Formative assessment: Is Australia ready for a physical activity surveillance system?

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Abstract

Objectives: This study investigated the feasibility of establishing a comprehensive and standardised physical activity surveillance system (PASS) in Australia to guide policy and programs to address this public health priority.

Methods: We gathered information about existing data and reporting obligations in relation to physical activity, by conducting cross-sectoral workshops for each state and territory. This information was synthesised by sector/domain using the socioecological model. We developed a set of potential PASS indicators for feedback from the policymakers in the National Physical Activity Network.

Results: Jurisdictions identified existing physical activity-relevant surveillance measures across socioecological levels and sectors. The most common were individual behavioural measures; less common were interpersonal, settings, environmental, and policy measures. Feedback was gathered from policymakers about model indicators that could be considered in future discussions.

Conclusions: Our findings reveal areas where data availability is most widespread as well as areas of deficiency. Although this process identified relevant cross-sectoral indicators, further feasibility assessment will require national-level discussions, cross-agency planning, and leadership by Federal and State governments to progress PASS discussions further.

Implications for public health: The existing physical activity surveillance system in Australia is fragmented and lacks nationwide standardisation. Most physical activity surveillance focuses on individual behaviours, and limited monitoring occurs of broader elements of the "physical activity system." Improvements will contribute to more informed and accountable decision-making and enable more effective monitoring of progress at multiple levels towards achieving state and national physical activity goals. Policymakers need to embrace this agenda and further the discussions on the scope, shape, and structure of a physical activity surveillance system.

Background

Surveillance is a core function of public health and refers to the ongoing and systematic collection, analysis, and interpretation of outcome-specific data for use in the planning, implementation, and evaluation of interventions to enhance population health.[1] Physical activity is "any body movement produced by large (skeletal) muscles that uses energy"[2] and is a core risk factor for chronic disease prevention. Existing surveillance for physical activity (PA) has predominantly focused on measuring moderate-to-vigorous PA in individuals, assessing the proportion that meet WHO recommended levels, and monitoring changes in population levels over time[3]; this has long been the case with a surveillance focus on trends and disparities in prevalence.[4] Available trend data have shown that insufficient PA remains a public health priority, with limited progress over the past 15 years worldwide[5] and over 22 years in Australia,[6] which has significant implications for chronic disease control.

It is well recognised that physical inactivity is a complex problem, influenced by multiple and interrelated drivers that necessitate a "systems approach," involving actions across multiple sectors.[7,8] It follows that surveillance systems for PA should also expand beyond the measurement of individual behaviours to monitor the wider sociocultural, environmental, and policy determinants of PA. The World Health Organization recognised this in its 2006 report "A framework to monitor and evaluate implementation: WHO Global Strategy on Diet, Physical Activity and Health," which proposed a broad set of indicators covering behavioural, environmental, and policy factors, to assist Member States with measuring implementation of this global strategy at country level.[9] Broader approaches to surveillance were a specific action recommended by the WHO in its Global Action Plan on Physical Activity 2018–2030 (WHO GAPPA).[8] Alongside regular population trends in PA behaviour, WHO GAPPA recommends multisectoral monitoring and reporting on policy implementation to track progress and inform policy and practice.[8]

In the context of global tobacco control and the WHO Framework Convention on Tobacco Control (WHOFCTC),[10] a comprehensive and standardised surveillance system—the Global Tobacco Surveillance System—provides internationally comparable data to monitor tobacco use and progress across the tobacco control strategies that comprise MPOWER (the WHO's technical package guiding implementation of the WHO FCTC).[11,12] It monitors behavioural measures as well as the implementation and effectiveness of tobacco control policy and interventions (e.g., smoke-free laws, cessation interventions, health warnings and marketing bans, raising tobacco taxes). Such monitoring is fundamental to understanding and reversing the smoking epidemic, and a similar surveillance system should be considered for physical inactivity.

