



# MDHS Graduate Research Conference 2020

## Population Health Booklet

<https://mdhs.unimelb.edu.au/mdhs-graduate-research-conference-2020>

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# MESSAGE FROM THE CHAIRS

Dear Delegates,

Welcome to the virtual inaugural Medicine, Dentistry and Health Science Graduate Research Conference 2020 (MDHS GR Conference), a student conference for all biomedical graduate research students that are part of the MDHS Faculty of the University of Melbourne. The organising committee is made up of members from 11 different student society across the MDHS faculty campus. The conference schedule consists out of 12 parallel session covering a variety of interesting topics and accommodating our student talks as well as national and international keynote speakers, Science Communication workshop and a Career Panel Discussion. This event was only possible due to the generous support of the University of Melbourne and the Graduate Student Association (GSA).

We hope that MDHS GR Conference will provide you with opportunities to listen to national and international leaders talking about their ground-breaking research in different biomedical fields and communicate your research to a broad scientific audience. Despite the fact that this conference will be virtually it will give you a unique chance to meet and network with peers from different research fields engage in discussions. We hope that the MDHS GR Conference will inspire you with new possibilities for your future career by listening to our invited speakers from academia and industry.

We wish you all the best for your presentation and hope you enjoy the event and get novel project ideas, career opportunities and new connections out of it.

Martha Blank & Alexander Anderson

*(Chair & Deputy-Chair of the Medicine, Dentistry and Health Science Graduate Research Conference 2020)*

# GENERAL PROGRAM

**08.00 - 08.15 Conference Opening & Welcoming Address**

Professor Alex Boussioutas and Martha Blank

**08.15 - 10.00 Session 1**

**10.00 - 10.30 Break**

**10.30 - 12.30 Session 2**

**12.30 - 13.00 Break**

Virtual Socialise

**13.00 - 14.30 Science Communication Workshop**

Dr. Shane Huntington

**14.30 - 16.00 Break**

Virtual Socialise | Networking | Games

**16.00 - 17.00 Careers Panel Discussion**

A/Prof. Nicholas Opie | Dr. Danijela Miroso | Dr. Ashish Sethi  
Dr. Maryam Hussain | Dr. Simranpreet Kaur

**17.00 - 19.00 Session 3**

**19.00 - 20.00 Award Ceremony & Conference Closing**

Martha Blank and Alexander Anderson

# SCIENCE COMMUNICATION WORKSHOP



## Dr. Shane Huntington

Dr. Shane Huntington has been providing consulting services in communication and strategy for over 20 years. As a successful broadcaster, business owner, academic and strategist he draws together experience from multiple sectors, offering clients a more detailed and analytical approach than competitors. Shane has trained thousands of people to communicate more effectively, especially in fields of research. His unique and engaging style has led to him delivering programs to some of Australia's most prestigious institutions.

# CAREERS PANEL DISCUSSION



## A/Professor Nicholas Opie

Synchron Founding Director and CTO  
Co-Lab Head of the Vascular Bionics Laboratory, The University of Melbourne



## Dr. Danijela Mirosa

Franchise Director of Oncology for the Oceanic Cluster  
Takeda Pharmaceuticals



## Dr. Ashish Sethi

Postdoctoral Research Fellow  
Department of Biochemistry & Molecular Biology, The University of Melbourne



