

# ASPA CONFERENCE 2021

Virtual Conference



**ABSTRACT BOOK**

Abstract book for the ASPA 2021 Conference held online on Friday 19<sup>th</sup> November 2021

Published by: Australasian Society for Physical Activity

*Note about the content of the abstract book*

The Scientific and Abstract committees have not made any edits to the content of the abstract. The abstracts are, therefore, presented as they were submitted by the authors.

Version: 1.0

Last Updated: 17/11/2021

# Table of Contents

Welcome from the President and Co-Chairs .....	1
Sponsors and Supporters .....	2
Platinum Sponsor .....	2
Silver Sponsors .....	2
Bronze Sponsor.....	2
Committees.....	3
Scientific Committee.....	3
Abstracts Committee .....	3
ASPA Executive Committee: .....	3
Conference Program.....	4
Keynote Sessions .....	6
Session 1: Built Environment .....	6
Professor Karen Witten.....	7
Mr George Weeks.....	8
Ms Tamara Bozovic .....	9
Session 2: Mental Health .....	10
Associate Professor Simon Rosenbaum .....	11
Dr Stewart Vella.....	12
Dr Jordan Smith.....	13
Dr Jaelea Skehan .....	14
Session 3: Implementation .....	15
Dr Harriet Koorts.....	16
Ms Louise Czosnek .....	17
Ms Skye Wimpole .....	18
e-Presentation Abstracts.....	19

## Welcome from the President and Co-Chairs

Dear ASPA members and delegates,

It is our pleasure to welcome you to the inaugural meeting for the Australasian Society for Physical Activity (ASPA). Although we are disappointed that it was not possible to run our planned hybrid conference format, we are excited about the prospect of bringing together delegates to advance the science and practice of physical activity in the Asia Pacific region.

We have an exciting program for our inaugural meeting with ten invited presentations and 52 e-presentations. Our conference will include three sessions focused on the (i) Built Environment, (ii) Mental Health, and (iii) Implementation Science. Each session will include presentations from a panel of researchers, practitioners, and policymakers. Our excellent invited speakers include: Professor Karen Witten, Mr George Weeks, Ms Tamara Bozovic, Associate Professor Simon Rosenbaum, Dr Stewart Vella, Dr Jordan Smith, Dr Jaelea Skehan, Dr Harriet Koorts, Ms Louise Czosnek and Ms Skye Wimpole.

We are growing our special interest groups (SIGs) and there will be two satellite conferences this year. On Thursday 18<sup>th</sup> November 2021, the ASPA Scaling Up Physical Activity SIG and the Physical Literacy SIG will each run half-day virtual satellite events via Zoom.

This year we have awards for the two highest rated e-presentations, which will be awarded at the conference. In addition, the five highest rated e-presentations will be invited to present their work at a webinar on Friday 26<sup>th</sup> of November (1-week post conference). The five highest rated presentations will then be shared on Twitter for 1-week (until the 3<sup>rd</sup> of December) to collect 'likes' and 'retweets'. The 'People's Choice' will be awarded to the presentation with the most 'likes' and 'retweets'.

We would like to acknowledge the ASPA scientific committee members including Corneel Vandelanotte, Emiliano Mazzoli, Kylie Hesketh, Jordan Smith and Lisa Mackay. We would like to thank and especially acknowledge our platinum sponsor Sport New Zealand-Ihi Aotearoa. We would also like to thank our silver sponsors: AIA Australia and moodfix, and our bronze sponsor the Heart Foundation.

We hope you have a wonderful meeting and gain new understanding of the work that is occurring across the region to advance physical activity. We thank you for your continued support of ASPA.



Prof Jo Salmon  
ASPA President



Prof Erica Hinckson  
Scientific Committee Co-Chair



Prof David Lubans  
Scientific Committee Co-Chair

## Sponsors and Supporters

### Platinum Sponsor



Sport New Zealand is a crown agency and the kaitiaki (guardian) of the play, active recreation and sport system in Aotearoa New Zealand. The purpose of Sport New Zealand is to promote and support quality experiences in play, active recreation and sport, to improve levels of physical activity and, through this, ensure the greatest impact on wellbeing for all New Zealanders.

The Intelligence Team within Sport New Zealand leads research and evaluation on the changing physical activity, play and active recreation landscape in Aotearoa New Zealand. The Team operates a number of survey instruments, conducts major programme evaluations, and supports growing capability across the sector in the use and collection of data and insights. The Team is active in sharing its data and working with others to improve the overall understanding of physical activity behaviour change. The Intelligence Team is open to new conversations and developing new relationships.

### Silver Sponsors



AIA Australia is a life, health and wellbeing specialist with over 48 years of experience. It offers a range of products that protect the financial health and wellbeing of more than 3.8 million Australians. AIA Vitality is a global science backed wellbeing program that's been designed to educate, empower and incentivise members to understand their health and to make positive lifestyle choices



Mood has a powerful effect on everything we do. Understanding the factors that influence mood is fundamental to our wellbeing and productivity.

Say hello to moodflx - a world's first mood navigation system built for the enterprise and the individual. It is the X factor in a new world of mental fitness!

### Bronze Sponsor



# Committees

## Scientific Committee

- David Lubans (Co-Chair), University of Newcastle, Australia
- Erica Hinckson (Co-Chair), Auckland University of Technology, New Zealand
- Corneel Vandelanotte, Central Queensland University
- Emiliano Mazzoli, Deakin University, Australia
- Kylie Hesketh, Deakin University, Australia
- Jordan Smith, University of Newcastle, Australia
- Lisa Mackay, Auckland University of Technology, New Zealand

## Abstracts Committee

- Corneel Vandelanotte (Chair), Central Queensland University
- Emiliano Mazzoli, Deakin University, Australia
- Jordan Smith, University of Newcastle, Australia

## ASPA Executive Committee:

- Jo Salmon (President), Deakin University, Australia
- David Dunstan (Vice President), Baker Heart and Diabetes Institute, Australia
- Nicola Ridgers, Deakin University, Australia
- Trevor Shilton, National Heart Foundation, Australia
- Bridget Foley, University of Sydney, Australia
- David Lubans, University of Newcastle, Australia
- Corneel Vandelanotte, Central Queensland University
- Erica Hinckson, Auckland University of Technology, New Zealand
- Kylie Hesketh, Deakin University, Australia
- Leah Valente, Deakin University, Australia
- Lindsey Reece, University of Sydney, Australia
- Lisa Mackay, Auckland University of Technology, New Zealand
- Peter McCue, NSW Office of Sport, Australia
- Scott Duncan, Auckland University of Technology, New Zealand
- Verity Cleland, University of Tasmania, Australia
- Yanping Duang, Hong Kong Baptist University

# Conference Program

Time (AEDT)	Item	International Time Zones
08:30	<b>Zoom Webinar platform opens</b>	
08:45 – 09:00	<p><b>Opening Ceremony</b></p> <p>Chair: Professor Jo Salmon, Deakin University</p> <p><b>Acknowledgement of Country</b></p> <p><b>Welcome to ASPA Conference 2021</b></p> <p><b>Mihi Whakatau</b> will be led by Robert Hogg, Auckland University of Technology</p>	<p>05:45 Perth, Hong Kong, China, Malaysia, Singapore</p> <p>07:45 Brisbane</p> <p>10:45 New Zealand</p>
09:00 – 10:20	<p><b>SESSION 1</b></p> <p><b>Harnessing community voice to enhance the built environment for physical activity.</b></p> <p>Chair: Professor Erica Hinckson, Auckland University of Technology</p> <p><b>Panel Speakers</b></p> <p><b>Professor Karen Witten, Massey University</b> <i>Two way listening in the contested realm of public space planning</i></p> <p><b>Mr George Weeks, Kāinga Ora - Homes and Communities</b> <i>Healthy Urban Design: Learning from London and Auckland</i></p> <p><b>Ms Tamara Bozovic, Auckland University of Technology</b> <i>Barriers to walking as experienced, measured, and seen by practitioners</i></p> <p><b>Panel Discussion and Audience Q&amp;A</b></p> <p>Post your questions to the panel speakers in the Zoom Webinar Q&amp;A </p>	<p>06:00 Perth, Hong Kong, China, Malaysia, Singapore</p> <p>08:00 Brisbane</p> <p>11:00 New Zealand</p>
10:20 – 11:00	<p><b>BREAK</b></p> <p><i>e-Presentations will be displayed on-screen during the break (40 minutes).</i></p> <p><i>Panel discussion is continued with keynote speakers in Zoom Meeting #1 for 15 minutes (1020-1035).</i></p>	
11:00 – 12:20	<p><b>SESSION 2</b></p> <p><b>Vulnerable populations, challenges and opportunities for improving mental health through physical activity.</b></p> <p>Chair: Professor David Lubans, University of Newcastle</p>	<p>08:00 Perth, Hong Kong, China, Malaysia, Singapore</p> <p>10:00 Brisbane</p> <p>13:00 New Zealand</p>

**Panel Speakers**

**Associate Professor Simon Rosenbaum, UNSW Sydney**

*Physical activity in the treatment and prevention of mental illness*

**Dr Stewart Vella, University of Wollongong**

*Mental Health Promotion through Sport: How, What, and Why?*

**Dr Jordan Smith, University of Newcastle**

*Physical activity, fitness and resilience to stress during the final years of schooling*

**Dr Jaelea Skehan, Everymind**

*Breaking down silos for better outcomes*

**Panel Discussion and Audience Q&A**

Post your questions to the panel speakers in the Zoom Webinar

Q&A 

12:20 – 13:00

**BREAK**

*e-Presentations will be displayed on-screen during the break (40 minutes).*

*Panel discussion is continued with keynote speakers in Zoom Meeting #2 for 15 minutes (1220-1335).*

13:00 – 14:25

**SESSION 3**

**Systems approaches to physical activity: How it applies to implementation, scale-up and policy development in Australia.**

Chair: Professor Kylie Hesketh, Deakin University

**Panel Speakers**

**Dr Harriet Koorts, Deakin University**

*Using systems science approaches to enhance the scaling up of population interventions*

**Ms Louise Czosnek, Australian Catholic University**

*Applying evidence to inform policy action*

**Ms Skye Wimpole, Department of Education and Training Victoria**

*Creating Active Schools*

14:25 – 14:45

**Closing Ceremony**

Chair: Professor Jo Salmon, Deakin University

**e-Presentation Awards** will be presented by Professor Corneel Vandelanotte, Central Queensland University

**Closing of ASPA Conference 2021**

10:00 Perth, Hong Kong, China, Malaysia, Singapore  
12:00 Brisbane  
15:00 New Zealand

11:25 Perth, Hong Kong, China, Malaysia, Singapore  
13:25 Brisbane  
16:25 New Zealand

Times are displayed in AEDT – Melbourne, Sydney, Canberra, Hobart  
+2 hours Auckland, Wellington  
-1 hour Brisbane  
-3 hours Perth, Hong Kong, China, Malaysia, Singapore

## Keynote Sessions

### Session 1: Built Environment

Harnessing community voice to enhance the built environment for physical activity.

Chair: Professor Erica Hinckson, Auckland University of Technology, New Zealand

Our panellists include:



**Professor Karen Witten**

Two way listening in the contested realm of public space planning



**Mr George Weeks**

Healthy urban design: Learning from London and Auckland



**Ms Tamara Bozovic**

Barriers to walking as experienced, measured, and seen by practitioners



**Professor Karen Witten**

*SHORE & Whariki Research Centre, Massey University, New Zealand*

### **Two way listening in the contested realm of public space planning**

Whose voices do we hear?irate neighbours fighting higher density development. Business owners resisting street changes. Children's voices. This presentation discusses examples of studies seeking voices seldom heard in built environment planning – those of neighbours not making headlines when confronted by new housing developments and of children in urban and suburban neighbourhoods. The mixed success of engaging children will be highlighted with reference to organisational advocacy, project timing, the openness of professionals and the need to develop the knowledge and capacity of children to participate and envisage what is possible.

**About Karen:** *Professor Karen Witten is a geographer and psychologist with research interests in neighbourhood design and how housing, transport, amenity access and social environments influence the everyday mobility, health and wellbeing of residents. Her work is interdisciplinary and has had a particular focus on the wellbeing of children and people with disabilities. She is a Professor of Public Health at the SHORE & Whariki Research Centre, Massey University, Auckland.*



**Mr George Weeks**

*Kāinga Ora – Homes and Communities*

### **Healthy urban design: Learning from London and Auckland**

Regular physical activity is essential for public health. Successive investment decisions in favour of private motor traffic have reduced people's exposure to utilitarian exercise. While the health consequences of physical inactivity are reasonably well known, it can be much more challenging to redirect business-as-usual processes to deliver streets that enable active travel. How can the community voice make a difference? This presentation examines case studies from Auckland and London, examining innovative approaches to street design, communication, engagement and evaluation.

**About George:** *George Weeks is a Principal Urban Designer at Kāinga Ora – Homes and Communities, focusing on sustainable transport and street design. He was previously based at the Auckland Council Urban Design Unit, where he was the lead author for the Auckland City Centre Masterplan refresh. His work reflects a lifelong interest in understanding the effects of street design on urban health and wellbeing.*



**Ms Tamara Bozovic**

*Auckland University of Technology, New Zealand*

### **Barriers to walking as experienced, measured, and seen by practitioners**

People assess their environments, deciding how “walkable” they are, and what barriers they present. Perceived barriers and difficulties are essential to understanding why local trips might not be walked. This presentation examines the non-walkable as perceived by diverse people and by professionals involved in the design of street environments. Drawing on interviews of Aucklanders (disabled and non-disabled), as well as a survey and focus group of professionals, it examines how the needs are understood by the practice, and what challenges evidence-based improvement of the environments.

**About Tamara:** *Tamara Bozovic is a transport planner interested in cities for people, places that are inclusive, sustainable, and easy to get around. She has worked in Switzerland, Argentina and New Zealand, focusing on public transport, walking, cycling, and integration between transport systems and urban design. Now she is completing a PhD at Auckland University of Technology examining barriers to walking experienced by people of different ages and abilities, in car-dominated urban environments.*

## **Session 2: Mental Health**

Vulnerable populations, challenges and opportunities for improving mental health through physical activity.

Chair: Professor David Lubans, University of Newcastle, Australia

Our panellists include:



### **Associate Professor Simon Rosenbaum**

Physical activity in the treatment and prevention of mental illness



### **Dr Stewart Vella**

Mental health promotion through sport: How, what, and why?



### **Dr Jordan Smith**

Physical activity, fitness and resilience to stress during the final years of schooling



### **Dr Jaelea Skehan**

Breaking down silos for better outcomes



**Associate Professor Simon Rosenbaum**

*UNSW Sydney, Australia*

### **Physical activity in the treatment and prevention of mental illness**

From depression to schizophrenia, anxiety to post-traumatic stress – physical activity is an evidence-based strategy to reduce symptoms and promote recovery from various mental disorders. Addressing motivational deficits and overcoming barriers, especially for those that are most unwell remains an ongoing challenge to the routine implementation of physical activity as a component of mental health care. This presentation will use examples of established clinical exercise in mental health programs, with a focus on novel strategies, including staff interventions that can help facilitate culture change and physical activity adoption within mental health treatment facilities.

**About Simon:** Simon Rosenbaum is Scientia Associate Professor in the School of Psychiatry, UNSW Sydney, and an honorary fellow at the Black Dog Institute. Simon's research focuses on physical activity, mental illness, sport for development and global mental health. Simon has worked with a variety of groups including youth, veterans, emergency service workers and refugees. Simon has published >180 peer-reviewed publications including a textbook and a Lancet Commission. He serves as an elected national director of Exercise and Sports Science Australia, the President Elect of the Australasian Society for Traumatic Stress Studies and co-chair of the Olympic Refugee Foundation's think tank on sport and humanitarian settings. In 2019, Simon was recognised by the Clarivate Highly Cited list for mental health, awarded to the top 1% of researchers in a given field worldwide.



**Dr Stewart Vella**

*University of Wollongong, Australia*

### **Mental health promotion through sport: How, what, and why?**

The promotion and protection of mental health in organised sports is an issue of increasing visibility and importance. This presentation will cover the big questions of how, what, and why mental health promotion through sport might be an effective approach to public health. Using the example of the Ahead of the Game program, Dr Vella will talk about the opportunities and challenges in developing, evaluating, translating, and scaling sport-based mental health programs around the world.

***About Stewart:** Dr Stewart Vella is the Director of the Global Alliance for Mental Health and Sport at the University of Wollongong, Australia. He is the most published scientist in the world on the topic of mental health and sport. He is also a Subject Matter Expert on mental health in sport with Movember. His work spans mental health programs, mental health guidelines, psychological safety, and mental fitness. Since 2015 he has led the design, development, evaluation, translation and scaling of the “Ahead of the Game” program, including as the official program of the Rugby League World Cup 2021. He is currently developing mental health guidelines for community sports in Australia.*



**Dr Jordan Smith**

*University of Newcastle, Australia*

### **Physical activity, fitness and resilience to stress during the final years of schooling**

The final years of schooling are highly stressful for many students, and evidence shows a spike in stress-related mental disorders during this period. Physical activity (PA) is an often-cited strategy for coping with stress, but only 6% of older adolescents meet national PA recommendations. Although stress reduction is a readily recalled benefit of PA, exactly 'how' PA confers this benefit remains unclear. The Cross-Stressor Adaptation Hypothesis posits that the 'physical' stress of PA leads to physiological adaptations that promote resilience to 'psychosocial' stressors. This presentation describes recent research with older adolescents aimed at understanding the impacts and underlying mechanisms of PA on stress in this priority population.

**About Jordan:** *Dr Jordan Smith completed his PhD at the University of Newcastle (UoN) in 2015 and is currently a Senior Lecturer in the School of Education at UoN. Dr Smith has published more than 50 peer-reviewed journal articles, along with three invited book chapters. His work has attracted over 3000 citations, and he currently has a Google Scholar H-index of 25. Dr Smith has received competitive research funding from the NHMRC (as CI), industry partners (as CI and PI), and philanthropy (as PI) for the design, implementation and evaluation of physical activity interventions for school-aged youth. Dr Smith has a particular interest in the promotion of health behaviours such as physical activity for supporting the mental health of children and adolescents, using schools as the primary intervention sett*

**Dr Jaelea Skehan**

*Everymind, Newcastle, Australia*

### **Breaking down silos for better outcomes**

New knowledge without effective and timely implementation into policy and practice is a lost opportunity for change. Traditional research methods have time delays that cannot meet the current needs of individuals, families and communities who are experiencing, or at risk of, mental health challenges. There is a clear and pressing need for new methods of translating research into practice and working across disciplines and settings. There is also an imperative to shift towards practice that draws together, in real-time, the best available knowledge from research, from practice and from lived experience. This presentation will outline current challenges in the current approach as well as pose some opportunities for change.

**About Jaelea:** *Dr Jaelea Skehan OAM is an internationally respected leader in the prevention of mental ill-health and the prevention of suicide. She is the Director of Everymind, a Newcastle-based organisation delivering best-practice programs and translational research. Between 2019 and 2020, Dr Skehan was the Special Adviser to the National Suicide Prevention Taskforce, supporting the work of the Prime Minister's Adviser on Suicide Prevention. Jaelea is passionate about translating evidence into practice and building the capacity of individuals, families, services and communities to be involved in mental health and suicide prevention. She is a registered psychologist and holds a conjoint appointment with the College of Health, Medicine and Wellbeing at the University of Newcastle. She is co-lead of the Prevention Hub, a collaborative centre for research translation in prevention of depression and anxiety and contributes to national and global reform through advisory roles. In 2014 Jaelea was announced as one of Australia's 100 Women of Influence, and in 2020 she was awarded an Order of Australia Medal (OAM) for services to community mental health and wellbeing and won the University of Newcastle Alumni Award for Regional Leadership.*

### Session 3: Implementation

Systems approaches to physical activity: How it applies to implementation, scale-up and policy development in Australia.

Chair: Professor Kylie Hesketh, Deakin University, Australia

Our panellists include:



**Dr Harriet Koorts**

Using systems science approaches to enhance the scaling up of population interventions



**Ms Louise Czosnek**

Applying evidence to inform policy action



**Ms Skye Wimpole**

Creating active schools

**Dr Harriet Koorts***Deakin University, Australia***Using systems science approaches to enhance the scaling up of population interventions**

Despite many important global public health successes, for physical activity there is a continued lack of interventions that have been scaled up to achieve sustainable and equitable population health improvement. Implementation science approaches have dominated the scale up literature, which typically promote a sequential and mechanistic spread of interventions. Systems change plays a major role in the relationship between implementation processes and institutionalization of public health interventions; yet systems approaches remain underutilized in scaling up. This presentation will discuss findings from a study using systems analysis, which identified mechanisms underpinning the successful scale-up of physical activity and nutrition interventions in Australia.