We are aware of few examples of a comprehensive and standardised surveillance system for PA, other than in Canada which has, since 1997, built and maintained a surveillance system comprising periodic surveys of schools, workplaces, audits of the built environment, and measuring the social and economic consequences of PA.[13] This is in addition to routine PA surveys, including objective pedometer measurement of representative samples which has provided a device-based population estimate of important walking/running components of physical activity among Canadian schoolchildren.[13] The Canadian system is flexible and responsive to emerging priorities, allowing for the inclusion of cross-sectoral indicators and assessing the reach, uptake, and/or impact of new initiatives.[13] It has met key stakeholder needs especially in the Health and Sport sectors and is used by Federal and Provincial/Territory governments.[13] Overall, Canada's experience demonstrates that a complex and multisectoral PA surveillance system (PASS) is feasible for informing PA policy and providing a useful accountability mechanism for resource allocation.[13] There are efforts in the United States to enhance PA surveillance, instigated by the launch of the National Physical Activity Plan in 2016, which identified this as a priority.[1] So far, progress has involved convening expert panels and working groups to identify existing surveillance data and systems, pinpoint needs and gaps, and formulate recommendations to advance surveillance of PA in subgroups and enhance monitoring of institutional and community supports.[1] [1] This national US plan has now been incorporated into the National Physical Activity Alliance (https://paamovewithus.org/about-paa/#).

In Australia, the National Preventive Health Strategy (NPHS) was launched in 2021 with inclusion of PA as one of the priority areas and recognised that current monitoring and surveillance systems for prevention are fragmented, with significant consequences for the planning, implementation, and monitoring of prevention activity.[14] Of relevance, most components of PA surveillance are currently collected by states and territories using their own data systems, methods, and indicators rather than in a standardised way at the national level. The NPHS identified the need for a comprehensive prevention monitoring and surveillance system that includes information about the wider, systemic factors that underpin health and wellbeing.[14] Together with Australia's commitment to achieving the WHO GAPPA target of a 15% reduction in population physical inactivity by 2030,[15] the policy context is ripe for discussions with policymakers and other stakeholders around enhancing PA surveillance in Australia.

The "Australian Systems Approach to Physical Activity" (ASAPa) is a national project to develop systems approaches to PA, supported by the Australian Government Medical Research Future Fund.[16] This paper describes findings from our engagement with government policymakers about the feasibility of a comprehensive and standardised PASS in Australia, current data systems among state and territory jurisdictions, and common formats that could form the basis of a comprehensive PASS. We provide a synthesis of our insights concerning the type of information that might be collected to guide the next steps in developing a PASS. We also gathered feedback from policymakers on model indicators that could be considered as part of a PASS in Australia.

Methods

Stakeholder workshops

We consulted with an existing national and cross-sectoral network of policymakers involved in PA promotion (known as the National Physical Activity Network [NPAN]) to determine interest in improving the PASS in Australia. The approach comprised workshops with stakeholders from each jurisdiction to gather their perspectives about existing health and cross-agency data collected in relation to PA, and their views about a PASS for Australia.

We conducted a series of online workshops with each jurisdiction from September 2021 to February 2022, coordinated with the assistance of one or two NPAN representatives from that jurisdiction. Each workshop ranged from 30 mins to 1.5 hours, and involved between 4 and 21 attendees (on average 10, and in total 76). All meetings had representation from the Health sector, and most jurisdictions had Sport and Transport representation. Half of the jurisdictions had representation from the Education department, and two jurisdictions had representation from the Planning department. Workshops followed a similar format, commencing with an introductory video[17] to outline and stimulate discussion on the PA surveillance issues in Australia. Sector representatives shared information about their existing data and reporting obligations in relation to PA (e.g., PA behaviours such as sport, active transport and PA in schools; and more upstream indicators such as changes to the built environment and major settings) and contributed their views on other components that could usefully form part of a cross-agency PASS.

In Canada, a conceptual framework of indicators underpinned the development of their PASS, comprising the different levels of the socioecological model and settings where PA occurs (community, neighbourhood, workplaces and schools).[13] We drew on this framework to ascertain the comprehensiveness of PA surveillance in Australia, by categorising information about existing PA indicators according to (a) the sector (or domain) that they best corresponded to, based on the intervention areas covered by ISPAH's 8 investments[18] and WHO GAPPA(8) (Health, Transport, Planning and Environment, Sport and Recreation, Workplace, Education, Healthcare); and (b) the level they best corresponded to in the socioecological model (individual, interpersonal, settings, environment, and policy).