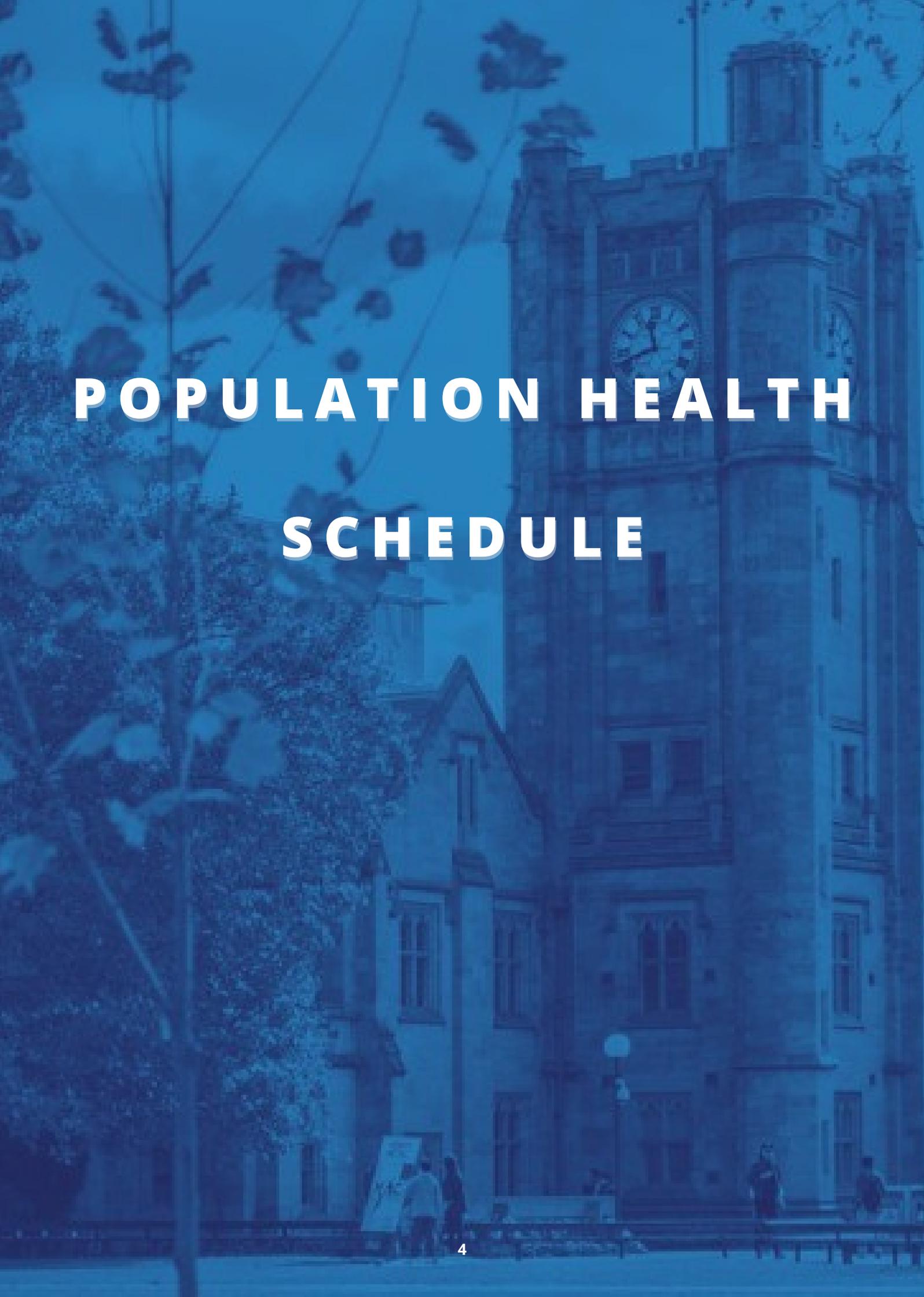
## Dr. Maryam Hussain

Medical Science Liaison  
Boehringer Ingelheim



## Dr. Simranpreet Kaur

Postdoctoral Researcher  
MitoBrain Murdoch Children's Research Institute



# POPULATION HEALTH SCHEDULE

# POPULATION HEALTH

## SCHEDULE

### SESSION 1

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08.15 – 08.45	<b>Causal Inference in Population Health Research</b> <b>Keynote Speaker:</b> A/Prof. Jessica Young	
08.45 – 09.00	<b>Does disability modify the relationship between labour force status and psychological distress among young people?</b> Marissa Shields	9
09.00 – 09.15	<b>Preventing violence-related deaths among young people exposed to the youth justice system</b> Melissa Willoughby	10
09.15 – 09.30	<b>The importance of gestational weight gain in twin pregnancies for maternal and child health</b> Deborah Ashtree	11
09.30 – 09.45	<b>Infant telomere length associated with attention deficit/hyperactivity symptoms in children</b> Cindy Pham	12
09.45 – 10.00	<b>High excess cost of care associated with sepsis in first year of cancer diagnosis: Results from a population-based matched cohort</b> Michelle Tew	13

### SESSION 2

10.30 – 11.00	<b>Monitoring global health: what have we learned from three decades of The Global Burden of Disease Study</b> <b>Keynote Speaker:</b> Prof. Alan Lopez	
11.00 – 11.15	<b>The short-term relationship between grass pollen exposure, food sensitisation and allergy in infants</b> Sabrina Idrose	14
11.15 – 11.30	<b>Association between 24-hour movement behaviours and health-related quality of life in children</b> Xiuqin Xiong	15
11.30 – 11.45	<b>Never too old for STIs: Trends in chlamydia diagnosis and testing among older women in Australia 2000-2018</b> Louise Bouchier	16
11.45 – 12.00	<b>Developing a values-based leadership framework to address GP burnout</b> Christo Karuna	17
12.00 – 12.30	<b>Breast cancer risk: it's all in the genes mammogram</b> <b>Keynote Speaker:</b> Prof. John Hopper	

### SESSION 3

17.00 – 17.15	<b>Strengthening the response to drug-resistant tuberculosis in Pakistan: A Practice Theory informed approach</b> Shazra Abbas	18
17.15 – 17.30	<b>Development of hypertensive disorders of pregnancy (HDP) management pathways for Indonesian primary care settings</b> Fitriana Ekawati	19
17.30 – 17.45	<b>Challenges faced by specialists in providing dental care for individuals with special needs</b> Mathew Lim	20

# POPULATION HEALTH

## Keynote Speakers



**Professor Jessica Young**  
Harvard Pilgrim Health Care  
Institute  
Harvard Medical School  
Harvard University

Session 1 08.15 - 08.45 am

Dr. Young is an Assistant Professor and Biostatistician in the Department of Population Medicine. She is also an Assistant Professor in the Department of Epidemiology at the Harvard Chan School of Public Health. Her research focuses on the development and application of statistical methods that may remain valid for estimating the causal effects of time-varying treatment strategies on health outcomes in the face of complex time-varying confounding and selection bias. She has particular interest in failure event outcomes that may be subject to competing risk events and dynamic time-varying treatment strategies; i.e. strategies under which treatment assignment at a given time may depend on time-evolving patient characteristics. Dr. Young received her PhD in Biostatistics from the University of California, Berkeley in 2007. Prior to joining DPM, she was a Postdoctoral Research Fellow and Research Associate in the Program on Causal Inference at the Harvard T.H. Chan School of Public Health.