**About Harriet:** *Dr Harriet Koorts is a Senior Research Fellow/Implementation Scientist in the Institute for Physical Activity and Nutrition (IPAN) at Deakin University, Melbourne. Harriet's research focuses on the implementation and scale-up of population health interventions, including the use of systems methodologies. Harriet leads IPAN's Implementation Science Cross-Domain Theme and is chair of ASPA's Scaling Up Physical Activity (SUPA) Special Interest Group. Over the past 10 years, Harriet has held multiple positions in academia, local government and the UK National Health Service, requiring her skills in implementation and evaluation to inform the commissioning of health promotion programs and delivery of clinical health services in practice.*



**Ms Louise Czosnek**

*Australian Catholic University, Australia*

### **Applying evidence to inform policy action**

The 8 'best-buys' represent a systems-based approach to implementing physical activity policy. This presentation will demonstrate how this evidence was used to build a system-based approach to physical activity policy development (and implementation). Examples are drawn from within the Victorian (Australia) policy context. The presentation will describe some of the challenges and opportunities that arose through applying the evidence across different sectors and how these factors were overcome.

**About Louise:** *Louise is an experienced policy advisor, having worked in both the non-for-profit and State government sectors. Her policy focus is physical activity, and she has developed and/or contributed to State-wide policy across multiple sectors including health, sport, education and transport. A key strength is her ability to build relationships across government that facilitate policy alignment to elevate the role of physical activity. Louise is completing a PhD in implementation science with a focus on implementing physical activity within routine healthcare services. When she is not working and studying, she likes to get lost on a leafy (but not too hilly!) trail run.*



**Ms Skye Wimpole**

*Department of Education and Training, Victoria, Australia*

### **Creating active schools**

Physical activity is a complex behaviour which is influenced by many factors. Schools, families and the community all have a role to play. Strategic, cross government action is required to shift physical activity outcomes. Cross government commitment through a Joint Ministerial Statement between Education (Minister Merlino), Community Sport (Minister Spence) and Health (Minister Foley) is supporting schools to shift physical activity outcomes through the creation of Active Schools.

An Active School encourages physical activity through a whole school approach which goes beyond traditional physical education and sport, and promotes physical activity at every opportunity as part of everyday school life. The approach also engages families and communities, to promote healthy behaviours beyond the school environment. This presentation will provide an overview of the Active Schools approach and provide some early learnings on the implementation of this initiative across Victoria.

**About Skye:** *Skye is currently Manager of the Physical Activity and Healthy Eating team at Department of Education and Training. She is an experienced policy advisor and practitioner, having worked in the State government sector, not-for-profit sector and schools. Originally starting out as a primary school teacher and personal trainer, she later completed a Masters of Health Promotion and lead the Heart Foundation's Jump Rope Heart Program as well as working in Health Promotion at the Alfred Hospital. Passionate about empowering children, young people and families to be more physically active, her skillset has allowed her to translate public policy into practice.*

## e-Presentation Abstracts

E01. The Play Active Program for Early Childhood Education and Care: describing educator physical activity practices.....	22
E02. Gender differences and inequalities in accelerometer-measured physical activity among Japanese middle-aged adults .....	23
E03. Changes in families’ screen time behaviours before and during COVID-19 in Australia: findings from the Our Life at Home Study .....	24
E04. The associations between the neighbourhood social environment and preschool children’s physical activity and screen time .....	25
E05. Queensland Early Childhood Educators’ perceived physical literacy .....	26
E06. Wellbeing for rangatahi: Enhancing the Sport New Zealand Outcomes Framework through an equity lens.....	27
E07. “Stopping the rot before it’s too late”: Cross-sectional analyses of inequities in physical activity for tamariki in Aotearoa New Zealand.....	28
E08. Early childhood educators’ awareness and knowledge of the movement guidelines for pre-school aged children in Hong Kong.....	29
E09. “Smells like teen spirit”: Cross-sectional analyses of inequities in physical activity for rangatahi in Aotearoa New Zealand .....	30
E10. Associations of home and neighbourhood environments with children’s physical activity in USA: the Neighborhood Impact on Kids study.....	31
E11. Changes in physical activity and sedentary behavior in young adults during the COVID-19 pandemic: a longitudinal study throughout one year.....	32
E12. <i>trips4health</i> : Findings from a COVID-interrupted randomised controlled trial to increase public and active transport .....	33
E13. Effectiveness of interventions to increase adolescents' physical activity and reduce sedentary behaviours in secondary school settings: systematic review and meta-analysis. 34	
E14. Drop-out in A Web-based Health Intervention Program: A Mixed-Method Approach... 35	
E15. Correlates and determinants of transport-related physical activity among adults: an interdisciplinary systematic review.....	36
E16. “Lion-hearted”: Wellbeing impacts of the 2017 British and Irish Lions Rugby Tour of Aotearoa New Zealand .....	37
E17. Effects of classroom-based physical activity interventions on schoolchildren’s step count, cognition and the academic performance: a systematic review and meta-analysis... 38	
E18. Not such a “Teenage dirtbag”: Cross-sectional analysis of secondary school physical activity facilities and experiences in Aotearoa New Zealand .....	39
E19. Using incentives to increase public transport use for physical activity gain: process evaluation of the <i>trips4health</i> randomised controlled trial.....	40
E20. Association between Socio-economic Status and Physical Activity among Chinese Children and Adolescents .....	41

E21. Moodfix: a parent-report instrument of child emotional wellbeing.....	42
E22. Feasibility of a teacher facilitated physical activity intervention for adolescents with disability: The Burn 2 Learn adapted pilot study .....	43
E23. Compliance with the 24-hour Movement Guidelines in Chinese primary schoolchildren: Correlates and associations with weight status .....	44
E24. “The whole is greater than the sum of its parts”: Data linking to build a comprehensive physical activity surveillance system.....	45
E25. Parent wellbeing and socioeconomic status during early childhood predicts 8 – 13 year old Indigenous children achieving Australian physical activity recommendations .....	46
E26. Facilitators and barriers to physical activity and sport participation experienced by Aboriginal and Torres Strait Islander adults: mixed method review .....	47
E27. Distribution and correlates of self-reported children’s perceived physical literacy.....	48
E28. “Life is not a competition”: Cross-sectional analysis of sport club member experiences in Aotearoa New Zealand .....	49
E29. The journey to dissemination - developing, piloting, adapting and scaling-up a school-based physical activity program: Physical Activity 4 Everyone (PA4E1) .....	50
E30. Media advocacy: Lessons learned from engaging Australian media in school uniform policy physical activity research.....	51
E31. “Greater than the sum of its parts”: Qualitative synthesis of steps to forming a physical activity insights and evaluation network.....	52
E32. Do patterns of activity behaviour vary by occupation? A compositional analysis .....	53
E33. Legal strategies to improve physical activity in populations .....	54
E34. 4-legged friend facilitates children’s physical activity – the PAWS intervention .....	55
E35. Active lifestyle behaviours among South Asian immigrants in Australia.....	56
E36 . Using problem and solution trees to investigate ways to reduce adolescent sedentary time at school.....	57
E37. Physical activity and mental wellbeing during the COVID-19 pandemic: Longitudinal analyses among a cohort of adults in Aotearoa New Zealand.....	58
E38. ProjectPARK: Understanding park features for encouraging visitation and active and social park use among children, adolescents and older adults' .....	59
E39. SALSA Youth Voices: Physical Activity Advocacy in the School Environment.....	60
E40. Engaging older adults in community-based physical activity; The parkrun Generations Evaluation .....	61
E41. “What’s the state of play?”: Qualitative exploration of physically active play opportunities and participation in Aotearoa New Zealand .....	62
E42. “Time to grow-up”: Qualitative synthesis of an Insights Maturity Model to improve evidence-based decision-making in physical activity policy and practice .....	63
E43. Feasibility of increasing physical activity in the whole family using activity trackers and apps: The Step it Up Family program .....	64

E44. Reliability and validity of the Muscle-Strengthening Exercise Questionnaire (MSEQ) .	65
E45. “Healthy Active Learning”: Baseline evaluation to inform local co-design of a national cross-government physical activity initiative .....	66
E46. A qualitative exploration of perceptions of activity compensation in primary school children and their parents .....	67
E47. The NHMRC-funded SAGE trial of yoga for fall prevention: successful adaptation to online delivery during COVID19.....	68
E48. Examining mediators of impacts on physical activity and sedentary time in a wearable activity tracker intervention for adolescents .....	69
E49. Acceptability and feasibility of an online physical activity program for women over 50: a pilot trial.....	70
E50. Physical activity during the COVID-19 pandemic: Longitudinal analyses among a cohort of adults in Aotearoa New Zealand adults .....	71
E51. The Effectiveness of Face-to-face and eHealth Blended Interventions in Promoting Healthy lifestyle among Adults: A Systematic Review and Meta-Analysis .....	72
E52. Associations of physical activity with academic achievement and academic burden in Chinese children and adolescents .....	73

## EO1. The Play Active Program for Early Childhood Education and Care: describing educator physical activity practices

\* Emma Adams, Emma.adams@telethonkids.org.au, Telethon Kids Institute, Perth, Australia.  
Andrea Nathan, andrea.nathan@telethonkids.org.au, Telethon Kids Institute, Perth, Australia.  
Phoebe George, Phoebe.george@telethonkids.org.au, Telethon Kids Institute and University of Western Australia, Perth, Australia.  
Elizabeth Wenden, Elizabeth.wenden@telethonkids.org.au, Telethon Kids Institute and University of Western Australia, Perth, Australia.  
Hayley Christian, Hayley.christian@telethonkids.org.au, Telethon Kids Institute and University of Western Australia, Perth, Australia.

**Introduction:** Early Childhood Education and Care (ECEC) services are an important place for supporting children to be physically active, healthy, and developmentally on track. However, ECEC services have limited resources and training to ensure children's physical activity is supported and promoted. The Play Active Program includes an evidence-informed physical activity policy template coupled with resources and training to enable services to successfully implement their policy. This paper aims to describe the physical activity context of ECECs as measured through educator practices and attitudes.

**Methods:** A pragmatic randomised controlled trial testing the effectiveness of the Play Active Program in 79 Perth (WA) ECEC services, with 565 educators participating in the evaluation, is currently underway. Baseline educator reported data on physical activity-related interpersonal factors, practices, and training were analysed using descriptive statistics, exploratory factor analysis (EFA), and latent class analysis (LCA).

**Results:** At baseline, 70% of educators reported providing at least 180 minutes of physical activity, 83% provided at least 30 minutes of energetic play, and 60% provided infants with at least 30 minutes of tummy time each day. Only one-third of educators received physical activity-related professional development more than once per year, and one-quarter had never received training. EFA revealed three scale factors for physical activity practices (Encouraging, Planning, Using Rewards), five scale factors for interpersonal constructs (Values, Space Perceptions, Confidence, Motivation, Support), and eight single item factors. Using factor scores in the LCA, four groupings of educator physical activity promoting contexts emerged: Inconsistent (34.3% of educators), Supportive (28.1%), Challenging (24.0%), and Needs Improvement (15.3%).

**Discussion:** Educators generally had positive perceptions of their individual physical activity-related practices and attitudes. However over 70% of educators had physical activity-related practices and attitudes that were classified as inconsistent, challenging, or needing improvement. Improving these attitudes and practices is a key objective of the Play Active Program.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## EO2. Gender differences and inequalities in accelerometer-measured physical activity among Japanese middle-aged adults

\*Shiho Amagasa, shiho.ama@gmail.com, Tokyo Medical University, Tokyo, Japan. Waseda University, Tokyo, Japan.  
Shigeru Inoue, inoue@tokyo-med.ac.jp, Tokyo Medical University, Tokyo, Japan  
Ai Shibata, shibata.ai.ga@u.tsukuba.ac.jp, University of Tsukuba, Ibaraki Japan  
Kaori Ishii, ishikaori@waseda.jp, Waseda University, Saitama, Japan  
Sayaka Kurosawa, sayakakurosawa@akane.waseda.jp, Waseda University, Saitama, Japan  
Neville Owen, neville.owen@baker.edu.au, Baker Heart and Diabetes Institute, Melbourne, Australia  
Koichiro Oka, koka@waseda.jp, Waseda University, Saitama, Japan

**Introduction:** Previous international and national studies have found women to be less physically active than men, when evaluated by moderate-to-vigorous physical activity (MVPA). Our recent study of community-dwelling older Japanese adults has shown that, contrary to the existing evidence, when taking into account any bout length and intensity of physical activity (PA), the level of PA among women was actually greater than men, owing to longer time spent in light-intensity PA (LPA) and intermittent MVPA. However, the generalizability of previous findings to middle-aged adults remains unclear. Therefore, we aimed to examine differences in the amount of PA between middle-aged Japanese women and men.

**Methods:** A cross-sectional study was conducted via a mail survey in 2013-2015, targeting randomly sampled 6,000 middle-aged (40-64 years) people living in urban and suburban cities in Japan. Participants were asked to wear valid accelerometer, Active style Pro HJA-350IT (Omron Healthcare, Japan) on the waist for 7 consecutive days. Age-adjusted gender differences in PA were examined by analysis of covariance (ANCOVA), and the variances for women and men were compared by Levene's test.

**Results:** A total of 711 participants (273 men, mean age  $49.9 \pm 6.9$  years) who had valid accelerometer data were included in the analysis. Overall, participants had percent time spent in sedentary behavior, LPA, MVPA during wearing time (mean 15.3 hours) corresponding to 54.5%, 37.9%, and 7.7%, respectively. Women accumulated a significantly greater volume of PA than did men (17.8 vs. 15.1 METs\*hour/day,  $P < 0.001$ ) owing to higher LPA (13.5 vs. 10.5 METs\*hour/day,  $P < 0.001$ ). Similar findings were observed after stratification by socio-demographic factors such as working status, income, and educational attainment. In addition, women had significantly lower levels of variability in PA than did men.

**Discussion:** Our findings suggest that Japanese middle-aged women have higher levels of PA than men, and with smaller inequality. These gender differences in PA may be a result of social roles (e.g., housework expectations of women). Given the health benefits of LPA, evaluating only MVPA may disproportionately underestimate levels of participation and benefit from PA in women.

**Conflict of Interest Statement:** The authors declare no conflict of interest.

### EO3. Changes in families' screen time behaviours before and during COVID-19 in Australia: findings from the Our Life at Home Study

\*Lauren Arundell lauren.arundell@deakin.edu.au, Deakin University, Burwood, Australia  
Jenny Veitch jenny.veitch@deakin.edu.au, Deakin University, Burwood, Australia  
Shannon Sahlqvist shannon.sahlqvist@deakin.edu.au, Deakin University, Burwood, Australia  
Riaz Uddin r.uddin@deakin.edu.au, Deakin University, Burwood, Australia  
Nicola D Ridgers nicky.ridgers@deakin.edu.au, Deakin University, Burwood, Australia  
Jo Salmon jo.salmon@deakin.edu.au, Deakin University, Burwood, Australia  
Anna Timperio anna.timperio@deakin.edu.au, Deakin University, Burwood, Australia  
Kate Parker k.parker@deakin.edu.au, Deakin University, Burwood, Australia

**Introduction:** The COVID-19 lockdown restrictions likely impacted engagement in numerous screen time behaviours, many of which are negatively associated with physical and psychosocial health outcomes. This study aimed to understand differences in leisure, educational/work and social screen time behaviours experienced by parents and children in Australia due to the national COVID-19 lockdown restrictions. Findings may inform behaviour change strategies and policy in the transition to COVID-normal.

**Methods:** Participants in the Our Life at Home study completed a cross-sectional online survey in April/May 2020. Parents (n=218) recalled their own and their child's/adolescents' participation in nine screen time behaviours in the past month (during lockdown) and retrospectively for February 2020 (pre-lockdown). Screen time behaviours were grouped into leisure (computer/laptop, and tablet/smartphone for leisure, TV/videos/DVDs, and game consoles); educational/work (computer/laptop, and tablet/smartphone for work/education); and social screen time behaviours (computer/tablet/smartphone for social communication with friends, family, and for parents only communication for work). Wilcoxon signed rank tests and effect sizes (r) compared the median time spent in each behaviour pre- and during lockdown.

**Results:** In total 218 parents (43.4±6.8 years, 88% female) recalled their own and their child's (8.7±2.0 years, 42% female) or adolescents' (15.0±1.5 years, 50% female) screen time behaviours. During lockdown, parents, children and adolescents spent more time engaged in almost all screen time behaviours compared to pre-lockdown. Large differences were observed in social (parents: r=0.41-0.57; children: r=0.55-0.65; adolescents: r=0.28-0.43) and education (children: r=0.50-0.65 and adolescents: r=0.25-0.37) behaviours. There were small or no differences in leisure time screen use. The larger effect size amongst children compared to adolescents suggest that their screen time may have been more adversely impacted by the COVID-19 lockdown restrictions.

**Discussion:** The unprecedented COVID-19 lockdown restrictions have greatly impacted parent's and children's screen time, which may have implications for their future screen time trajectories and their physical and psychosocial health. Longitudinal research is now crucial to understand how these behaviours are maintained or change as lockdown restrictions ease. To help support families to manage screen time, future research and policy should consider strategies to reduce reliance on screens for school/homework and encourage face-to-face social interactions.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work

## EO4. The associations between the neighbourhood social environment and preschool children's physical activity and screen time

\*Jessica Baldwin, jess.baldwin@deakin.edu.au, Deakin University, Melbourne, Australia  
Lauren Arundell, lauren.arundell@deakin.edu.au, Deakin University, Melbourne, Australia  
Jill Hnatiuk, jill.hnatiuk@deakin.edu.au, Deakin University, Melbourne, Australia

**Introduction:** The neighbourhood social environment (NSE) has been associated with health behaviours in adults and youth however less is known about this relationship in preschool-aged children (2-5 years). This study seeks to explore associations between the NSE (social cohesion, social interaction, sense of community, social norms and neighbourhood crime) and the physical activity (PA) and screen time (ST) behaviours of preschool-aged children.

**Method:** Cross-sectional data was collected in 2019. Parents ( $n=214$ ) of preschool-aged children ( $m=3.8\pm 0.8$  years) completed an online survey where they answered questions about their NSE (Likert scales, three existing and two purpose designed measures) and proxy-reported their child's usual minutes/day of PA and ST. Two hierarchical linear regressions were run to assess relationships between NSE predictor variables and minutes/day of PA and ST. Three logistic regressions were run to assess how NSE predictors affected the likelihood of meeting PA ( $\leq 180$ -minutes/day), ST ( $\leq 60$ -minutes/day) and overall movement (PA and ST) guidelines. Child age, gender, childcare attendance, and socioeconomic status (SES) were controlled for.

**Results:** Social interaction was associated with increased PA ( $b=17.76$ , 95%CI=0.81, 34.71) and decreased ST ( $b=-12.77$ , 95%CI=-23.23, -2.23) and improved the likelihood of meeting PA (OR=1.81, 95%CI=1.20, 2.75) and overall movement (OR=1.51, 95%CI =1.03, 2.21) guidelines. Social cohesion, sense of community, social norms and neighbourhood crime were not statistically significant predictors of daily PA or ST or meeting guidelines. Crime was negatively associated with likelihood of achieving ST guidelines (OR=0.47, 95%CI=0.47, 0.99).

**Discussion:** Social interaction was positively associated with PA, likelihood of meeting PA and overall movement guidelines and negatively associated with ST. Future research should consider parental facilitation of outdoor time as a potential mediator in this relationship. Improving understanding of the relationship between the NSE and health behaviours in young children will help to guide community-based initiatives aimed at increasing guideline achievement.

**Conflict of Interest Statement:** The author declares no relevant conflict of interest in relation to this work

## EO5. Queensland Early Childhood Educators' perceived physical literacy

\*Jaime Barratt, [j.barratt@uq.edu.au](mailto:j.barratt@uq.edu.au), University of Queensland, Brisbane, Australia  
John Cairney, [j.cairney@uq.edu.au](mailto:j.cairney@uq.edu.au), University of Queensland, Brisbane Australia

**Introduction:** Physical activity (PA) for preschool children promotes several health outcomes. Considering majority spend their weekdays in childcare settings, the Early Childhood Educator (ECE) becomes a key facilitator of PA. From a pragmatic perspective, physical literacy (PL) is a vehicle for promoting lifelong engagement in PA. However, little research exists exploring ECEs perceived PL to further explore the relationship between their PL and children's PA. This study is the first to explore ECEs' perceived PL in accordance with the domains in the Australian Physical Literacy Framework (APLF). Therefore, the purpose of this study is to explore Queensland ECEs' perceived PL according to the APLF domains, and factors that contribute to their own PL and preschoolers' PA.

**Methods:** This qualitative study aimed to explore ECEs perceived PL through one-on-one semi-structured in-depth interviews. Three ECEs were recruited from three separate kindergartens across Queensland, Australia, and participated in the audio-recorded interviews via Zoom. They were each asked 33 questions surrounding their PL. Interviews were transcribed verbatim and analyzed in NVivo12 following Braun and Clarke's (2006) phases of thematic analysis. Categorisation of themes were driven by the APLF domains.

