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National sports injury data strategy

Draft consultation report



National sports injury data strategy: draft consultation report

Australian Institute of Health and Welfare Canberra

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Summary

A sports injury can occur while playing or training in organised and non-organised sport and during other types of physical exercise. A sports injury can occur suddenly following a fall, collision with another person, impact with an object, overexertion leading to a muscle strain or a repetitive strain injury.

Many Australians are engaged in sport, with over 82% participating in weekly sports or physical activity in 2019 (ASC 2021a), and view media coverage of sports with high impact collisions and injuries. Injuries in elite players are monitored by dedicated teams to reduce and rehabilitate injuries to manage health and ensure long-term success. In contrast, little is known about the types of sports injuries experienced by the remainder of the Australian population, unless an injury is very severe and results in a hospital admission.

There are physical and mental health benefits from participating in sport. These benefits, to individuals and the health system, also carry a risk of a sports injury occurring. Without better data, it is hard to establish the overall balance of benefits and risks that comes with sports participation and learn what is needed to prevent injury.

Data gaps and opportunities

Australia currently lacks a national data collection that can provide information about the frequency and cause of sports injury to inform injury prevention activities and provide evidence on the risks and benefits of participation. Both injury prevention and increased participation can contribute to better health outcomes. More detailed and high-quality information can indicate where injury prevention activities are most needed and of most benefit to the population.

In recognition of this data gap, the Australian Institute of Health and Welfare (AIHW) has been commissioned by the Australian Sports Commission (ASC) to investigate the feasibility of developing a National Sports Injury Data Asset (NSIDA). The proposed data asset would capture information on sport injuries and their contexts, to inform research, policy and prevention programs, providing a reliable evidence base on which to improve the safety in sport. Undertaking data improvement activities, such as reporting using available data sources, developing data sources and linkage of data sources, will require considerable resources. Future work will need to carefully consider the availability of data for reporting across key areas from existing data sources, balanced against the costs and benefits of undertaking data activities to improve data on community sports injuries in order to better support injury prevention and increased participation.

This National Sports Injury Data Strategy (the 'strategy') describes the development of an NSIDA and consultation with community sports and researchers. The strategy builds on previous sports injury work done to support better data collection in Australia. Improvements in data collection platforms and IT systems and new government initiatives in the injury prevention landscape, in particular leading up to the Brisbane 2032 Olympics, make this an opportune time to invest in the development of an NSIDA.

The strategy seeks broader consultation to ensure that the data benefit individuals, sport organisations and researchers. The NSIDA also needs to be sustainable, secure and efficient with regards to the demands of data collection and help support a culture of injury and incident reporting to enable organisations to respond appropriately and reduce the chance of injury and its consequences for participants.

Chapter 1: Introduction

Australia's health system faces challenges from an ageing population and high levels of chronic health conditions associated with modern lifestyles and low levels of physical activity. Participation in sport is beneficial in reducing the number and severity of chronic health conditions. Physical activity helps prevent and manage heart disease, stroke, diabetes and several cancers and helps maintain a healthy body weight. The physical and social aspects of sport participation can improve mental health, quality of life and wellbeing.

It is an aim of government to increase participation in sport, for both the health gains to individuals and cost savings to the health system and economy as a whole. However, with participation in sport comes some risk of injury. The benefit of increasing physical activity is well established, but the magnitude and impact of injury that can accompany physical activity, while expected to be a small proportion of the overall gains, is poorly estimated due to a lack of quality data.

Sports injury data can also be used to understand how injuries occur so that programs and policies can be implemented to prevent as many injuries as possible. Injury prevention includes:

- preventing the event causing the injury (primary prevention)
- reducing the energy transferred or harm caused during the event and enhancing outcomes and recovery (secondary prevention)
- reducing the harm or long-term impact once an injury event has occurred through treatment or rehabilitation (tertiary prevention) (Hunter et al. 2019).

The prevention and management of sports injuries varies depending on whether athletes are participating in elite level (professional/semi-professional) or community level sport. Elite sports participants are often supported by a team of trainers and health professionals, while community-based sports are largely supported by volunteers with a limited amount of health professional support. More participants play at the community sport level than at the elite level, resulting in more injuries at the community sport level. The intensity of play is more intense in elite sports, and participants also spend more time training, playing and following prevention programs designed and supported by professionals. The data collected in elite sports are usually supported by staff and secure IT systems, with a view to maximising data insights, minimising injury and increasing the chances of competition success. This is in contrast to the resources available in community sports environments.

Australia currently does not routinely collect community sports injury data at a national level and therefore many injuries are not reported. Severe sports injuries may result in an insurance claim. Individual insurers may track claim types and costs and respond with increases in premiums or decline to cover higher risk activities. This may require sporting organisations to respond with a change in practice, increase registration costs or change insurers. Better data can promote a more proactive approach as observed in New Zealand where a universal injury insurance model invests in prevention initiatives (Accident Compensation Corporation 2022).

Current data are often limited to sport-specific publications or to national hospitalisation data for more severe sport injuries (AIHW: Kreisfeld & Harrison 2020). While there are some specific data on particular types of injury or procedures related to a sport activity, there is no national database specific to sports injury that can monitor the number, severity and impact of injury and injury prevention programs across sports.

What we know about sports injury and physical activity in Australia

Hospitalisations

In 2016–17, almost 60,000 people were hospitalised for sports injuries, with males twice as likely to be hospitalised as females (AIHW: Kreisfeld & Harrison 2020). Playing a code of football caused 32% of all hospitalised sports injuries, with 30% of football injuries reported to the hips and legs and 25% to the head and neck. Cycling injuries were 11% of all hospitalised sports injuries.

The 3 main sports in males hospitalised for sports injuries were football (all codes) (38%), cycling (12%) and wheeled motor sports (8%). Among females, equestrian activities accounted for 11% of hospitalised injuries, followed by netball (10%), and cycling (7%). Life-threatening sports injuries accounted for 10% of all hospitalised sports injuries, with swimming and diving injuries making up 27% of life-threatening cases, followed by cycling (24%), and equestrian activities (24%).

Burden of disease

Burden of disease analysis is a way to measure of the impact of different diseases or injuries on a population. Burden of disease analysis measures the years of healthy life lost through injury, illness or premature death and is measured in a population as disability-adjusted life years. Sport contributes to a decrease in disability-adjusted life years through the benefits of physical activity, which helps prevent and manage a number of chronic physical and mental conditions, including cardiovascular disease, type 2 diabetes and some cancers (AIHW 2019a).

The cost of sports injury in Australia

Several studies over the past 15 years have estimated the cost of sports injury within the health system and broader community. However, many of the estimates are now outdated and would benefit from updating with clearer assumptions, inclusions and underlying data.

The Sports Injury Prevention Taskforce (2013) estimated that sports injury was responsible for 12–15% of all injury health-care costs. The 2018–19 cost of ‘all injuries’ to the Australian health system within the AIHW disease expenditure database is \$10.3 billion (AIHW 2021c). Using the taskforce estimates of the sports injury proportion and the cost of ‘all injuries’ to the Australian health, the estimated cost of sports injuries in 2018-19 are estimated to be \$1.2-1.5 billion per year. The AIHW is currently investigating the economic investment to the health system resulting from participation in physical activity. Preliminary estimates have shown that the immediate cost of treating injuries caused by physical activity through the hospital system was \$764 million in 2018-19 (AIHW 2022).

It has been estimated that around 5.2 million Australians sustain sport-related injuries each year (Medibank Private 2006), and that in 2002 and 2005, sports injuries cost the Australian community \$1.65 and \$2 billion per year, respectively (Orchard & Finch 2002; Sports Injury Prevention Taskforce 2013), when including loss of productivity and other societal costs. The methods used to determine these costs do not disclose if they incorporate the costs of subsequent impacts of injury such as osteoarthritis.

Injury can impact future sport participation and lead to long-term consequences such as musculoskeletal conditions or traumatic brain injury. Such linked conditions should be included in estimates of the cost of injury to provide a more complete picture of the costs of injury and the benefits of injury prevention in Australia. Better data are required to provide a more accurate estimate of the costs to the health system.

The case for developing a National Sport Injury Data Asset (NSIDA)

The lack of national data on the extent and nature of sport injuries in Australia makes it difficult to formulate, prioritise and evaluate injury prevention initiatives. Data on the effects of physical activity at a population level are available from burden of disease estimates, and while the overarching effects of injury are known, the contribution of sports injury has not been clear in burden of disease analyses due to a lack of data.

Better sports injury data will help us understand the impact and causes of sports injury and improve injury prevention and management. This will lead to better health and reduced costs and benefit individuals, the sports sector, and the Australian health-care system. Better evidence on the risks of sports injury and the benefits of injury prevention strategies will also assist individuals to make more informed decisions regarding sport participation.

The collection of sports injury data across community sport aims to provide data to the public, sports organisations and researchers so that the risks of participation are understood and prevention programs can be prioritised. Ongoing data collection will also help us understand how prevention programs are working in community sports and inform adjustments over time. An ongoing data collection will also provide early detection of emerging issues to enable more rapid responses. Better data are anticipated to support injury prevention and improve sport participation and physical activity. The World Health Organization (WHO) recommend increasing physical activity as a ‘best buy’ intervention in public health, representing an excellent return on investment (WHO 2017). Chapter 2 describes a number of Australian Government initiatives that align with an NSIDA to inform injury prevention.

Overview of this strategy

This section sets out the background, vision, aims and envisaged outputs and outcomes of implementing an NSIDA. Delivering the envisaged data, insights and outcomes from this strategy is an ambitious endeavour. The last part of this section sets out a chapter-by-chapter guide to the main steps to deliver an NSIDA for Australia.