[A causal framework for classical statistical estimands in failure time settings with competing events.](#)

**Young JG**, Stensrud MJ, Tchetgen Tchetgen EJ, Hernán MA. *Statistics in Medicine*. 2020; 39(8): 1199-1236.



**Professor Alan D. Lopez**  
Global Burden of Disease Group  
The University of Melbourne  
University of Oxford

Session 2 10.30 - 11.00 am

Professor Alan Lopez AC PhD FAHMS FASSA is a Melbourne Laureate Professor and the Rowden-White Chair of Global Health and Burden of Disease Measurement at The University of Melbourne. He was Head of the School of Population Health at the University of Queensland and held worked at the World Health Organization (WHO) in Geneva for 22 years. He is an advisor to WHO on strategies to improve the registration and certification of births, deaths and causes of death worldwide.

He is the co-author with Christopher Murray of the seminal *Global Burden of Disease Study* (1996), and subsequent updates, which have greatly influenced global and national debates about priority setting and resource allocation in health. In 2018, Professors Lopez and Murray were awarded the John Dirks Canada Gairdner Global Health Award, for their ground-breaking work in conceptualizing and quantifying the Global Burden of Disease.

He was awarded the Peter Wills Medal by Research Australia in 2014 for his outstanding contributions to building Australia's international reputation in health and medical research. Since 2015 he has been listed among Thompson Reuters Highly Cited (HiCi) Researchers in clinical medicine, and in 2015 was ranked among the top 10 most cited scientists in the world by Thompson Reuters. He is a Foreign Associate Member of the US National Academy of Medicine, a Fellow of both the Australian Academy of Health and Medical Sciences and the Academy of the Social Sciences in Australia. In 2016 he was made a Companion of the Order of Australia (AC) for eminent service to science and to the advancement of planning and policy development to improve public health in developing countries.

[Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study, 2010.](#)

Lozano R, Naghavi M... **Lopez AD**, Murray CJ, AlMazroa MA, Memish ZA. *Lancet*. 2012 Dec 15;380(9859):2095-128. doi: 10.1016/S0140-6736(12)61728-0. Erratum in: *Lancet*. 2013 Feb 23;381(9867):628. AlMazroa, Mohammad A [added]; Memish, Ziad A[added]. PMID: 23245604.

# POPULATION HEALTH

## Keynote Speakers



### **Professor John Hopper**

**Melbourne School of Population and  
Global Health  
University of Melbourne**

**Session 2 12.00 - 12.30 pm**

John is a statistician and epidemiologist who has been researching breast and other cancers for more than 20 years. He is a research director at the Centre for Epidemiology and Biostatistics at The University of Melbourne. He is funded by the National Health and Medical Research Council and he has also been supported by the National Institute of Health (USA), the National Breast Cancer Foundation, and Cancer Australia. His interests include understanding the epidemiology and genetic factors involved in measures of breast cancer risk, and of breast cancer masking, based on features in breast images.

[Going Beyond Conventional Mammographic Density to Discover Novel Mammogram-Based Predictors of Breast Cancer Risk.](#)

**Hopper JL**, Nguyen TL, Schmidt DF, et al. *J Clin Med.* 2020;9(3):627. Published 2020 Feb 26. doi:10.3390/jcm9030627



# ABSTRACTS



## POPULATION HEALTH

### Does disability modify the relationship between labour force status and psychological distress among young people?

Marissa Shields<sup>1</sup>, Stefanie Dimov<sup>1</sup>, Tania L King<sup>1</sup>, Allison Milner<sup>1</sup>, Anne M Kavanagh<sup>1</sup>, Matthew J Spittal<sup>2</sup> & George Disney<sup>1</sup>

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<sup>2</sup> Centre for Mental Health, Melbourne School of Population and Global Health, The University of Melbourne, Victoria, Australia

**Introduction:** Unemployment rates are high among young workers, and previous research has shown that unemployment is associated with poorer mental health among young people. The effect of labour force status on mental health is unlikely to be the same across the whole population of young people; in particular, young people with disabilities experience poorer mental health and may be particularly vulnerable to experiencing barriers to finding work. However, there is little information on whether the association between unemployment and mental health outcomes varies based on disability status.

**Methods:** We used three waves of cohort data from the Longitudinal Surveys of Australian Youth. We fitted logistic regression models to account for confounders of the relationship between employment status (employed, unemployed and having problems looking for work) at age 21 years and psychological distress at age 22 years. We then estimated whether this association was modified by disability status at age 21.

**Results:** Being unemployed and having problems looking for work at age 21 was associated with odds of psychological distress that were 2.48 (95% CI 1.95, 3.14) times higher than employment. There was little evidence for additive effect measure modification of this association by disability status (2.52, 95% CI -1.21, 6.25).

**Conclusions:** Young people who were unemployed and having problems looking for work had increased odds of poor mental health. Interventions should focus on addressing the difficulties young people report when looking for work, with a particular emphasis on supporting those young people facing additional barriers to employment such as young people with disabilities. Our results suggest that well-designed interventions to facilitate employment would improve the mental health of young people with and without disabilities, but may not reduce the mental health inequality experienced by young people with disabilities.