**Results:** Analyses resulted in four overarching themes related to the APLF domains: physical, psychological, social, and cognitive. Each educator reported a similar upbringing, high engagement in PA, and perceived themselves confident and capable to engage in PA in and outside of kindergarten settings. The most prominent factors they believed play a role in their own and children's PA and PL, include involvement in sports, organisational collaboration, maintaining a positive attitude, and access to outdoor spaces. One of the most significant barriers to PA and PL reported by ECEs, was organisational policies.

**Discussion:** The voices of ECEs are fundamental to exploring and improving PL and PA in early years settings. The results illustrate all three ECEs were quite physically literate when discussing their capabilities in each domain (according to the APLF). Importantly, since all educators perceived similar factors contributing to PA and PL, this suggests their upbringing, and the organisation they are employed within, and its' policies play an important role in promoting PL and PA.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## EO6. Wellbeing for rangatahi: Enhancing the Sport New Zealand Outcomes Framework through an equity lens

\*Tom Bergen, berto954@student.otago.ac.nz, University of Otago, Wellington, New Zealand.  
Melissa McLeod, melissa.mcleod@otago.ac.nz, University of Otago, Wellington, New Zealand.  
Louise Signal, louise.signal@otago.ac.nz, University of Otago, Wellington, New Zealand.  
Anja Mizdrak, anja.mizdrak@otago.ac.nz, University of Otago, Wellington, New Zealand.  
Justin Richards, justin.richards@sportnz.org.nz, Sport New Zealand, Wellington, New Zealand.

**Introduction:** The Sport New Zealand Outcomes Framework (SNZOF) is internationally novel because it attempts to comprehensively describe the contribution of physical activity (PA) to national wellbeing. It was developed based on the Living Standards Framework (LSF), which articulates the NZ Government's wellbeing agenda. Our knowledge is developing regarding what positive or negative contributions the SNZOF makes to the nation and whether it will benefit all New Zealanders equally. This paper aims to enhance the SNZOF by using an equity-based approach to examine literature and further strengthen our understanding of the multifaceted influence PA has on rangatahi (i.e. young people aged 12-17 years) wellbeing.

**Methods:** We conducted a literature review on critiques of the LSF, existing literature on other wellbeing frameworks and key assumptions presented in the SNZOF to identify population groups likely to experience the most inequities when applying the existing framework. We then applied an inductive thematic analysis of our review findings to identify key themes about gaps found within the SNZOF from the perspective of these groups.

**Results:** We found that the SNZOF does not fully encapsulate wellbeing from a Māori and Pasifika perspective and not all of it is applicable for rangatahi and disabled populations. The literature also revealed that the SNZOF lacked information in areas that are important to the identified rangatahi groups that were categorised into three key themes: Accessibility, Culture and Autonomy.

**Discussion:** This study addresses the disconnect between holistic rangatahi wellbeing and the PA system through the perspective of groups experiencing inequities within Aotearoa. The SNZOF can be enhanced by adapting the presentation of the wellbeing domain priorities to align with a more holistic conceptualisation of wellbeing across the lifespan and by more explicitly articulating system processes that embrace all New Zealanders. Policy makers and practitioners worldwide should utilise and further uplift these recommendations in pursuit of PA systems that enrich everyone's lives equally.

**Conflict of Interest Statement:** Tom Bergen is of European and Māori descent and respects that he is not part of Pasifika and disability groups, his recommendations should be informed by research from their perspective. Tom Bergen received a Sport NZ scholarship. Justin Richards is an employee of Sport NZ. The views in this paper are the authors and do not represent those of Sport NZ.

## EO7. "Stopping the rot before it's too late": Cross-sectional analyses of inequities in physical activity for tamariki in Aotearoa New Zealand

\*Janette Brocklesby, janette.brocklesby@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Stefanie Ruckpaul, stefanie.ruckpaul@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Jay Carlsen, jay.carlsen@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Hamish McEwen, hamish.mcewen@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Roman Konopka, roman.konopka@nielseniq.com, NielsenIQ, Wellington, NZ  
Elise van Bergenhenegouwen, elise.vanbergenhenegouwen@nielseniq.com, NielsenIQ, Wellington, NZ  
Antoinette Hastings, antoinette.hastings@nielseniq.com, NielsenIQ, Wellington, NZ  
Justin Richards, justin.richards@sportnz.org.nz, Sport New Zealand, Wellington, NZ

**Introduction:** Participation in physical activity declines across the lifespan, with tamariki (i.e. children aged 5-11 years) the most active age group in Aotearoa New Zealand (NZ). Despite high participation levels of tamariki, little is known about any variation across different population groups and the underlying determinants of their physical activity behaviour. We examined differences in physical activity levels and key barriers to participation according to key socio-demographics.

**Methods:** Active NZ is a national participation survey for physical activity that applies a continuous data collection method to assess ~3,500 tamariki throughout the year with the assistance of a parent/care-giver. We pooled data from 2017 to 2019 (n=10,687) and calculated means for physical activity levels and various determinants of participation for the full sample and stratified groups according to age, gender and socio-economic status. Descriptive comparisons between groups were analysed using parametric methods (p<0.05).

**Results:** Tamariki were active for an average of 10.9 hours/week. Except at age 5, where participation levels were lower, there was no variation by age. Although time spent in play decreased by 26% as tamariki got older, this was counterbalanced by increased participation in competitive sport. There was disparity in physical activity participation according to gender, with males active on average one hour more and reporting 4% more enjoyment of sport and 10% higher motivation for physical challenge. Although there was no difference in self-reported confidence or competence according to gender, females were more likely to express fear of getting injured and experience affordability and access barriers. Tamariki in lower socio-economic areas were less likely to have access to physical activity opportunities and identified affordability (27%), no places nearby (17%) and limited equipment (12%) as key barriers.

**Discussion:** Physical activity levels are maintained as tamariki grow up, but their preferences change from informal play to organised sport. However, the systemic inequities in physical activity participation according to gender and socio-economic status that exist in older age groups are already entrenched for tamariki in NZ. Future intervention should address both experience and access barriers experienced by tamariki females and focus on providing equitable opportunities for lower-socioeconomic communities.

**Conflict of Interest Statement:** JB, SR, JC, HM and JR are employees of Sport NZ and are actively engaged in researching and promoting quality play and physical activity policy and practice in Aotearoa New Zealand. RK, EB and AH are contracted by Sport NZ to manage and deliver the Active NZ survey.

## EO8. Early childhood educators' awareness and knowledge of the movement guidelines for pre-school aged children in Hong Kong

\*Catherine M. Capiro, ccapiro@eduhk.hk, The Education University of Hong Kong, Hong Kong SAR  
Kevin K.H. Chung, kevin@eduhk.hk, The Education University of Hong Kong, Hong Kong SAR  
Catalina S.M. Ng, csmng@eduhk.hk, The Education University of Hong Kong, Hong Kong SAR  
Cindy H.P. Sit, sithp@cuhk.edu.hk, The Chinese University of Hong Kong, Hong Kong SAR  
Rachel Jones, rachelj@uow.edu.au, University of Wollongong, NSW, Australia

**Introduction:** Movement behaviours in childhood are believed to track to adulthood, potentially impacting later life. The *Guidelines on Physical activity, Sedentary behaviour and Sleep for Children under five years of age* by the World Health Organisation was adopted by the Centre for Health Protection in Hong Kong. It is being disseminated to early childhood education centres (ECECs) who had volunteered to join a campaign on healthy eating and physical activity. ECEC educators who are aware and knowledgeable of movement guidelines could help promote healthy movement behaviours. We assessed early childhood educators' awareness and knowledge of the movement guidelines for young children in Hong Kong.

**Methods:** Invitations to participate in an online survey were sent to registered local ECECs. Teachers (N = 301) responded to close-ended questions that were adapted from previous studies that measured the awareness (i.e., whether they had seen or heard of them) and knowledge of physical activity, sedentary behaviour, and sleep guidelines for children aged two to six years. Additional questions enquired about the background of the respondents (i.e., professional qualification, age, sex) and the contexts in which physical activities were being implemented in ECEC settings.

**Results:** Majority of the participants reported awareness and knowledge, respectively, of the guidelines for physical activity (88%, 87%), sedentary behaviour (70%, 80%), and sleep (58%, 84%) of young children. Smaller portions of the participants reported the correct recommended time for physical activity (23%), sedentary behaviour (25%), and sleep (62%). Teachers who have higher degree qualifications tended to be aware of the guidelines for physical activity ( $X^2=9.56$ ,  $p=0.04$ ) and sedentary behaviour ( $X^2=13.20$ ,  $p=0.01$ ), more so than those with lower qualifications. Physical activities were reportedly promoted in ECEC settings during free play (81%), outdoor activities (73%), indoor games (66%), and other learning areas such as literacy and numeracy (28%).

**Discussion:** It appears that dissemination of the movement guidelines for young children has been adequate to promote awareness amongst ECEC teachers in Hong Kong. However, further effort is needed to ensure that correct knowledge is shared. The findings suggest that policies are needed for a targeted and systematic strategy to enable educators in promoting healthy movement behaviours in ECEC learning contexts.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## EO9. "Smells like teen spirit": Cross-sectional analyses of inequities in physical activity for rangatahi in Aotearoa New Zealand

\* Jay Carlsen, jay.carlsen@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Janette Brocklesby, janette.brocklesby@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Stefanie Ruckpaul, stefanie.ruckpaul@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Hamish McEwen, hamish.mcewen@sportnz.org.nz, Sport New Zealand, Wellington, NZ,  
Roman Konopka, roman.konopka@nielseniq.com, NielsenIQ, Wellington, NZ  
Elise van Bergenhenegouwen, elise.vanbergenhenegouwen@nielseniq.com, NielsenIQ, Wellington, NZ  
Antoinette Hastings, antoinette.hastings@nielseniq.com, NielsenIQ, Wellington, NZ  
Justin Richards, justin.richards@sportnz.org.nz, Sport New Zealand, Wellington, NZ

**Introduction:** Physical activity levels decrease across the lifespan, but there is a particularly rapid decline that occurs in rangatahi (i.e. young people aged 12-17 years) in Aotearoa New Zealand (NZ). However, little is known about any variation in rangatahi physical activity participation and its underlying determinants across different population groups. We examined differences in physical activity levels and key barriers to participation according to key socio-demographics.

**Methods:** Active NZ is a national participation survey for physical activity that applies a continuous data collection method to assess ~2,000 rangatahi throughout the year. We pooled data from 2017 to 2019 (n=5,711) and calculated means for physical activity levels and various determinants of participation for the full sample and stratified groups according to age, gender, ethnicity and socio-economic status. Descriptive comparisons between groups were analysed using parametric methods ( $p < 0.05$ ) and only statistically significant results are reported.

**Results:** Rangatahi reported a ~50% decline in physical activity duration and number of activities they participated in from the age of 12 to 17 years. The biggest decline happens at the age of 15 years and is primarily driven by a drop in participation in organised sports, as opposed to informal activities. There is disparity according to ethnicity, with Asian rangatahi 29% less active than others and Māori and Pasifika rangatahi 14% more active. There were also inequities according to gender, with females 14% less active and more likely to report low motivation (24%), fear of not being fit enough (14%) and no-one to be active with (14%) as barriers to participation.

**Discussion:** Physical activity levels drastically decline in rangatahi and there are also significant inequities in participation according to gender and ethnicity. Future intervention should focus on ensuring appropriate physical activity opportunities are available for Asian rangatahi and address key psychosocial factors affecting the participation of females. The promotion and maintenance of informal activities may be an effective strategy to maintain physical activity levels, particularly during the tumultuous life transition that often occurs during mid teenagehood.

**Conflict of Interest Statement:** JC, JB, SR, HM and JR are employees of Sport NZ and are actively engaged in researching and promoting quality play and physical activity policy and practice in Aotearoa New Zealand. RK, EB and AH are contracted by Sport NZ to manage and deliver the Active NZ survey.

## E10. Associations of home and neighbourhood environments with children's physical activity in USA: the Neighborhood Impact on Kids study.

\*Alison Carver, Alison.Carver@acu.edu.au , Australian Catholic University, Melbourne, Australia  
Ester Cerin, Ester.Cerin@acu.edu.au, Australian Catholic University, Melbourne, Australia  
Muhammad Akram, Muhammad.Akram@acu.edu.au, Australian Catholic University, Melbourne, Australia  
Kelli L. Cain, kcain@health.ucsd.edu, University of California, San Diego, La Jolla, CA, USA  
Carrie M. Geremia, cgeremia@health.ucsd.edu, University of California, San Diego, CA, USA  
Terry L. Conway, tconway@health.ucsd.edu, University of California, San Diego, CA, USA  
James F. Sallis, jsallis@health.ucsd.edu, University of California, San Diego, CA, USA  
Brian E. Saelens, brian.saelens@seattlechildrens.org, Seattle Children's Research Institute, Seattle, WA, USA

**Introduction:** School-aged children are at risk of physical inactivity. Supportiveness for physical activity (PA) of home and neighbourhoods environments may affect children's PA levels. However, most studies on this are cross-sectional. We examined environmental predictors of change in children's PA over two years.

**Methods:** Data were drawn from the prospective, observational study, 'Neighborhood Impact on Kids'. Participants were children (aged 6-12 years) attending elementary school, paired with their parent/caregiver (n = 727 dyads) in two areas of San Diego, California and Seattle, Washington, USA. Children's moderate-to-vigorous PA (MVPA) was objectively measured using accelerometers at two time-points: T1 (2007-2009) and T2 at two years. At T1, parents survey-reported on PA equipment at home and demographics. Neighborhood environmental exposures were measured using Geographic Information Systems (intersection density, park availability) and audits (informal playspace near home; park-based PA facilities; land use; support for walking/cycling). Following multiple imputation of missing data, generalized additive mixed models were used to estimate total effects, then direct effects, of environmental attributes on MVPA at T1. Two-way moderating effects of child's sex and age were examined. To examine associations of baseline environmental exposures with changes in MVPA, we estimated interaction effects of environmental attributes on the association between time and MVPA.

**Results:** On average, children accumulated 146 min/day (SD 53) of MVPA at T1, and 113 (SD 58) min/day at T2. There were no significant total or direct effects of environmental attributes on MVPA at T1, and no significant two-way interaction effects of child's age and sex. However, we found that if playspaces had more amenities, MVPA declined less from T1-T2. Higher residential density and higher quality PA facilities in parks were associated with greater declines in MVPA.

**Discussion:** Informal playspaces of higher quality may help offset declines in MVPA. Having such venues close to home may promote unstructured active play with opportunities for discreet parental surveillance. Unexpectedly, better PA facilities in parks were associated with greater declines in children's MVPA. Possibly, parents of children in this age-group do not consider parks as safe venues to play and feel a need for parental accompaniment, resulting in less habitual play.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E11. Changes in physical activity and sedentary behavior in young adults during the COVID-19 pandemic: a longitudinal study throughout one year

\* Sitong Chen, stiong.chen@live.vu.edu.au, Victoria University, Melbourne, Australia  
Kaixin Liang, liangkaixin2020@email.szu.edu.cn, Shenzhen University, Shenzhen, China  
Xinli Chi, xinlich@126.com, Shenzhen University, Shenzhen, China

**Introduction:** The COVID-19 pandemic has caused significant changes in physical activity (PA) and sedentary behavior (SB). However, little is known about changes in PA and SB throughout one year during the COVID-19 period, as the pandemic is still ongoing. This study aimed to examine the changes in PA and SB in a sample in Chinese young adults using a repeated-measure design composed of four surveys.

**Methods:** 1793 study participants were invited to engage in the survey initially (early 2020), and finally, 411 participants provided self-reported data of sociodemographic characteristics (including sex, age), PA, and SB for all the four surveys. Nonparametric tests with Dwass-Steel-Critchlow-Fligner post hoc comparisons and generalized estimating equations were conducted for changes in PA and SB, and its associated sociodemographic predictors, separately.

**Results:** Data revealed significant changes in moderate to vigorous PA (MVPA), light PA (LPA), and SB. Compared to the baseline (the first survey), MVPA and LPA generally increased in the later surveys ( $p < 0.05$ ) with some slight variations, whilst SB significantly decreased ( $p < 0.05$ ). Being female was the only one predictor of changes in MVPA (Beta = -0.311,  $p < 0.001$ ). Being female (Beta = 0.115,  $p = 0.003$ ) and perceived family affluence (Beta = -0.059,  $p < 0.001$ ) were significant two predictors of changes in SB. As such, at a later stage during the COVID-19 era, health behaviors in young adults were improved, of which specifically MVPA increased than that during the early pandemic, which SB decreased than that during the early pandemic.

**Discussion:** Tracking PA and SB during the COVID-19 pandemic is useful to understand the impact of the pandemic on active lifestyle in young adults. This study offers evidence that with regular routine returned, PA and SB in young adults were likely to optimized and tended to be healthful. Sex and perceived family affluence were two important factors to predict health behaviors. This should be considered when targeting risk populations for behavior changes during the public health crisis. Our results can inform efficient policies or interventions in the COVID-19 era and future similar public health events.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work

## E12. *trips4health*: Findings from a COVID-interrupted randomised controlled trial to increase public and active transport

Ting Zhao, ting.zhao@utas.edu.au, University of Tasmania  
Oliver Stanesby, oliver.stanesby@utas.edu.au, University of Tasmania  
Kim Jose, kim.jose@utas.edu.au, University of Tasmania  
Kylie Ball, kylie.ball@deakin.edu.au, Deakin University  
Stephen Greaves, stephen.greaves@sydney.edu.au, University of Sydney  
Gudrun Wells, gudrun.wells@utas.edu.au, University of Tasmania  
Melanie Sharman, melanie.sharman@utas.edu.au, University of Tasmania  
Megan Morse, meganpod@yahoo.com, Tasmanian Health Service  
Lexie Magill, lexie.magill@stategrowth.tas.gov.au, Tasmanian Government Dept of State Growth  
Leigh Blizzard, leigh.blizzard@utas.edu.au, University of Tasmania  
Katie Cooper, katie.cooper@metrotas.com.au, Metro Tasmania  
Andrew Palmer, andrew.palmer@utas.edu.au, University of Tasmania  
Alison Venn, alison.venn@utas.edu.au, University of Tasmania  
\*Verity Cleland, verity.cleland@utas.edu.au, University of Tasmania

**Introduction:** Public transport (PT) users accumulate more physical activity (PA) than motor vehicle users, but evidence of effective and scalable strategies for increasing public transport-related PA is sparse. The randomised controlled trial (RCT), *trips4health*, was designed to increase transport-related PA through increased PT use. It was abandoned due to the COVID-19 pandemic; at that time, approximately one third of the target sample had been randomised. This report presents feasibility and proof-of-concept data.

**Methods:** *trips4health* was a theory-informed single-blinded RCT with a 16-week intervention phase. Participants (n=109) were randomised to: an incentives-based intervention (bus trip credits for reaching bus trip targets; weekly text messages; written PA guidelines); or an active control (written PA guidelines). Measures collected prior to randomisation (baseline) and post-intervention (16 weeks) were self-reported demographic (e.g., age, gender, education) and health (e.g., body mass index, smoking) characteristics, and bus use via self-report and travel smartcard data (also collected for 10 weeks post-intervention). Descriptive statistics describe bus use, average trips, and target attainment.

**Results:** There were no significant differences in baseline demographic, health, or bus use characteristics between groups prior to intervention. During the intervention period, from smartcard data records, 55% of intervention and 40% of control group participants travelled by bus; intervention group participants made 2.5 trips/week and control group participants made 1.8 trips/week; and 42% of intervention and 25% of control group participants met weekly trip targets. Between intervention completion (16 weeks) and 10 weeks post-intervention (26 weeks), bus use (from smartcard data) declined dramatically, coinciding with the broadscale social changes (i.e., impacts on travel and work arrangements) resulting from the COVID pandemic.

**Discussion:** The proportion of participants travelling by bus, the number of bus trips made, and the proportion of participants meeting targets were greater amongst intervention than control group participants on average and every week during the trial, despite no differences at baseline. Data from this COVID-interrupted RCT provide promising preliminary evidence that PT incentives may increase bus use. Future analysis will focus on the impact on PA. These findings may be used to inform the development of a larger effectiveness trial.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

### **E13. Effectiveness of interventions to increase adolescents' physical activity and reduce sedentary behaviours in secondary school settings: systematic review and meta-analysis**

\* Ana María Contardo-Ayala, a.contardoayala@deakin.edu.au, Deakin University, Melbourne, Australia  
Kate Parker, k.parker@deakin.edu.au, Deakin University, Melbourne, Australia.  
Emiliano Mazzoli, e.mazzoli@deakin.edu.au, Deakin University, Melbourne, Australia.  
Natalie Lander, natalie.lander@deakin.edu.au, Deakin University, Melbourne, Australia.  
Nicola D. Ridgers, nicky.ridgers@deakin.edu.au, Deakin University, Melbourne, Australia.  
Anna Timperio, anna.timperio@deakin.edu.au, Deakin University, Melbourne, Australia.  
David R. Lubans, david.lubans@newcastle.edu.au, University of Newcastle, Callaghan, Australia  
Gavin Abbott, gavin.abbott@deakin.edu.au, Deakin University, Melbourne, Australia.  
Harriet Koorts, h.koorts@deakin.edu.au, Deakin University, Melbourne, Australia.  
Jo Salmon, jo.salmon@deakin.edu.au, Deakin University, Melbourne, Australia.