Background

In the 2018–19 Federal Budget, the Australian Sports Commission (ASC) received funding for an economic analysis of sports injury and the exploration of existing and potential data sources relating to sports injury and assessment in relation to the development of a national sports injury database. The AIHW was commissioned by the ASC to perform this work commencing in June 2020.

This strategy is the first published product of the work program and presents a concept for an NSIDA to seek feedback from stakeholders and ensure it provides value to stakeholders and data providers.

Vision

The vision of an NSIDA is to provide the evidence base to:

- help individuals, organisations, policymakers and researchers understand the types and causes of sports injury in the community
- allow for quicker detection of changes in injury types and causes and promptly identify emerging issues
- indicate where and what type of injury prevention programs are needed
- understand the costs and benefits of sport to the health system and the cost-effectiveness of prevention programs
- provide ongoing surveillance to evaluate injury prevention programs in-the-field.

Aims, outputs and outcomes

This document proposes a strategy for the development of an NSIDA for review and critique by stakeholders, with the aim being to provide information on the number and causes of injury by sport, sex, age and area.

The 2 main outputs of this strategy are:

- analyses of de-identified data from several data sources to determine the suitability for inclusion in an NSIDA
- assessment of the feasibility of a voluntary online sports injury data collection tool to inform future NSIDA data collections.

Successful implementation of an NSIDA will:

- enable reporting of aggregate data by different sports, geographical areas, age groups, sexes, types of injuries, causes and, in some cases, whether injury prevention equipment or programs were in use
- build capability to standardise the way data are collected and reported
- enable more accurate economic analyses on the health system costs of sport injury and savings due to participation in sporting activities
- enable injury and injury prevention research
- increase participation by providing the evidence-base for injury prevention programs leading to a reduction in injury and more participants able to continue participating and developing in their sport
- increase participation by providing evidence on the actual risks and types of injury in community sport
- decrease costs to the health system, individual out-of-pocket, insurance and lost productivity costs arising from decreased injury and health benefits from increased participation.

Structure of this strategy

The strategy includes a number of components, some of which are underway. Several of the following components will be iterative and ongoing throughout the project:

- data landscape review – Chapter 2 provides a review of the context and sports injury data landscape in Australia and internationally

- data sources – Chapter 3 identifies and reviews potential data sources for inclusion in the NSIDA
- stakeholder engagement – Chapter 4 outlines the stakeholder consultation plan and presents preliminary stakeholder engagement findings
- designing the NSIDA – Chapter 5 describes the plan for developing the NSIDA
- building the NSIDA – Chapter 6 describes the proposed plan for building the NSIDA, including a data collection tool
- implementation – Chapter 7 describes the plan for launching and rolling out the NSIDA and the NSIDA data collection tool and the proposed governance structures for the NSIDA, including arrangements for data management, data access and oversight.

Chapter 2: Data landscape review

The NSIDA project is relevant to many government policy areas and is the latest among many efforts to collect sports injury data. This chapter outlines the NSIDA's policy relevance and the history of Australian sports injury data and describes international sports injury data collections.

Australian policies and strategies relevant to sport injury

The following Australian Government initiatives are of particular relevance to the development of the NSIDA:

- The *National Preventive Health Strategy 2021–2030* aims to improve the health of all Australians at all stages of life, through a systems-based approach to prevention that addresses the wider determinants of health, reduces health inequities and decreases the overall burden of disease (Department of Health 2021a). A focus on increasing physical activity will be integral to the strategy, alongside other key focus areas where a stronger and better-coordinated effort will enable accelerated gains in health. The strategy outlines 7 system enablers that are critical to drive change across the health and prevention systems to support the strategy in achieving its aims. These include: partnerships and community engagement, research and evaluation, and monitoring and surveillance.
- The draft *National Injury Prevention Strategy 2021–2030* aims to create a national focus on injuries and their prevention (Department of Health 2020). An objective of the strategy is to reduce the rate and impact of sports injuries through:
 - supporting sports clubs and schools to develop, implement and enforce safety policies and practices covering education of players and parents, compulsory use of relevant protective equipment, use of relevant modified equipment and fixtures, maintenance of sporting fields, exercise-training programs, refereeing and rules for safe play, and accreditation of coaches and coaching standards
 - promoting head-injury awareness, appropriate concussion policies and management and wearing of protective headgear, especially in sports such as horse-riding, skiing, cricket and football codes.
- The draft *National Obesity Prevention Strategy 2022–2032* promotes a physical activity system that helps people to connect with culture, nature, sports and active travel, and grow participation in walking, cycling, public transport, active recreation and sport by minimising cost and access barriers (Department of Health 2021b).
- The *National Osteoarthritis Strategy* (de Melo et al. 2020; National Osteoarthritis Strategy Project Group 2018) has prevention as a key theme to address the increasing rates of anterior cruciate ligament (ACL) injuries and subsequent osteoarthritis. Prevention activities include increasing physical activity and reducing the risk of joint injuries.
- Government concussion initiatives include:
 - updating the *Concussion in Sport Australian Position Statement* by the Australian Institute of Sport (AIS), the Australian Medical Association, the Australasian College of Sport and Exercise Physicians and Sports Medicine Australia (AIS 2019).

- a *Concussion and Brain Health Project* evaluating brain health in retired elite athletes led by the AIS in collaboration with the University of Newcastle and University of Canberra and to be delivered in 2024 (AIS 2021)
- the *Traumatic Brain Injury Mission*, providing \$4 million of Medical Research Future Fund research grants in 2021, to investigate the prevention, diagnosis and treatment of sports-related concussion (Department of Health 2021c).

History of previous initiatives to improve sports injury data in Australia

A desktop review and stakeholder consultation with injury researchers revealed that efforts at both national (Appendix Table A1) and state/territory (Appendix Table A2) levels to improve sports injury data have been ongoing for more than 20 years. Several of these initiatives published recommendations regarding improved data development that are still relevant.

Previous government initiatives identified a need for:

- more detailed data on physical activity injuries, including less severe injuries and the causes of injury
- a lead agency to collaborate with health and sport sectors to collect government and non-government data
- infrastructure support and training.

While the collection of elite athlete sports injury data has grown to be comprehensive, elite injuries represent a small fraction of injuries nationally, and the types of injury and prevention strategies in elite athletes may not be relevant or scalable to the broader community.

International injury and sport-specific data sets

Ongoing injury and sports injury data collections in other developed countries were often referenced by stakeholders during stakeholder consultations. The extent to which systems in the United States, Canada, New Zealand or Korea could be implemented in Australia would be influenced by resource availability, population, sampling approaches, and the presence of national insurance schemes.

The importance of ongoing funding and appropriate resourcing of injury surveillance systems was a theme observed in this review of international data sets. This was relevant to long-term funding of the data collection as well as funding to data collectors in emergency departments (EDs) and athletic trainers. Systems should ideally be simple, flexible, accepted, stable, useful, cost-effective, and timely (Groseclose & Buckeridge 2017). Shipton and Stone (2008) found that 3 staff resources were critical to ED injury surveillance: an ED staff member, a data analyst, and someone responsible for promoting preventive measures.

United States

National Electronic Injury Surveillance System

The Consumer Product Safety Commission (CPSC 2021) operates the National Electronic Injury Surveillance System (NEISS), which collects data on all injuries from 100 EDs to obtain a representative sample, with cause of injury data collected daily.

Each ED has an NEISS hospital coordinator that reviews the data and codes it using rules described in an NEISS coding manual. The CPSC's analytical process begins on the same day the data are collected, with epidemiology analysts reviewing data quality and screening for potential emerging hazards. The patient's age, gender, race, ethnicity, injury diagnosis, affected body parts, and incident location are among the data variables coded. A brief narrative description of the incident is also included, which is searchable via a user-friendly public query tool. The cost per record is estimated at USD \$6 (EuroSafe 2020a). NEISS is considered the best injury surveillance system in the world and has ongoing federal funding.

National Collegiate Athletic Association Injury Surveillance Program

The National Collegiate Athletic Association (2021) Injury Surveillance Program started in 1982. This system has had a large impact, informing many injury prevention policy changes, such as those relating to heat-related injuries in football, eye injuries in lacrosse, and player contact rules in ice hockey and basketball.

National High School Sports-Related Injury Surveillance System

The National High School Sports-Related Injury Surveillance System uses an online reporting tool called High School RIO™ and is performed by the Colorado School of Public Health (2021). The data collection commenced in 2005–06 and is performed annually with 100 nationally representative schools providing data. High School RIO™ captures information on athletic activity (number of athlete practices and number of athlete competitions per week), injury (such as body site, diagnosis and severity) and injury event (such as mechanism, activity, position/event, field/court location). Data are submitted weekly by certified athletic trainers, who are paid a USD \$200–\$300 honorarium per year.

Massachusetts Youth Health Survey

The Massachusetts Youth Health Survey is conducted every 2 years by the Massachusetts Department of Public Health (2021). In 2017, 18.6% of middle school and 12.4% of high school student athletes reported symptoms of a sports-related concussion in the past year. Similar results were observed in 2019, with 18.5% of middle school and 15.6% of high school athletes. Half of both middle and high school students who reported symptoms of a sports-related concussion continued to play sports that day. Concussions were more likely to be reported in males with males less likely to be removed from play than females (44.8% and 58.0% removal in 2017 for male and female middle school students, respectively; 46.3% and 58.0% removal in high school).

Canada

Canadian Hospitals Injury Reporting and Prevention Program

The Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) is an ED-based injury and poisoning surveillance system established in 1990 (Crain et al. 2016). The CHIRPP operates in 11 paediatric and 6 general hospitals across Canada and is funded and administered by the Public Health Agency of Canada. Due to the large proportion of paediatric hospitals involved, 80% of all records are paediatric.