## POPULATION HEALTH

### Preventing violence-related deaths among young people exposed to the youth justice system

Melissa Willoughby<sup>1,2</sup>, Matthew Spittal<sup>3</sup>, Rohan Borschmann<sup>1,2</sup>, Jesse Young<sup>1,2</sup> & Stuart Kinner<sup>1</sup>

<sup>1</sup>Justice Health Unit, Melbourne School of Population and Global Health, The University of Melbourne, Melbourne, Victoria, Australia

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<sup>3</sup>Mental Health Policy and Practice, Melbourne School of Population and Global Health, The University of Melbourne, Melbourne, Victoria, Australia

**Introduction:** Violence is a leading cause of death among young people aged 10-24 years. Remarkably little is known about the risk of violence-related death (VRD) among young people exposed to the youth justice system. In this population, we aimed to: (1) calculate the incidence of VRD, (2) describe the circumstances of VRD, (3) compare the rate of VRD to that in the general population.

**Methods:** We conducted a retrospective data linkage study examining all young people (aged  $\leq 18$  years) who had contact with the youth justice system from 1993-2017 in Queensland, Australia (N=48,963). Youth justice records were linked probabilistically with the death, coronial, and adult correctional records. Crude mortality rates (CMRs) and standardised mortality ratios (SMRs) were calculated overall and stratified by sex and Indigenous status.

**Results:** Over the study period, 51 (3.5%) deaths resulted from violence-related causes. The VRD CMR was 8.1 deaths per 100,000 person-years (95%CI: 6.1-10.6). Risk of VRD in the cohort was 4.9 times higher than in the general population (95%CI: 3.7-6.4). Indigenous young people had the greatest elevation in risk of VRD with a mortality rate 10.8 times that of the general population matched on age and sex (95% CI: 7.2-16.1). Young women were 6.9 times more to die from violence compared to the general population matched on age and sex (95% CI: 3.70, 12.76). The majority of VRDs where information on circumstances of death were available (n=36) involved the use of a weapon (n=26, 72%), most commonly a knife (n=17, 65%). For women, the violent incident was most frequently preceded by a relationship breakdown or argument (n<5), and for men it was most frequently a physical or verbal altercation (n=12, 43%; p=0.004).

**Conclusion:** Young people exposed to the youth justice system have an increased risk of VRDs in the community. Violence-related deaths in this population are a public health issue that warrants urgent attention. Our findings highlight the need for violence prevention programs and interventions that target young people who have contact with the youth justice system." a structure that controls gametocyte morphology during its 12-day development period.



## POPULATION HEALTH

### The importance of gestational weight gain in twin pregnancies for maternal and child health

Deborah N. Ashtree<sup>1,2</sup>, Deborah A. Osborne<sup>2</sup>, Amelia Lee<sup>3,4</sup>, Mark P. Umstad<sup>5,6</sup>, Richard Saffery<sup>7,8</sup>, Jeffrey M. Craig<sup>9,10</sup> & Katrina J. Scurrah<sup>1,2</sup>

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<sup>8</sup> Department of Paediatrics, University of Melbourne, Parkville, Australia

<sup>9</sup> Centre for Molecular and Medical Research, School of Medicine, Faculty of Health, Deakin University, Waurn Ponds, Australia

<sup>10</sup> Molecular Epidemiology, Murdoch Children's Research Institute, Royal Children's Hospital, Parkville, Australia

**Introduction:** Gestational weight gain (GWG) is an important risk factor for both maternal and offspring health. Gaining too much weight during pregnancy is associated with pregnancy complications, such as pre-eclampsia, whereas gaining too little is associated with low birthweight and preterm birth. Twin gestations are already at higher risk of adverse pregnancy complications, so appropriate GWG is particularly important for women pregnant with twins. Though the Institute of Medicine provides recommendations for GWG in twin pregnancies, these are based on a limited sample of women, and may not be representative of all twin pregnancies. Therefore, there is a need to understand patterns of GWG in twin pregnancy, identify potential barriers to appropriate GWG, and determine long-term effects of GWG on twin health.

**Methods:** We used data from the Melbourne-based Peri/postnatal Epigenetic Twins Study (PETS). We used group-based growth models to identify trajectories of GWG from 12 weeks' gestation until delivery. We fitted robust linear and Poisson regressions to identify whether maternal pre-pregnancy and gestational exposures were associated with risk of gaining too much or too little weight, then fitted generalised estimating equation regressions to identify associations of maternal GWG with twin health at birth, 18 months and six years of age.

**Results:** A total of 172 women had GWG measures available, of which only 47% gained within the current recommendations. We identified three GWG trajectories, corresponding to those who gained above, within or below the current recommendations. Gestational diabetes was associated with a 2.40-fold higher risk of inadequate GWG (95% confidence interval (95%CI): 1.53-3.75), whereas obesity pre-pregnancy (risk ratio: 1.88, 95%CI: 1.09-3.26) and hypertensive disorders of pregnancy (risk ratio: 2.64, 95%CI: 1.20-5.81) were associated with increased risk of excessive GWG. Higher GWG was associated with higher weight at birth ( $\beta$ : 117.30 grams, 95%CI: 71.93, 162.68). Twins born to women who gained either too much or too little during pregnancy were heavier at 18 months and six years compared to women with appropriate GWG.

