness" and has been exposed to a PCH or hospital setting where there has been one of more confirmed cases.

---

[17] https://manitoba.ca/asset_library/en/coronavirus/interim_guidance.pdf

Every death causes great sadness and grieving for loved ones, but if the person had a very short life expectancy from advanced cancer, a "do not resuscitate" order, and a health care directive for "comfort care only", would her death reasonably be attributed to COVID-19 and compared equally to a death in a younger person without other health conditions – whether associated with COVID-19 or not?

There is no data in any of the Respondents' affidavits comparing the putative 755 COVID-19 deaths over 9 and 1/2 months with other causes of death. Even assuming that COVID-19 was the underlying cause of death in all 755 deaths, this would equate to 950/11,000 = 9% of all deaths. This is significantly less than deaths from heart disease, cancer, and other diseases that are attributable to diabetes, smoking, and alcohol – diseases and conditions that are not described as a cause of death in any of the Respondents' affidavits and have been given little attention in government or public health communications in the past year.

Perhaps more significantly, the median age of deaths listed in Table 2 on page 16 of Loeppky's Affidavit is 85 for females and 80 for males. 60% of these deaths occurred in people over the age of 80, 80% occurred over the age of 70, and 90% occurred over the age of 60. There is no data in the Respondents' affidavits showing the average life expectancy or annual death rates of residents in personal care homes stratified by age and health status. There is no data in the Respondents' affidavits showing what proportion of personal care home residents – prior to COVID-19 – usually die from pneumonia and how often that has been certified as the underlying cause of death. This is relevant because of the importance of measuring and analyzing the impact of COVID-19 – or any disease - age of death and on life expectancy. What has not been shown by the Respondents is an estimation of the potential years of life lost that can be attributed to COVID-19. Without that information, the number of deaths is not a meaningful measure of the burden of the illness or the magnitude of the public health threat. Pneumonia is a common immediate cause of death for people in an advanced stage of illness or frailty, but it is rarely listed as the cause of death – i.e. underlying cause of death – when it is the last stage of a series of conditions. The decisions to list COVID-19 as the cause of death regardless of other underlying factors can only have the effect of overestimating the burden and lethality of this disease – especially in comparison to previous causes of pneumonia as the immediate cause of death.

Estimation of premature death and potential years of life lost

Paragraph 53 of Roussin's Affidavit states "Public health intervention seeks to reduce mortality and morbidity, and places emphasis on disease prevention and health promotion for a community".

From a population health perspective, modern assessments of the impact of deaths - from any or all causes - focus on quality-adjusted or disability-adjusted potential years of life lost rather than crude counts of death that do not differentiate deaths by age, quality of life or life expectancy. The Manitoba Health Provincial Health Indicators include potential years of life lost

and premature deaths as indicators of importance to priorize causes of death[18]. Statistics Canada provides reports on these measures.[19]

Priorizing health problems with consideration for their impact on life expectancy and quality of life are not new ideas, but it has taken time to integrate them into routine and transparent measures. The World Health Organization initiated the Global Burden of Disease Project in 1990.[20] It emphasizes the importance of assessing and comparing disease burden by loss of quality-adjusted life years, stating "the framework for integrating, validating, analysing and disseminating such information is needed to *assess the comparative importance of diseases, injuries and risk factors in causing premature death, loss of health and disability* in different populations. Countries can combine this type of evidence along with information about policies and their costs to decide how to set their health agenda" (emphasis added).

To measure more meaningfully the impact of COVID-I9 on the lives of Manitobans, and the need for restrictive health orders, would require a more accurate assessment of the causes of death, assessments of life expectancy, and assessments of quality of life. There is no indication in the affidavits of the Respondents that any of these measurements or analyses have been undertaken.

In addition to obtaining a reasonable estimate of the impact of COVID-19 on life expectancy and quality-adjusted life years, it would be important to compare this with other causes of death – underlying and immediate. It would also be useful to guide policy with respect to public health interventions that restrict gatherings of family members. Given the shorter life expectancy of Manitobans that are at highest risk, the enforcement of social isolation for the duration of their remaining life is not warranted by the evidence that has been provided.

[18] https://www.gov.mb.ca/health/documents/ind-all.pdf
[19] https://open.canada.ca/data/en/dataset/a04b5362-7534-4fb7-846c-262275eea1c3
[20] https://www.who.int/healthinfo/global_burden_disease/about/en/

2. Have the public health orders which have restricted rights and freedoms of people at very low risk for severe illness or death been shown to be reasonably necessary with regard to the principles of public health and the standards under the Act, fair, and sufficiently effective to protect those at higher risk and to maintain hospital capacity for all Manitobans?

As stated on page 60 in Roussin's affidavit the "focus" of the approach is "to minimize severe illness and death from COVID-19 by maintaining the spread of virus to manageable levels so it does not overwhelm our health care resources."

A primary "focus" or end is to avoid overwhelming health care resources. The means to that end is to minimize severe illness by maintaining the spread of the virus to manageable levels. There are no measurable objectives referred to or reported. Specific targets have not been specified beyond which the health care system would be considered to be overwhelmed. It has been reported often that intensive care units are full - or nearly full – operating "overcapacity" – an oxymoron in need of explanation. Intensive care units are always "full" or "nearly full". During "flu" seasons, most ICU patients have been diagnosed with influenza and elective surgery and other procedures have been delayed for weeks. As has been demonstrated many times in the past, the capacity of Manitoba's health system to provide acute care may be stretched, but has not been exceeded – depending of course on definitions of these terms and objective standards for measurement. The Respondents have failed to provide information as to Manitoba's ICU capacity, surge capacity, and the degree to which the ICU was "overwhelmed" due to Covid-19. Without this information, decision-makers and the public may be mislead about the severity and danger imposed by claims of the exceedance of or "on the brink of" exceedance of capacity. Noe doubt, like in past "flu seasons" hospitals and ICU's are "stressed". The issue is that when big decisions like "lockdowns" are made on the basis of concerns – often legitimate concerns – of hospital capacity there should be more measured, objective and transparent information and analysis to explain and justify those decisions.