**Introduction:** Globally, the majority of adolescents fail to meet the physical activity guidelines and spend most of the school day sitting. Currently, it is unclear which types of school-based interventions effectively increase physical activity and reduce sedentary time among adolescents. This systematic review and meta-analysis aimed to identify a) strategies used to increase adolescents' physical activity and reduce sedentary time during the school day; b) the effect of these strategies on physical activity, sedentary time, academic, physical health and/or psychological outcomes; and c) factors related to intervention implementation (e.g., fidelity, dose, and reach).

**Methods:** Authors searched MEDLINE complete, EMBASE, CINAHL, SPORTDiscus, APA PsycINFO, and ERIC databases in January 2021 for studies that 1) included secondary/middle/high school-age adolescents; 2) involved an intervention delivered in the school setting to increase physical activity of any intensity and/or decrease sedentary behaviour; and 3) were published in English. Reported effects of school-based initiatives on the different outcomes were pooled in meta-analyses.

**Results:** In total, 74 articles met the inclusion criteria, with 23 unique intervention strategies used. Interventions that involved physical activity sessions, environmental modifications, teacher training, peer support, educational and/or active lessons were positively associated with physical activity and sedentary time and with academic, psychological and/or physical health outcomes. The meta-analyses showed statistically non-significant effects on device-measured physical activity (Standardised mean difference [SMD]=0.06, 95%CI -0.00, 0.12) and sedentary time (SMD=0.00, 95% CI -0.12,0.12), and statistically significant small decreases in device-measured sitting (SMD= -0.60, 95%CI -1.21, -0.00) and small increase in standing time (SMD=0.54, 95%CI 0.00, 1.08) (across the whole day). Statistically non-significant effects on waist circumference (SMD=0.08, 95%CI -0.15,0.31) and small statistically significant decrease in body mass index (SMD=-0.09, 95%CI -0.18, -0.00) were also found. Factors related to intervention implementation were reported in just ~28% of the articles.

**Discussion:** While some intervention approaches demonstrated promise, small or non-significant effects were found in the meta-analyses. Future school-based interventions should utilise a whole of school approach to beneficially change adolescents activity. Consistent reporting of implementation strategies will increase understanding of how interventions effect outcomes.

**Conflict of interest:** The authors declare no relevant conflict of interest in relation to this work.

## E14. Drop-out in A Web-based Health Intervention Program: A Mixed-Method Approach

\*Yanping Duan, duanyp@hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China  
Min Yang, myanghkbu@gmail.com, Hong Kong Baptist University, Hong Kong, China  
Wei Liang, wliang1020@hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China  
Yanping Wang, 21482705@life.hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China

**Introduction:** The high drop-out rate is common in the field of eHealth intervention programs, and it can weaken the effects of intervention. This study aimed to investigate the drop-out in a web-based health intervention program targeting physical activity (PA) and fruit and vegetable intake (FVI) among Chinese university students. The study objectives were 1) to examine the difference in the effects of web-based health intervention between dropouts and completers; 2) to identify the predictors of drop-out; 3) to understand the experience of web-based intervention of dropouts and completers; 4) to find out the drop-out reasons.

**Methods:** A mixed-method approach was applied in this study. In the quantitative study, 330 Chinese university students (Mean age = 20.1 years, SD=1.04, female 60.6%) from an 8-week web-based intervention group (4-week PA + 4-week FVI) were included. Among them, 282 were completers and 48 were dropouts. PA, FVI, social-cognitive variables of two behaviors (intention, motivational self-efficacy (Mo-SE), volitional self-efficacy (Vo-SE), and plan), BMI and quality of life were measured at pre-test and post-test respectively. Linear mixed model and the logistic regression were applied. In the qualitative study, 24 participants (Mean age =19.38 years, SD=0.81) were recruited from the quantitative study, including 12 completers and 12 dropouts. The semi-structured interviews were conducted on two topics: 1) experience of participating in web-based health intervention; 2) the drop-out reasons. The thematic analysis method was applied to analyze qualitative data.

**Results:** In the quantitative research, a significant difference was identified in FVI between dropouts and completers. Completers reported significant changes of PA intention, FVI intention, PA Mo-SE and FVI Mo-SE compared to those of dropouts. Gender, PA intention, PA Vo-SE, and FVI Mo-SE were predictors of drop-out. In the qualitative research, three themes were identified for topic 1, including PA and FVI behaviors, determinants affecting behavior change, and physical and mental health benefits. Two themes were identified for topic 2, including internal causes and external causes.

**Discussion:** Completers obtained more benefits from the intervention than dropouts. The predictors and reasons of drop-out were identified, which can be intervened in future web-based intervention to enhance the retention of participants.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E15. Correlates and determinants of transport-related physical activity among adults: an interdisciplinary systematic review

\*Jack Evans, jack.evans@utas.edu.au, Menzies Institute for Medical Research, Hobart, Australia.  
Hoang Phan, thi.phan@utas.edu.au, Menzies Institute for Medical Research, Hobart, Australia.  
Marie-Jeanne Buscot, m.buscot@utas.edu.au, Menzies Institute for Medical Research, Hobart, Australia.  
Seana Gall, seana.gall@utas.edu.au, Menzies Institute for Medical Research, Hobart, Australia.  
Verity Cleland, verity.cleland@utas.edu.au, Menzies Institute for Medical Research, Hobart, Australia.

**Introduction:** Transport-related physical activity (TRPA) has been identified as a way to promote physical activity due to its discretionary and habitual nature. Factors thought to influence TRPA span multiple disciplines and are rarely systematically considered in unison. This systematic review aimed to identify cross-sectional and longitudinal factors associated with adult TRPA across multiple research disciplines.

**Methods:** Using four electronic databases, a systematic search of English, peer-reviewed literature spanning 2010 – 2020 was performed. Studies quantitatively examining factors associated with the outcome of adult TRPA were eligible.

**Results:** Seventy-three studies (n=66 cross-sectional; n=7 longitudinal) were included, cumulatively reporting data from 1,278,632 participants. Thirty-six factors associated with TRPA are reported within a social-ecological framework: individual factors including physical/health, behaviours, and socio-economic status (n=15); social factors including neighbourhood cohesion and normalisation (n=3); and environmental factors including infrastructure, distance, and residential locale (n=18).

**Discussion:** This is the first comprehensive compilation of the correlates and determinants of adult TRPA. A range of individual, social, and environmental factors demonstrated consistent associations with TRPA. Models formed using these factors may facilitate more effective promotion of TRPA. There is a lack of longitudinal studies, as well as studies assessing cognitive/attitudinal and social factors, highlighting gaps for further research. Those developing policies and strategies targeting TRPA need to consider a broad range of factors at the individual, social, and environmental level to maximise the likelihood of effectiveness.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E16. "Lion-hearted": Wellbeing impacts of the 2017 British and Irish Lions Rugby Tour of Aotearoa New Zealand

\*Alex Hamilton, alex.hamilton@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Bridgette Lynch, bridgette.lynch@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Hamish McEwen, hamish.mcewen@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Conal Smith, conal.smith@kotata.org.nz, Kotata, Wellington, NZ  
Justin Richards, justin.richards@sportnz.org.nz, Sport New Zealand, Wellington, NZ

**Introduction:** High-performance sport may contribute to population wellbeing beyond its commonly hypothesized but under-evidenced role in inspiring people to participate in physical activity (i.e. trickle-down effects). For example, an elite sporting event that socially connects the general population has inherent wellbeing value, independent of whether it changes subsequent physical activity behaviour. Major events are a key mechanism by which high performance sport is proposed to produce population wellbeing benefits, both tangible and intangible. While there have been several international studies on the wellbeing benefits of hosting major sporting event, this has not previously been explored in Aotearoa New Zealand (NZ). We examined the impact of a major sporting event on population wellbeing using econometric analyses of existing data.

**Methods:** We compared the relative media profile of significant major sporting events held in NZ between 2016-2019 and identified the 2017 British and Irish Lions' Rugby Tour of NZ (Lion's Tour) as the target event for our analyses. Using nationally representative survey data (n=73,472) and a difference in differences design, we analysed the relationship between exposure to the Lion's Tour and self-reported subjective wellbeing for different demographic groups.

**Results:** The Lion's Tour appeared to have a moderate impact on the subjective wellbeing of the rugby-playing community in NZ, who had a 0.11 higher subjective wellbeing score when compared to the comparison group during the study period. When annualized, the effect size was 0.064.

**Discussion:** To contextualise our results, the annualized wellbeing impact of the Lion's Tour was comparable to half that of volunteering for a year (+0.15) or moving from a damp to a dry home (+0.15). This analysis provides a conservative estimate of the contribution of high-performance sport to wellbeing beyond its unsubstantiated contribution to physical activity participation. Failing to recognise this broader value of high-performance sport undermines its importance to the wellbeing of NZ and may compromise or misallocate national investment in the sector. Future decisions on investment into sport and physical activity may benefit from applying similar econometric analyses to optimise the impact on population wellbeing, particularly in times of fiscal constraint.

**Conflict of Interest Statement:** AH, BL, HM and JR are employees of Sport NZ and are actively engaged in researching and promoting quality play and physical activity policy and practice in Aotearoa New Zealand. CS is contracted by Sport NZ to advise on wellbeing assessment and valuation.

## E17. Effects of classroom-based physical activity interventions on schoolchildren's step count, cognition and the academic performance: a systematic review and meta-analysis

D.L.I.H.K. Peiris, hashi@kln.ac.lk, Hong Kong Baptist University, Hong Kong, China.  
Wei Liang, williangneo@foxmail.com, Hong Kong Baptist University, Hong Kong, China.  
Min Yang, myanghkbu@gmail.com, Hong Kong Baptist University, Hong Kong, China.  
Julien S. Baker, jsbaker@hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China.  
Corneel Vandelanotte, c.vandelanotte@cqu.edu.au, CQUniversity, Rockhampton, Australia.  
Borui Shang, borui\_shang\_pe@qq.com, Hebei Institute of Physical Education, Hebei, China.  
\*Duan Yanping, duanyp@hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China.

**Introduction:** Physical activity-based interventions for schoolchildren are acknowledged to improve step count (SC), cognitive skills (CS), and academic performance (AP). However, the effectiveness of classroom-based physical activity interventions (CBPAI) reveals a wide range of diversity and less consistency. Therefore, this study evaluated CBPAI's effects on schoolchildren's SC, cognition, and AP.

**Methods:** Randomised controlled trials exclusively carried out inside the classroom versus control groups (CG) among children aged 6 to 13 years old for SC, CS, and AP were searched using PubMed, PsycINFO (ProQuest), MEDLINE (EBSCOhost), Embase/ Ovid, SportDISCUS (EBSCOhost), Web of Science, Scopus and Academic Search Premier (EBSCOhost). Studies' methodological and quality were evaluated using the revised Cochrane risk-of-bias (RoB) tool for randomised trials. Data were extracted for participant characteristics, intervention design, SC, CS, and AP. RevMan 5.4 and JAMOVI 2.0 softwares were used to perform meta-analysis and the publication bias (PB) test respectively. Study removal method was used for sensitivity analysis.

**Results:** Data from 11 trials involved 40 to 3056 children were extracted for the qualitative synthesis. Meta-analysis from 10 studies were conducted for SC, CS, and AP. ROB scores ranged from 9.1% to 54.5%, and PB was detected in CS. SC increased both in control group (CG) and intervention group (IG), but did not favour the IG ( $p = .06$ , CI95%  $-.56, .01$ ,  $ES_{SC} = .27$ ,  $df = 1$ , RE Model  $I^2=0\%$ ). CS of IG significantly improved by the CBPAI ( $p = .06$ , CI95%  $-.56, .01$ ,  $ES_{EFupdating} = -.27$ ,  $df = 1$ , RE Model  $I^2=0\%$ ). CBPAI was not effective in improving AP ( $p = .20$ , CI95%  $-.32, 1.57$ ,  $ES_{mathematics} = .62$ ,  $df = 6$ , RE Model  $I^2=97\%$ ;  $p = .45$ , CI95%  $-1.38, 3.10$ ,  $ES_{reading} = .86$ ,  $df = 2$ , RE Model  $I^2=99\%$ ;  $p = .17$ , CI95%  $-1.38, 3.10$ ,  $ES_{spelling} = .86$ ,  $df = 1$ , RE Model  $I^2=93\%$ ; and  $p = .08$ , CI95%  $-.09, 1.48$ ,  $ES_{foreignlanguage} = .70$ ,  $df = 1$ , RE Model  $I^2=80\%$ ).

**Discussion:** The findings of the study are limited due to the heterogeneity, and imprecision caused by different samples settings, test standards, and intervention design. Well-designed interventions with high methodological quality should further evaluate CBPAI's contribution in improving SC's SC, cognition and AP.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work. PROSPERO registration number CRD42021234192.

## E18. Not such a “Teenage dirtbag”: Cross-sectional analysis of secondary school physical activity facilities and experiences in Aotearoa New Zealand

\*Loren Howson, loren.howson@sportnz.org.nz, Sport NZ, Wellington, NZ  
Jack Lane, jack.lane@sportnz.org.nz, Sport NZ, Wellington, NZ  
Glen McCarty, glen.mccarty@sportnz.org.nz, Sport NZ, Wellington, NZ  
Justin Richards, justin.richards@sportnz.org.nz, Sport NZ, Wellington, NZ

**Introduction:** Participation in physical activity declines across the lifespan and there is a notable “drop off” in duration, frequency and variety of activity in rangatahi (i.e. young people aged 12-17 years) in Aotearoa New Zealand (NZ). A large proportion of this decline in physical activity levels happens in the secondary school setting, but little is known about the determinants of this behaviour change. We examined the physical activity experiences of rangatahi in secondary school settings in NZ to identify potential levers for effective school-led interventions.

**Methods:** Voice of Rangatahi is a self-report survey that was circulated to 47 secondary schools in NZ between July 2020 – November 2020 (n=7,978 rangatahi). It comprises measures of satisfaction with physical activity experiences at school and key barriers to participation. Descriptive statistics were calculated for the full sample and for stratified groups according to age, gender, ethnicity and school decile as an indicator of socio-economic status. Descriptive comparisons between groups were analysed using parametric methods ( $p < 0.05$ ) and only statistically significant results are reported.

**Results:** Satisfaction with the overall experience of physical activity at school was low, with only 31% of students rating themselves as very or extremely satisfied with it. Across all items of satisfaction, Rangatahi were least satisfied with their school ‘having clean and well-maintained facilities’ (27% very/extremely satisfied). A third (34%) of rangatahi also reported ‘cleanliness and maintenance of facilities’ as the factor they would most like to see improved at school. This was significantly greater for mid-decile schools (33.5%) than high-decile (24%) and low-decile (21%) schools. It was also significantly greater for males (36%) than females (32%).

**Discussion:** Rangatahi are generally dissatisfied with physical activity experiences at secondary school and there is a strong indication for intervention. Addressing the cleanliness and maintenance of facilities may be an effective way to address this dissatisfaction, particularly the facilities used by males and in mid-decile schools. Our results also demonstrate the importance of thinking beyond individual factors (e.g. knowledge, confidence, skills) when considering the determinants of physical activity experience, including considering the potential influence of physical environments associated with being active.

**Conflict of Interest Statement:** The authors are employees of Sport NZ and are actively engaged in researching and promoting quality play and physical activity policy and practice in Aotearoa New Zealand.

## E19. Using incentives to increase public transport use for physical activity gain: process evaluation of the *trips4health* randomised controlled trial

\*Kim Jose, kim.jose@utas.edu.au University of Tasmania,  
Melanie Sharman, melanie.sharman@utas.edu.au University of Tasmania,  
Oliver Stanesby, oliver.stanesby@utas.edu.au University of Tasmania,  
Stephen Greaves, stephen.greaves@sydney.edu.au University of Sydney,  
Katie Cooper, Katie.Cooper@metrotas.com.au Metro Tasmania,  
Andrew Palmer, andrew.palmer@utas.edu.au University of Tasmania,  
Verity Cleland, verity.cleland@utas.edu.au University of Tasmania

**Introduction:** In partnership with a public transport provider, state government, and local government, we designed a single-blinded randomised controlled trial, *trips4health*, to investigate the impact of public transport (PT) use incentives on transport-related physical activity (PA). The intervention involved four-months of incentives (bus trip credits) for achieving increasingly difficult weekly PT use targets, supported by weekly text messages. This paper reports the *trips4health* process evaluation.

**Methods:** Process evaluation, guided by the Medical Research Council UK's framework for complex public health interventions, focused on participant reach and acceptability, intervention fidelity (was the intervention delivered as intended) and feasibility. Data collection included administrative data, post-intervention surveys which were analysed descriptively, and semi-structured interviews which were analysed thematically.

**Results:** The trial was placed on hold (March 2020) then abandoned (May 2020) due to COVID-19. At that time, 116 participants (approximately one third of target sample) had completed baseline measures, 110 were randomised, and 64 completed post-intervention measures. Participants ranged from 18 – 80 years (average 44.3 years) with females (70%) and those with tertiary education (55%) over-represented. Administrative data showed that the intervention was delivered with high fidelity with 96% of bus trip credits and 98.6% of behavioural text messages sent as intended to intervention participants. Interviews with PT provider staff (n = 4) indicated that embedding systems to support the trial was uncomplicated. Intervention participant acceptability was high with 90% of 29 participants reporting that bus trip incentives were helpful and 59% reporting they motivated them to use PT more; responses varied by level of education. 76% of intervention group participants reported that text frequency was just right, but 55% indicated text messages did not change their bus use or PA. Interviews (n = 7) and open-ended survey responses of intervention participants revealed that; meeting bus trip targets and incentives were important for some participants, PT planning supported increased PT use and, not meeting targets was demotivating for continuing bus use for some participants.

**Discussion:** The *trips4health* study demonstrated good acceptability and, with partner support, strong fidelity and feasibility. Future intervention studies incentivising PT use will need to adopt strategies to increase reach.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work

## E2O. Association between Socio-economic Status and Physical Activity among Chinese Children and Adolescents

YouZhi Ke, kyz19941219@163.com, Shanghai University of Sport, Shanghai, China  
Yang Liu\*, docliuyang@hotmail.com, Shanghai University of Sport, Shanghai, China

**Introduction:** Analyze the association between socioeconomic status and physical activity of Chinese children and adolescents, and explore the impact of socio-economic status of children and adolescents of different genders and school levels.

**Methods:** A total of 2486 students (average age  $12.2 \pm 2.3$ , male 49.5%) were investigated by questionnaire. Moderate-to-Vigorous Physical Activity as a measure of physical activity for children and adolescents, parental education, family affluence scale, and self-evaluated economy status measures the Socio-economic Status of children and adolescents. Using descriptive statistics to analyze the basic conditions, and using chi-square tests to compare the differences in variables between different genders and school segments; Pearman correlation analyzed the relationship between socioeconomic status and the number of MVPA days, and further analyzed the impact of socioeconomic status on MVPA for children and adolescents with binary logistic regression.

**Results:** 11.0% of children and adolescents achieved MVPA, boys' rate of reaching MVPA recommendation is higher than girls' rate. Parental education, self-assessment SES and FAS were positively correlated with physical activity ( $p < 0.05$ ), and had significant effects on physical activity of children and adolescents. For different genders, parental education and FAS are positively related to physical activity of boys and have a significant effect ( $p < 0.05$ ); parental education, self-assessment SES and FAS are positively related to physical activity of girls and have a significant effect ( $p < 0.05$ ).

**Discussion:** The proportion of MVPA in children and adolescents in China is relatively low, and that of boys is better than that of girls. With the growth of school stage, the proportion of children and adolescents who reach the recommended amount of MVPA shows a downward trend. In China, socio-economic status has a positive impact on the physical activities of children and adolescents, and there are differences in gender. In the future, we should attach great importance to the problem of insufficient physical activities of children and adolescents, make clear the social stratification differences in physical activities of children and adolescents, and make intervention plans according to the actual situation to ensure the social fairness of physical activities of children and adolescents.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E21. Moodflx: a parent-report instrument of child emotional wellbeing

\*Natalie Lander natalie.lander@deakin.edu.au Deakin University, Melbourne, Australia  
Christopher Greenwood christopher.greenwood@deakin.edu.au Deakin University, Melbourne, Australia  
Craig Olsen craig.olsson@deakin.edu.au Deakin University, Melbourne, Australia  
Paul Salmon paul.salmon@hijo.com.au moodflx, Melbourne, Australia  
Matthew Fuller-Tyszkiewicz matthew.fuller-tyszkiewicz@deakin.edu.au Deakin University, Melbourne, Australia

**Introduction:** Emotional wellbeing is important to children's overall development and enjoyment of life. Accurate measurement of this important domain is required to identify at-risk individuals, understand individual- and population-level risk factors, and to track emotional wellbeing over time. Collecting the views of parents is an important part of a holistic assessment of child emotional wellbeing. However, a lack of consensus regarding measurement approaches, coupled with a lack of adequate measures appropriate for large-scale study of children, complicates efforts to accurately measure emotional wellbeing in this age group. Therefore, the aim of the present study was to design and validate a brief parent-report instrument on child emotional wellbeing - moodflx.