CHIRPP collects patient accounts of pre-event injury circumstances using a questionnaire completed during a patient's visit to the ED, and health-care staff add clinical data which is then coded by clinical coders. The CHIRPP captures more information about risk and protective factors than do hospital administrative or mortality data alone, and also identifies less serious injury cases that do not require hospitalisation (Crain et al. 2016).

United Kingdom

Emergency Care Data Set

The National Health Service (2021) in England launched the Emergency Care Data Set (ECDS) in 2017 which replaced the Accident & Emergency Commissioning Data Set. The ECDS contains 108 data fields, including details on time and place of injury, nature of injury, activity at time of injury, and mechanism of injury.

All Wales Injury Surveillance System

The All Wales Injury Surveillance System (AWISS, Daniels et al. 2020) is a population-based, multi-source injury surveillance system which includes ED, admitted patient, mortality and demographic data within Wales. AWISS collects data on injury risk factors, severity, outcomes and costs, to allow injury prevention practitioners and policymakers to make evidence-based informed decisions. For example, AWISS data can be used to identify groups at high risk of injury and to support the planning and evaluation of injury-related interventions and policies. The quality of location and activity data to indicate sport is not well captured in the ED data.

European Union

European Injury Database

The European Injury Database (EU-IDB) contains standardised cross-national information on the external causes of injuries treated in EDs within the European Union (EU) (EuroSafe 2020b). The ED coverage is not complete but considered representative and contains around 300,000 cases a year from over 100 hospitals in the EU. The EU-IDB provides users with information about the number of injuries and their characteristics, including age, gender, type and mechanism of injuries, intent, and setting in which they occur (home, school, sport, leisure, work and road). The EU-IDB classification is based on the WHO's International Classification for External Causes of Injuries (ICECI), and includes activity when injured, with a *Sport and exercise during leisure time* category and a *Sports* module for specific sport activity, which is applied to both that category and other categories such as education activities (physical education classes and school sports). Eurosafe has published policy briefings on specific types of sport injuries, such as basketball and handball injuries, and helmet use in snow sports.

A EuroSafe (2020a) position paper noted that budget restrictions were threatening the continuation of the EU-IDB. Since 2017, the EU-IDB has been dependent on the voluntary contributions of participating countries and participation has been declining. The EU-IDB is currently hosted by the Italian National Institute of Health.

New Zealand

The Accident Compensation Corporation (ACC 2018, 2021a, 2021b) is a no-fault scheme that covers everyone injured in an accident in New Zealand and receives an average of 480,000 sport-related claims per year. The scheme has covered all injuries since 1974 and publishes sports injury data by sport, sex, and injury type. ACC is the sole sport insurer and invests in injury prevention activities such as SportSmart (ACC 2022).

South Korea

Emergency Department-based Injury In-depth Surveillance database

This database commenced in 2011 with 20 EDs and is based on the WHO's ICECI. It includes patient characteristics, pre-hospital emergency medical service records, and injury-related information such as time, place, sport type, mechanism of injury and information about the environment where the injury occurred (Choi et al. 2019).

Chapter 3: Review of existing data sources

A desktop review and consultation with stakeholders was performed to identify existing and potential Australian sports injury data sources. Sports injury information is currently collected by a variety of providers in different settings and for different purposes. These data sources are potential candidates for inclusion in the NSIDA. This section describes the identified existing and potential data sources.

Severe injury is usually treated in the hospital system, while less severe injuries are usually treated by physiotherapists, general practitioners (GPs), specialist outpatient clinics and other allied health professionals. Data from severe sports injuries can be found in established data collections such as national data collections for admitted patient care, ED care, deaths, as well as trauma registries and insurance claims data.

General practices, sport and exercise physicians and allied health care providers (including physiotherapists) do not currently record sports injury in a systematic way and store data using a variety of software platforms. In addition, there is much variation in how information is recorded by health-care providers, even within the same setting. The AIHW (2021e) is leading other work to develop a National Primary Health Care Data Asset and the amount and quality of these data will be monitored as this data asset evolves.

Data on both severe and less severe injuries can also be sourced from sporting organisations that have their own data collections. Access to the data held by insurers may vary due to privacy and commercial-in-confidence concerns. Information on some injuries may appear in more than one data source, such as the more severe injuries that could be recorded in both insurance data and the admitted hospital data collected in the National Hospital Morbidity Database (NHMD).

Key characteristics of existing sports injury data sources are listed in Table 3.1. Each data source is then described in more detail, moving from small to large numbers of sports injury records and progressing from detailed records of sports injury to those that may not report sport involvement in the injury record.

Table 3.1: Key characteristics of existing Australian sports injury data sources

Data source	Approximate number of sports injury records per year	Injury severity	Injury diagnosis collected?	Sport or physical activity recorded?	Availability
National Coronial Information System	<1,000	Very severe (deaths)	Yes	Yes	Yes
Registries, for example, Australian Spinal Cord Injury Register, Australia New Zealand Trauma Registry	<10,000	Very severe	Yes – coded using ICD-10-AM classification system; a subset of admitted patient data	Yes – coded using ICD-10-AM classification system	Variable coverage by state/territory
Sports insurers	<10,000	Moderate–Severe	Yes	Yes – text	Variable
Survey data	<10,000	Various	Yes	Yes	Yes – ABS National Health Survey 2001, 2004–05
Research publications	Variable, but usually <10,000	Various	Varies	Yes	Aggregate data published
AIS Elite Athlete Management System	>10,000	Various	Yes	Yes	Not available at this stage
Professional sports codes (AFL, NRL, Rugby Australia, SSN League, Cricket Australia) reports	>10,000	Various	Yes	Yes	Published as aggregated reports, may be limited to national and/or state
Health insurers	10,000–100,000	Various	Often no diagnosis information for allied health; diagnosis only when admitted to hospital	Only assumed to be related if a sports hospital admission occurred	Not available at this stage
AIHW National Hospital Morbidity Database – admitted patient care	60,000 ^a	Severe	Yes	Yes	National collection by AIHW – ongoing
AIHW National Non-Admitted Patient Emergency Department Care Database	550,000 ^b	Mild, moderate, severe	Yes – emergency department principal diagnosis coded using emergency department ICD-10-AM shortlist	Not at national level Local hospitals systems may have this information	National collection by AIHW – ongoing
General practice and allied health care providers	>1 million	Mild and moderate	Yes – variable quality	Text – dependent	Not available at this stage

AFL Australian Football League

NRL National Rugby League

SSN Suncorp Super Netball

(a) Based on AIHW Hospitalised sports injury 2016–17 (AIHW: Kreisfeld & Harrison 2020).

(b) Based on 11% of emergency department sports injury presentations leading to hospital admission (Fernando et al. 2018).

Deaths data

If an injury resulting in death occurred during a sports activity, it is likely to be recorded in the National Coronial Information System (NCIS), as this keeps a record of all unexpected fatalities. Deaths are usually certified by a doctor (86%–89%) with the remaining 11%–14% certified by a coroner (ABS 2020). NCIS data are collected for administrative purposes, so are not a perfect source for understanding how or why a death occurred (Fortington, pers. comm., 2021). Further, because of the overall small numbers of sports-related injury deaths, conclusions are limited and not easily generalised. Due to these limitations, NCIS data cannot be used to extrapolate to less severe (non-fatal) injuries, and the small numbers makes any surveillance of injury levels, type or cause challenging over periods less than several years.

The AIHW National Death Index is an alternative data source that contains data on cause of death but does not include any injury-associated activity that can be attribute to a sports-related cause.

Registries

Registries such as the Australian Spinal Cord Injury Register and the Australia New Zealand Trauma Registry collect relevant sports injury data. However, the coverage of such registries may be limited, as they rely on data from specific clinical groups. Only a subset of registry injury cases would be related to sport. One advantage of registry data is the excellent data quality and longer patient follow-up periods, which can include outcome data.

Sport insurance data

Sport insurance data capture more moderate to severe sport-specific injuries and could potentially capture some data outside of the national hospital data collections. Only a small proportion of all people with sports injuries are eligible to make a successful insurance claim, and a subset of those may not claim due to lack of awareness, choosing not to claim or claiming instead via private health insurance or Medicare. The ability to claim for loss of income on some insurance policies is likely to skew the number and value of claims for wage-earners versus those for children and non-wage-earners.

Pending approvals for release of data by sporting organisations, several sport insurance groups could provide de-identified claims data. It is likely that a number of these more severe claims would also be captured in the NHMD collection. Both data sources need to be compared to understand the additional value that sport insurance claims data can provide.

Survey data

There are a number of surveys that gather relevant data on a periodic or non-ongoing basis. The coverage of sports injury questions has varied over time.

The Australian Bureau of Statistics (ABS) National Health Survey (NHS)

The National Health Survey (NHS) is an in-person household survey conducted by the ABS every 3 years. In both 2001 and 2004–05, approximately 19,000 participants were asked if they had an injury in the past 4 weeks (ABS 2003, 2006). Data were collected on

demographics, injury type, location, sport and if they went to a medical professional for their injury or visited a hospital.

In 2007–08 and 2011–12 the NHS did not ask detailed injury questions but asked whether participants had a long-term condition that resulted from an injury, and asked what the condition was and where this injury occurred ('exercise or sport'). There were no injury-specific questions in the NHS in 2014–15 or 2017–18.

National Aboriginal and Torres Strait Islander Health Survey (NATSIHS)

In 2012–13, the NATSIHS, an in-person household survey of National Aboriginal and Torres Strait Islander people, asked if participants had an injury in the past 4 weeks (ABS 2013). A further question asked if this was 'Injured while playing sport', if medical attention was sought, the type of injury, body region affected, and where the injury occurred (including options for 'sports facility, athletics field or park'). These questions were not repeated in the 2018–19 NATSIHS.