From the community perspective, "manageable levels of spread" have not been defined. A reasonable and achievable target for minimizing severe illness and death has not been explained. No goals or objectives for other causes of severe illness and death – i.e. all causes of morbidity and mortality have been part of the "focus". No specific and distinct goals and objectives have been stated for people and communities at highest risk compared to those at lowest risk. No goals or objectives have been stated for other health consequences of the public health orders, including mental health, addictions, social isolation, loss of employment and income, and other social, educational, and economic determinants of health.

Without defining and setting goals, objectives, limits, and triggers, - especially for the most important indicators – meeting the required public health standard under the Act of justification for restrictive directives is more difficult to demonstrate.

The first priority is to identify and estimate quantitatively who is at highest risk and who is at lowest risk for severe illness and the need for hospitalization. This enables strategies to be more targeted towards protection and early care for those at highest risk.

The measures of most importance are rates of hospitalization, intensive care hospitalization, and death. As discussed earlier with respect to cause of death, it is important to minimize misclassification of attribution to COVID-19. Without accurate ascertainment, other estimates of risk and rates may be biased.

The list of deaths on pages 14-33 of Exhibit B of Loeppky's affidavit include the date of death, sex, age and health region. They are not summarized or analysed by any of the fields of data in the table. Using the data provided, the following calculations have been made.

Pivot tables derived from the Affidavit of Carla Loeppky pages 17-33. The imported raw data was double checked and corrected against the pdf. Pivot table calculations were also double-checked. No third-party has verified my dataset or calculations.

Deaths by Year	Count
Unknown	3
2020	679
2021	73
Grand Total	755

Deaths by Gender	Count
Female	396
Male	359
Grand Total	755

Row Labels	Min of Age	Max of Age
Female	28	105
Male	8	105

Average Age at Time of Death	Average of Age
Female	82
Male	77
Both*	80

*Properly calculated, not by merely adding totals and averaging.

Median Age Among Deaths	Median Age
Female	85
Male	80
Both*	83

*Also properly calculated.

Age at death by Decile	Count	%	Cumulative %
0-9	1	0.001	1.00
20-29	2	0.003	1.00
30-39	11	0.015	1.00
40-49	22	0.029	0.98
50-59	40	0.053	0.95
60-69	76	0.101	0.90
70-79	153	0.203	0.80
80-89	252	0.334	0.60
90-99	182	0.241	0.26
100+	16	0.021	0.02
Grand Total	**755**	1.000	

This data shows that that the median age of death is 83, meaning that one-half of all deaths have occurred at a higher age than 83.

This data shows that 80% of deaths have occurred in people over the age of 70 and 90% of deaths have occurred over the age of 60.

This data shows that 10% of deaths have occurred under the age of 60 and 2% of deaths have occurred under the age of 40.

Using the denominator of cases or of estimated infections, rates can be used to estimate the probability of severe illness amongst cases, such as the case-fatality ratio. Using the denominator of the population, these rates represent population-based rates, such as the mortality rate.

Even more so than influenza and other infectious diseases, severe illness from COVID-19 is highly associated with age, certain chronic health conditions, and socio-economic characteristics such as Indigenous identity, as Roussin points out in his affidavit. Combinations of these increase that risk further. For these reasons, it is important to fully understand the actual and relative risks of those at highest and lowest risk. This requires that these rates be stratified by the most relevant factors.

Unlike some provinces, Manitoba's data provided in the Respondents' affidavits has not been summarized or analyzed to readily provide a quantitative assessment of actual and relative risks for severe illness, stratified by factors of most importance. Without this information and analyses, there is less ability to show that the Respondents meet the public health standard that restrictions of those at lowest risk for severe illness have been reasonably necessary, fair, and sufficiently effective to protect those at higher risk and to maintain hospital capacity.

Has it been shown reasonably by the Respondents with respect to the relevant public health standards that by use of valid models and other methods that alternative less restrictive strategies could not have achieved better health outcomes with less harm?

Section three of the Manitoba Public Health Act and section one of the Canadian Charter of Rights and Freedoms make it necessary for alternative strategies to be considered by government and why it must be shown transparently that there were no less restrictive strategies that could have achieved an equal or better balance of benefits and harms. Section three of the Manitoba Public Health Act states that *"the restriction must be no greater than is reasonably necessary". Without considering and comparing alternative strategies which cause less restrictions, the test of "reasonably necessary" cannot be explained or defended.*

Mathematical models: Uses and limitations

Mathematical models may be used to forecast or predict outcomes. They can be used to better understand and to demonstrate which factors are associated with those outcomes. Like all models, which are a conceptual simulation and simplification of more complex realities, they can be helpful or unhelpful, depending on how realistically they are constructed, how valid are the inputs, and how meaningful are the outputs. More important than the quality of the models – which are less than perfect, at best – is the quality of their interpretation and application to decision-making.

As stated on page 25 of exhibit F of Loeppky's Affidavit, "as with models trying to predict the future, its results must be interpreted with caution". The expectation would be therefore, that the caution used in the interpretation or application of any model's predictions would be specifically described and clearly explained before drawing conclusions about how their results should be used. Such descriptions and explanations have not been evident in the affidavits submitted by the Respondents. Either such cautions have not been used or the cautions have not been disclosed. This raises concerns about how these models have been interpreted and how they have been used to make decisions and for communication to the public to justify those decisions.