We summarised and categorised information into conceptual groupings from the information identified in the workshops (including any follow-up review of publicly available data sources that were identified), except for national-level data that could already be stratified by jurisdiction (e.g., Australian Bureau of Statistics' National

Figure 1: AUS-ACTIONS model framework for a physical activity surveillance system in Australia.

Development of model indicators
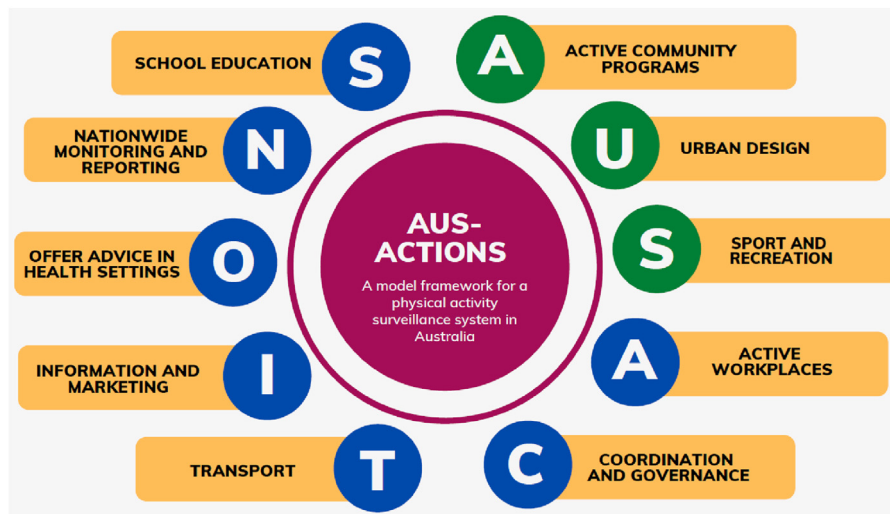
Health Survey data, Sport Australia's Ausplay data). In this phase of work, we did not consider frequency of collection, geographic scope, or population sample for the data sources although these factors could be considered in subsequent discussions.

Development of model indicators

After providing a synthesis of the workshop findings to NPAN, we used that information to develop a draft list of model indicators that could be considered as part of a PASS in Australia. This aimed to support future discussions on this issue through a PA-specific national strategy. These indicators were prepared by considering the indicators reported in the literature,[1,9,19,20] used in the Canadian system,[21] and reflecting on the indicators shared in the workshops. NPAN members were invited to complete a survey to provide their feedback. The survey was circulated by the NPAN secretariat and remained open for 9 working days, with 2 reminders issued in that time. The indicators covered the elements in this proposed "AUS-ACTIONS" PASS framework (**Figure 1**; further detail in Supplementary Table 1).

The survey consisted of two main parts: monitoring ISPAH's eight investments for PA(18) and the eight domains of infrastructure support for PA identified in the Physical Activity Environment Policy Index,[22] with the addition of "public reporting and transparency." For the first part, indicators were suggested for each of the eight investments, ranging from 2 to 9 per domain, and participants were asked to rate the importance of each as a core indicator (i.e., forming part of a minimum set of indicators) for that domain, using a 7-point likert rating scale (from extremely unimportant to extremely important). For the second part, participants were asked to rate the importance of including each of the eight domains of infrastructure support as core components of a PASS. Participants were able to provide other feedback on any of these elements.

The stakeholder survey received ethics approval from the University of Sydney Human Research Ethics Committee (2022/265).

Results

Summary of workshop findings

The current availability of different surveillance data across sectors by socioecological levels is summarised in Table 1. The table identifies the types of data that were most commonly available across jurisdictions in each category (including measures under development), and how widely available those data were across the jurisdictions.

Individual and settings indicators

Individual indicators included PA behaviours across multiple sectors and were the most prevalent type of data available as shown in green in Table 1. They included active travel to work or school, duration of physical education in school time, and participation in organised PA and sport. They also extended to non-behavioural measures such as perceptions about the availability and quality of local environments, and satisfaction measures for walking and cycling infrastructure and transport choice. Several jurisdictions were trialling new technological methods for collecting individual PA data, in particular, the use of mobile phone data to obtain information about PA behaviours and their location.