Future ABS sports injury survey data

There is no sport or physical activity injury module within the next (2020–21) NHS or the 2021–2023 Intergenerational Health and Mental Health Study, which will survey 60,000 individuals and include a nutrition and physical activity survey. The current focus is to better understand chronic health conditions and risk factors and the 2021 Census has also collected data on the most common chronic conditions. Further data on the risk factors for chronic conditions, such as those caused by sports injury are needed.

Other national health surveys

In 2016, the Longitudinal Study of Australia's Children asked 16–17 year olds about injuries that resulted in missing 2 or more days of school in the previous 2 years (AIFS 2021). This question is unlikely to capture minor injuries and included sport injuries across team (44.1% of participants), individual (20.8%) and fitness activities (45.0%). Transport injuries that occurred while cycling and walking were not included among sport injuries. The study found 22% of 16–17 year olds had missed multiple days of school or work due to an injury in the previous 2 years and that 57% of these were due to playing sport, with 61% for males and 51% for females. Young people who had been injured earlier in adolescence were 1.8 times as likely to have a sports injury and 2.1 times as likely to have a non-sports injury. More males than females were injured (25% compared with 19%) and it was common (52%) for the injured adolescents to report multiple injuries in the previous 2 years.

Sports injuries occurred in outside public places (56%), school (28%) or inside public places (14%). For sports injuries causing 2 or more days absence from school – strains or sprains were most common (52%) and higher in females (63%) than males (45%). Bone fractures caused 25% of sports injuries (33% in males, 12% in females), followed by bruises or swelling (12%), dislocation (8%) and concussion (6%). Of the most serious injuries reported by respondents, 56.6% resulted in 3–10 days of school or work lost. Of the 387 sports injuries requiring at least 2 days away from school, most were seen by a medical professional: 32.1% saw a medical specialist (physiotherapist or dentist), 31% and 28.1% saw a doctor or nurse (at a hospital or clinic, respectively), and 7.9% an ambulance paramedic. Coaches and teachers (18.5%), parents (19.2%) and participants (15.1%) also treated injuries. Note that injuries could be treated by more than one provider.

Sport participation surveys

'AusPlay' is the yearly Australian sport and physical activity participation survey that commenced in 2015 and is funded by the ASC (ASC 2021b). The survey sample is 20,000 adults (15 years and over) and 3,600 children (0–14 years). AusPlay collects sport and physical activity participation data, with 'poor health or injury' or 'fear of injury' as response options to the barriers to participation. Prior to 2022, there were no specific questions on sports injury occurrence. Following consultation with the AIHW, the ASC has modified the existing survey questions to elicit specific information on injuries with data collection commencing in 2022.

The continuous New South Wales Population Health Survey collects sports participation data but has not asked injury questions since 2005, when it collected information on the number of times a person was injured while playing sport in the past 12 months, and the type of treatment sought (New South Wales Health 2006).

Data collected by sporting bodies

Some sporting organisations have taken the initiative to develop injury incident reporting data systems, to improve performance in elites, support insurance claims or assist with transparency and risk management in their organisation.

Athlete Management System

The Athlete Management System (AMS) collects data on elite level and high-performance athletes. The AMS is provided by the AIS through a nationally available web-based platform to support education and decision making by national sporting organisations and the National Institute Network, with the aim of improving athlete health and performance outcomes.

The AMS captures data from a variety of sources including questionnaires completed by athletes, automated integration of wellbeing and monitoring tools, injury and illness electronic health records, and purpose-built custom applications. These data sources allow for further analysis, providing athletes, coaches and support staff with alerts, reports and visualisations that improve communication and decision making. The AMS consists of 7 linked Smartabase platforms (Fusion Sports 2021). Since 2013, the AMS has recorded over 1.5 million training sessions and over 300,000 injury treatments from over 10,000 athletes across 42 sporting organisations. While the level of detail is typically high quality, the system has high resource requirements and the injuries recorded may not represent those in community sport.

Professional sports codes

Professional sports codes publish aggregated sports injury data in yearly reports (e.g., AFL, NRL, Rugby Australia, Suncorp Super Netball League, Cricket Australia). Some of these are public facing and others are internal only. Most report only at the top level of competition, but some also report data at the tier below. Many use the Smartabase commercial database platform, but franchises within the same league can use different platforms.

Basketball NSW

Basketball NSW have an online injury reporting system that allows players and others to make a report with data held at the central office site. Basketball NSW has de-identified data for nearly 700 injuries that can be provided to AIHW. For more information, see the case study in Chapter 4.

Equestrian sports

Incident reporting is performed by both Pony Club Australia (see case study in Chapter 4) and Equestrian Australia. These can be used to rapidly inform administrators of issues and for mitigations of safety risks to be put in place.

Rugby League Canberra

Canberra Region Rugby League uses commercially available online reporting, and sports trainers log injuries using their computer or mobile device. Documentation is sent through to administrators, who can make a player 'unavailable' for subsequent games pending sign-off from a GP following a concussion.

Private health insurance data

Private health insurers often hold multiple years of longitudinal data, especially for people who regularly claim. This can enable data linkage (within private health insurance data systems) of a known sports injury to prior or subsequent physiotherapy, rehabilitation and other allied health care visits. A caveat is that prior and subsequent allied health care visits would be assumed to be related to the sports-related event, and that not all persons with private health insurance would have both hospital and 'extras' cover, and that annual claim limits could under-represent the number of allied health care visits recorded. However, private health insurance data may include patient journeys that involve hospital admission for a sports injury where patients have full health insurance cover.

Hospital data

Admitted patient care – national hospitalisations data

Admitted patient care includes medical, surgical and other services for both non-elective and elective hospital admissions (AIHW 2019b). Admitted patient care data are collected from essentially all hospitals in Australia and are collated in the AIHW's NHMD. The NHMD is a compilation of episode-level records from patient administrative and clinical record systems (AIHW 2019b). In the NHMD, a record is included for each separation, not for each patient, so patients who separated more than once in the year have more than one record in the NHMD.

The NHMD includes data fields for demographic information, diagnoses, procedures, external cause of injury, place of injury occurrence, and activity when injured. The activity codes include codes for specific sports (for example, *Soccer*) and codes for unspecified types of sport (for example, *Football, unspecified*, which means the type of football was not known or reported). Only about 40% of injury records in the NHMD are accompanied by an activity code to allow reporting on sports injuries such as [Hospitalised sports injury in Australia 2016–17](#) (AIHW: Kreisfeld & Harrison 2019). Nevertheless, the NHMD is the best existing source of national community sports injury data.

The annual AIHW publication *Australia's hospitals at a glance* is a companion publication to data on the MyHospitals website which provides broad analysis of results from the NHMD (AIHW 2020). Metadata for the NHMD is also published in the AIHW Metadata Online Registry (METeOR) (AIHW 2021f) which is Australia's repository for national metadata standards for health statistics and information.

Emergency department presentations – national data

State and territory health authorities provide ED data to the AIHW for collation into the AIHW National Non-Admitted Patient Emergency Department Care Database (NNAPEDCD). A record is created for each ED presentation, not each patient. The data set holds demographic, triage, wait time and clinical information since 2013. Three clinical diagnosis fields are available for injury reporting: principal diagnosis and first and second additional diagnoses (if applicable). Diagnosis data are coded using the ED diagnosis short-list of ICD-10-AM classification codes. Broad analysis results from the NNAPEDCD are published on the MyHospitals website (AIHW 2021d).

Unlike the NHMD, the NNAPEDCD does not have data fields for external cause of injury, place of injury occurrence, or activity when injured. However, state/territory-based ED data collection systems often capture external cause of injury as free text, so that injury cause and activity may be identified by interrogating text fields if the clinician has provided sufficient detail. Some free-text fields are limited to a certain number of characters or words which may limit the amount of information recorded.

The Queensland Injury Surveillance Unit (QISU) and the Victorian Injury Surveillance Unit (VISU) routinely code free-text injury information from their ED data systems into ICD-10-AM codes, enabling counting of ED presentations due to sports injuries, however, like the NHMD, many records do not include information on the activity being undertaken at the time of injury, resulting in a likely undercount of sports injury ED presentations.

The methodology used by Victoria and Queensland differs, so the data from the 2 data sets should not be aggregated, but trends over time within or between data sets could be further investigated.

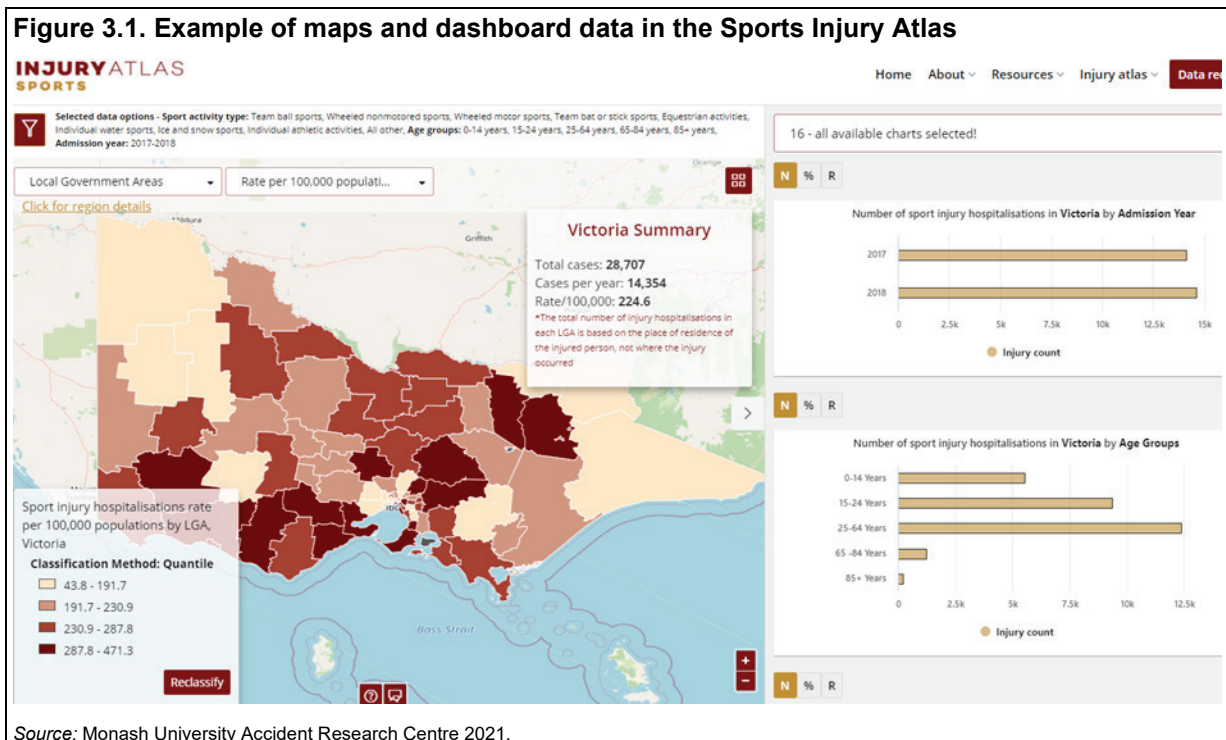
Victorian Injury Surveillance Unit (VISU) hospital admissions and ED data