Structure, processes, inputs, and outputs

The "Made-in-Manitoba" Agent-based Modelling Simulations are described on pages 23-33 of exhibit F of Loeppky's affidavit. There is insufficient information to describe the actual design of the model, how the inputs are estimated or used, and how to interpret the outputs.

The only output variable shown by the model projections results on pages 30-33 of exhibit F to Loeppky's Affidavit are the numbers of cases. More relevant outputs, such as the proportion of those cases expected to need hospital care or expected to die are not described. That would be dependent on the age, health status, and other risk factors of the population of cases. Also, there do not appear to be any harmful outcomes projected by this model (e.g unemployment, social isolation)

The information the Respondents have provided about the "165 parameters" referred to on page 25 of exhibit F to Loeppky's Affidavit is insufficient to assess the validity and usefulness of the model. Without more detailed definitions of each parameter and what estimates have been used as inputs, one cannot assess the appropriateness of the model or how its results should be used.

For example, with respect to transmission dynamics, there are three parameters for a "transmission probability reduction factor for asymptomatic infections" – lower limit, mode, upper limit. As noted elsewhere in this report, the estimated prevalence of asymptomatic or pre-symptomatic infections and the estimated probability of transmission from asymptomatic or pre-symptomatic infections under different circumstances are very important considerations in risk assessment spread of the virus.

Without information about the probability values that have been used in the model simulations, it is not reasonable to expect an evaluation of the model nor to gain the confidence of others in its forecasts.

There is a parameter "probability of a random contact happening outside social compartments three times per week". Another is "daily probability of participating in a larger event". Another is "number of random interactions in a large event". Another is "number of random interactions on a day." No information has been made available by the Respondents about how these parameters were "made in Manitoba", how they were measured, and how they have been validated.

One use of a model is to perform sensitivity analyses on the input parameters to determine which variables have the biggest effect on the outcomes of main interest. Sensitivity analyses were not mentioned in the Respondents' Reports. Either sensitivity analyses were not done or their results have not been shared. Without sensitivity analyses, a model cannot be evaluated with respect to the most important and least important input parameters. Without that evaluation, the usefulness of the model is limited and should be used with even more caution than usual.

Other strategies to consider

Despite what one might conclude from mainstream media and government communications, there has been since the beginning of this pandemic the expected scientific and other debates amongst "experts" and non-experts alike.

An open communication to all first ministers in July, 2020 "*Dealing with COVID-19: A Balanced Approach*" [21] was signed by 18 Canadian physicians currently or previously in leadership positions in public health and health care, including two Manitoban physicians at the University of Manitoba. The letter contained 12 recommendations to support the overall goal: *Minimize the*

[21] https://healthydebate.ca/opinions/an-open-letter-to-pm-covid19/

impact of COVID-19 using methods that are practical, effective and compatible with our values and sense of social justice. We need to focus on preventing deaths and serious illness by protecting the vulnerable while allowing society to function.

This approach is similar to that known as the Great Barrington Declaration, initiated by three prominent international experts in medicine, epidemiology, and infectious diseases. It was released on October 5, 2020 and has been signed by 14,000 medical and public health scientists, 42,000 medical practitioners, and 760,000 concerned citizens. The essence of the declaration – "focused protection" - is recommended as "*The most compassionate approach that balances the risks and benefits of reaching herd immunity, is to allow those who are at minimal risk of death to live their lives normally to build up immunity to the virus through natural infection, while better protecting those who are at highest risk. We call this Focused Protection*".

Paragraphs 161 – 179 of Roussin's affidavit constitute the arguments in support of Manitoba's policies and directives, including the restrictions on faith-based and outdoor gatherings. Because these arguments are central to the requirement that the government justifies that its public health directives are proportionate and reasonably necessary, it is important to respond to each of them.

There have been and continue to be variations in the public health orders with respects to geographic regions, settings, and activities. What is not mentioned in paragraph 162 of Roussin's Affidavit is the essence of the concept of focused protection, namely a focus on people that are at highest risk of severe illness and need for hospitalization.

The statements at paragraphs 163 and 164 of Roussin's Affidavit are true that severe illness and death has not only occurred in residents of personal care homes and that there is a risk that younger persons working or visiting long term care facilities will transmit the disease. Whether the risk will be greater if young people "were allowed to circulate freely in the community" is a matter of opinion. It would be important to provide evidence and an estimate of the risk before rejecting this concept out of hand. None was provided. It would be necessary to show that the probability (point prevalence) of asymptomatic infection or the probability of concealing a symptomatic illness would be more significant factors than compliance with non-pharmaceutical interventions (distancing, masks, hygiene) when interacting with people at highest risk.

In reference to the experience with children and schools, paragraph 165 of Roussin's Affidavit provides good examples of focused protection. It is true that SARS-CoV-2 is communicable. It is likely that "outbreaks" have occurred in all settings, especially when they are defined as one or two cases. Whether PCH deaths would be less if there was less ability of visitors and PCH staff to "circulate freely in the community" would need to be explained and quantified.

The numbers of deaths cannot be changed. It is a 1:1 ratio with births. When death will occur, from what causes, and how many quality-adjusted life years can be saved are epidemiological questions. The Respondents' Affidavits have not provided data on the residents of personal care homes that have died and those that have not. What was the age and sex distribution of the PCH

deaths? What was their health status, quality of life, and actuarial life expectancy? How many had a health care directive for "do not resuscitate" and "comfort care" only? How many of them and their families would have accepted the risk of "catching pneumonia" to have visits and care from loved ones? These are epidemiology questions also.