**Conclusions:** More than half of the women in the PETS did not meet the current GWG recommendations. Gestational diabetes and hypertensive disorders were associated with GWG outside these guidelines, and GWG outside the recommendations was associated with the long-term health of the twins. Given that the current recommendations may not be representative of all twin pregnancies, the observed link between GWG and twin health indicates that more comprehensive GWG guidelines for twin pregnancies are needed.



## POPULATION HEALTH

### Infant telomere length associated with attention deficit/hyperactivity symptoms in children

Cindy Pham<sup>1,2</sup>, Regan Vryer<sup>1</sup>, Christos Symeonides<sup>1</sup>, Martin O'Hely<sup>1,3</sup>, Richard Saffery<sup>1</sup>, Peter Vuillermier<sup>1,3</sup>, Anne-Louise Ponsonby<sup>1,2</sup> & the Barwon Investigator Group

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<sup>2</sup> Florey Institute of Neuroscience and Mental Health, University of Melbourne, Parkville, 3052, Australia

<sup>3</sup> Deakin University, Geelong, Victoria 3220, Australia

**Introduction:** Chromosomal telomere length (TL) shortening may be induced by factors such as oxidative stress. Previously, TL at birth has been inversely associated with attention deficit/hyperactivity disorder (ADHD) symptoms in school aged children. This study aimed to assess the association between TL in infancy and subsequent ADHD symptoms in children.

**Method:** TL, (telomeric genomic DNA / $\beta$ -globin single-copy gene (T/S ratio)), was measured by quantitative polymerase chain reaction from cord (n=807) and 12-month (n=629) blood from children in the Barwon Infant Study. ADHD symptoms were assessed using Child Behaviour Checklist (CBCL) at age 2 and Strengths and Difficulties Questionnaire at age 4. Multivariable linear regression models used to estimate the influence of infant TL on ADHD symptoms, adjusted for relevant covariates. We also examined candidate single nucleotide polymorphisms (SNPs) previously related to TL.

**Results:** Median (interquartile range) TL was 0.77 (0.53, 1.08) at birth (TL0) and 0.68 (0.41, 1.01) at 12 months (TL12). Longer TL12 was associated with reduced CBCL Diagnostic and Statistical Manual of Mental Disorder (DSM-5)-ADHD problems (CBCL-ADHP) at 2 years of age (-0.64 raw score units per unit T/S ratio increase; 95% CI (-1.11, -0.16), p=0.008), but not ADHD at 4 years (95%CI (-0.45, 0.25)). TL0 did not relate to these outcomes. The magnitude of the inverse association between TL12 and CBCL-ADHP was increased by adjustment for TL0. Paternal age and 4 candidate SNPs were associated with TL (at both time-points) and CBCL-ADHP, but there was no evidence that the effect of either the SNPs or paternal age on CBCL-ADHP were mediated through TL.

**Conclusions:** Longer TL at 12 months was prospectively associated with a reduced risk of ADHD symptoms at age 2 but not at age 4 years. Further work including relevant biological markers (e.g. oxidative stress) are needed to elucidate the role of TL in neurodevelopment.



## POPULATION HEALTH

### High excess cost of care associated with sepsis in first year of cancer diagnosis: Results from a population-based matched cohort

Michelle Tew<sup>1,2</sup>, Karin Thursky<sup>2,3</sup>, Maarten IJzerman<sup>1,4</sup>, Philip Clarke<sup>5</sup>, Monica Slavin<sup>2</sup>, Murray Krahn<sup>6</sup>, Lusine Abrahamyan<sup>6</sup>, Eric Bow<sup>7</sup>, Andrew M Morris<sup>8</sup> & Kim Dalziel<sup>1</sup>

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<sup>3</sup> National Centre for Antimicrobial Stewardship, Royal Melbourne Hospital, Australia

<sup>4</sup> University of Melbourne Centre for Cancer Research, Victorian Comprehensive Cancer Centre, Australia

<sup>5</sup> Health Economics Research Centre, Nuffield Department of Population Health, University of Oxford, United Kingdom

<sup>6</sup> Toronto Health Economics and Technology Assessment Collaborative

<sup>7</sup> Departments of Medical Microbiology and Internal Medicine, the University of Manitoba, and Infection Control Services, Cancer Care Manitoba, Canada

<sup>8</sup> Department of Medicine, Division of Infectious Disease, Sinai Health, University Health Network, and University of Toronto, Canada

**Introduction:** Cancer patients are at significant risk of developing sepsis due to underlying malignancy and necessary treatments. Little is known about the economic burden of sepsis in this high-risk population. We estimate the short- and long-term healthcare costs associated with sepsis in cancer patients using individual-level linked-administrative data.

**Methods:** We conducted a population-based matched cohort study of cancer patients aged 18 and above, diagnosed between 1st January 2010 and 31st December 2017 using data from the Ontario Cancer Registry. Cancer patients were classified as cases if identified with sepsis (captured using published sepsis-related ICD-10 codes) within the 5-year study period and within 1 month prior to cancer diagnosis. Cases were matched 1:1 by age, sex, cancer type and other variables to uninfected controls. Individual-level healthcare resource use including hospitalisations, ambulatory care and long-term care were captured using population-linked administrative records. We estimated mean costs (2018 Canadian dollars) for patients with and without sepsis up to 5 years from the healthcare system perspective. Excess (net) cost due to sepsis (cost difference between the two cohorts) was also estimated. To account for censoring, costs were adjusted using survival probabilities estimated at partitioned intervals across the study period. Patients with haematological and solid cancers were analysed separately.