VISU analyses, interprets and disseminates Victorian data on injury deaths, hospital admissions and ED presentations across the state (Figure 3.1) (Monash University Accident Research Centre 2021). The Victorian Emergency Department Dataset (VEMD 2021) contains diagnosis coding and collects the following injury surveillance data items:

- activity when injured
- body region
- description of injury event
- human intent
- injury cause
- nature of main injury
- place where injury occurred.

The Victorian 2017 and 2018 hospital admissions data are used for a Sports Injury Atlas with breakdowns by year, sex, age groups, Indigenous status and various geographic areas (Monash University Accident Research Centre 2021). Sports categories include a range of team ball sports, wheeled motoring and non-motored sports, team bat or stick sports, equestrian activities, individual water sports, ice and snow sports, athletic activities, and other activities. Separate data are available for some individual sports, with AFL being the most common activity in Victoria, followed by football (unspecified), soccer, basketball and cycling.

Figure 3.1. Example of maps and dashboard data in the Sports Injury Atlas



De-identified aggregated VISU data in table form would be available for cell sizes over 5 by sport and demographic breakdowns. These data are currently accessed by researchers for specific projects, but regular reporting at an aggregated level could be available for publication on the AIHW website pending appropriate privacy and ethics processes and approvals from the data custodian. It is anticipated that these data could be made available within 1 year of the end of the reporting period, making this a relatively timely source of feedback to monitor changes in injury following any changes in policy or prevention programs.

Queensland Injury Surveillance Unit (QISU) ED data

QISU collects injury data from 18 EDs at participating hospitals across Queensland (Queensland Injury Surveillance Unit 2020). QISU data are coded for injury surveillance using the National Data Standards for Injury Surveillance (NDS-IS v.2c). QISU relies on the coding of text in ED records. The objects and substances involved in injury are recorded in this system, with areas related to physical activity under infant and child products, transport (bicycle), and sporting equipment (ball, sport projectile, bat, racquets, stick, other playing area structure and other). Approximately 43% of the data presented were either manually coded by triage nurses at each participating hospital (17%) or by QISU coders (26%). The remaining data were coded using a machine-learning classifier.

QISU is able to run data searches on the data collected to provide a custom-tailored injury data report. Data items currently collected include:

- demographics (age, sex, postcode)
- country of birth
- language
- time and date of injury event
- text narrative of injury event

- cause of injury
- intent of incident
- place of injury
- activity (for example, playing cricket)
- nature of injury and body location
- diagnosis (ICD-10-AM and SNOMED classification systems)
- mechanism of injury
- major injury factor
- triage category (an indication of severity)
- admission status.

General practice, specialist and allied health data

Sports injury data are not systematically collected in primary or secondary care. A variety of software platforms are used and improvements in injury data collections from these sources would need collaboration with software platform providers. Medical Director™ and Best Practice™ are the more common platforms in general practice, while Genie™ is used in the specialist/out-patient sector, and Cliniko™ and SmartSoft™ are used in the allied health care sector. These system variations will be superimposed on variations in information recording by health-care providers, even within the same setting. The AIHW (AIHW 2021e) is leading other work to develop a National Primary Health Care Data Asset and the amount and quality of these data will be monitored as this data asset evolves.

The amount or quality of sports injury data that could be obtained from secondary use of My Health Record is currently unknown.

Medicare Benefits Schedule (MBS) administrative data records the type of visit but does not record the reason for visit in order to capture the number of services related to sports injury.

Other data sources

Ambulance and first aid data

Many community sports do not have first aid providers unless a major event is planned. Fewer community sports have trainers and the default for more urgent cases is calling an ambulance, while less injured persons may follow up with medical providers individually.

Ambulance data are usually collected electronically by state/territory-based ambulance services with specific coding of sports injury done by New South Wales Ambulance.

More first aid providers such as St John Ambulance are commencing electronic record keeping in some states, which could provide further avenues for data.

Sports trainers are not usually required to report injury through their sporting clubs unless at the elite level. Reporting requirements can also be dependent on who the sports trainers are employed by and their insurance requirements. Many trainers do not have access to an electronic reporting system.

HeadCheck data

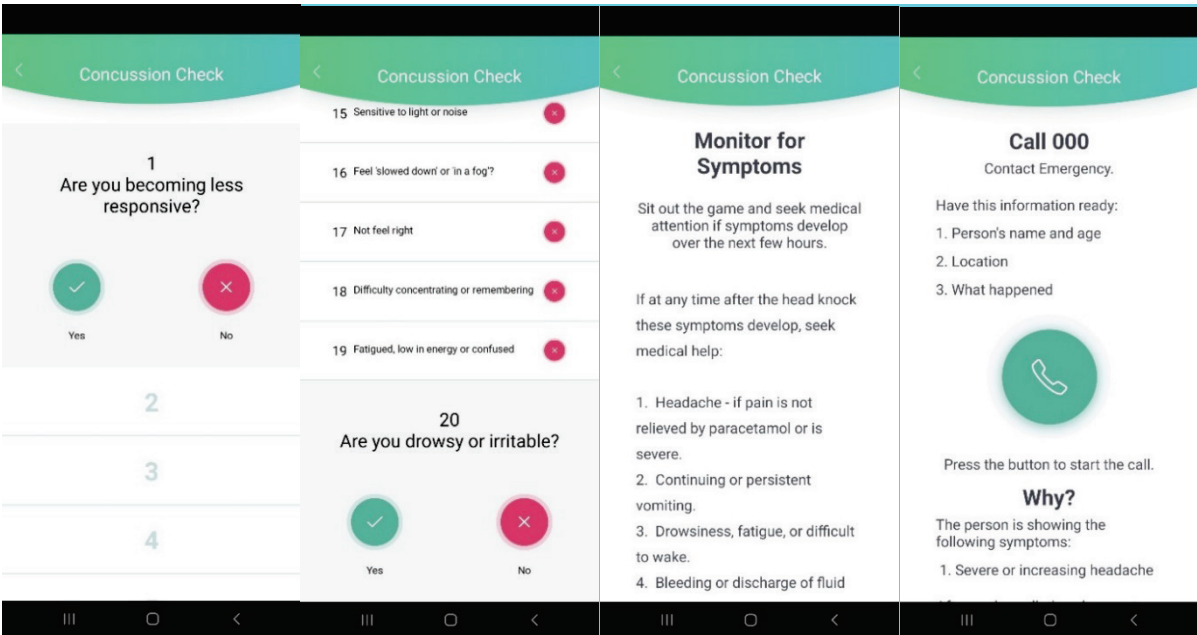
HeadCheck is a mobile-based app that assists people to recognise and manage concussion in adults and children aged 5–18 years. HeadCheck was developed by researchers and emergency medicine doctors from the Murdoch Children’s Research Institute (2021) to provide best practice in concussion education and advice (Figure 3.2). HeadCheck has been downloaded more than 50,000 times in Australia.

HeadCheck follows approved medical guidelines to assist with sideline recognition of concussion and recommend when escalation to emergency services is needed. The app also guides return to sport or other activities, for example, levels of sleep which are normal post-concussion or which require medical attention.

The AFL have made HeadCheck part of their trainer and coach education modules, and its use is mandatory in the senior leagues with plans for a roll-out through all levels of the game.

Anonymous data from the app are recorded for gender, age, organised or non-organised sport, helmet/headgear, sport, postcode, date, previous medically diagnosed concussions, and whether the concussion was diagnosed by a health-care professional. Downloads of these data should be able to record trends over time in the number of concussions by sport and season.

Figure 3.2: Four screen shots from the HeadCheck app



Source: Murdoch Children’s Research Institute 2021.

State and territory education data

Schools record injury incidents with varying thresholds and different systems across states and territories. Some state data can provide data by sport and age, but others may have only an aggregated number of injuries and do not capture whether injury is related to sports. The data cannot be compared across states and while data from individual states can offer insights, a national perspective on sports injuries in schools cannot be provided from the current systems.