These questions are objective and epidemiological. They are not intended to imply values or expectations or preferences. They are intended to provide a fuller understanding of the end-of-life circumstances, priorities, and risks for 10,000 Manitobans who live the last part of their lives in personal care homes.

With reference to paragraph 166 and 167 of Roussin's Affidavit, it is true that most people over the age of 60 do not live in long-term care facilities or other congregate settings. Most of them would not be considered vulnerable. They are, in general, healthier and less likely to be frail or have severe dementia. They are less likely to be at an advanced stage of cancer, chronic heart or lung disease – and are more likely to have an intact immune system. They are more likely to be able to sit up and walk without assistance, have a good cough reflex, and strong respiratory muscles. Perhaps most importantly, they are more likely to have a high tolerance for oxygen desaturation from pneumonia - one of the most life-threatening conditions faced by people at higher risk, whether it is initiated by a common cold or other respiratory tract. With more public education about who is at higher risk for severe illness, how they can be protected without socially isolating ("compartmentalizing") them, and when to seek timely medical care for them – as was the approach taken in Manitoba during the pandemic H1N1 influenza – what evidence has been presented that less restrictions on the majority of the population at lowest risk would result in higher rates of hospitalization and death?

For clarity, it is better to separate hospitalizations and deaths. This is because most people under 60 survive their hospitalization. 5% of all deaths in Manitoba have occurred in people under the age of 60. However, with respect to hospital capacity, it is a valid point. It would have been useful to include in the Respondents' Affidavits more data on the characterization of hospitalized patients, duration of stay, and outcomes. Similarly, it would have been useful for there to be more data on the occurrence of deaths with respect to location of deaths, i.e. hospitals, ICU, long term care facilities, palliative care units or other chronic disease settings, or home. This would help us to understand the pressure on hospital capacity associated with deaths and what stage of life those persons were at when they died. The points raised in paragraph 167 emphasize the importance of ascertaining the immediate and underlying causes of deaths for people that have died and had a positive PCR test. The changes in the medical certification of death protocols proposed by the World Health Organization and U.S. Centers for Disease Control appear to have been adopted by Manitoba Health[22]. Adopting this protocol, a reversal of decades of policy, will make it difficult to identify and monitor the importance of underlying causes of death and the sequence of clinic-pathological states towards the immediate cause. As is known to any physician, the immediate cause of death is often the "last straw". For example, a

[22] https://www.gov.mb.ca/health/publichealth/surveillance/covid-19/resources/Notes.html

person in an advanced stage of pancreatic cancer with a prognosis of "months" rather than "years" does not die of cancer per se. The immediate cause of death is something that interferes with adequate blood circulation, oxygenation, or biochemical imbalance. Either the heart stops first or the breathing stops first. Pneumonia is one of the most common immediate causes of death, but unless it is a primary pneumonia and is not part of the causal pathway to death from an underlying disease such as cancer, heart disease, dementia, neuromuscular disease, liver or kidney failure, then it would not be listed as the cause of death (underlying cause of death).

If we ever test for influenza the way we have been testing for SARS-CoV-2, the public health response could be even more challenging, especially because of influenza's higher rates of severe illness and death for healthy people under the age of 60, especially children.

At paragraph 168 of Roussin's Affidavit we find what could be considered an example of risk-based strategy with some features of focused protection. When a whole population – because of racialized or geographic status - is at increased risk in addition to individual age and other risk factors, it is appropriate, in collaboration with the community and with Indigenous health leaders, to implement targeted strategies for all Indigenous people and in specific Indigenous communities.

Contrary to paragraph 169 of Roussin's Affidavit, the primary principle of focused protection is to maximize protection of those at highest risk while enabling those at lowest risk to maintain and support social, educational, economic, and recreational living for all that are safe to participate. The anticipated benefit of natural immunity is secondary. Functionally, it is evident that the innate immunity against SARS-CoV-2 has been effective in limiting the impact of the infection for the vast majority of the population. For healthy people under the age of 60, the infection-fatality ratio has been estimated to be in the range of one per 10,000 infections. The issue of re-infection is a matter of probability, not possibility. One anecdotal report of a variant "re-infection" one year after the onset of a pandemic is not a very strong signal for a common event. Regardless of the merits of an anecdotal case report, experience with previous viral infections would suggest that re-infection, not surprisingly, happens. What is more challenging is to estimate its frequency and its epidemiological significance. The very same question and challenge applies to the duration of immunity from a vaccine.

With respect to paragraph 170 of Roussin's Affidavit and the Manaus, Brazil situation attested to in the affidavit of Jason Kindrachuk ("Kindrachuk's Affidavit"), drawing conclusions from afar about events in other places should be done with caution. Accurate and representative estimates of the prevalence of infected people are difficult to achieve under the best of conditions. Explaining patterns of rising and falling rates of infection without consideration of many biological and social factors should be done with caution.

Herd immunity is not an absolute categorical state; it is a continuum. This is especially true with in places where populations are not isolated or closed off from others. As the immune proportion of the population increases, the effective reproduction number – the average number of people infected by one case – decreases.

The issue is not whether there is "clear evidence" that "lasting herd immunity can be achieved by allowing less vulnerable people to circulate freely". What is clear evidence? A randomized controlled trial of comparative strategies? Valid evidence of that type has not been available to justify the lockdown or other restrictive strategies that have been in use. What is needed to consider alternative strategies is a fair and objective comparison of estimated benefits and harms based on existing science and current analysis of relevant data collected by comprehensive and detailed surveillance.