**Methods:** Australian parents were recruited, and followed over 14 waves of data collection during the first COVID-19 lockdown (April 2020– May 2020). Factor analyses were conducted using MPlus. In the wave 2 data (n=1,279), exploratory factor analysis examined model fit. Subsequent confirmatory factor analysis was used to examine the proposed structure, in both the wave 2 data (n = 1,279; 1-level model) and the wave 3-10 data (n = 1,334; 2-level model, repeated measures over time). In wave 2 data (n = 1,279) hybrid invariance-multiple indicator multiple causes modelling were used to test COVID-19 environmental stressor effects on items and latent means.

**Results:** Exploratory factor analysis of the moodflx scale in a sample of 1,279 Australian parents suggested that a 2-factor solution showed acceptable fit. Subsequent confirmatory factor analyses supported the factor structure. Analyses suggested that COVID-19 stressors had little influence on the items or latent factors. In addition, increased scores on the moodflx positive subscale were associated with decreased child mental health outcomes ( $\beta$ range = -0.22 to -0.48), while increased scores on the moodflx negative subscale were associated with increased child mental health outcomes ( $\beta$ range = 0.38 to 0.55).

**Discussion:** moodflx is a concise and psychometrically strong instrument that provides an attractive alternative for parent-reporting of children's emotional wellbeing at a population level. As such, moodflx could provide valuable holistic data on the impact of large-scale physical activity interventions on child emotional well-being.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E22. Feasibility of a teacher facilitated physical activity intervention for adolescents with disability: The Burn 2 Learn adapted pilot study

\*Angus Leahy, angus.leahy@newcastle.edu.au, University of Newcastle, Callaghan, Australia  
Sarah Kennedy, sarah.kennedy@westernsydney.edu.au, University of Western Sydney, Kingswood, Australia.  
Jordan Smith, Jordan.smith@newcastle.edu.au, University of Newcastle, Callaghan, Australia.  
Narelle Eather, narelle.eather@newcastle.edu.au, University of Newcastle, Callaghan, Australia.  
James Boyer, james.boyer1@det.nsw.edu.au, NSW Department of Education, Sydney, Australia.  
Nora Shields, n.shields@latrobe.edu.au, La Trobe University, Melbourne, Australia.  
Ben Dascombe, ben.dascombe@newcastle.edu.au, University of Newcastle, Callaghan, Australia.  
David Lubans, David.lubans@newcastle.edu.au, University of Newcastle, Callaghan, Australia.

**Introduction:** Disability is recognised as a global public health issue. Adolescents with disability are less active and have lower fitness than their typically developing peers, and also have more co-occurring physical and mental conditions. Schools are ideal settings to address this, however few school-based interventions have been designed and evaluated among this group. As such, this study examined the feasibility of a teacher facilitated physical activity intervention for adolescents with disability, known as Burn 2 Learn adapted (B2La).

**Methods:** A non-randomized pilot trial was conducted with sixteen adolescents with disability (aged  $17.3 \pm 0.7$  years) at one secondary school in New South Wales, Australia. Two classroom teachers were trained to facilitate the delivery of 2-3 weekly high-intensity interval training (HIIT) sessions for a period of 2 months. Four domains of feasibility (acceptability, implementation, adaptability, and practicality) were assessed using quantitative measures at the student and teacher levels (e.g., observations, process evaluation questionnaires, and heart rate [HR] monitoring). Preliminary efficacy of the B2La intervention on measures of adolescents' functional capacity (6-minute walk/run test) and muscular fitness (sit-to-stand test and modified push-up test) were analyzed using paired sample t-tests. Adolescents' mood was also assessed before and after HIIT sessions.

**Results:** B2La was well received by both students (80% rated "Good" or "Excellent") and teachers (100% rated "Good" or "Excellent"). Teachers reported delivering  $2.5 \pm 0.7$  sessions per week during the study, however session intensity was lower than intended (72%). Researcher fidelity observations revealed the program was delivered effectively by teachers (14/20). The program was considered 'adaptable' by teachers, with several observed modifications to HIIT sessions to cater for the needs of adolescents with disability. Mean mood scores improved from pre-session to post-session after participating in HIIT. Improvements were observed for functional performance (distance covered) and muscular fitness (sit-to-stand and push-up repetitions).

**Discussion:** The findings suggest it is feasible to train teachers to deliver a school-based HIIT program for adolescents with disability. Efficacy findings were promising, but should be considered preliminary given the small sample size and lack of control group. An evaluation of B2La within a larger-scale effectiveness trial will be conducted.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E23. Compliance with the 24-hour Movement Guidelines in Chinese primary schoolchildren: Correlates and associations with weight status

Wei Liang, wliang1020@hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China

Lin Zhou\*, zlin5198@126.com, Hebei Normal University, Hebei, China

Yuxiu He\*, shiohe@163.com, Hebei Normal University, Hebei, China

Yanping Duan, duanyp@hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China

Julien S. Baker, jsbaker@hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China

**Introduction:** This study aimed to 1) explore the compliance of the 24-hour movement guidelines in Chinese primary schoolchildren aged 7-10-years; 2) investigate the correlates of guideline compliance; and 3) examine the association between guideline compliance and weight status among Chinese primary schoolchildren.

**Methods:** This study used a cross-sectional design using convenience random sampling. Primary schoolchildren were recruited from 1-3 grades of four primary schools in Shijiazhuang, Hebei province, China. The demographics (e.g. grade, ethnicity, residence, parental education levels, and household income) and 24-hour movement guidelines for physical activity (PA), screen time (SCT), and sleep time (SLT) were completed by students' parents via online questionnaires. Weight status, including body mass index (calculated by body weight and body height), body composition (fat free mass, FFM; skeletal muscle mass SMM; and fat percent, Fat%), was collected using objective measures. Descriptive analyses, and multi-level linear/logistic regression models were conducted using SPSS 26.0.

**Results:** A total of 477 primary schoolchildren (54.1% boys) (age  $8.3 \pm 0.94$  years) were included in the analysis. 15.7% of children met all three behavioral guidelines, while 29.4%, 69.3%, and 72.7% complied with the guidelines for PA, SCT, and SLT, respectively. Among diverse demographic variables, only household income showed a significant positive association with the compliance of 24-hour movement guidelines in primary schoolchildren (OR = 1.08, 95%CI: 1.02 to 1.15). After controlling for demographics, compliance with the 24-hour movement guidelines was found to be significantly negatively associated with overweight/obesity (OR = 0.54, 95%CI: 0.30 to 0.97), FFM ( $b = -0.96$ , SE = 0.48, 95%CI: -1.90 to -0.02), and SMM ( $b = -0.58$ , SE = 0.29, 95%CI: -1.15 to -0.02), but not with Fat% ( $b = -0.34$ , SE = 1.04, 95%CI: -2.38 to 1.71) among primary schoolchildren.

**Discussion:** This study provides evidence for a detrimental health status among Chinese primary schoolchildren. The findings support the critical role of complying with 24-hour movement guidelines in the prevention of childhood obesity. In particular, the study supports the practice of performing adequate PA, limiting screen time, and ensuring proper sleep time among primary schoolchildren. Further studies on investigating comprehensive correlates of the guideline compliance (e.g., psychological, social, and environmental determinants), using objective measures for behavioral indicators, and applying a longitudinal design, is warranted in the future.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E24. "The whole is greater than the sum of its parts": Data linking to build a comprehensive physical activity surveillance system

Bridgette Lynch, [bridgette.lynch@sportnz.org.nz](mailto:bridgette.lynch@sportnz.org.nz), Sport New Zealand, Wellington, NZ  
Jason Donaldson, [jason.donaldson@sportnz.org.nz](mailto:jason.donaldson@sportnz.org.nz), Sport New Zealand, Wellington, NZ  
Justin Richards, [justin.richards@sportnz.org.nz](mailto:justin.richards@sportnz.org.nz), Sport New Zealand, Wellington, NZ

**Introduction:** Physical activity is a complex multi-faceted behaviour and combining data from multiple sources is likely to produce richer insights into how people participate and its underlying determinants. However, there are limited examples internationally where physical activity data from different sources has been linked at the individual level. We examine the process of creating an information "sandpit" that enables integration of multiple data sources and improves our understanding of physical activity at an individual level in Aotearoa New Zealand (NZ).

**Methods:** We applied the following steps in the data linking process: 1) Embed pre-defined individual data linking variables (e.g. full name, date of birth, sex) and consent statements for data linking into all relevant data collection vehicles; 2) After data collection, put only the predefined linking variables from each data set into the "sandpit" to identify matches and allocate a unique "linking ID"; 3) Merge the "linking ID" back into the original data sets; 4) De-identify data prior to moving all full datasets back into the "sandpit" with "linking ID" to integrate at the individual level. The output is a "living" dataset that is open to additions from other sources from across government, independent academic studies and/or programme evaluations.

**Results:** To-date three datasets have been linked: 1) Active NZ survey assessing physical activity behaviour and its determinants across the lifespan (n=107,149); 2) Voice of Participant survey assessing the experiences of sport club members across the lifespan (n=152,558); 3) Voice of Rangatahi survey assessing the experiences of physical activity in secondary schools (n=3,552). Initial analyses have enabled a more holistic view of physical activity participation and experiences in NZ.

**Discussion:** The integrated data "sandpit" provides a platform for more comprehensive surveillance across the physical activity system in NZ and also enables tracking of participants in multiple surveys over time. Key learnings have included clearly articulating the parameters for collecting the linking variables data (e.g. consistency in the way date of birth is captured across different vehicles). Future data additions to the "sandpit" will also include non-person centric data (e.g. facility locations) and will be linked using location based indicators (e.g. postcode).

**Conflict of Interest Statement:** The authors are employees of Sport NZ and are actively engaged in researching and promoting quality play and physical activity policy and practice in Aotearoa New Zealand.

## E25. Parent wellbeing and socioeconomic status during early childhood predicts 8 – 13 year old Indigenous children achieving Australian physical activity recommendations

\*Rona Macniven, r.macniven@unsw.edu.au, UNSW Sydney, Australia  
Rebecca Stanley, University of Wollongong, Australia  
Brett Biles, b.biles@unsw.edu.au, UNSW Sydney, Australia  
Dot Dumuid, University of South Australia, Australia  
Paul Chandler, UNSW Sydney, Australia  
Tim Olds, University of South Australia, Australia  
Anthony Okely University of Wollongong, Australia  
\*John Evans john.evans@uts.edu.au University of Technology Sydney

**Background:** Physical activity is wholistically linked to culture and wellbeing among Aboriginal and Torres Strait Islander people (Indigenous peoples in Australia). Correlates of high physical activity among Indigenous children include living in a remote area, having an employed mother and low screen time but little is known about physical activity determinants. This study examines sociodemographic, parental social and emotional wellbeing, culture, community and sedentary behaviour early life determinants of physical activity among Indigenous children aged 8-13 years.

**Methods:** The Longitudinal Study of Indigenous Children (LSIC) is the largest First Nations child cohort study in the world and collects data primarily through parental report in 11 Australian study communities across urban, regional and remote areas. Generalized linear mixed models examined whether sociodemographic characteristics and parent social and emotional wellbeing, measured using the culturally relevant and validated Strong Souls Index (Strengths/resilience and Distress/anxiety/depression) at Wave 1 (age 0-5 years), predicted achieving physical activity recommendations of  $\geq 1$  hour/day moderate-vigorous physical activity (MVPA) at Wave 9 (aged 8 – 13 years).

**Results:** Achieving MVPA recommendations at Wave 9 was associated with the following Wave 1 determinants: high parent social and emotional wellbeing (Resilience; Adjusted Odds Ratio (OR) 1.87 (95% CI 1.32-2.65) but not Distress), having an Aboriginal & Torres Strait Islander mother (1.82 (1.26-2.61)), living in remote areas (OR 3.66 (2.42-5.54)), regional areas (OR 2.98 (2.13-4.18)), low socioeconomic areas (OR 1.85 (1.08-3.17)), main source of family income not wages/salaries (OR 0.66 (0.46-0.97)), and if families played electronic games (OR 0.72 (0.55-0.94)), after adjusting for covariates.

**Discussion:** Strategies to promote high parental wellbeing and resilience, and low levels of family screen time during the critical early years of life (0-5 years), even in families living in remote, low-socioeconomic areas with low employment, are important for Indigenous children's future physical activity levels. An important time point before child physical activity levels often decline. Such strategies should collaborate with Aboriginal and Torres Strait Islander communities and families in designing and implementing physical activity policies and programs.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E26. Facilitators and barriers to physical activity and sport participation experienced by Aboriginal and Torres Strait Islander adults: mixed method review

\* Rona Macniven, r.macniven@unsw.edu.au, UNSW Sydney, Australia  
Bridget Allen, b.allen@neura.edu.au, Neuroscience Research Australia, Australia  
Karla Canuto, karla.canuto@sahmri.com, South Australian Health and Medical Research Institute, Australia  
Ebony Lewis, ebony.lewis@unsw.edu.au, UNSW Sydney, Australia  
Josephine Gwynn, josephine.gwynn@sydney.edu.au, The University of Sydney, Australia  
Kylie Radford, k.radford@neura.edu.au, Neuroscience Research Australia, Australia  
Kim Delbaere, k.delbaere@neura.edu.au, Neuroscience Research Australia, Australia  
Justin Richards, justin.richards@vuw.ac.nz, Te Herenga Waka—Victoria University, New Zealand  
Nigel Lovell, n.lovell@unsw.edu.au, UNSW Sydney, Australia  
Michelle Dickson, michelle.dickson@sydney.edu.au, The University of Sydney, Australia  
\* John Evans, john.evans@uts.edu.au, University of Technology Sydney, Australia

**Introduction:** Physical activity has cultural significance as well as population health and other benefits. However, high participation levels among children decrease during adolescence. A range of factors may influence Aboriginal and Torres Strait Islander adult participation. This mixed methods systematic review synthesised existing evidence on facilitators and barriers for physical activity participation experienced by Aboriginal and Torres Strait Islander adults.

**Methods:** Joanna Briggs Institute methodology was used. A systematic search was undertaken of 11 databases and 14 grey literature websites during 2020. Included studies reported physical activity facilitators and barriers experienced by Aboriginal or Torres Strait Islander participants aged 18+ years. We also examined Indigenous capacity building characteristics of studies and appraised studies using the Mixed Method Appraisal Tool (MMAT) and the Aboriginal and Torres Strait Islander Quality Appraisal Tool (QAT).

**Results:** Twenty-seven studies met inclusion criteria, 22 studies involved local Indigenous communities, of which nine collaborated with local Indigenous organisations. Study methodological quality was generally high according to the MMAT but much poorer or unclear from an Indigenous appraisal perspective. Sixty-two different facilitators and 63 different barriers were identified across individual, interpersonal, community/environmental and policy/program themes. Prominent facilitators included support from family, friends, and program staff, and opportunities to connect with community or culture. Prominent barriers included a lack of transport, financial constraints, lack of time, and overriding work, family or cultural commitments. Five action statements were generated. Firstly, personal attitudes and life circumstances should be considered in effectively identifying and addressing opportunities and potential barriers. Secondly, promoting the holistic benefits, whilst also addressing specific challenges, may facilitate participation. Third, recognising the importance of family and cultural connections and providing opportunities for positive connections may facilitate participation. Fourth, respect connections to culture and support communities to be supportive, safe, and well-resourced. Finally, programs should be sustainably resourced and receptive to participants' needs and expectations.

**Discussion:** The five action statements give clear practical guidance for future program and planning, as well as for improving current program delivery. Strategies to increase physical activity participation should seek to enhance facilitators and address barriers, collaboratively with communities and with Aboriginal and Torres Strait Islander leadership.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E27. Distribution and correlates of self-reported children's perceived physical literacy

\* Emiliano Mazzoli, e.mazzoli@deakin.edu.au, Deakin University, Burwood, Australia.  
Natalie Lander, natalie.lander@deakin.edu.au, Deakin University, Burwood, Australia.  
Jo Salmon, jo.salmon@deakin.edu.au, Deakin University, Burwood, Australia.  
Lisa M. Barnett, lisa.barnett@deakin.edu.au, Deakin University, Burwood, Australia.

**Introduction:** Physical literacy encompasses the skills, knowledge, and motivation towards physical activity. Based on the Australian definition of physical literacy, the Physical Literacy in Children Questionnaire [PL-C Quest]) is a newly developed tool that can measure children's perception on their own skills relating to 30 physical literacy elements, within 4 domains (physical, psychological, social, and cognitive). The study aimed to test differences in children's responses by common demographic factors.

**Methods:** The PL-C Quest was administered online using Qualtrics. For each item, children were presented with a bunny-like character in two different scenarios (e.g., the bunny showing a positive attitude vs. the same bunny angry, for missing a target). Children had to select the scenario that represent themselves the most, and then indicate whether what they selected is a lot or a bit like them. Thus, responses are on a 4-point Likert scale. For each item, differences by sex were tested using Chi-squared tests. Differences in the physical literacy overall score and each subdomain by demographic factor (i.e., sex, age, language spoken at home, parental education, and occupation) were assessed using non-parametric tests. A Bonferroni correction of the  $\alpha$ -level was utilised to account for multiple comparisons.

**Results:** Data were collected for 669 parents and their 7–12-year-old children. Children (59% boys) were  $10.1 \pm 1.7$  years old. No differences based on age/sex emerged in relation to the total score or subdomains. Significant differences by sex were found within the physical domain, favouring boys for moving with equipment, cardiovascular endurance, agility, strength, and girls for coordination. Most parents spoke English at home (91%) and their education level varied (university [61%], technical/trade [16%], completed high school [15%], not completed high school [8%]). Physical literacy overall and each subdomain scores followed a gradient according to education ( $p$ -values  $< 0.001$ ). No other differences emerged.

**Discussion:** Boys' and girls' responses aligned with common gender-stereotypes (e.g., boys being better at skateboarding). To our knowledge, this is the first data on self-perception of physical literacy in children using a broad comprehensive definition. Data can be used to inform programming on how to address children with low physical literacy in certain areas.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E28. "Life is not a competition": Cross-sectional analysis of sport club member experiences in Aotearoa New Zealand

\*Glen McCarty, glen.mccarty@sportnz.org.nz, Sport NZ, Wellington, NZ  
Jack Lane, jack.lane@sportnz.org.nz, Sport NZ, Wellington, NZ  
Jay Carlsen, jay.carlsen@sportnz.org.nz, Sport NZ, Wellington, NZ  
Loren Howson, loren.howson@sportnz.org.nz, Sport NZ, Wellington, NZ  
Justin Richards, justin.richards@sportnz.org.nz, Sport NZ, Wellington, NZ

**Introduction:** There is a steep decline in physical activity levels from teenage years into early adulthood in Aotearoa New Zealand (NZ). This spans various types of physical activity, including participation through sports clubs. However, little is known about the physical activity experiences people have in sports clubs in NZ and how this may be contributing to the fall in participation. We examined sport club member experience in NZ to identify potential levers for club-based interventions.

**Methods:** Voice of Participant is a self-report online survey that was circulated to club members of 18 sports in NZ between July 2017 – April 2020 (n~97,000 club members). It measures satisfaction with various aspects of club experience and other key determinants of club membership. Descriptive statistics were calculated for the full sample and for stratified groups according to age group (5-12 years, 13-18 years, 19-34 years, 35+ years). Descriptive comparisons between groups were analysed using parametric methods ( $p < 0.05$ ) and only statistically significant results are reported.

**Results:** Overall satisfaction with club experience was 65%, but varied according to age. The lowest level of club satisfaction was observed for young adults aged 19-34 years (57%), which was significantly lower than the rest of the sample. Satisfaction levels for young adults were on average 11% lower than all ages in the following areas: quality/availability of officials, fulfilling potential, coaching, professionalism & club management, providing information, playing venues and value for money. This aligns with the most common reason young adults identified for belonging to a club, which changed throughout the lifespan, but for 19-34 year-olds was to 'play competitively'.

**Discussion:** Our findings indicate that the changing needs of club members throughout the lifespan are currently only being partially met, particularly in the transition to young adulthood. Addressing characteristics that optimise the "competitive experience" may be an effective way to improve the satisfaction of 19-34 year-old sport club members. However, further research is needed to identify whether this would reduce or exacerbate the decline in physical activity participation during young adulthood, which is when previous research suggests informal recreational physical activity becomes more popular.

**Conflict of Interest Statement:** The authors are employees of Sport NZ and are actively engaged in researching and promoting quality play and physical activity policy and practice in Aotearoa New Zealand.