Data limitations

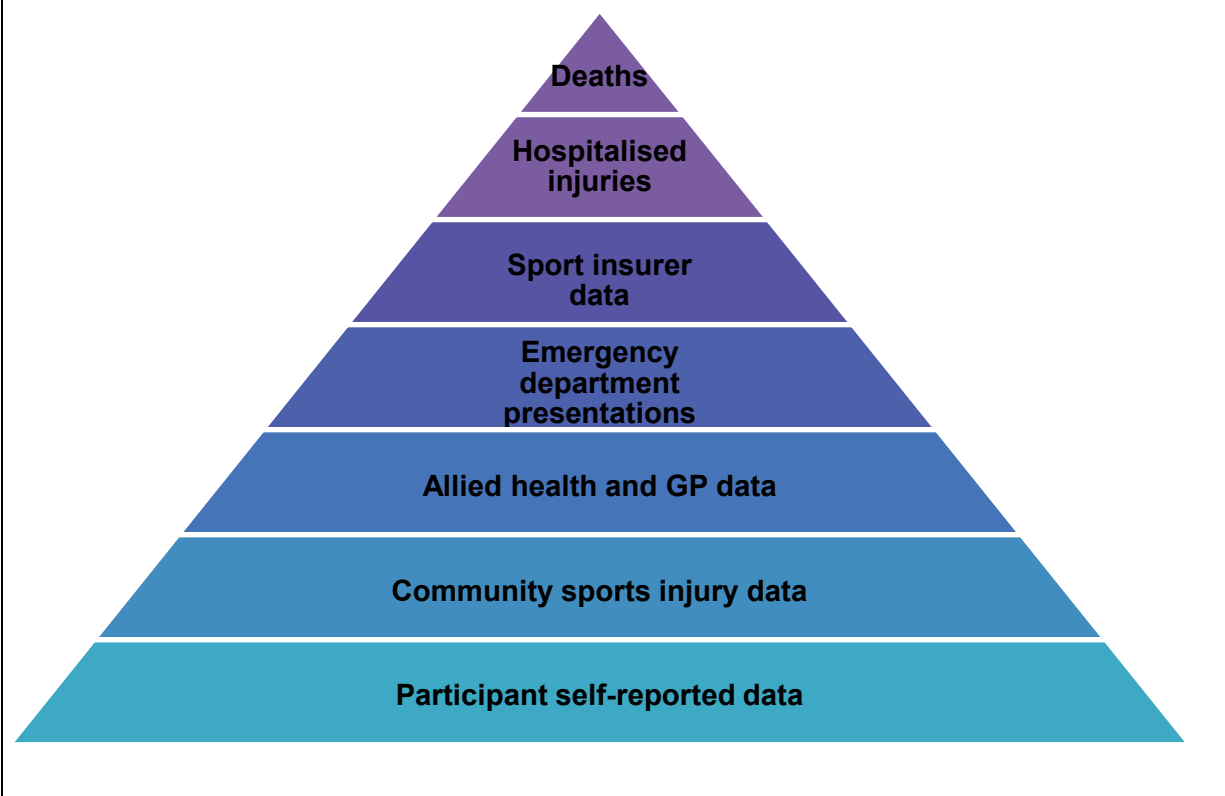
Data sources vary greatly in terms of scope, data quantity and data quality. This often depends on the purposes for which they were created.

Scope

Not all data sources include data on all types of injuries and the number of potential sports injuries reported in various data sources varies by factors such as injury severity and outcomes.

Figure 3.3 gives a visual representation of the greater volume of injury data records expected at the less severe end of the injury-severity spectrum (for example, participant self-reported data) and far fewer at the more severe end of the spectrum (for example, hospitalised injuries and deaths).

Figure 3.3: Sports injury data hierarchy (adapted from Finch et al. 1995)



While some data collections may record any type of injury complaint, most restrict the number of records collected by defining the scope of the collection. For example, some data collections only include records where:

- certain types of medical attention were provided (for example, hospital admission data)
- a certain type of outcome occurred (for example, deaths data)
- there was time loss to playing or training (for example, time loss information is typically in-scope for insurance claim data).

Data quantity

Most data sources are not mandatory – in many cases, data are provided on a voluntary or best-endeavour basis. Factors that influence the number of records submitted to a data collection include:

- time available to record injury data
- whether data providers are paid for participation
- socio-cultural influences (for example, some sub-cultures may see reporting injury as declaring a weakness)
- lack of access to reporting systems
- cost
- lack of knowledge of reporting systems or access to training
- lack of access to health-care services (where the service triggers collection of data).

Data quality

Recorded data can vary substantially in quality, including in its completeness, accuracy and compliance with data specifications. Data quality can be limited by, for example:

- missing or incorrect data
- lack of time for data reporting
- lack of knowledge on how to report
- lack of understanding of the purpose of collecting data
- incorrect formatting of data
- incorrect or absence of systematic coding.

Chapter 4: Stakeholder engagement – methods and preliminary findings

Overview

A systematic approach to stakeholder relations and communication is critical to ensuring the successful development of the data asset. As part of stakeholder engagement, the AIHW is consulting with a wide range of sporting organisations, sports injury health-care providers, researchers and policymaker stakeholders from government and non-government sectors, including academia and software providers. Ongoing stakeholder engagement is a central feature of the data asset's development, operation and continued refinement.

Stakeholder engagement plan

The overall purpose of AIHW's stakeholder engagement is to understand sports injury data needs and explore how these could be met by the development of the data asset.

Aims

The stakeholder engagement aims to:

- build relationships and trust
- understand current sports injury data and gaps
- assess technologies for data collection
- inform and refine the data development plan
- inform and refine the scope and inclusions of the data asset
- understand preferred governance structures
- identify potential project risks.

Key stakeholders

Stakeholder engagement will continue through the project. There were 8 key groups of stakeholders identified with potential interest in the data asset:

- sports participants
- sporting organisations
- sport and health insurance providers
- health-care services commissioners (Commonwealth and state/territory governments, and private health insurers)
- health-care providers (primary, specialist and allied health care)
- policymakers (Commonwealth and state/territory health departments, other government departments)
- researchers and non-government organisations
- providers involved in the development and standardisation of selected health-care and sports injury data variables and infrastructure including clinical information systems.

Consultation process

The phases of stakeholder engagement during 2021–22 are discovery, drafting, further consultation and participation in a pilot data collection. The objectives of each phase are described in more detail in Appendix Table C1. The level and method of stakeholder engagement will vary depending on stakeholders and objectives.

Stakeholder engagement – preliminary findings from the discovery phase

In Phase 1 of the stakeholder engagement consultation process, the AIHW met with stakeholders from 45 organisations across health, government, industry, sporting and insurance sectors (see stakeholder list in Appendix Table C2). The AIHW also conducted a stakeholder survey to gain a better understanding of what sports injury data are currently collected, how the data are collected and reported, what data could be useful to collect in the future, and barriers to data collection (Box 4.1).

Box 4.1 Stakeholder survey

In July to September 2021, the AIHW conducted an online stakeholder survey. The survey was open to the public and publicised through the ASC Clearinghouse, AIHW social media and the Australian Physiotherapy Association.

Injury data collected

- Of the 193 respondents, 57% were aware of injury data being recorded, with 24% not reported, and 18% unsure. Awareness of injury recording was more frequent in national sporting organisations (20/24) than at the club level (44/92). State organisations were between the national and club levels (24/38).
- When respondents were asked who was responsible for reporting, most organisations had multiple groups identified as being responsible, with 306 entries from 165 respondents. National, state and sports club levels had those responsible across athlete/parent, coach/trainer, administrator, first aid/sports trainer and allied health professional, with ranges between 10%–28% across these 5 groups. In trainer, first aid providers and physiotherapist responses, multiple categories (an average of 2) were listed as being responsible for recording injury data and identifying their group as responsible occurred far less than the assumed 100% rate (78%, 67% and 93%, respectively).
- 54% of respondents who knew how data were collected used an electronic form, 33% converted paper forms to electronic, and 13% only used paper forms.
- The time spent to record injury data varied, with 21% spending <4 minutes, 29% spending 5–9 minutes, 15% spending 10–14 minutes, and 35% taking more than 15 minutes. It should be noted that only 2 participants and parents completed this survey, so the responses cannot be extrapolated to that group.
- The injury data collected were most commonly an incident or medical record (both approximately 65% of question respondents), with 48% also used for potential insurance claims and 36% for actual insurance claims. Data were most commonly used for more than 2 purposes by the reporting organisation.
- Around half of the respondents were aware of data collated into injury reports.

continued

Box 4.1 (continued) Stakeholder survey

Willingness to record data

- 87% indicated they would consent to have their injury data recorded, with the remaining 13% unsure.
- Respondents across all groups provided an average of 4 categories that should report injury, with responses spread across first aid providers (57%), physiotherapists (54%), athlete (49%), doctor (44%), coach (43%), trainer (41%), responsible adult (28%), other allied health professional (27%), parent (24%), organiser (6%), and club official (6%). No selection was made for the referee/umpire or centralised body options.
- Respondents selected an average of 5 responses for the minimum level of injury to be recorded. Respondents selected that the threshold for recording an injury was 'medical attention sought after playing' (81%), emergency department/hospital (76%), 'medical attention sought from sideline trainer/physio' (68%), missing games (62%), missing training (57%), decreased or modified training (58%) and injury with no decrease in playing (50%).
- Across all respondents, 22% were willing to spend up to 3 minutes recording each injury, 47% up to 4–6 minutes, 12% 7–9 minutes and 19% over 10 minutes. The results did not differ greatly between sports clubs and physiotherapists, being –2%, –5%, 6% and 1% different across the 4 time preferences.

Barriers to injury data collection

For those respondents who currently did not collect injury data:

- 68% reported a lack of infrastructure, 41% not a high enough priority, 35% did not know where to start, 29% had privacy concerns and 12% had no time.
- In the 16 respondents who didn't want injury data collected, privacy concerns (88%) followed by too much work (13%) were listed as reasons.

Main themes

Themes arising from the consultations to date are summarised in this section and are illustrated with quotes from stakeholders.

Theme 1: Existing mandatory sports injury reporting

There was recognition of the benefits of existing mandatory sports injury reporting systems.

(Sports organisation)... 'have made the use of the HeadCheck app mandatory.'