Regarding Roussin's Affidavit's reference to variants, there are a variety of factors which may be associated with the number and frequency of variants, one of which is our ability to test for them. A statement of fact that "permitting the virus to replicate more widely results in more variants" should not be made without clarification, explanation and evidence. Perhaps it was intended to be stated as a hypothesis.

While paragraph 171 of Roussin's Affidavit attempts to make a case that natural herd immunity would come at a much greater cost of deaths and severe outcomes, this requires at the least, a statement of assumptions and estimates. A decision analysis or other type of model could provide more clarity. No further analysis or information was provided, therefore this is not an evidence-based conclusion.

As set out at paragraph 173 of Roussin's Affidavit, on October 14, 2020, another declaration – known as the John Snow Memorandum – was released. It has been signed by 6,900 scientists, researchers, and health care professionals. It advocates for more general restrictions until a vaccine strategy has been implemented. It states: "The evidence is very clear: controlling community spread of COVID-19 is the best way to protect our societies and economies until safe and effective vaccines and therapeutics arrive within the coming months. We cannot afford distractions that undermine an effective response; it is essential that we act urgently based on the evidence."

This report has opined that there is no clear evidence for more general restrictions in Manitoba. Reasonable arguments for more effective, less harmful, and less restrictive alternatives are not "distractions". On the contrary, the arguments presented to the First Ministers for a more risk-based, less restrictive, and balanced approach and the arguments presented in the Great Barrington Declaration for strategies for focused protection are those that must be refuted by the Manitoba government in order to justify its actions and to be compliant with the standards inherent in the Public Health Act and the Charter of Rights and Freedoms.

To varying degrees, within Canada, and in other countries, less and more restrictive measures have been used without clear evidence of significant long-term differences in morbidity and mortality associated with COVID-19. NEED EXAMPLES HERE. Less restrictive and less harmful strategies should be considered and compared in a transparent way.

4. Have the Respondents demonstrated how they met the public health standard and ensured that the restrictions of their policies have been no greater than reasonably necessary by anticipating, considering, estimating, and surveilling the observed health and social harms of the restrictions, including their impact on all determinants of health?

Public health work is not about only one disease or one goal, even in a crisis or emergency situation. In clinical medicine, it is important that the treatment should not be worse than the disease. In public health, it is important that a prevention strategy is not worse than the disease.

It is reasonable to have goals to prevent severe illness and death from COVID-19. It is reasonable to have goals to maintain hospital and other health care capacity for all who need it. But from a public health perspective, there should be other goals. There should be goals to minimize the harmful impacts of public health interventions, to minimize societal disruption, and to minimize negative impacts on the determinants of health. Short term and long term impacts on health should be considered.

Paragraph 87 of Roussin's affidavit states:

> Public health officials also consider potential collateral effects of restrictions such as unintended adverse economic or mental health impacts. By their nature, pandemics are very hard on a population. In addition to the direct health impacts of the disease, pandemics may cause fear and anxiety among the public. Public Health Orders that restrict gatherings or temporarily close places can also adversely affect peoples' economic status and their mental health. This is why we seek to impose the least restrictive measures necessary. It is a difficult balance, which must be re-evaluated in a dynamic way as the pandemic progresses. Governments also attempt to alleviate these hardships by providing mental health supports and economic relief.

This paragraph acknowledges some of the significant adverse impacts restrictive public health interventions and the importance of a balanced approach. It is not evident how this balance is being achieved? What specifically is being monitored and how has it been re-evaluated, other than a rise or fall in case counts, deaths, and hospitalization rates from one disease only? What are the goals and measurable objectives? What are the important indicators? What are the ethical values? What are the priorities? How are inequities measured and prevented? What are the decision-making processes? What are the mechanisms for consultation and engagement? The Respondents have not provided a transparent strategy and response plan. Without it, this information is scattered and incomplete. Without this information, the Respondents have not demonstrated how they have met the relevant public health standards and ensured that the restrictions of their policies have been no greater than reasonably necessary.

It has been long recognized that, in addition to health care, there are many other determinants of health – of individuals and communities. From Health Canada's official set of twelve, seven determinants of particular relevance are listed here. How have they been affected by COVID-19 and by the government and public health response?

Paragraph 12 of Loeppky's Affidavit states that the Epidemiology and Surveillance Unit is monitoring the impacts of the COVID-19 pandemic on various Manitoba health indicators. Exhibit D to Loeppky's Affidavit is the report "Impacts of COVID-19 PUBLIC HEALTH MEASURES ON VARIOUS HEALTH INDICATORS IN MANITOBA, November 1, 2020."

The Report contains 52 figures of various data. Many of these are important indicators to monitor and much of the data can be useful. The data is described, but there are few commentaries about the validity, limitations, or implications of the findings. It is not stated why these particular descriptors were chosen and what phenomena they are meant to indicate.

The conclusion of the Report contains some descriptions that may be misleading. For example, it is stated that "during COVID-19 period, the monthly number of MMRV childhood immunization doses administered in Manitoba increased from April 2020 to August 2020 by 103%". However, the rate in April 2020 had already dropped significantly and the rate in August 2020 was less than that in August 2019. Although difficult to quantify from the graph, it is evident that less children have been vaccinated from March to August in 2020 than were vaccinated during the same period in 2019. There are significant concerns about the impact of the pandemic response on preventive care for children and others. It is important to monitor, quantify and explain these and other indicators in a more robust and clear manner.

The patterns of increased utilization of health services for mental health and behavioural disorders referenced in Loeppky's affidavit including substance use, overdoses, and injuries, are of particular concern because of the increasing awareness of the impacts of restrictions of the determinants of health, especially social supports and coping skills, healthy behaviours, childhood experiences, education and literacy, employment and working conditions, and income and social status.