## E29. The journey to dissemination - developing, piloting, adapting and scaling-up a school-based physical activity program: Physical Activity 4 Everyone (PA4E1)

\*Matthew Mclaughlin, Matthew.Mclaughlin1@health.nsw.gov.au, University of Newcastle, Australia.  
Rachel Sutherland, Rachel.Sutherland@health.nsw.gov.au, University of Newcastle, Australia.  
Elizabeth Campbell, Libby.Campbell@health.nsw.gov.au, University of Newcastle, Australia.  
Nicole Nathan, Nicole.Nathan@health.nsw.gov.au, University of Newcastle, Australia.  
Tom McKenzie, Tom.McKenzie@health.nsw.gov.au, Hunter New England Population Health, Australia.  
Lynda Davies, Lynda.Davies@health.nsw.gov.au, Hunter New England Population Health, Australia.  
Luke Wolfenden, Luke.Wolfenden@health.nsw.gov.au, University of Newcastle, Australia.  
John Wiggers, John.Wiggers@health.nsw.gov.au, University of Newcastle, Newcastle, Australia.  
On behalf of the Physical Activity 4 Everyone expert advisory group.

**Introduction:** Small-scale trials of school-based physical activity programs conducted in a research context have shown promise, such as Physical Activity 4 Everyone (PA4E1). These programs need scaling-up for real-world delivery, in order to achieve population health impact. Our aim is to describe a body of research that led to a scale-up trial of PA4E1, including developing, piloting, adapting and evaluating a scale-up trial of PA4E1.

**Methods:** PA4E1 was developed using the theoretical domains framework and behaviour change wheel. PA4E1 is comprised of evidence-based school physical activity practices. Schools are supported to implement these practices through implementation support strategies. A pilot randomised controlled trial (RCT) (from 2012-2014) was conducted in 10 secondary schools, evaluating both effectiveness (student physical activity and weight status) and cost-effectiveness. PA4E1 was then adapted for a scale-up trial (2016). The scale-up type III hybrid implementation-effectiveness trial was an RCT (n=49 schools) to evaluate practice uptake by schools (primary outcome), student physical activity (secondary outcome) and a comprehensive process evaluation (from 2017-2019).

**Results:** The pilot program comprised of seven evidence-based physical activity practices and six implementation support strategies. Findings from the pilot RCT found positive intervention effects on student physical activity and unhealthy weight gain, and was deemed cost-effective (total cost AUD\$329,952; AUD\$394 per student). Twenty adaptations were made for to facilitate scale-up. The majority of adaptations were fidelity consistent (n=18) and made systematically (n=19). Findings from the scale-up trial indicated that, at 24-month follow-up, school uptake of 4 or more practices (primary outcome) was significantly higher in the program group (16/23, 69%) than the control group (0/25, 0%) (p<0.001). Fidelity (provision) and reach (uptake) of the seven implementation support strategies was high (>75%). Per student, the cost of the scale-up trial was one quarter of the pilot trial (total cost \$415,112 AUD; \$117.30 per student).

**Discussion:** Results of the scale-up trial indicate that the implementation support strategies can be delivered with high fidelity and reach in a scale-up context, and this led to high uptake of physical activity practices by schools. Policymakers and practitioners responsible for advocating for physical activity in schools should consider this implementation approach.

**Conflict of Interest Statement:** The authors declare no relevant conflicts of interest in relation to this work.

## E30. Media advocacy: Lessons learned from engaging Australian media in school uniform policy physical activity research

\*Matthew Mclaughlin, Matthew.Mclaughlin1@health.nsw.gov.au, University of Newcastle, Newcastle, Australia.  
Nicole McCarthy, Nicole.McCarthy@health.nsw.gov.au, University of Newcastle, Newcastle, Australia.  
Rachel Sutherland, Rachel.Sutherland@health.nsw.gov.au, University of Newcastle, Newcastle, Australia.  
John Wiggers, John.Wiggers@health.nsw.gov.au, University of Newcastle, Newcastle, Australia.  
Luke Wolfenden, Luke.Wolfenden@health.nsw.gov.au, University of Newcastle, Newcastle, Australia.  
Nicole Nathan, Nicole.Nathan@health.nsw.gov.au, University of Newcastle, Newcastle, Australia.

**Background:** Media advocacy contributes to accelerating knowledge translation of research into practice and policy. We use a case-study of a media advocacy strategy applied to research investigating the physical activity impact and process of changing Australian school uniform policies, from a traditional school uniform - to a sports uniform every day. Our aims are to (i) describe the push and pull strategies used to engage media; (ii) to summarise the extent of media outputs; (iii) to identify strategies to improve future media advocacy.

**Methods:** We, the author team, developed the media strategy in consultation with a media expert. The media outputs are summarised descriptively. To identify strategies to improve future media advocacy, we have collated our key learnings and reported these descriptively.

**Results:** The media strategy was launched with a national article (pull) published in The Conversation AU (95,139 reads, 30/08/2021). A locally targeted media release (Newcastle, NSW, Australia) (push) was sent to regional radio stations (n=5) and print media (n=5) 24 hours ahead of the release of the Conversation article, with an embargo until its release. Following the release of the Conversation article and the lifting of the embargo, we had radio interviews (n=8), print media interviews (n=5), television interviews with authors (n=2) and television discussions between hosts (n=2). All except one of these outputs framed the issue positively (i.e. in support of the policy change). Our key learnings were (i) allocating time to execute the media advocacy strategy; (ii) being persistent with media outlets; (iii) building relationships with media through clear and timely communication; (iv) being clear on the message; (v) iteratively developing a media hook with media experts; and (vi) the need for a 'call to action'.

**Discussion:** We implemented a media strategy which snowballed into many positive media outputs. It was not possible to ascertain if the pull or push strategies led to the snowball of media outputs, though it was likely a combination of both. Future media advocacy could use paid media and employ a dedicated media expert to co-ordinate the strategy.

**Conflict of Interest Statement:** The authors declare no relevant conflicts of interest in relation to this work.

## E31. "Greater than the sum of its parts": Qualitative synthesis of steps to forming a physical activity insights and evaluation network

\*Elaine More, elaine.more@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Amie Kendall, amie.kendall@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Bria Sargent, bria.sargent@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Neil Snowling, neil.snowling@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Justin Richards, justin.richards@sportnz.org.nz, Sport New Zealand, Wellington, NZ

**Introduction:** The World Health Organisation Global Action Plan for Physical Activity (GAPPA) explicitly identifies the need to build workforce capacity and calls for actions that "strengthen national and institutional research and evaluation". Effective capability building involves the implementation of a range of strategies to support individual growth, which often includes the formation of knowledge sharing and support networks of like-minded people. However, there is limited empirical evidence on the efficacy of these networks nor on the most effective way to establish them. We examine the Insights & Evaluation (I&E) network that has developed among Regional Sports Trusts (RSTs) in Aotearoa New Zealand (NZ) to identify critical elements of its effective formation.

**Methods:** We applied a developmental evaluation framework to a series of face-to-face workshops with the I&E leads from all 14 RSTs across NZ. Participants were initially asked about the most effective ways to share and collaborate with others and subsequent sessions further explored the key ideas that they identified as the network was being formed. These were augmented by small online focus groups with leaders and managers within each of the RSTs to understand any unique needs in their context. Data were analysed using a deductive thematic approach to identify critical components of establishing an effective network.

**Results:** Four key steps were identified: 1) Create a central hub – establish a virtual platform that enables rapid sharing of information and collective problem solving; 2) Ensure multi-direction information flow – facilitate discussion across and between teams and individuals within the network, rather 'pushing' information out one way; 3) Foster intellectual collaboration, transparency and safety – support open sharing of information to test ideas, iterate and learn; 4) Sustain the connection – maintain positive tone and actions to allow organic evolution.

**Discussion:** The I&E network has been an effective strategy for physical activity evaluation and research capacity building across the RSTs in NZ. It's success was not based on a "if you build it, they will come" approach. Rather, the process of its development self-generated a reason for participant engagement and effectively maintaining ongoing connection has enabled the I&E leads to share and create knowledge together.

**Conflict of Interest Statement:** The authors are employees of Sport NZ and are actively engaged in researching and promoting quality play and physical activity policy and practice in Aotearoa New Zealand.

## E32. Do patterns of activity behaviour vary by occupation? A compositional analysis

\*Anantha Narayanan, anantha.narayanan.tl@aut.ac.nz, Auckland University of Technology, Auckland, New Zealand.  
Tom Stewart, tom.stewart@aut.ac.nz, Auckland University of Technology, Auckland, New Zealand.  
Lisa Mackay, lisa.mackay@aut.ac.nz, Auckland University of Technology, Auckland, New Zealand.

**Introduction:** To understand how physical demands vary across occupations, it is important to quantify precise patterns of physical behaviour. Using compositional analysis, this study explored how patterns of sitting, standing, and walking (measured using a novel two-accelerometer system) and the transitions among them (e.g., stand-to-walk) varied across different work groups during their working hours.

**Methods:** One hundred employees across four diverse work groups in the New Zealand aviation industry (office workers, cabin crew, airport front house, airport back house) wore two Axivity AX3 accelerometers (on their thigh and lower back) for seven days. Estimates of time spent sitting, standing, and walking (during working hours) were derived using machine-learning techniques, and the number of transitions between each behaviour were calculated. Compositional MANOVA was used to compare the behaviour and transition compositions (separately) among the work groups, and Hotelling's T-squared test was used to examine pairwise contrasts between each work group pair. Finally, differences in compositional parts were explored using log-ratio differences and bootstrapped confidence intervals.

**Results:** The composition of physical behaviours and their transitions were different among all four work groups (all pairwise  $p < 0.01$ ). Office workers had the highest sitting time (79% of their working hours) and very low standing and walking time (~21%). Yet, their stand-to-walk and walk-to-stand transitions accounted for almost 71% of their total transitions. Cabin crew mostly spent their working hours standing (48.6%) with very low walking time (6.9%), but 75% of their total transitions were from stand-to-walk and walk-to-stand. Lastly, back house and front house workers had similar walking behaviours (13.7 vs. 16.5%), stand-to-walk transitions (40.3 vs. 43.7%) and walk-to-stand transitions (43.4 vs. 39.5%), but back house workers spent more time sitting (53.7 vs. 39%).

**Discussion:** Our results show distinct patterns of physical behaviours and transitions between different work groups, suggesting the physical demands associated with each occupation are varied. It was also observed that patterns of transition could vary between groups regardless of the total time spent in each behaviour. Future studies must consider both patterns of physical behaviours and their transitions when exploring job demands and how these patterns impact productivity and overall wellbeing.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

### E33. Legal strategies to improve physical activity in populations

\*Tracy Nau, tracy.nau@sydney.edu.au, The Australian Prevention Partnership Centre, University of Sydney, Sydney, Australia  
Ben J Smith, ben.smith@sydney.edu.au, The Australian Prevention Partnership Centre, University of Sydney, Sydney, Australia  
Adrian Bauman, adrian.bauman@sydney.edu.au, The Australian Prevention Partnership Centre, University of Sydney, Sydney, Australia  
Bill Bellew, william.bellew@sydney.edu.au, The Australian Prevention Partnership Centre, University of Sydney, Sydney, Australia

**Introduction:** Countries including Australia have adopted the World Health Organization's (WHO) recommended target of achieving a 15% reduction in physical inactivity by 2030. The WHO Global Action Plan on Physical Activity (GAPPA) provides a framework to achieve this, using a comprehensive systems-based approach that addresses the social and environmental determinants of physical inactivity. The importance of legislative and regulatory measures continues to be highlighted by WHO as necessary elements within the multicomponent and multisectoral action needed to reduce physical inactivity. Conceptual frameworks offer a means of defining the ways in which law can be used to influence physical activity behaviours, environments and systems.

**Methods:** We adapted the logic model of public health law research to incorporate two main dimensions for physical activity: (i) a typology of legal strategies, and (ii) the policy domains where these strategies can be applied to contribute to a whole-system response to physical inactivity. We based our typology of legal strategies on the classification used by the Healthy Food Policy Project, and the policy domains on the WHO GAPPA strategic objectives.

**Results:** The resulting framework is named RAMPARTS – the Regulatory Approaches to Movement, Physical Activity, Recreation, Transport and Sport. 'Lawmaking' is at the core, representing the multiple determinants that affect the use, enactment, form and content of law for physical activity. RAMPARTS identifies seven legal strategies that may be used by law to influence this issue. Implementation, compliance and enforcement are highlighted as crucial factors affecting whether legal strategies achieve their intended objectives. The four strategic objectives of WHO GAPPA (i.e. to create an active society, environments, people and systems) are identified as policy domains where legal strategies can be applied.

**Discussion:** Research on legal interventions for physical activity is underdeveloped compared to other major chronic disease risk factors such as smoking and alcohol. RAMPARTS is designed to direct the attention of policy makers and researchers to the breadth of ways in which legal strategies could be used to strengthen a whole-system response for promoting physical activity. It aims to inform a research agenda for law and physical activity that could help improve policy and practice.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E34. 4-legged friend facilitates children's physical activity – the PAWS intervention

\* Michelle Ng, michelle.ng@telethonkids.org.au, Telethon Kids Institute, Australia  
A/Prof Hayley Christian, hayley.christian@telethonkids.org.au, Telethon Kids Institute, University of Western Australia, Australia  
Dr Leanne Lester, leanne.lester@uwa.edu.au, University of Western Australia, Australia  
Ms Elizabeth Wenden, elizabeth.wenden@telethonkids.org.au, Telethon Kids Institute, University of Western Australia, Australia

**Introduction:** Even though most families own a dog, few children participate in dog walking and play. The PLAYCE PAWS study tested a light touch, mobile health ('mHealth') intervention to encourage more family dog walking and play, and improve children's overall activity levels.

**Methods:** 150 children aged 5-10 years were assigned to either one of two intervention groups or a 'usual care' control group. A light touch mobile health strategy consisting of text messages to parents was administered; the 'pedometer' group also received a dog pedometer and personalised dog steps diary. Parent-report measures of child dog walking and dog play were collected at baseline, 1 month and 3 months post intervention. Change variables were coded as positive change or no positive change between baseline and each follow-up. Dog walking and dog play variables were summed into a dog-facilitated physical activity variable. Unadjusted chi-square analysis within groups was conducted.

**Results:** Results were in the expected direction, however none of the differences achieved significance. A higher proportion of children in intervention groups showed positive changes in dog walking behaviours at both follow-ups when compared with the control group: 1 month follow-up 48.6% SMS, 44.7% vs. 27.3% control; 3 month follow-up 43.6% SMS, 41.9% pedometer vs. 35.3% control. Similarly more children in the intervention groups reported more dog walking at both follow-ups: 1 month follow-up 20.7% SMS, 24.3% pedometer vs. 6.9% control; 3 month follow-up 17.9% SMS, 23.3% pedometer vs. 14.7% control. More children in the intervention groups reported positive changes to dog-facilitated physical activity: 1 month follow-up 57.1% SMS, 47.4% pedometer vs. 36.4% control; 3 month follow-up 43.6% SMS, 44.2% pedometer vs. 35.3% control.

**Discussion:** The pilot light touch intervention appears to show promising results. More children reported to have increased dog walking after the intervention, compared to playing with their dog. This is interesting and surprising as it indicates that parents (who are becoming increasingly time poor), are taking the time and getting involved in family dog walking. In-depth analysis adjusting for covariates will be conducted to further examine any associations between the intervention and children's dog-facilitated physical activity behaviours.

**Conflict of Interest Statement:** The authors declare that they have no competing interests in relation to this work.

## E35. Active lifestyle behaviours among South Asian immigrants in Australia

\*Mehwish Nisar, m.nisar@uqconnect.edu.au, The University of Queensland, Brisbane, Australia.  
Tracy L Kolbe-Alexander, tracy.kolbe-alexander@usq.edu.au, University of Southern Queensland, Ipswich, Australia  
Asaduzzaman Khan, a.khan2@uq.edu.au, The University of Queensland, Brisbane, Australia.

**Introduction:** Current research investigating physical activity and sedentary behaviour in the Australian population under-represent South Asian immigrant. This study aimed to explore physical activity and sedentary behaviours and associated factors among South Asian immigrants in Australia.

**Methods:** A national online survey was administered (November 2020 to March 2021) among South Asian immigrants in Australia. Participants reported their walking, moderate and vigorous physical activity by answering the items from the Active Australia Survey. The main outcome measure was MET.min/week. Sedentary behaviour is assessed as sitting time (hours/day) on a usual weekday and weekend day across four domains: whilst travelling, watching television (including gaming), in general leisure, and using a computer at home. Interpersonal and environmental barriers to physical activity were also measured. Logistic regression models were used to examine factors associated with physical activity and sedentary behaviour.

**Results:** A total of 321 adult participants (average age: 35 years (SD 7.06) females 44%) completed the online survey. Nearly, 32% of participants were born in Pakistan, 29% were born in India and 38% were born in other South Asian countries. Approximately 76% of the participants were insufficiently active and 27% reported sitting >8 hours/day. Two-thirds of the participants reported that their physical activity levels increased after migration. Only 6% of participants reported participating in active travel (cycling/walking). The main reported barriers were lack of money, transport problems, cost of a gym membership, lack of access to childcare, and same-sex gym. Active lifestyle behaviours showed significant associations with gender, age, country of birth, income, physical health, and obesity.

**Discussion:** The prevalence of insufficient physical activity was higher in South Asian immigrant participants compared to the general Australian population. The results of this study highlighted the need of focused interventions that can deal with the diverse needs of the immigrant population and facilitate the promotion of activity behaviours.

**Conflict of interest:** The authors declare no relevant conflict of interest in relation to this work.

## E36 . Using problem and solution trees to investigate ways to reduce adolescent sedentary time at school.

\*Anne-Maree Parrish, aparrish@uow.edu.au, University of Wollongong, Wollongong, Australia.  
Anthony D. Okely, tokely@uow.edu.au, University of Wollongong, Wollongong, Australia.  
Jo Salmon, jo.salmon@deakin.edu.au, Deakin University, Burwood, Australia.  
Stewart Trost, s.trost@qut.edu.au, Queensland University of Technology, South Brisbane, Australia.  
Megan Hammersley, mhammers@uow.edu.au, University of Wollongong, Wollongong, Australia.  
Anisse Penning, Anisse.Penning@health.gov.au, Department of Health, Canberra, Australia.

**Introduction:** As children transition into adolescence, rates of physical activity decline and are replaced by more sedentary pursuits. Adolescents spend over 50% of a 24-hour day and 63% of the school day sedentary. To date few comprehensive qualitative studies have explored teachers and students perceptions of potential strategies to reduce sedentary time in the high school setting. Acknowledging that stakeholder input is key to research translation, this project aimed to investigate the views of adolescents and school staff as to feasible and acceptable ways of encouraging adolescents to “sit less and stand or move more” during the school day.

**Methods:** This study used a participatory research design (‘problem and solution tree’), to guide focus group implementation. Students, teachers and executives from four schools in the Illawarra and surrounding area (NSW) Australia were invited to participate. This technique guides participants to understand why a ‘problem’ occurs, then identify factors that contribute to the identified problems and the consequences of the problems. Participants then identified potential ‘solutions’ to the problems. We asked participants to change from a problem (‘high levels of sedentary time’ during the school day) to a solution orientation (50% reduction in sedentary time) by providing options to reduce sedentary time during the school day.

**Results:** A total of 55 students (24 from years 7/8; 31 from years 9/10), and 31 teachers/executives consented to participate in the study. Participants were interviewed in three groupings, younger adolescents, older adolescents and teachers/executives. Thematic analysis across the groupings elicited five main ‘problems’: lesson structure, non-conducive classroom environment/structure, non-conducive break-time environment, curricular pressures and school related factors increasing sedentary behaviour outside of school. Some potential ‘solutions’ included: changes to classroom layout/furniture, pedagogical changes, hands on learning, outdoor lessons, more comfortable uniforms, more breaks during class time, more compulsory physical activity and outdoor equipment.

**Discussion:** The proposed solutions to reduce adolescent sedentary time during the school day have potential to be feasibly implemented in the school setting, even when funding is limited. It is possible that education, policy changes, pedagogical support and some structural/environmental changes could facilitate ongoing improvements in adolescent sedentary time.

**Conflict of interest:** The authors declare no relevant conflict of interest in relation to this work.

## **E37. Physical activity and mental wellbeing during the COVID-19 pandemic: Longitudinal analyses among a cohort of adults in Aotearoa New Zealand**

\*Justin Richards, justin.richards@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Oliver W. A. Wilson, oliver.wilson@auckland.ac.nz, University of Auckland, Auckland, NZ

**Introduction:** The COVID-19 pandemic had a profound impact on both physical activity and mental wellbeing globally. However, our understanding of the effect of the pandemic on the well-established association between physical activity and mental wellbeing is limited. We examined the robustness of this association and the protective properties of physical activity for mental wellbeing across five waves of data collection from pre-pandemic through to April 2021.