**Results:** 77,483 cancer patients with sepsis were identified and matched. 64.3% of the cohort were aged  $\geq 65$ , 46.3% female and 17.8% with haematological malignancies. Our findings indicate that patients with sepsis incur substantially higher costs compared to non-sepsis patients. Among solid tumour patients, the excess cost of care associated with sepsis was \$29,081 (95%CI, 28,404-29,757) in the first year, rising to \$60,714 (95%CI, 59,729-61,698) over 5 years. This was higher for haematology patients; \$46,154 (95%CI, 45,505-46,804) in year 1, increasing to \$75,931 (95%CI, 74,895-76,968).

**Conclusions:** Sepsis imposes substantial economic burden and can result in a doubling of cancer care costs, particularly during the first year of cancer diagnosis. Population-based, individual-level data can be used to generate useful real-world evidence for resource allocation decisions. These estimates are helpful in improving our understanding of burden of sepsis along the cancer pathway and to deploy targeted strategies to alleviate this burden.



## POPULATION HEALTH

### The short-term relationship between grass pollen exposure, food sensitisation and allergy in infants

N. Sabrina Idrose<sup>1,2</sup>, Don Vicendese<sup>1,3</sup>, Rachel L Peters<sup>2</sup>, Adrian J Lowe<sup>1</sup>, Kirsten P Perret<sup>4</sup>, Mimi LK Tang<sup>4,5</sup>, Jo A Douglass<sup>6,7</sup>, Caroline J Lodge<sup>1\*</sup> & Shyamali C Dharmage<sup>1\*</sup>

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<sup>6</sup> Department of Clinical Immunology and Allergy, Royal Melbourne Hospital, Parkville, 3050, Victoria, Australia

<sup>7</sup> Department of Medicine, University of Melbourne, Victoria, 3052, Australia

**Introduction:** Cross-reactivity between pollen and certain food allergens is well-established. We hypothesised that levels of pollen exposure may contribute to food sensitisation and allergy. Here, we aimed to determine the relationship between short-term grass pollen exposure, food sensitisation and the reaction threshold to oral food challenges (OFC).

**Methods:** Of 5276 1-year-old infants enrolled in the HealthNuts study, 1105 underwent skin-prick testings (SPT) to foods during the grass pollen seasons and were included in this sub study. Those who had a SPT wheal diameter of  $\geq 1$ mm proceeded to have OFC. Exposure was considered for grass pollen counts on the day of testing (lag 0), up to three days before (lag 1, lag 2, lag 3) and the cumulative exposure over three days (lag 0-3). Outcome measures were food sensitisation ( $\geq 2$ mm) to peanut, egg, sesame and milk allergens and the cumulative dose given during an OFC before a reaction occurred. The associations were analysed using binary logistic regression and quantile regression models, respectively.

**Results:** Increased grass pollen exposure, with a threshold of 75-100 grains/m<sup>3</sup>, 2-3 days before was associated with an increased probability of sensitisation to all food allergens. The cumulative dose given to peanut-allergic infants before a reaction occurred decreased with increased grass pollen exposure at lag 0 and lag 3, with the effect size to be larger at lag 3.

**Conclusion:** High ambient grass pollen exposure "primes" the immune system and triggers a general reaction to food in infants 2-3 days after. Peanut-allergic infants had a much lower reaction threshold to OFC if the grass pollen levels were high 3 days before. This indicates that there may be a temporal association between grass pollen exposure and the onset of peanut allergy symptoms, and also cross-reactivity between grass pollen and peanut allergens



## POPULATION HEALTH

### Association between 24-hour movement behaviours and health-related quality of life in children

Xiuqin Xiong<sup>1</sup>, Kim Dalziel<sup>1</sup>, Natalie Carvalho<sup>1</sup>, Rongbin Xu<sup>2</sup> & Li Huang<sup>1</sup>

<sup>1</sup> Centre for Health Policy, Melbourne School of Population and Global Health, The University of Melbourne, Melbourne, VIC, Australia

<sup>2</sup> Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine, Monash University, Melbourne, VIC, Australia

**Introduction:** There is growing evidence that 24-hour movement behaviours are associated with multiple health outcomes. We investigated associations between adherence to the 24-hour movement guidelines and health-related quality of life (QOL) in children.

**Methods:** We used the Longitudinal Study of Australian Children (2004-2016), a biennial nationally representative sample with data available for children aged 2-15 years. We calculated physical activity time, recreational screen time and sleep time using time use diaries, and classified children as 'meeting guideline' or 'not' based on the age-specific 24-hour movement guidelines. Health-related QOL was measured using the Pediatric Quality of Life Inventory (PedsQL). Associations between meeting guidelines and health-related QOL were assessed with linear mixed effects models and stratified by age, sex, household income and whether a school-day.