5.Have the Respondents reasonably explained their estimation of the absolute (actual) and relative risk of transmission of COVID-19 causally associated with attending church services?

Paragraph 26 of Roussin's affidavit states the following with respect to transmission of SARS-CoV-2:

"COVID-19 has been proven to be highly communicable and contagious among people."
"asymptomatic and especially pre-symptomatic transmission of SARS-CoV-2 does occur."
"Children can transmit the virus."

"There is evidence that certain activities like singing and talking loudly can pose a greater risk of transmission."

Paragraph 27 of Roussin's affidavit states "It has become understood that certain settings, including indoor crowded spaces with poor ventilation, have led to a higher risk of transmission.

Paragraph 31 of Roussin's affidavit states that "for a certain segment of the population who become infected, COVID-19 engages very serious symptoms that can only be treated through hospitalization", "some individuals require admission to an Intensive Care Unit and ventilation", and "COVID-19 can be fatal for the most severely affected segment of the population."

Whereas the general truth of each of these statements are uncontestable, none of them meet the expectations for sound decision-making as described in paragraph 54 of Roussin's affidavit. This is because there are no quantitative estimates. What is the quantitative meaning of "highly communicable"?

Paragraphs 155-160 of Roussin's affidavit describes reasons that "places of worship and faith-based gathering have their own potential for virus transmission and outbreaks" and the decision in November 2020 that places of worship had to temporarily closed. No data is provided to estimate the asserted increased risk other than reference to a total of 19 clusters or outbreaks in Canada and the United States – 10 of which are discussed below. Although there are limitations of cluster analyses with respect to ascertainment of the numbers of infections and ascertainment of sources of exposures, there is no doubt that there have been and will be transmission of the SARS-CoV-2 and many other coronavirus respiratory viruses, influenza, adenovirus, and rhinoviruses. The issue of importance from a public health perspective is quantitative risk – frequency and severity. Without objective and reasonably accurate estimates of the risks of attending church, how can the Respondents claim that they've met the relevant public health standards that their restrictive orders are proportionate to the risk and reasonably necessary?

Paragraph 56 of Roussin's Affidavit states the Canadian Public Health Association's five main building blocks of public health practice: evidence, risk assessment, policy, intervention, and evaluation. The document referred to – exhibit 10 – Public Health: A Conceptual Framework states "Prior to taking action on a specific issue, ***a risk assessment is necessary to estimate the nature and likelihood*** of negative health outcomes in individuals." With regard to effectiveness, it is stated on page 12 that "Outcome evaluations measure progress in the program's targeted public health challenge, and may include short-, intermediate-, and long-term results, that are also based on quantitative and qualitative data."

- Ratios of probabilities of events associated with the disease or outcomes of interventions. These are necessary for the purposes of valid comparisons. For example, listing the number of cases associated with each of "ten clusters associated with

attendance at faith-based events"[23] does not provide sufficient data for a risk assessment. At the very least there should be an estimation of a denominator such as the number of Manitobans that attend a place of worship during the relevant time period. More relevant, an assessment of the effectiveness of closing places of worship should be based on the estimated ratio of the probability of getting infected per week when that week includes one or two hours of church attendance in comparison with the probability of getting infected per week when that week does not include any church attendance.

- Proportions are a way to compare events or characteristics and to put them into better perspective. For example, rather than merely counting the number of cases associated with attendance at faith-based events[24], additional information such as the comparison with the total number of cases would help to put the numbers in perspective. It is not clear over what time period, these data have been collected, but 172 "primary" cases and 30 "secondary" cases were identified in 10 "clusters" between August 2020 and February 2021. Even assuming that the church exposure was actually the one responsible for their infections and that this included all worship, and using all cases in Manitoba until January 14, 2021[25] as the denominator, the data provided represents an estimate of 202/26954 = 0.7% or one per 133 of all Manitoba cases over a one year period. These data provided by the Respondents show that the risk from attendance at settings of worship are significantly less than other settings which have remained – to some degree and intermittently – open.

Estimation of actual risk of transmission in places of worship and outdoor gatherings

Estimates of the actual and relative risk of transmission of COVID-19 in places of worship or public gatherings can be modeled theoretically or analysed from observational data.

Theoretical modelling would include a number of parameters such as prevalence of asymptomatic or pre-symptomatic infected people, compliance with non-attendance by people with COVID-like symptoms, type of activities with respect to close contact exposures, separation of households, distancing, masks, duration of exposure, etc.

Such modelling or estimation of the actual risks has not been included in the affidavits of the Respondents either for attendance at places of worship or outdoor gatherings.

One would expect that in addition to the reports of clusters, data from contact tracing would provide more information about the observed rate of transmission associated with attendance at a place of worship or an outdoor gathering. No summaries or analyses of the results from the

[23] Loeppky's affidavit, Paragraph 14
[24] Loeppky's affidavit,
[25] Loeppky's affidavit, exhibit B page 1.

contact tracing of more than 30,000 reported cases have been included in the affidavits or posted on Manitoba's COVID-19 websites. Without that information, the opportunity for population-based risk-assessment has been missed, relying instead on more anecdotal and speculative information.

Estimation of actual risk of transmission in places of worship

According to a report by the Pew Research Centre in 2013 and Statistics Canada in 2003, 1/3 of people in Manitoba over the age 15 attend a religious service at least once per month.[26,27] The number of Manitobans over the age of 15 is 1.1 million[28]. Based on these numbers a reasonable estimate of Manitobans in a religious service at least once per month is 370,000. Using the Respondents' health reports, there have been 10 clusters with 202 cases. Using as the denominator 370,000 multiplied by 10 months of COVID-19 reporting, there have been 3,700,000 person-exposure. Using an average of one hour per service, this equates to 3,700,000 person-hours of exposure. The rate of cases per hour of exposure can be estimated, therefore, at 202 divided by 3,700,000 = one case per 18,000 hours of exposure. This level of risk would not normally be considered as a reasonable basis to justify prohibition of attending religious services.