**Methods:** Active NZ is a national physical activity participation survey that applies continuous data collection to assess ~20,000 adults throughout the year. It was paused in April 2020 due to the pandemic. Participants between January 2017 and March 2020 (i.e. pre-pandemic), who had agreed to be recontacted were re-surveyed in April 2020, June 2020, September 2020 and April 2021. Measures included socio-demographics (i.e. age, gender, ethnicity, socio-economic status, disability), leisure-time physical activity participation (i.e. meeting recommendations, hours of physical activity) and mental wellbeing (i.e. WHO-5 Index). Logistic regressions adjusted for socio-demographics examined both the cross-sectional and prospective association between the physical activity indicators and mental wellbeing across the five time points.

**Results:** Data from 1,854 participants who responded to surveys at all five time points were analysed. Physically active people had approximately double the odds of having good mental wellbeing throughout the pandemic and every additional hour of activity increased the odds of having good mental wellbeing by between 6-10%. This association was at its weakest during the initial lockdown in April 2020 (OR=1.94, 95%CI=1.52-2.47). People who were physically active pre-pandemic had 32%-51% higher odds of having good mental wellbeing up until June 2020, but were no longer protected in September 2020. The duration of pre-pandemic physical activity was not associated with subsequent mental wellbeing during the pandemic.

**Discussion:** People who maintained recommended levels of physical activity during the pandemic were more likely to have better mental wellbeing and there appeared to be a dose-response relationship. Participation in any physical activity prior to the pandemic was protective of mental wellbeing during the first three months of the pandemic. These findings suggest that physical activity contributes to subsequent mental health resilience in an acute crisis.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## **E38. ProjectPARK: Understanding park features for encouraging visitation and active and social park use among children, adolescents and older adults'**

\*Elise Rivera, edrivera@deakin.edu.au, Deakin University, Burwood, Australia

Anna Timperio, anna.timperio@deakin.edu.au, Deakin University, Burwood, Australia

Kylie Ball, kylie.ball@deakin.edu.au, Deakin University, Burwood, Australia

Benedicte Deforche, benedicte.deforche@ugent.be, Vrije Universiteit Brussel, Brussels, Belgium & Ghent University, Ghent, Belgium

\*Jenny Veitch, jenny.veitch@deakin.edu.au, Deakin University, Burwood, Australia

**Introduction:** Parks provide opportunities to embrace nature, be active, and connect socially. However, parks are not well-used by many age groups. Certain park features may be particularly important for encouraging people to visit, and be active and social in parks. However, limited research exists concerning optimal park (re)development. ProjectPARK aimed to examine the relative importance of park features that attract children (8-12 years), adolescents (13-18 years) and older adults (65+ years) to visit parks, and to be active and socially interact during park visits.

**Methods:** This large-scale project (2017-2020) was conducted in three phases. First, qualitative walk-along interviews were performed in nine parks of varying size and amenity, located in diverse areas of Melbourne, Australia. While walking through one of these parks, children (n=30), adolescents (n=34), and older adults (n=30) discussed important park features and characteristics that could be added or changed to enhance visitation and active and social park use. Next, two surveys were administered. First, participants (752 across the age groups) rated (1-10 scale) images of 42 park features based on how much the feature made them want to visit, and be active and social in the park. The ten highest-rated park features, based on mean scores and standard deviations, for each outcome (visit, active, social) for all three age groups were determined and further examined in the second survey. Another sample of participants (739 across the age groups) then completed Adaptive Choice-Based Conjoint analysis tasks to derive a relative ranking of important park features for encouraging visitation, physical activity, and social interaction in parks.

**Results:** Children valued adventurous, fun play equipment, climbing structures, interactive areas, and obstacle courses. Adolescents preferred large swings, grassy open space, sports courts, cafes, barbecues, and fitness equipment. Older adults valued a peaceful and relaxed setting, shady trees, and walking paths.

**Discussion:** These insights can help stakeholders better understand what park features should be prioritised for optimal park (re)planning that maximises use of these valuable public resources, while catering to individuals across the lifespan.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work

## E39. SALSA Youth Voices: Physical Activity Advocacy in the School Environment

\*Kym Rizzo Liu, kym.rizzoliu@health.nsw.gov.au, Western Sydney Local Health District, Sydney, Australia  
Emma Sainsbury, emma.sainsbury@health.nsw.gov.au, Western Sydney Local Health District, Sydney, Australia  
Clinical Professor Smita Shah, smita.shah@health.nsw.gov.au, The University of Sydney, Sydney, Australia

**Introduction:** SALSA Youth Voices (YV) is an extension of the Students As LifeStyle Activists program (SALSA) [1]. Capturing student voice has been shown to be a powerful and effective tool for school planning and improvement. YV provides a platform for adolescents to share their 'voice' and to translate their 'voice' into action. The aim of this program was (1) to establish what skills students gain from participating in YV, and (2) to determine if students, when given further leadership and advocacy opportunities, are able to develop and implement an action in their school to increase physical activity and improve diet.

**Methods:** In 2019, we held a one-day leadership workshop for SALSA Peer Leaders (Term 3) to build further communication, teamwork, and advocacy skills. The activities were designed for students to develop an action plan to encourage healthy eating and physical activity at their school. In Term 4, peer leaders presented their plans at the YV Action Day which provides a platform for student advocacy and agency.

**Results:** 84 SALSA Peer Leaders (age~15 years) from 7 western Sydney high schools, a low SES area, participated in the leadership workshops. Post workshop, peer leaders reported building leadership (77%), communication (85%), and teamwork (90%) skills. Students from all participating schools presented their actions at the YV Action Day, to an audience of 100 stakeholders from education and health. The actions included activities to increase physical activity in girls, re-designing girls' sport-shorts, installing water refill stations, improving school gyms, and lunch-time activities. On follow up, through visits to the schools, we observed that most of these activities had been successfully implemented.

**Discussion:** YV uses a strengths-based approach to build student agency and advocacy skills to design and implement an action plan at their school to improve physical activity improve diet. These creative and student driven actions to increase physical activity and healthy eating in low SES areas emphasise the importance of involving the affected stakeholders to drive positive change. The actions designed by the students have the potential to positively impact on current and future students' levels of physical activity and improve diet.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work

## E4O. Engaging older adults in community-based physical activity; The parkrun Generations Evaluation

\*Dr Catriona Rose, [Catriona.rose@sydney.edu.au](mailto:Catriona.rose@sydney.edu.au), University of Sydney, Sydney, Australia  
Dr Katherine Owen, [Katherine.owen@sydney.edu.au](mailto:Katherine.owen@sydney.edu.au), University of Sydney, Sydney, Australia  
Bridget Foley, [Bridget.foley@sydney.edu.au](mailto:Bridget.foley@sydney.edu.au), University of Sydney, Sydney, Australia  
Glen Turner, [glen.turner@parkrun.com](mailto:glen.turner@parkrun.com), parkrun Australia, Gold Coast, Australia  
Dr Lindsey Reece, [lindsey.reece@sydney.edu.au](mailto:lindsey.reece@sydney.edu.au), University of Sydney, Sydney, Australia

**Introduction:** Loneliness, lack of social connection, physical inactivity, reduced physical capacity and mental ill health are all problems faced by growing numbers of older adults that can be mitigated through participation in community sport and physical activity (PA) opportunities like parkrun (weekly, volunteer-run, timed 5km events held in local parks globally). Difficulties remain in reaching and recruiting older adults to participate in parkrun; a perceived “running race”. The parkrun Generations project, funded by Sport Australia’s Better Ageing Grant, aimed to increase reach and engagement amongst older adults in parkrun. The integrated evaluation aimed to understand effective strategies for increasing engagement, the impact of parkrun participation on health and wellbeing, and learn the value from the recruitment of targeted community engagement volunteers, known as Outreach Ambassadors.

**Methods:** Mixed method study design involved quantitative survey data from new registrants of parkrun aged 65 years and older (n=2,110), as well as an analysis of skills, competencies, and motivations of newly recruited volunteers or “Ambassadors” recruited by parkrun were evaluated using surveys (n=20).

**Results:** An increase in the number of days participants were achieving 30 minutes of PA was seen from 4.1 to 4.4 days per week after 6 weeks of involvement, with largest increases seen in the oldest age group (70+). Most of the Outreach Ambassadors were 50 years or older, predominantly female, and 50% had volunteered at an organisation other than parkrun prior to recruitment.

**Discussion:** The adoption of parkrun by this older age category suggests that the wide variety of ways in which to participate (e.g., walk, run, volunteer) encourage participation from all ability levels. Challenging misconceptions of the ability of older adults to participate in sport activities will assist parkrun in reaching and impacting the PA of older adults. The ‘seasoned’ Outreach Ambassadors recruited have experience and knowledge that could be utilised across volunteer networks. Increasing the diversity of volunteers to include older cohorts and/or other priority groups may be used to promote engagement through leverage of existing networks. Findings of enhanced PA of older adults is promising. Community-based physical activities, like parkrun, present opportunities for older adults to create connections with the local community and support their mental and physical wellbeing. Further insights to understand the impact of participation in parkrun on health and wellbeing for older adults needs to be investigated beyond COVID-19.

**Conflict of Interest Statement:** Dr Lindsey Reece, a co-author on the parkrun Generations Grant Evaluation Report, Lindsey is also a member of the global research board for parkrun.

## E41. "What's the state of play?": Qualitative exploration of physically active play opportunities and participation in Aotearoa New Zealand

\*Stefanie Ruckpaul, stefanie.ruckpaul@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Rachel Knight, rachel.knight@dna.co.nz, Innovation Unit, Wellington, NZ

**Introduction:** Participation in quality play is associated with positive wellbeing outcomes that include cognitive development, inter-generational socialisation and healthy recreation. However, it is not known how the emergence of digital technology and changes in our modern lifestyle have affected engagement in play and its impact on wellbeing. We examined current perceptions of play opportunities and how they are valued across Aotearoa New Zealand (NZ).

**Methods:** We conducted eight face-to-face focus groups in four regions across NZ, with a total of ~200 tamariki (i.e. children aged 5-11 years), care-givers (e.g. parents) and key play stakeholders (e.g. education, sport & recreation, local/central government, disability advocates, mana whenua). Additional information was obtained from participants via phone interviews and surveys. Tamariki participants and their care-givers were asked about their preferred types of play and access to these opportunities. Other key play stakeholders were asked to reflect on current play opportunities for tamariki, barriers to participation and aspirations for play in their communities. Data were analysed using an inductive thematic approach to identify potential options for intervention.

**Results:** Three key themes emerged: Safety, Technology and Access. However, There were diverging views across each of these. Firstly, whilst some felt excessive safety regulations were limiting child development through play, others identified care-giver fears of injury and judgement from other adults as the primary barrier. Secondly, various stakeholders thought that technology was displacing play activities, but care-givers focussed more on the balance between digital and non-digital play. Tamariki did not make this distinction, but rather, saw engagement with modern technology as another form of play. Thirdly, inequities in access to play spaces and opportunities were identified according to socio-economic status, urbanicity and (dis)ability.

**Discussion:** Our findings demonstrate the importance of capturing the perspectives of tamariki and their caregivers when investigating play opportunities and participation. Future intervention must address inequities in access to play spaces and opportunities. There may also be value in creating a healthier balance between child safety and developmental risks. Further research is indicated into the relative wellbeing benefits of digital vs non-digital play for tamariki and optimising the use of technology to promote healthy play.

**Conflict of Interest Statement:** SR is an employee of Sport NZ and is actively engaged in researching and promoting quality play and physical activity policy and practice in Aotearoa New Zealand. RK was an employee of the Innovation Unit, which was contracted by Sport NZ to conduct Play research.

## E42. "Time to grow-up": Qualitative synthesis of an Insights Maturity Model to improve evidence-based decision-making in physical activity policy and practice

\*Bria Sargent, bria.sargent@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Elaine More, elaine.more@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Amie Kendall, amie.kendall@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Justin Richards, justin.richards@sportnz.org.nz, Sport New Zealand, Wellington, NZ

**Introduction:** Effective collection and analysis of data can be used to make evidence-based decisions and improve the subsequent impact of organisations driving forward physical activity policy and practice. However, little is known about the current use of insights and information to inform the decisions of key stakeholders across the physical activity sector in Aotearoa New Zealand (NZ). We examined decision-making processes of the Regional Sports Trusts (RSTs) in NZ to develop an Insights Maturity Model (IMM) that captures key characteristics of evidence-based organisations.

**Methods:** We applied a grounded theory approach and conducted a series of face-to-face focus groups and interviews with insights and management personnel from RSTs across NZ. Participants were initially asked about the current use of evidence to inform decisions in their organisation and then given the opportunity to explore how this could be improved. Data were analysed using a deductive thematic approach, which then guided a subsequent literature review and consultation with subject matter experts on organisational rubric development. This was then further refined iteratively in consultation with the RST insights leads (i.e. the end users) to ensure it was fit-for-purpose.

**Results:** Four key themes emerged in the development of the IMM: 1) Competency (of the organisation) in generating and interpreting evidence, 2) Buy-in from organisational leadership on the use of evidence to inform decisions, 3) Capacity to communicate evidence with internal, local, regional and national stakeholders, 4) Systems to support the use of data and evidence. Each of these themes was broken into four domains: Knowledge, Attitudes, Behaviour and Processes. Each domain could be rated at one of four levels of maturity: emerging, developing, consolidating, highly developed. The IMM was designed to be used for both self- and external assessment of organisational practice.

**Discussion:** The IMM has been widely accepted by RSTs as a tool that helps them understand how effectively they use data and evidence across their organisation. It also provides an indication of best practice and a roadmap for improvement. Future research should focus on how the IMM actually improves the use of evidence to inform decisions on physical activity policy and practice.

**Conflict of Interest Statement:** The authors are employees of Sport NZ and are actively engaged in researching and promoting quality play and physical activity policy and practice in Aotearoa New Zealand.

## E43. Feasibility of increasing physical activity in the whole family using activity trackers and apps: The Step it Up Family program

\*Stephanie Schoeppe, s.schoeppe@cqu.edu.au, Central Queensland University  
Jo Salmon, jo.salmon@deakin.edu.au, Deakin University  
Susan Williams, s.p.williams@cqu.edu.au, Central Queensland University  
Deborah Power, d.a.power@cqu.edu.au, Central Queensland University  
Stephanie Alley, s.alley@cqu.edu.au, Central Queensland University  
Amanda Rebar, a.rebar@cqu.edu.au, Central Queensland University  
Melanie Hayman, m.j.hayman@cqu.edu.au, Central Queensland University  
Mitch Duncan, Mitch.Duncan@newcastle.edu.au, The University of Newcastle  
Corneel Vandelanotte, c.vandelanotte@cqu.edu.au, Central Queensland University

**Background:** Interventions using advanced activity trackers and smartphone apps have demonstrated their ability to increase physical activity in children and adults. However, they have not been tested in families. Further, very few family-based interventions have actively involved both parents.

**Purpose:** This pilot study investigated the feasibility of increasing physical activity in the whole family using age-specific activity trackers and apps. Intervention feasibility was assessed in mothers, fathers and children aged 6-10 years.

**Methods:** Between May 2017 and January 2019, 40 families participated in the 6-week *Step it Up Family Program* in Queensland, Australia. Using commercial activity trackers combined with apps (Garmin Vivofit Jr for children, Vivofit 3 for adults), this pre/post intervention included individual and family-level goal setting, self-monitoring and performance feedback, family step challenges, family social support and modelling, weekly motivational text messages, and a face-to-face introductory session. Parent surveys, family telephone interviews and activity tracker/app recordings were used to assess intervention feasibility (recruitment, retention, engagement as per activity tracker and app usage, perceived usefulness). Descriptive statistics and qualitative content analysis were applied for analyses.

**Results:** Of 76 recruited families, 40 families including mothers (39/98%), fathers (33/83%) and children (58/84%) participated in the intervention. Thirty-eight of the 40 families completed the post intervention survey (95% retention). Families recorded steps using the activity trackers and apps for an average of 36 out of 42 intervention days (mothers: 37 days, fathers: 36 days, children: 34 days). Most parents (mothers: 96%, fathers: 87%) and children (94%) found the activity trackers useful for increasing their physical activity. Similarly, most parents (mothers: 93%, fathers: 83%) and children (96%) considered the app useful for increasing physical activity. Parents reported that the *Step it Up Family Program* increased their awareness of physical (in)activity levels in the family, and improved family quality time and connections.

**Conclusions:** This pilot study demonstrates feasibility of increasing physical activity in the whole family using age-specific activity trackers and apps. Using this technology, both mothers and fathers can be easily and actively involved in a family-based intervention. The findings support the implementation of a RCT to examine intervention efficacy.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E44. Reliability and validity of the Muscle-Strengthening Exercise Questionnaire (MSEQ)

\* Jane Shakespear-Druery, Jane.Shakespear-Druery@usq.edu.au , University of Southern Queensland, Springfield Central, Australia.

Katrien De Cocker, Katrien.DeCocker@ugent.be , Ghent University, Ghent, Belgium.

Stuart J H Biddle, Stuart.Biddle@usq.edu.au , University of Southern Queensland, Springfield Central, Australia.

Jason Bennie, Jason.Bennie@usq.edu.au , University of Southern Queensland, Springfield Central, Australia.

**Introduction:** Strong scientific evidence shows that muscle-strengthening exercise (MSE) has multiple independent health benefits. Furthermore, this exercise mode has been a component of global physical activity guidelines for over a decade. However, the assessment of MSE within population-level health surveillance is often limited to the constructs of frequency (days/week) and duration (minutes/session), with little focus on constructs such as MSE type, muscle groups targeted, and level of MSE intensity. Moreover, within health surveillance, there is currently no standardised instrument for assessing self-reported MSE. This study describes the development, test-retest reliability, and concurrent validity, of the new online Muscle-Strengthening Exercise Questionnaire (MSEQ) for adults which assesses multiple MSE participation constructs at the population level.

**Methods:** The MSEQ was developed to assess weekly frequency, session duration and intensity, types of MSE (e.g., weight machines, bodyweight exercise), and the muscle groups targeted (i.e., legs, hips, back, abdomen, chest, shoulders, and arms). Two convenience samples of English-speaking adult participants (aged  $\geq 18$  years) from Australia and internationally, were recruited from the larger MSE cross-sectional study (n=461). Test-retest reliability was completed online by 85 participants (60.0% female). Concurrent validity was assessed for 54 participants (61.1% female) using an online 7-day MSE log.

**Results:** The MSEQ shows high test-retest reliability for frequency, duration, and level of intensity for each of the four MSE types (i.e., using weight machines, bodyweight exercises, resistance exercises, and holistic exercises), and for the four types combined (Spearman's Rho range 0.76-0.91). For muscle groups targeted the reliability ranged mostly from moderate-to-substantial for each of the four MSE types (Kappa range 0.44-0.78; Percentage agreement range 72.2%-96.3%), and fair-to-moderate for the four types combined (Kappa range 0.35-0.51; Percentage agreement range 77.8%-83.3%). Concurrent validity for frequency, duration, and level of intensity for each of the four MSE types, and the four types combined, was moderate to high (Spearman's Rho range 0.30-0.77).

**Discussion:** The MSEQ showed substantial test-retest reliability and adequate validity when using a 7-day MSE log as the standard, suggesting it has potential for use in future population-level physical activity surveillance.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E45. "Healthy Active Learning": Baseline evaluation to inform local co-design of a national cross-government physical activity initiative

\*Neil Snowling, neil.snowling@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Ajmol Ali, A.Ali@massey.ac.nz, Massey University, Auckland, NZ  
Jeffery Adams, J.B.Adams@massey.ac.nz, Massey University, Auckland, NZ  
Alex Hamilton, alex.hamilton@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Zara Taylor, zara.taylor@sportnz.org.nz, Sport New Zealand, Wellington, NZ  
Justin Richards, justin.richards@sportnz.org.nz, Sport New Zealand, Wellington, NZ

**Introduction:** Healthy Active Learning (HAL) is a 4-year cross-government initiative aimed at improving physical activity opportunities for tamariki (i.e. children aged 5-13 years) through 800 schools/kura across Aotearoa New Zealand (NZ). Prior to the implementation of HAL, little was known about the existing opportunities and teacher capability to deliver physical education in these schools/kura. There was also limited understanding of how physical activity was valued and prioritised by the teachers and students. We examined these characteristics of the physical activity environment at the schools/kura participating in the HAL initiative.

**Methods:** We conducted the baseline assessment of a longitudinal quasi-experimental mixed methods evaluation. This included high level surveys at all phase-one schools/kura (n=300) and further in-depth assessment of 38 intervention and 17 control schools/kura. Our measures included teacher surveys about physical activity opportunities and the delivery of physical education (n=766) and student surveys about physical activity determinants and participation (n=4,033). Descriptive statistics were calculated for the full sample and disaggregated at the regional level to inform locally relevant co-design of the HAL intervention.

**Results:** Nationally, schools/kura provided a range of physical activities that were inclusive and met the needs of tamariki, but there was significant variation amongst regions. A total of 71% of teachers indicated that they were confident in their provision of physical education, but only 45% of them reported planning their lessons. Although 86% of schools/kura indicated that they highly valued physical activity, 63% of teachers rated physical education as only "medium" priority. The majority of students reported enjoying physical education, but 27% of them did not like it and did not feel included.