**Results:** We included 8,919 children, with 33,603 person-wave observations. The mean number of guidelines met was 1.6 (SD 0.9), with 16.6% of children meeting all three guidelines, and 10.2% who met none. Each additional guideline met was associated with a 0.52 (95% confidence interval [CI]: 0.39-0.65) increase in PedsQL total score. Compared with meeting none of the guidelines, the effect of meeting physical activity guidelines alone ( $\beta=0.93$ , 95% CI: 0.42-1.44) was larger than meeting screen time ( $\beta=0.66$ , 95% CI: 0.06-1.27) and sleep time ( $\beta=0.47$ , 95% CI: 0.04-0.89) guidelines alone, with the highest increment observed in meeting both screen time and physical activity guidelines ( $\beta=1.89$ , 95% CI: 1.36-2.43). Associations were stronger in children from lower-income families ( $\beta$  for meeting all guidelines versus meeting none = 2.88, 95% CI: 1.77-3.99) and among older children aged 14-15 years ( $\beta=4.44$ , 95% CI: 2.49-6.40).

**Conclusion:** Adherence to 24-hour movement guidelines is associated with higher health-related QOL. There are important opportunities to further understand and improve health-related QOL outcomes for children through improved guideline adherence, particularly for older children and children from lower-income families.



## POPULATION HEALTH

### Never too old for STIs: Trends in chlamydia diagnosis and testing among older women in Australia 2000-2018

Louise Bouchier<sup>1</sup>, Sue Malta<sup>1,2</sup>, Meredith Temple-Smith<sup>3</sup> & Jane Hocking<sup>1</sup>

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**Introduction:** It is often assumed that older adults are not sexually active, however many people do continue sexual activity into their later years. While sexual expression is beneficial for mental and physical health, it can also put an older person at risk of STIs. There is limited research on STIs among older people. This study explores recent trends in chlamydia among older women in Australia.

**Methods:** We examined chlamydia data for older women in two older age brackets (55-64 and 65-74), and compared these with two younger age brackets (15-24 and 25-34). Notifications were sourced from the National Notifiable Diseases Surveillance System, and testing from Medicare rebate data (only available from 2009). First, we generated figures for diagnosis rates (2000-2018), and for testing and test positivity rates (2009-2018). Second, we analysed the data using Poisson regression. Third, we undertook an additional Poisson regression for the 2014-2018 time period to highlight the most recent trends.

**Results:** Chlamydia rates increased among all four age groups from 2000 to 2018, but increased the most among the two older groups. Although the sharpest increases were among older women, rates remained substantially lower than they were for younger women. From 2014 to 2018, chlamydia rates increased the most among women aged 55-64 years (IRR=1.06; 95%CI:1.02, 1.10) and even declined for women aged 15-24 years (IRR=0.99; 95%CI: 0.99, 0.99). Chlamydia testing increased for all age groups. From 2014 to 2018 testing increased the most for those aged 55-64 years (IRR=1.09; 95%CI: 1.08, 1.09) and the least for those aged 15-24 years (IRR=1.02; 95%CI: 1.01, 1.02). Among young women chlamydia test positivity declined, however for older women it remained stable. From 2014 to 2018, positivity decreased among those aged 15-24 years (IRR=0.97; 95%CI: 0.97, 0.98) and those aged 25-34 years (IRR=0.99; 95%CI: 0.99, 1.00), but did not change among those aged 55-64 years (IRR=0.97; 95%CI: 0.93, 1.01) or aged 65-74 years (IRR=1.01; 95%CI: 0.90, 1.12).

**Conclusion:** While STIs primarily affect young adults, some older women are also at risk of infection. Increasing chlamydia rates among older women in Australia suggest that today's older adults may be at greater risk than previous older cohorts, and that monitoring is important. Primary care is likely best positioned to meet the sexual health needs of older adults, and general practitioners may need to consider initiating sexual health conversations, taking sexual histories, and recommending STI testing where appropriate.



## POPULATION HEALTH

### Developing a values-based leadership framework to address GP burnout

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Burnout is a pervasive work-related phenomenon that has been documented to have negative consequences for organisations. The World Health Organisation's 11th revision of the International Classification of Diseases in 2018 describes burnout as "a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed". I show that burnout is especially high in primary care, with prevalence estimates reported to be in the range 24-67%, with its harmful effects on the primary care system documented in recent studies. This makes GP burnout an important case to study as GPs have to deal with the primary care system within which they operate.

Values-based leadership (VBL) offers an approach that may have the potential to reduce GP burnout. According to the Conservation of Resources theory, burnout occurs when valued resources are inadequate to meet work demands. By encouraging GPs to work according to their core values, VBL may provide GPs with the necessary resources to cope with their job demands and increase engagement with the practice. Hence, VBL offers an approach that may have the potential to reduce GP burnout.

My PhD thesis explores whether an intervention based on values-based leadership plays a role in influencing GP burnout. Findings from recent systematic reviews of interventions on physician burnout suggest that an intervention that combines individual and organisational factors may have potential to reduce physician burnout. However, no study has tested whether such an intervention is effective in reducing GP burnout. My research will be conducted in four stages: (1) a systematic review of the prevalence of GP burnout, (2) a systematic review on interventions to reduce GP burnout, (3) a conceptual paper on the role of values-based leadership in primary care, and (5) a case study of an intervention based on a VBL conceptual framework to reduce GP burnout.