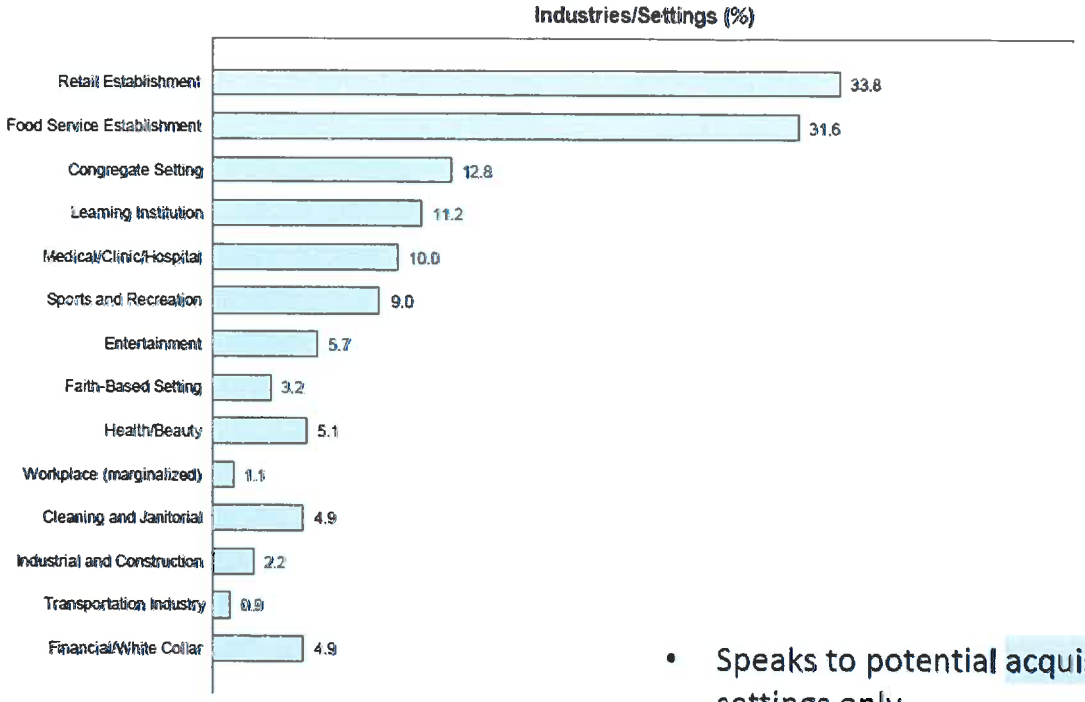
Regarding the number of cases, this could be an underestimate because of incomplete testing or because of incomplete surveillance ascertainment. If it is believed that this number of cases is an underestimate of the actual case rate or infection rate, an alternative estimate should have been provided. Contact tracing of 30,000 should have generated more accurate and complete statistics.

Without a transparent protocol for determining the most probable source and setting of transmission, one cannot assess the likelihood that these cases actually acquired their virus at a religious service. Even at one hour per week, this exposure period compares to 16 hours per day multiplied by 7 days per week of awake time = 112 hours. In other words, it is reasonable to estimate that for people that attend services four times the average Manitoban, less than one percent of their awake time is spent in a place of worship. Without a clear and reasonable protocol to determine the likeliest source of exposure, the probability that transmission happen elsewhere – such as a retail outlet, educational setting, or restaurant, is, by exposure proportion, more likely.

Of 633 cases reported in September, 2020, 3.2% were "potentially" acquired at a faith-based setting, ranking 11th out of 14 industries and settings exposures. The 10 highest-ranking settings accounted for 92% of cases, two-thirds of which were at retail and food service establishments. (Page17, Exhibit E, Loeppky's affidavit)

---

[26] https://www.pewforum.org/2013/06/27/canadas-changing-religious-landscape/
[27] https://www.statcan.gc.ca/sites/default/files/6493-eng.pdf
[28] https://www.manitoba.ca/health/population/pr2019.pdf



- Speaks to potential acquisition settings only.

It is correct and important for this graph to be qualified by the caveat of "potential acquisition". In contact tracing, one cannot assume which setting or exposure was the source of the infection of the "secondary case". That is because of the many number of possible exposures during the time period of relevance. Also people may not remember all of the facts or may not want to disclose them. Many assumptions and estimates are made before drawing the conclusion about the setting of exposure.

Summary and Conclusions.

1. Has the PCR test and have the PCR test results – and other methods - been used in a reasonable and reliable way to estimate accurately frequency of infections, fatality-rate of infections, hospitalizations, deaths, and years of life lost attributable to COVID-19 and to justify the reasonable necessity of restrictions of rights and freedoms, including quarantine and isolation?

For the following reasons, the answer to this question is "no".

- A positive PCR test result is the only criterion necessary to define a "confirmed case" despite instructions in product inserts that the tests should be interpreted in the context of the individual's clinical information and despite Dr. Bullard's own admission that "no single PCR Ct value in isolation can be used to determine infectiousness of a case and

must be interpreted in the overall clinical context" – a process for which no description has been given and from which no data has been provided.