A few jurisdictions identified interpersonal indicators, but these were limited to the Health domain, such as attitudes and social norms regarding PA. Very few jurisdictions had settings-level data, the most common being school participation in PA programs although others were also identified in the Sport, Transport, and Workplace domains (e.g., types of PA programs offered by active recreation organisations, proportion of settings providing active travel facilities, proportion of workplaces running PA programs).

Environmental indicators

Environmental indicators included data obtained from geographical information systems (GIS) in the Transport domain to map access to public transport services, distance to cycling network and

Table 1: Availability of common types of surveillance data across states and territories.

| Domain | Type of measure | | | | |
	Individual	Interpersonal	Settings	Environmental	Policy
Health	e.g. PA behaviours	e.g. attitudes and social norms about PA	e.g. settings that regularly run PA programs		e.g. local government public health plans that address PA
Sport and Recreation	e.g. sport membership / participation		e.g. types of PA programs offered	e.g. availability of sports facilities	
Transport	e.g. mode share for active travel, active travel behaviour		e.g. settings that provide facilities for active travel	e.g. accessibility to destinations by active travel	e.g. budget commitment for bicycle grant program
Planning and Environment	e.g. perceptions of local environments			e.g. availability of pedestrian infrastructure	e.g. land use plans that implement performance criteria for walking and cycling
Workplace	e.g. active travel to work		e.g. workplaces providing end-of-trip facilities		
Education	e.g. PE duration (minutes) during school time		e.g. school participation in PA programs		e.g. schools implementing mandated PA requirements
Cross-agency					e.g. budget commitments towards PA by each sector

Colour coding is based on the most common type of data in each category and its availability (as reported by workshop participants) across the jurisdictions:

Red = low availability (available in 1-2 jurisdictions)

Orange = medium availability (available in 3-5 jurisdictions)

Green = high availability (available in 6-8 jurisdictions)

Blue = does not exist but proposed as an informative component for a comprehensive PA surveillance system, by one or more jurisdictions.

Note, the surveillance data are not necessarily collected using the same methods, for the same population group, or expressed in exactly the same way.

walkability access to primary schools; in the Sport domain to map the availability of sports venues and facilities; and in the Planning domain to measure the proximity of homes to public open spaces and destinations.

Other environmental data included the use of bicycle and pedestrian counters to measure active travel; crash statistic data as indicators of road safety for pedestrians and cyclists; audits of approvals to measure the availability of buildings and infrastructure available for secondary use for community sport and recreation; and measures of tree canopy, green cover, and urban heat mapping.

Some indicators had a specific equity focus, for example, equity in transport opportunities in terms of steepness for walking and cycling and public transport accessibility, proportion of public assets and facilities adapted to increase universal access, and usage of core walking/cycling infrastructure by people of diverse experience, ages, gender, and abilities.

Policy indicators

Very few jurisdictions identified policy indicators, but these were reported for the Education, Planning, and Transport domains. They included the use of school census and audit data to monitor implementation by schools of mandated requirements to deliver a minimum amount of physical education and PA; auditing local land use plans for compliance with performance criteria for walking and cycling; and monitoring annual budget commitments for a bicycle grant program.

Other observations

Several jurisdictions noted the need for surveillance data to inform local policy and program delivery and to involve local government as a key partner in the development of a PASS. Suggestions were made in relation to ways in which a PASS could enhance cross-agency accountability and engagement in PA promotion; for example, by monitoring sectoral budget commitments towards PA, and quantifying the co-benefits of PA promotion such as for active travel and health and wellbeing, PA and social capital, and sport voucher usage and educational engagement. Additional suggestions were offered to promote cross-agency cooperation for the development of a PASS, drawing on the leadership of any existing cross-agency taskforce or PA council, or policy levers that currently have cross-agency traction for that jurisdiction (e.g., mental health, social connectedness, wellbeing).

The needs of special sub-populations are beyond the scope of our investigation and would need to be considered in the next stages of development of a PASS. However, one specific area warrants specific mention, the physical activity needs of Indigenous Australians, which are currently measured using mainstream physical activity measures, necessary for comparability[23]; in a surveillance system, consideration should be given to the context of Indigenous physical activity and to ensure that traditional games and active recreation are included in Indigenous estimates.