**Discussion:** The variation in physical activity opportunities across regions highlights the need for a tailored locally-led approach to intervention development that is co-designed with stakeholders from each school/kura to ensure it meets the needs of their teachers and students. At a national level there is a clear indication for improved teacher training in physical education planning and delivery. Advocacy for the value of providing quality physical activity experiences for all tamariki within schools/kura is also warranted.

**Conflict of Interest Statement:** NS, AH, ZT and JR are employees of Sport NZ and are actively engaged in researching and promoting quality play and physical activity policy and practice in Aotearoa New Zealand. AA and JA are contracted by Sport NZ to evaluate the delivery and impact of HAL.

## E46. A qualitative exploration of perceptions of activity compensation in primary school children and their parents

\*Brittany Swelam, bswelam@deakin.edu.au, Deakin University, Geelong, Australia  
Jo Salmon, jo.salmon@deakin.edu.au, Deakin University, Geelong, Australia  
Lauren Arundell, lauren.arundell@deakin.edu.au, Deakin University, Geelong, Australia  
Anna Timperio, anna.timperio@deakin.edu.au, Deakin University, Geelong, Australia  
Abbe L. Moriarty, abbe.moriarty@deakin.edu.au, Deakin University, Geelong, Australia  
Nicola D Ridgers, nicky.ridgers@deakin.edu.au, Deakin University, Geelong, Australia

**Introduction:** The activitystat hypothesis posits that an increase in activity at a given timepoint may result in a decrease in activity at another point. Whilst activity compensation is considered a biological response, little research has examined how it may manifest. Moreover, little is known regarding whether children or their parents perceive that compensation occurs. Understanding perceptions of activity compensation will provide deeper insights into how the activitystat may manifest. The aim of this study was to explore children's and parents' awareness/perceptions of activity compensation; and identify perceived influencing factors and/or reasons for activity compensation.

**Methods:** Children and parents were invited to participate in a short-duration semi-structured interview (6-20 minutes) to identify whether they perceived that children 'compensate' their activity, and to discuss potential reasons for any compensatory responses. Children were interviewed at school (n=12) or via Zoom (n=1), whilst parents were interviewed using telephone (n=16) or Zoom (n=1). A thematic analysis of both child and parent data was conducted using a framework developed by the research team and guided by previous literature.

**Results:** In total, 13 child and 17 parent interviews were completed. Thematic analysis of the interviews resulted in two overarching themes: awareness of compensation and mechanisms of compensation. In general, after an active day at school, most parents and children perceived that compensation occurred later in the day (i.e., they were less active). In contrast, children and parents did not perceive that compensation of physical activity and sedentary behaviour occurred between days. Mechanisms of compensation included psychological, physiological, environmental, and interpersonal mechanisms. Results suggested that hedonistic activities, social/familial support, and an active routine may have the potential to override compensatory responses. Conversely, the appeal of screen time may override potential compensatory responses to inactive school days after school hours.

**Discussion:** Parents and children indicated that compensation responses may occur within, but not between, days, and may manifest via different mechanisms. Understanding how and where compensatory responses may occur could inform the tailoring of future interventions. Future research is needed to establish concordance between perceived and device-assessed compensation.

**Conflict of interest:** The presented work received financial funding through National Heart Foundation of Australia Future Leader Fellowship (ID101895) awarded to NR. The authors had no financial relationships with any organisations that might have an interest in the presented work in the previous three years; no other relationships or activities that could appear to have influenced the presented work.

## E47. The NHMRC-funded SAGE trial of yoga for fall prevention: successful adaptation to online delivery during COVID19

\*Anne Tiedemann, anne.tiedemann@sydney.edu.au, The University of Sydney, Sydney, Australia  
Juliana S. Oliveira, juliana.oliveira@sydney.edu.au, The University of Sydney, Sydney, Australia  
Giane C. Camara, giane.caoncamara@sydney.edu.au, The University of Sydney, Sydney, Australia  
Shannon Colley, shannon.colley@sydney.edu.au, The University of Sydney, Sydney, Australia  
Kaarin J. Anstey, k.anstey@unsw.edu.au, University of New South Wales, Randwick, Australia  
Adrian E. Bauman, adrian.bauman@sydney.edu.au, The University of Sydney, Sydney, Australia  
Anne C. Grunseit, anne.grunseit@sydney.edu.au, The University of Sydney, Sydney, Australia  
Stephen R. Lord, s.lord@unsw.edu.au, University of New South Wales, Randwick, Australia  
Romina Sesto, romina@yogatogo.com.au, Yoga To Go, Petersham, Australia  
Roberta B. Shepherd, roberta.shepherd@sydney.edu.au, The University of Sydney, Sydney, Australia  
Cathie Sherrington, cathie.sherrington@sydney.edu.au, The University of Sydney, Sydney, Australia

**Introduction:** Falls significantly reduce independence and quality of life in older age. There is clear evidence, from our recent Cochrane systematic review and others, that exercise that challenges balance can prevent falls. Yoga provides a high challenge to balance, however its effect on falls has not been evaluated. The NHMRC-funded Successful AGEing (SAGE) yoga trial will establish the effect of a yoga exercise program compared to a yoga relaxation program on falls. Recruitment to the face-to-face classes was, however, interrupted by the COVID19 pandemic. This presentation outlines key learnings regarding transitioning from face-to-face to online classes, including technology and ongoing support to engage older people and promote ongoing participation.

**Methods:** Participants (n=700), community-dwellers aged 60+, are randomised to either: (1) the SAGE yoga exercise program, involving twice-weekly supervised classes for 40 weeks, focussed on standing balance postures; or (2) a seated yoga relaxation program, involving 2 supervised classes and then ongoing unsupervised practice. Primary outcome is the rate of falls in the 12 months post-randomisation. Secondary outcomes include mental well-being, physical activity, health-related quality of life, balance self-confidence, physical function, pain, goal attainment and sleep quality at 12 months after randomisation. An economic evaluation will also be conducted.

**Results:** 680 participants were recruited so far since September 2019. Since the start of COVID19 pandemic, classes that were face-to-face are now delivered via Zoom. The change to online classes has expanded recruitment locations and offered people in regional and remote settings the possibility to join. The public response to this opportunity has been exceptional, with 119 people recruited in 6 months pre-COVID19 and 561 recruited in 14 months during the COVID19 pandemic, showing that access to supervised online physical activity is indeed welcomed and valued. Providing technology support, an initial one-on-one introduction to the yoga instructor and access to class-specific Whatsapp groups to promote social connection, have contributed to the success of the online delivery format.

**Discussion:** Considering the uncertainty of the current and future impact of COVID19 on our ways of living, further exploration of online fall prevention exercise programs, such as the SAGE yoga program, is crucial.

**Conflict of Interest Statement:** Author Sesto owns of Yoga To Go yoga studio. All other authors have no conflicts to declare.

## E48. Examining mediators of impacts on physical activity and sedentary time in a wearable activity tracker intervention for adolescents

\* Simone JJM Verswijveren, s.verswijveren@deakin.edu.au, Deakin University, Geelong, Australia.

Gavin Abbott, gavin.abbott@deakin.edu.au, Deakin University, Geelong, Australia.

Samuel K Lai, s.lai@deakin.edu.au, Deakin University, Geelong, Australia.

Jo Salmon, jo.salmon@deakin.edu.au, Deakin University, Geelong, Australia.

Anna Timperio, anna.timperio@deakin.edu.au, Deakin University, Geelong, Australia.

Helen Brown, h.brown@deakin.edu.au, Deakin University, Geelong, Australia.

Susie Macfarlane, susie.macfarlane@deakin.edu.au, Deakin University, Geelong, Australia.

Nicola D Ridgers, nicky.ridgers@deakin.edu.au, Deakin University, Geelong, Australia.

**Introduction:** Wearable activity trackers in combination with supportive resources have the potential to influence adolescents' physical activity levels. Examining the mediating pathways through which these interventions work can inform which mediators to target in future studies. This study examined the impact of the Raising Awareness of Physical Activity (RAW-PA) intervention on potential mediators of behaviour change post-intervention, and adolescents' physical activity and sedentary time at 6-months follow-up. In addition, it evaluated mediators of the intervention effects on physical activity and sedentary time at 6-months follow-up.

**Methods:** RAW-PA (n=159 complete case sample) was a 12-week multi-component intervention for inactive adolescents. Grounded in Social Cognitive Theory and Behavioural Choice Theory, it combined a wearable activity tracker with digital resources. The targeted potential mediators included self-efficacy, peer support, family support, teacher support, behavioural strategies, barriers, and enjoyment. Outcomes included sedentary time, light- and moderate- to vigorous-intensity physical activity. Mixed linear models were used to estimate intervention effects on physical activity and sedentary behaviour at follow-up and on potential mediators post-intervention, and test whether there were indirect effects of the intervention on physical activity and sedentary behaviour via mediators.

**Results:** There was a statistically significant intervention adverse effect on barriers to physical activity (mean adjusted difference=1.77 [95% CI: 0.19,3.34], p=0.03). While adolescents in the intervention group (n=75) perceived more barriers than control group (n=84) participants, this did not mediate intervention effects on physical activity and sedentary time at 6-months follow-up (all p>0.05). No intervention or mediator effects were observed on any of the remaining variables (p>0.05).

**Discussion:** The RAW-PA intervention did not affect hypothesised mediators. Future studies should examine and identify intervention strategies that effectively target these mediators to improve physical activity among adolescents. They should also explore additional potential mediators or different strategies to target them that may explain changes in the use of activity trackers and digital resources over time. This information is critical for the design of future successful wearable activity tracker interventions.

**Conflict of Interest Statement:** NDR and JS declare involvement in a start-up technological company. The remaining authors declare no relevant conflict of interest in relation to this work.

## E49. Acceptability and feasibility of an online physical activity program for women over 50: a pilot trial

\*Geraldine Wallbank, geraldine.wallbank@sydney.edu.au, The University of Sydney, Sydney, Australia  
Catherine Sherrington, cathie.sherrington@sydney.edu.au, The University of Sydney, Sydney, Australia  
Leanne Hassett, leanne.hassett@sydney.edu.au, The University of Sydney, Sydney, Australia  
Dominika Kwasnicka, dkwasnicka@swps.edu.pl, University of Social Sciences and Humanities, Wroclaw, Poland  
Josephine Y. Chau, josephine.chau@mq.edu.au, Macquarie University, North Ryde, Australia  
Philayrath Phongsavan, philayrath.phongsavan@sydney.edu.au, The University of Sydney, Australia  
Anne Grunseit, anne.grunseit@sydney.edu.au, The University of Sydney, Sydney, Australia  
Fiona Martin, fiona.martin@sydney.edu.au, The University of Sydney, Sydney, Australia  
Colleen G. Canning, colleen.canning@sydney.edu.au, The University of Sydney, Sydney, Australia  
Marian Baird, marian.baird@sydney.edu.au, The University of Sydney, Sydney, Australia  
Roberta Shepherd, roberta.shepherd@sydney.edu.au, The University of Sydney, Sydney, Australia  
Anne Tiedemann, anne.tiedemann@sydney.edu.au, The University of Sydney, Sydney, Australia

**Introduction:** Regular physical activity benefits health across the lifespan, particularly if commenced in earlier years. Women in their middle-age years often juggle carer and work responsibilities, are often inactive, and may benefit from tailored support to increase physical activity. This pilot trial aims to establish the acceptability, feasibility, and impact on physical activity of the *Active Women over 50* program on physical activity among women aged 50+.

**Methods:** Eligible participants across NSW, Australia were randomised to receive the *Active Women over 50* program either immediately, or 3-months post-randomisation (wait-list control). The program included access to 1) study-specific website with information, case studies and links, 2) 8 emails or 24 SMS motivation-based messages, 3) one telephone health coaching session. Outcomes, at 3 months post-randomisation, were acceptability (recommend study participation, intervention uptake), feasibility (recruitment, reach, completion), and short-term intervention impact (physical activity), intervention impressions.

**Results:** The 62 participants of mean (SD) age 59 ( $\pm 7$ ) years took 7459 ( $\pm 2424$ ) steps/day at baseline and most (92%) reported  $\geq 2$  medical conditions. At 3 months, acceptability and impact data were available for 52(84%) and 57(92%) participants respectively. Study participation was recommended by 83% of participants. Most participants agreed to receive health coaching (81%) and messages (87%: email=56%, SMS=44%), opened 82% of emails and accessed the website 4.8 times on average over a 3-month period. Respondents reported the intervention supported their physical activity. Intervention participants were more likely to increase steps from baseline by 2000+/day (OR: 6.31, 95%CI: 1.22 to 32.70,  $p=0.028$ ) than controls, and trended towards more light-intensity physical activity ( $p=0.075$ ) and greater odds of increasing moderate-vigorous intensity physical activity ( $p=0.11$ ).

**Discussion:** The *Active Women over 50* program demonstrated acceptability and feasibility among the target population, and effectiveness in some domains in the short term. The findings warrant further testing of the intervention in a full-scale RCT.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E50. Physical activity during the COVID-19 pandemic: Longitudinal analyses among a cohort of adults in Aotearoa New Zealand adults

\*Oliver W. A. Wilson, oliver.wilson@auckland.ac.nz, University of Auckland, Auckland, NZ  
Justin Richards, justin.richards@sportnz.org.nz, Sport New Zealand, Wellington, NZ

**Introduction:** Much is known about the profound impact of the COVID-19 pandemic on physical activity participation around the world. However, our understanding of the effect of the pandemic on physical activity behaviour of people in Aotearoa New Zealand (NZ) is more limited. We examined the incremental changes in physical activity across five waves of data collection from pre-pandemic through to April 2021.

**Methods:** Active NZ is a national physical activity participation survey that applies continuous data collection to assess ~20,000 adults throughout the year. It was paused in April 2020 due to the pandemic. Participants between January 2017 and March 2020 (i.e. pre-pandemic), who had agreed to be recontacted were re-surveyed in April 2020, June 2020, September 2020 and April 2021. Measures included demographic characteristics (i.e. age, gender, ethnicity, socio-economic status, disability) and leisure-time physical activity participation. McNemar's tests examined differences in the prevalence of participation in any physical activity and meeting aerobic physical activity recommendations. ANOVA examined changes in physical activity duration and number of activities while controlling for demographic characteristics and calibrating for seasonality.

**Results:** Data from 1,854 participants who responded to surveys at all five time points were analysed. During the initial lockdown (April 2020), there was a decline in number of activities/week (-20.3%) and hours of physical activity (-9.4%), but both the proportion of people meeting recommendations and participating in any physical activity remained stable. All physical activity indicators then deteriorated when NZ emerged from lockdown (i.e. June) and they were still significantly lower than pre-pandemic levels in April 2021: number of activities/week (-19.5%); hours of physical activity participation (-15.6%); meeting recommendations (-8.6%); participating in any physical activity (-3.6%).

**Discussion:** The initial lockdown appeared to reduce the duration and number of activities in highly active people, but minimally impacted the proportion meeting recommendations. This suggests "local" activity effectively replaced much of the pre-pandemic organised recreational activity and may present a novel opportunity to promote easily accessible options. However, the magnitude of the subsequent sustained decline in all physical activity indicators warrants urgent action to re-engage all New Zealanders in physical activities that they can maintain.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E51. The Effectiveness of Face-to-face and eHealth Blended Interventions in Promoting Healthy lifestyle among Adults: A Systematic Review and Meta-Analysis

Min Yang, myanghkbu@gmail.com, Hong Kong Baptist University, Hong Kong, China

Wei Liang, wliang1020@hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China

Ishanka Harshani Kusum Peiris DEHIWALA LIYANAGE, 20481020@life.hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China

\*Yanping Duan, duanyp@hkbu.edu.hk, Hong Kong Baptist University, Hong Kong, China

**Introduction:** There is an increasing number of studies blending the eHealth intervention and face-to-face intervention to jointly promote physical activity (PA) and diet among people. However, a comprehensive summary of these studies is lacking. This study aimed to synthesize the characteristics of blended interventions and meta-analyze the effectiveness of blended interventions in promoting PA, diet, and health among adults.

**Methods:** Following PRISMA guidelines, 5 electronic databases (PubMed, SportDiscuss, PsycINFO, Embase, and Web of Science) were systematically searched to identify eligible articles according to a series of inclusion criteria. The risk of bias was assessed using the Cochrane risk-of-bias guideline. The PA-related, diet-related, physical and mental health outcomes were extracted. Quantitative data were pooled into RevMan 5.4 for meta-analysis where at least three studies reported the same outcomes to identify the between-group effects. Effect sizes were calculated as standardized mean difference (SMD) or MD. The sensitivity analysis and publication bias tests were conducted in RevMan 5.4 and STATA 16.0 respectively.

**Results:** Of the 1357 identified studies, 13 were eligible for the systematic review. Studies varied in participants, study design, and outcome measures. 11 studies were included in the meta-analyses. There was evidence of no significant publication bias. The meta-analysis indicated that the blended intervention significantly promote healthy diet (SMD<sub>energy intake</sub> 0.36,  $P = 0.01$ ; SMD<sub>diet quality</sub> -131.26,  $P = 0.04$ ) and weight losing (MD<sub>weight losing</sub> -1.34,  $P < 0.001$ ), but did not contribute to more PA (SMD<sub>walking steps</sub> 0.22,  $P = 0.60$ ; SMD<sub>moderate-to-vigorous PA</sub> 0.89,  $P = 0.27$ ; SMD<sub>total PA</sub> 0.52,  $P = 0.11$ ) and healthy intake (MD<sub>fruit intake</sub> 0.82,  $P = 0.22$ ; MD<sub>vegetable intake</sub> 5.91,  $P = 0.35$ ) among adults, compared with control group.

**Discussion:** The study findings indicated that eHealth and face-to-face blended interventions achieve preliminary success in promoting healthy diet and weight losing among adults. Future studies could improve the blended intervention design to achieve better intervention effectiveness.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.

## E52. Associations of physical activity with academic achievement and academic burden in Chinese children and adolescents

Danqing Zhang, danqing0916@126.com, Shanghai University of Sport, Shanghai, China.

Jin-Tao Hong, hongjintao@shriss.cn, Shanghai Research Institute of Sports Science, Shanghai, China.

Si-Tong Chen, sitong.chen@live.vu.edu.au, Victoria University, Melbourne, Australia.

\*Yang Liu, docliuyang@hotmail.com, Shanghai University of Sport, Shanghai, China.

**Introduction:** Physical activity (PA) has been shown to be associated with improved cognition and mental health in children and adolescent. However, there are few studies examining the associations of PA with academic achievement (AA) and academic burden (AB). Hence, this study aimed to investigate the associations of moderate-to-vigorous PA (MVPA) with AA and AB in Chinese children and adolescents.

**Methods:** Using a multi-stage stratified cluster sampling design (recruited from four different regions in Southern east China), 2653 children and adolescents (8-19 years old, 51.2% girls) were included. A self-reported questionnaire was used to collect data on study participants' gender, school grade, family social economic status (SES), parental education level, MVPA, AA and AB. Binary logistic regression was applied to examine the associations of MVPA with AA and AB with odds ratios (ORs) and 95% confidence intervals (CIs).

**Results:** In the overall sample, compared with children and adolescents who did not meet the PA guidelines (at least 60 minutes MVPA daily), children and adolescents who met the PA guidelines were more likely to report above-average (OR = 1.61, 95% CI: 1.21-2.11) AA and no AB (OR = 1.61, 95% CI: 1.13-2.30). In both genders, meeting the PA guidelines was positively associated with above-average AA (OR = 1.43, 95% CI: 1.01-2.03 for boys; OR = 2.22, 95% CI: 1.43-3.44 for girls). However, the significant relationship between meeting the PA guidelines and AB was only observed in girls (OR = 1.99, 95% CI: 1.17-3.39) but not in boys.

**Discussions:** This study suggested that sufficient PA may be a contributory factor of improved AA and lower level of AB in Chinese children and adolescents. However, the associations of PA with AA and AB varied by gender. Promoting PA among girls may significantly influence their AA and AB.

**Conflict of Interest Statement:** The authors declare no relevant conflict of interest in relation to this work.



# moodflex™

Mood has a powerful effect on everything we do. Understanding the factors that influence mood is fundamental to our wellbeing and productivity.

moodflex is a world's first mood navigation system built for the enterprise and individual.

It is the X factor in a new world of mental fitness.

A smartphone app that harnesses mood-in-context analytics, identifying the environmental and behaviour triggers that impact mood.

moodflex is evidence-based and engages the user with innovative technology and a unique reward system.

At an individual level, moodflex captures real time and longitudinal profiles of mood that result in confidential and personalised insights, empowering the user to capitalise on the power of mood - to Flex it!

moodflex is also built for enterprise. Management summaries provide greater understanding of employee personal and contextual mood patterns, providing targeted insights to influence decisions and resources. moodflex directly informs organisational change programs, strengthens leadership capabilities, empowers employees, improves culture and minimises legal risks.

Become the master of your mood - 'unleash your untapped'.