- A positive PCR test result is the only criterion necessary to classify a hospitalized patient as a COVID patient (with the exception of injury).
- A positive PCR test result is the only criterion necessary to classify an intensive care patient as a COVID patient (with the exception of injury).
- A positive PCR test result is the only criterion necessary to classify a death as a COVID death (with the exception of injury).
- No estimates of potential years of life lost from COVID have been described.
- No clinic-pathological analyses of patients or deaths associated with a positive PCR have been described.
- A positive PCR test – in the absence of clinical and epidemiological information - does not indicate if or when a person was infected or is infectious.
- A positive PCR test result of any Ct level is used and interpreted and used in the same way, regardless of the estimated probability that the host of the sample was infectious at the time of the swab.
- The lab does not provide public health with the Ct values of positive cases.
- Based on data provided for December 2020, 40% of positive PCR tests have been associated with virus fragments that are not infectious (or have a far lower probability of being infectious) Isolating cases more than eight days after the onset of symptoms of with a Ct>25 is unnecessary, unfair, and is harmful. Quarantining contacts that were exposed to a case eight or more days after the onset of symptoms or after a positive test with Ct > 25 is unnecessary, unfair and harmful. Aside from inconvenience, mental stress and social isolation, isolation and quarantine interferes with care-giving, income, education, other necessary and healthy activities, and employment including health care services.

2. Have the public health orders which have restricted rights and freedoms of people at very low risk for severe illness or death been shown to be reasonably necessary, fair, and sufficiently effective with reference to the public health standards to protect those at higher risk and to maintain hospital capacity for all Manitobans?

   For the following reasons, my answer to this question is "no".

   - After one year, 30,000 cases, 1000 deaths, the Respondents have not used or had access to data to answer the following questions with sufficient detail and quantity:
     - What are the most important factors for highest risk for severe illness, hospitalization, and death;
     - In what settings and by what types of exposures has transmission occurred to those at highest risk;
     - To what degree has the presence of the virus SARS-CoV-2 contributed to the morbidity and mortality of Manitobans, quality-adjusted years of life lost,

hospitalizations, and deaths where sole criterion of a positive PCR test has been used to make the diagnosis of COVID-19 and surveillance have attributed hospitalizations and deaths to COVID-19 on the basis of a PCR test only.

3. Has it been shown reasonably by the Respondents by use of valid models and other methods that alternative less restrictive strategies could not have achieved better health outcomes with less harm?

   For the following reasons, my answer to this question is "no".

   - Without clear goals and measurable objectives of a response plan, there is no objective basis for determining which health outcomes and to what degree they could have been met with less restrictive measures.
   - None of the Respondents' models nor the international review included measures or estimates of harm caused by the interventions.
   - None of the Respondents' models defined clearly their outputs, inputs, the estimates and ranges used for their input parameters, the design and formulae of the model, or showed through sensitivity analysis which of the parameters were most important in correlating with the outcomes.
   - It is stated, reasonably, that "as with any models trying to predict the future, its results must be interpreted with caution". How the models have been used to shape policy has not been included in the Reports. Which cautions have been the most important have not been described.

4. Have the Respondents demonstrated how they have ensured that the restrictions of their policies have been no greater than reasonably necessary in accordance with the public health standards by anticipating, considering, estimating, and surveilling the observed health and social harms of the restrictions, including their impact on all determinants of health?

   For the following reasons, my answer to this question is "no".

   - There has not been a systematic monitoring or communicating of harmful consequences from the pandemic response, especially on individuals and communities most disadvantaged
   - There has not been a transparent and clear comparison of anticipated benefits and harms from strategies with different levels of restrictions

5. Have the Respondents reasonably explained their estimation of the absolute (actual) and relative risk of transmission of COVID-19 causally associated with attending church services?

   For the following reasons, the answer to this question is "no".

- No data from contact tracing of 30,000 Manitoba cases was provided in any of the affidavits of the Respondents. The frequencies of cases, exposures, transmission, and outcomes – and other relevant information – could have provided a rational basis for decisions to restrict or prohibit gatherings.
- Raw data of 10 faith-based clusters of 202 cases was described but no analysis or risk assessment was provided in any of the Respondents' affidavits.
- Anecdotal reports of "clusters" from other provinces and the USA are referred to but no representative analysis or overall quantitative risk is provided.
- Calculations using data from the affidavits of the Respondents, show that less than one percent of all reported COVID cases have been associated with attendance at a faith-based gathering.
- In one assessment of cases "potentially" acquired at settings during September, 2020, 3% of cases were acquired at faith-based settings
- Using data provided in the affidavits of the Respondents, a reasonable overall estimate of the risk of transmission during attendance at a church service in Manitoba was calculated to be one case per 18,000 hours of attendance.

Conclusion

To meet the requirements and standards of good public health practice, the Respondents are required to show that the severity of the threat has justified the restrictive interventions, that the effectiveness and benefits of the interventions have sufficiently outweighed the harms, and that there were no alternative strategies that would have been less restrictive, equally or more effective, and less harmful.

This report has provided evidence and arguments that the affidavits of the Respondents show that the severity of the threat has not been scientifically estimated, that the effectiveness of the restrictions have not been scientifically evaluated, that the harms caused by the restrictions have not been systematically assessed, and that alternative less restrictive interventions have not been described or compared with the restrictive interventions.

Accurate estimates have not been described of the illness severity, premature deaths, years of life lost, and pressure on the health system that can be attributed to COVID-19. Its impact appears to be overestimated.

Similarly, accurate estimates have not been described of the harms associated with the restrictive policies. Their harmful impacts appear to have been underestimated.

Finally, accurate estimates of the effectiveness of the restrictive policies have not been described sufficiently to justify their continuation without more rigorous evaluation. Their effectiveness appears to have been overestimated.