Our consultations also revealed that many agencies from non-Health sectors would like to assess PA in their participants or populations but find it challenging to identify appropriate and feasible measures. We therefore suggested the widespread cross-sectoral use of a single-item PA question, such as those validated in adults and adolescents,[24–26] and this was widely endorsed as a solution to measures that differed across jurisdictions.

Survey results on the model indicators

Of the 33 NPAN members who were invited to the survey, 11 members completed it. Supplementary Table 1 identifies the indicators that were rated highly, moderately and lowest by respondents.

Highly rated

The highly rated indicators were mostly individual measures for the Sport, Education, Transport, and Health domains (e.g., sport and recreation participation, overall PA at school, active travel levels, and moderate-to-vigorous PA). Three of the eight proposed infrastructure support elements were also highly rated (i.e., leadership and coordination, monitoring and intelligence, and funding and resources).

Of the qualitative responses, some thought that participation in organised PA should be the main focus of the Sport domain to align with existing datasets, while others considered it more important to capture informal sport and recreation (for people who may be less active than participants in organised PA). It was also suggested that the Education domain should include indicators for early childhood, and the Health domain should include light activity and sedentary behaviours: "While MVPA is important, people are more likely to increase their light activities when replacing sedentary time."

Moderately rated

Overall, most of the proposed indicators were moderately rated, including many relating to settings (e.g., provision of PA advice or referral in general practice or other health settings; end-of-trip facilities in workplaces), environments (e.g., spatial indicators relating to transport and urban design), and policy (e.g., implementation of mandates for minimum PE in schools, policy indicators for public transport access). All of the proposed indicators for the Public education and community-wide programs domain were moderately rated. Half of the proposed infrastructure elements were also moderately rated (i.e., governance, public reporting and transparency, workforce development, and health in all policies).

The qualitative responses identified some issues in relation to GP advice, for example, "*I don't think GPs are qualified to give PA advice, so referral to exercise specialists would be more important to me*" and "*often for GPs it is not knowing or having appropriate referrals to make about programs available that is an issue, i.e., they can't refer if they don't know what options are available.*"

Spatial indicators (i.e., physical measures) were emphasised as more important than policy indicators for the Transport and Urban design domains although it was noted that policy indicators could be more important for Urban design due to the difficulty in retrofitting built environments: "*if a choice has to be made, actual measures are more important than policy measures and can give an indication of policy settings*" and "*I think policy indicators are great; but not necessary. There might be a policy, but as some recent research has shown, policy doesn't always support research recommendations—so there would need to be some indicator related to that.*" It was noted that while standardisation of a set of spatial indicators is ideal, it needs to be considered how spatial indicators would be collected as there is "*Not capacity in population level surveys to ask these types of questions and funding often restricts projects specifically looking at GIS information*"; however, as another respondent noted, existing data assets/holdings could be leveraged where appropriate.

In relation to the Public education and community-wide programs domain, it was emphasised that measuring the community response to PA campaigns and programs is important, not just the existence of campaigns or the communication of available programs. Another suggestion was to include an indicator for the existence of community-wide programs and their breadth of coverage across the eight PA domains.

Lowest rated

The indicators that were lowest rated mainly included interpersonal indicators (e.g., community norms; supportive behaviour by friends/parents); settings indicators (i.e., provision of workplace PA programs), and policy indicators for urban design.

Nevertheless, in the qualitative responses, there was acknowledgement of the need to "*emphasise the social dimension of PA and PE, particularly for girls*" and that "*Social norms are important also, with light intensity activities (like walking) needing to be included more.*" Respondents also considered that the Workplace domain should cover broader indicators beyond provision of PA programs (e.g., organisational, environmental, and policy).