(Sports organisation several years ago)... 'made the sports injury tracker mandatory, which was "helpful for insurance" '

'We already had policies that mandated no play after a concussion (until there was a doctor sign-off)... we now have a prompt from the injury reporting form to the concussion forms for the doctor to sign-off. The system automatically shows the (concussed) player as 'unavailable to play' until the doctor forms have been submitted.'

The registration and management platform ‘has a concussion form that interacts with a database to “make players unavailable until they’re signed off by doctor”.’

‘In kids, helmets were mandated and we saw less teeth, jaw and head injuries than adults, [than] where the helmets weren’t mandated.’

See case studies elsewhere in this chapter for further discussion of existing sports injury reporting programs.

Theme 2: Support for an NSIDA

There was broad support from stakeholders for a national sports injury data asset.

‘Compulsory [injury] reporting gives the best chance for reporting to be performed and for a wider scope than just severe injuries for insurance claims.’

‘All incidents and near-misses for injury should be reported to inform prevention activities and to encourage continuous learning and improvement. Some of these approaches have come from established workplace health and safety approaches.’

‘We needed to know pre-event causation and the human factors involved.’

Theme 3: Design of an NSIDA

Stakeholders’ views on the data asset included that it should:

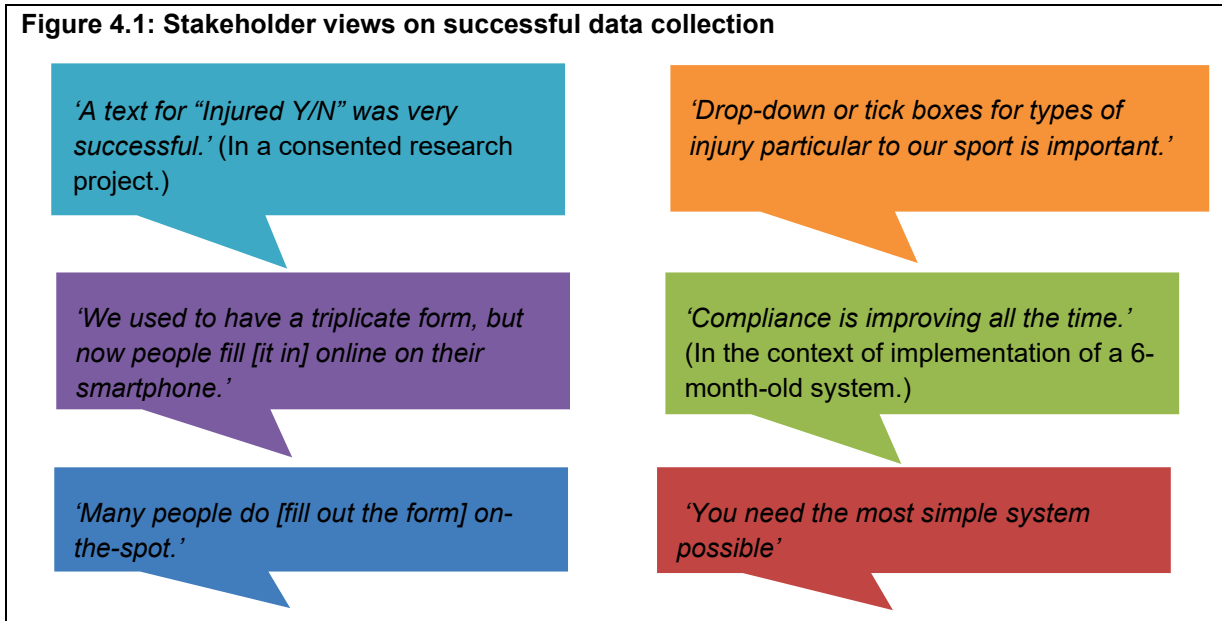
- be managed independently of the sport to ensure the data are stored and used with probity
- be designed to be enduring
- be tailored to the targeted population and sport (where possible)
- evolve to be able to capture multiple contributing causal factors across the system.

Theme 4: Data collection for the data asset

Stakeholders’ views on data collection tools are highlighted in the quotes provided in Figure 4.1. Overall feedback indicated a data asset should be:

- intuitive, quick and easy to use (for example, using tick-boxes and drop-down menus), as reporting is mostly done by volunteers
- accessible on a mobile phone (to allow it to be used at sport facilities)
- of value to users themselves
- championed and promoted to encourage injury reporting.

Figure 4.1: Stakeholder views on successful data collection



Theme 5: Need for promotion and prioritisation

Stakeholders agreed that data collection tools need championing and promoting to encourage usage. Stakeholders thought there needed to be:

- a champion for the change
- high-level approval within the organisation
- clear priority given to injury data collection among other activities, including overcoming the effects (such as participation and staff decreases) that occurred with COVID-19.

In some cases, such as after a catastrophic event or following several severe injuries, data collection is made a priority, requiring an urgent change in an organisation's processes, directed from the highest levels. In such cases organisational changes could include:

- dedicating staff and other resources to addressing a need for better information and better prevention measures
- making the governing body aware of the situation
- potentially communicating with their insurer about the situation.

'We use our Facebook page and newsletters to clubs and members [to tell them about the injury reporting system].'

'We have posters with QR codes that link to the reporting form at all our clubs.'

'[For the HeadCheck concussion app], there was a lot of marketing including advertising through the grassroots program and in emergency departments.'

'A local-level champion has a major effect on compliance.'

Theme 6: Ensuring value for users

Behaviour change, such as entering data, is more likely if the user gets value, for example, by receiving back useful information.

'They want to know when a player can come back to play.'

'The person entering the data either needs to be given value, or knows that the data itself is valuable.'

'The data needs to be reported back at least monthly to the sector.'

'The electronic [injury] report could go to the club and individual for them to take to their doctor.'

'Implementations are more likely to be successful if they are "simple, easy, highlight the benefits, and the message comes from high-up".'

'Incentives are also good.' [Current disincentives include being] 'fined if they don't send people to meetings or submit results on time.'

Theme 7: Challenges for an NSIDA

Challenges identified by stakeholders included:

- achieving successful behaviour change among participants, especially unpaid volunteers and poorly paid sports trainers
- changing the reporting culture takes time
- education and user support by the data collection team are critical enablers
- concerns about the security and collection of personal data
- concerns of additional financial costs on members or clubs
- technological barriers
- perceived reputational risk with increased transparency of injury statistics
- data quality and comparability concerns.

'Databases take time to evolve and engage people'

'To change the reporting culture can take a long time'

'The theory is good but the process hard.'

'You need to make sure a platform works really well. If it's clunky, then people will try and use it once or twice then dis-engage.'

'Some people complain they can't report because of internet issues, but internet excuses are getting less.'

'Some states see the value and are very enthusiastic and report comprehensively while others just report the "severe stuff".'

'Both a person and a club can report so data quality varies. The less severe injuries and incidents often have no names or ages captured. Some entries can be double-ups, especially when multiple clubs are at a carnival.'

'Many forms only have the first half filled out.'

Theme 8: Limited resources

Implementing an injury data collection requires resources to:

- communicate the need for change to current practice
- educate users:
 - to collect data
 - to understand protocols regarding consent, privacy and data security

- to understand how the data will be analysed and used.

Many sporting organisations reported reluctance to place additional demands on the time of their mostly volunteer workforce in order to implement an injury data collection.

‘Our volunteers are stretched as it is.’

‘We can’t even work out how to get information.’

‘We don’t have a designated first-aider. We have ice available for an injury, but if it’s anything severe, we call the ambulance.’

Many organisations did not have the capability or funding to commission a bespoke data collection tool for their sport, and would look to commercial apps or tools, which had a cost per participant. Groups that had exposure to the elite Athlete Management System (AMS) considered it too costly per participant for community purposes as well as the need for dedicated staff to support its use. Where commercial data collection applications were used, the cost was approximately \$2.50 per registration and the data were often stored outside Australia.

Theme 9: Previous bad experiences with data collections

Some organisations had been involved in one-off research projects, where data collection and governance issues were addressed by the researcher and sponsoring university. The location of data after a period of data collection was often unknown, and the lack of longevity, cost or continued access to some platforms could cause some former users to be reluctant to engage with a ‘new’ collection tool unless it was enduring.

Theme 10: Potential risks and unintended consequences

Representatives from some sports were concerned that messaging about recording sports injury could be seen to reflect that their sport is dangerous, both among their current participants and beyond. By encouraging reporting, more injuries could be reported, which could be seen as a perverse outcome for their sport.

There is a perceived risk that reporting injuries may create the expectation of action to address the impacts of reported injuries and the future risk of such injuries recurring. To put new prevention programs in place will take more resources and long-term investment, which can compete with other priorities, including training time.

Case studies

Through the consultation process, the AIHW identified several previous or existing community sports injury data collections. The following section contains 3 case studies of organisations currently collecting injury data and a fourth case study describing a previous data collection that operated for 5 years up to 2014. Consent was provided from the identified stakeholders regarding personal communications.

Case study 1: Basketball NSW

Basketball NSW is the governing body for basketball in New South Wales, and an affiliated member of Basketball Australia, the national governing body. Basketball NSW has 67,000 registered members.

Basketball NSW has adopted the Basketball Australia Member Protection Policy (Basketball NSW 2018), which:

‘conveys a strong message to all BNSW [Basketball NSW] members and participants, and prospective BNSW members and participants, that as a sport, we are committed to ensuring the safety and welfare of our people who are our most valuable asset well into the future.’

This policy encourages the confidential reporting of complaints to the organisation, as well as to the relevant New South Wales government authorities with regard to more serious allegations.

An online injury report form is available on the Basketball NSW insurance web page and these data can assist with the insurance claims process. The types of injury included in the form was based on the history of Basketball NSW insurance claims.

Since its launch, the Basketball NSW (2020) online injury form has been used hundreds of times.