## POPULATION HEALTH

### **Strengthening the response to drug-resistant tuberculosis in Pakistan: A Practice Theory informed approach**

Shazra Abbas<sup>1</sup>, Sumit Kane<sup>1</sup> & Michelle Kermode<sup>1</sup>

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**Background:** While Pakistan's Programmatic Management of Drug-Resistant Tuberculosis (PMDT) program, launched in 2010, initially yielded significant gains in treatment outcomes, performance has since plateaued, and in some cases regressed.

**Objective:** To critically investigate why the PMDT program, well-structured and generously resourced as it is, could not improve upon or sustain this early success.

**Method:** A Practice Theory informed ethnographic study was conducted at three PMDT clinics. Practice Theory consists of three elements; materialities, competencies and meaning. The analysis drew on nine months of participant observation and in-depth interviews with thirteen healthcare providers and four managers.

**Results:** The PMDT model primarily focused on materialities such as infrastructure, drugs, and numbers of people tested, and little on developing competencies of the PMDT staff to provide responsive care. This emphasis on materialities, and the linked focus of accountability processes, led the PMDT staff to create meanings that translated into prioritisation of certain easy-to-measure healthcare practices at the expense of more difficult-to-measure practices related to being responsive that are arguably also important for successful patient outcomes.

**Conclusions:** We demonstrate how this focus on measurable inputs, originating from priorities set at global and national levels, influence frontline care practices, with potentially negative consequences for patients. Greater emphasis on competent care may well enhance the effectiveness of the PMDT model of care. Practice Theory provides a simple yet comprehensive framework to critically interrogate health systems and healthcare practices to improve patient outcomes



## POPULATION HEALTH

### Development of hypertensive disorders of pregnancy (HDP) management pathways for Indonesian primary care settings

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**Introduction:** High maternal mortality rates caused by hypertensive disorders of pregnancy (HDP) occurs in low-and-middle-income countries (LMICs). In Indonesia, HDP causes more than 30% of its total maternal mortality rate. However, limited HDP guidelines are available in primary care practice. This study aims to improve the quality of HDP management in Indonesia by developing a set of HDP management pathways in primary care.

**Methods:** Guided by implementation science frameworks of Medical Research Council (MRC) and Practical, Robust, Implementation and Sustainability Model (PRISM), the study applied three consecutive research phases to achieve its aims. The first phase is exploratory interviews with Indonesian stakeholders to ask their experience of managing HDP in primary care practice. The second phase is pathway development phase using a three-round online Delphi survey. The third phase is the acceptability and feasibility phase evaluated with a triangulation of focus groups, interviews and observation. Qualitative data from the survey were analysed descriptively, and qualitative data from exploratory interviews and acceptability study were analysed thematically.

**Results:** A total of 187 participants were recruited during the study; 24 of them participated in the exploratory interviews, 52 participated in pathway development phase and 111 participated in the acceptability and feasibility study. Three HDP pathways have been developed, consist of a diagnosis flowchart, a management pathway and a surveillance pathway for women with HDP in primary care. They have also been implemented for a month in three primary care clinics in Indonesia. The providers attempted to apply recommendations in the pathways in various degrees, mainly on the HDP screening and monitoring. The short-implementation of the pathways was prominently challenged by professional boundaries and hierarchical barriers in primary care.

**Conclusion:** This study has developed HDP management pathways specifically designed for Indonesian primary care practice. The pathways have also been determined for their acceptability and feasibility in practice settings. Further research is needed to minimise the challenges and scale-up their implementation in Indonesian practices.



## POPULATION HEALTH

### Challenges faced by specialists in providing dental care for individuals with special needs

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**Introduction:** Individuals with disabilities and complex health needs continue to experience poorer oral health and access to dental care despite dedicated services in the public dental system and the dental specialty of Special Needs Dentistry having been established. This study aimed to investigate the challenges encountered at two of Australia's largest and most-established referral centres for individuals with special needs; the Integrated Special Needs Department (ISND) at the Royal Dental Hospital of Melbourne and the Special Needs Unit (SNU) at the Adelaide Dental Hospital (ADH). In particular, the objective was to identify barriers experienced by staff at the clinics that may be contributing to the oral health disparities and access to care issues in these populations.

**Methods:** Purposive sampling was used to invite key stakeholders, including specialists in special needs dentistry and management staff, at the Integrated Special Needs Department (ISND) and Special Needs Unit (SNU) to participate in semi-structured interviews to discuss their perceived challenges and barriers to providing dental care for individuals with special needs. Inductive thematic analysis was used to identify challenges and code for themes that emerged from these conversations.

**Results:** A total of 7 staff members from these specialist units (ISND = 4, SNU = 3) agreed to participate (78% response rate) including 5 specialists in Special Needs Dentistry. The three primary themes that arose from the discussions were that: (1) Existing services may not be reaching all of those requiring specialist level of care, (2) Specialist services were under-resourced to meet the needs of current patients trying to access care, and (3) General dentists seem unwilling to provide treatment for these patients in the primary care setting.

**Conclusion:** The lack of willingness of oral health professionals in the primary care setting to treat individuals with special health care needs was reported as a key challenge to providing dental care for these patients. This was further compounded by barriers due to the limited specialist workforce and inadequate resourcing of current specialist dental services for individuals with special needs.

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