Discussion

This paper has considered the scope of a PASS for Australia, and through consultations with policymakers and stakeholders, has developed a comprehensive public health framework to support the discussion of a surveillance system. To advance the development of a PASS in Australia, further national discussions at federal, state and territory levels together with cross-agency planning, leadership and collaboration will be required. These discussions would address the feasibility of PA assessment standardisation issues including to measure PA in population health surveys using consistent age ranges, with agreement on additional questions to monitor sedentary behaviour, muscle strengthening, and flexibility and balance (i.e., components of the national PA guidelines[28] that are assessed in few jurisdictions).[27] Such discussions would need to consider a minimum comparable data set for surveillance of antecedents of physical activity, activity-related environments, and policies. They should also consider the use of existing data sources outside the Health sector; such as the national population sport survey (Sport Australia's Ausplay) and household travel surveys that already exist in many jurisdictions, and spatial datasets for Transport and Urban Design. This will be greatly assisted if governments adopt the challenge of developing a longterm national physical activity plan and developing a comprehensive systems-based approach to monitoring this, both of which have not yet occurred in Australia.[29]

The workshops held as part of this study helped to identify the types of indicators that are most commonly available across the states and territories. When this information was compared to the survey feedback on potential model indicators, the most highly rated indicators generally aligned with those that are also more commonly available, in particular individual PA behaviours, sport participation, and active travel. These ratings may reflect respondents' greater familiarity with these more established indicators and their utility, compared to other types of indicators. Settings and environmental type indicators tended to be moderately rated, while policy indicators were considered to be less important, which was consistent with the low availability of these measures across jurisdictions. While the survey results are limited by the small sample size (being a subset of a selected group of policymakers who are actively engaged in PA promotion), this feedback may inform future discussions and priorities in developing a standardised set of indicators as part of a PASS.

Comprehensive surveillance systems for PA can be developed in stages and as new tools and methods become available to address data gaps, as seen in Canada.[13,30] The WHO framework to monitor and evaluate implementation of the Global Strategy on Diet, Physical Activity and Health, also addresses this concept of core and expanded indicators, where core indicators are regarded as most critical for the implementation of a national program for PA (and diet), and expanded indicators are those that could be considered when country resources and capacities allow, to deepen monitoring, evaluation, and surveillance.[9] While policy indicators were not considered to be as important for a PASS by survey respondents in this study, policy monitoring could still form an important part of a comprehensive surveillance system. Such monitoring could be conducted outside of government, using policy audit tools such as the Physical Activity Environment Policy Index (PA-EPI)[22] or the Comprehensive Analysis of Policy on Physical Activity (CAPPA) framework.[31]

More detail will also need to be shared by jurisdictions about their existing measures and data systems, to identify those which have the greatest potential to be aligned and integrated as part of a PASS. This would need to be balanced against design principles for indicator development (e.g., generalisability, simplicity, data quality, comprehensiveness, between-jurisdictional comparability, continuity and sustainability, adaptability and affordability[32]), and what would be most suitable, relevant, and useful for monitoring implementation of WHO GAPPA(8) and relevant national strategies such as the NPHS.[14]

Other limitations to note are that our findings were based on information identified by workshop participants. There may be other relevant data systems and indicators that were not shared or are held by sectors which were not represented at the workshops. There are also potential barriers to progressing a standardised and comprehensive PASS. For example, in the absence of a national PA strategy and leadership, there is no cross-sectoral imprimatur to further develop the themes identified in the workshops. Efforts to standardise and introduce new indicators, may also disrupt existing data collections and there may be constraints in existing systems that prevent the addition of new measures.

In the absence of progress towards developing a more harmonised and comprehensive PASS in Australia, alternatives may be considered that could still improve the information environment for PA. This could involve collating existing data sources (e.g., contributed by research institutes and state/territory government departments) and making them available on a centralised website, as has been done for the food environment in Australia.[33]

Conclusion and implications for public health

There are few examples globally of a comprehensive system of surveillance for PA, despite WHO recommendations for such surveillance. The existing system of PA measures in Australia lacks nationwide standardisation, without indicators assessing the implementation and monitoring of multisectoral actions to address PA. We have described a process of engaging with government policymakers about the feasibility of a comprehensive and standardised PASS and to gather information about existing data relevant to PA and its antecedents. These formative discussions revealed areas where data appear to be widely available and also gaps. Further national discussions and cross-agency planning and leadership will be needed to progress this issue. Improvements to the surveillance of PA will contribute to more informed and accountable decision-making and allocation of resources and efforts in relation to PA and enable more effective monitoring of progress towards the WHO GAPPA target and national PA goals.

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Ethical statement

The project received ethics approval from the University of Sydney Human Research Ethics Committee (2022/265).

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Conflicts of interest

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.anzjph.2023.100045.