‘In late August 2020 we had a “soft” launch of the new online injury form through our website and social media sites. This report form is designed for all levels of our sport, and it is up to each player or their team manager to complete, based on whether or not they feel that they may need medical treatment for their injury. We’ve had great uptake with nearly 700 reports in the first nine months’ (Basketball NSW, pers. comm., July 2021).

Case study 2: Surf Life Saving Australia

Surf Life Saving (SLS) is a community cause committed to reducing coastal drowning. SLS promotes water safety and provides surf rescue services. It has a strong focus on sport to ensure its members are rescue-ready.

SLS provides an integrated national lifesaving service, comprising over 47,300 proficient (bronze medallion qualified or higher) members. Over 1,000 of these members are paid lifeguards. SLS members performed almost 1.3 million volunteer patrol hours in 2020. On average, members perform 30 rescues every day and around 450 preventative actions every hour. Surf Life Saving Australia also operates the Surf Emergency Response System, which commenced in 2008 as a single point of contact to advise SLS of incidents 24/7.

SLS publish an annual national coastal safety report that provides insights into the causes of coastal deaths (drowning and other causes). This report helps the SLS to evaluate their current risk mitigation strategies, as well as to develop new ones. SLS has a custom integrated database called SurfGuard that includes an incident report database with up to 17 years of data. SurfGuard captures data on drownings, fatalities, resuscitations, major first aid, and member injuries. Authorised users can enter incident information, and search for and browse the incidents for their organisation.

One example of how these data have been helpful is in research on the cause of the high number of inflatable rescue boat (IRB) injuries:

‘We had a situation where the number of IRB injuries during training was increasing and this was impacting on insurance claims. We used the database to identify that these were mainly knee and ankle injuries and, based on this, worked with Charles Sturt University, who redesigned where the IRB foot straps were placed. We sourced a safety grant which enabled us to change the strap location on the vessel and fund the replacement of all the straps within our fleet of IRBs. This significantly reduced injuries and ensured insurance premiums remained within budget guidelines’ (SLS Australia, pers. comm., July 2021).

Case study 3: Pony Club Australia

Pony Club Australia (PCA) is the national governing body of pony clubs. PCA has 40,000 members and state/territory associations in all states/territories except the Australian Capital Territory. The PCA Incident Reporting System securely records injuries and near-misses. This system enables identification of high-risk activities, areas or groups of participants. Corrective steps can be taken to make those activities, areas or participant behaviour safer.

'The PCA Incident Reporting System was released in January 2021 and is administered through online software called JotForm (Jotform, San Francisco, <https://www.jotform.com/>). The system supports any insurance claims with Pony Club Australia's insurer, and the state/territory office and national office receive an instant notification and copy of the reporting form once it has been submitted' (PCA, pers. comm., July 2021).

Case study 4: The Victorian Sports Injury Tracker

Stakeholders frequently referenced the free Victorian branch of Sports Medicine Australia's Injury Tracker, an online system that operated between 2009 and 2014. The tracker had received Victorian grant funding, but a paid model was being investigated towards the end of that time to replace the free model once the grant had expired. The system was discontinued in 2014. Competition from other providers was also occurring around that time with other online providers entering the space, which could be a 'one-stop shop' for emergency contacts, permission notes, and for compliance in schools.

The tracker was used by trainers, some schools and other organisations, and collected approximately 2,000 sports injury reports. A feature of the tracker was that a copy of the report (if filled in by trainers) could be provided to the club or the individual to take to their health-care providers. The reports could be searched (for example, by ankle injury) and the head trainer could also edit records.

Motivations to collect sports injury data

Stakeholder consultations revealed the 4 main motivations for why these and other organisations collect injury data (Table 4.1).

Table 4.1: Primary motivations identified by organisations for collecting injury data

1. The need for a reliable evidence base for sports injury information
<p><i>'The top levels of an organisation didn't know what was going on in terms of injuries unless there was a severe injury.'</i></p> <p><i>'There were always paper-based systems, but the incidents were more filtered about an insurance claim.'</i></p> <p><i>'We put together our own form because we needed it.'</i></p> <p><i>'[A federated body is] many steps away from the clubs.'</i></p>
2. The desire for safer sport (injury prevention)
<p><i>'You just need to look at what is happening in other sports about the long-term effects of concussions to know we need to do something.'</i></p> <p><i>'Adoption of injury reporting is key to informing prevention activities.'</i></p> <p><i>'Getting involved in injury prevention and reporting is the right thing to do for our sport and participants.'</i></p> <p><i>'Monitoring gives us pro-active action.'</i></p>
3. To control costs, especially insurance costs
<p><i>'Insurance costs are going up and we need to do something so our registration stays affordable.'</i></p> <p><i>'The number of [sport] underwriters are decreasing, making insurance harder to get and more expensive.'</i></p> <p><i>'In Sweden, every community club has to record injuries, and in return they get a discount on insurance.'</i></p>
4. Reputation, perceptions and transparency
<p><i>'[The organisation] needs to come to terms with the public dissemination of information.'</i></p> <p><i>'We were vulnerable as we didn't know what events or injuries were happening.'</i></p> <p><i>'There's a perception that our sport is dangerous, and we need centralised data to know what's real.'</i></p>

Chapter 5: Designing the NSIDA

Creating a large, multi-source data asset is a complex task. This chapter describes the methodological approach the AIHW is using to plan the NSIDA, including the following components:

1. Identifying the data needs of the project
2. Assessing suitability of existing data sources
3. Identifying and prioritising data gaps
4. Developing new data to fill data gaps.

Identifying data needs

The minimum and desirable data needs from the literature review and stakeholder consultations are listed in Appendix Table B1.

Assessing suitability of existing data sources

Chapter 3 described the existing sports injury data sources currently available in Australia. The next step is to assess the suitability of each of those data sources for inclusion in the NSIDA. The decision-making flow chart in Appendix D outlines the main considerations taken into account when assessing the feasibility and quality of potential data sources. These often relate to governance issues, such as ethics, privacy, consent, data transmission and storage, as well as concerns relating to cost and benefits to stakeholders.

Identifying and prioritising data gaps

The data needs and data gaps are closely aligned given the lack of community sports injury data outside the admitted patient care hospital data in the NHMD. The NHMD is the best data source to date, but has gaps in:

- the completeness of sports injury listed as the activity associated with injury
- detailed information on the cause
- whether prevention programs or equipment were in place
- less severe injuries.

The ED data (outside of Victoria and Queensland) have gaps in sports injury diagnosis and cause data (as described in Chapter 3) as external cause of injury, place of injury occurrence, or activity is not collected in the NNAPEDCD. Changing hospital data collection to make further data collection routine is the best method to ensure quality and longevity, but it requires long timeframes to justify changes and to implement them.

Sports organisation injury reporting is emerging, but only reflects a small portion of sports injuries at present. Many concerns about collecting injury data were revealed in stakeholder consultations (Chapter 4).

Sports injury data are rarely available or published from the following sectors where treatment would be provided:

- GPs
- allied health (physiotherapists and exercise physiologists)

- specialist (orthopaedic surgeons and sport and exercise physicians)
- dental
- ambulance
- first aid
- trainer (likely for only the higher level leagues and competitions)
- state/territory clinics (walk-in clinics designed to reduce the burden on EDs)
- rehabilitation.

It is possible that further consultation being conducted by the AIHW will identify further data gaps which shall need to be prioritised.

Developing new data

The longer-term data development will involve working with stakeholders to:

- provide more complete admitted hospital care data in the NHMD
- expand ED data fields collected in the NNAPEDCD
- develop and pilot an injury data collection tool within community sports
- include or enhance injury-related content in existing surveys
- pursue longer-term data extraction from text fields in electronic data from general practices, allied health care providers, sports physicians, and ambulance services.

The evolution of data sources and access to new sources through sharing agreements over time will require the development of the NSIDA to be iterative, assessing the potential suitability of other sources of sports injury data as they become available.

Chapter 6: Building the NSIDA

Building the NSIDA is a significant undertaking. This chapter outlines the work that will be necessary to achieve this. The work is proposed to occur across at least 2 iterative phases:

- Phase 1: Developing the foundations of the NSIDA and gathering feedback through continued stakeholder engagement
- Phase 2: Building a refined version of the NSIDA.

Phase 1: Developing the foundations of the NSIDA

The main stages of developing the NSIDA are:

1. Selecting data elements
2. Compiling/creating metadata
3. Creating a new collection tool for community sports injury data
4. Collating data
5. Reviewing the NSIDA
6. Analysing and reporting data.

While the above indicate a sequential approach to the development of a data asset, many stages may overlap and there will be iterative refinements.

Selecting data elements

Data development is a methodological process, based on an understanding of the information to be derived using the data. It includes modelling data needs and clarifying the relationships between data. Key data concepts are identified and standardised using data elements. Data development results in the production of a set of data standards to ensure consistent collection and use of the data set (AIHW 2007).

A data element is used to standardise the representation of data and is composed of a data element concept in association with a value domain. It will have a name, definition, representational attributes (such as a permissible values or data types) and administrative attributes.

Data element selection will be based on the minimum and desirable data needs identified in Chapter 5. Where multiple data sources are used to contribute to the NSIDA, each data source will have its own set of data elements. If an existing data element is to be re-used, it is crucial that the concept that the data element needs to define is the same as that of the existing data element; otherwise, a new data element should be created.

Compiling/creating metadata

Metadata can be defined as information about how data are defined, structured and represented. Metadata helps us understand and accurately interpret information. It can provide meaning and context to data by describing how data are captured and the business rules for collecting data.

Each data source that is part of the NSIDA will have a set of data elements associated with it. Each set of data elements should have its own metadata with all metadata for AIHW data sources compiled in METeOR (the Metadata Online Registry, AIHW 2021f).

An important part of building the NSIDA will be to ensure that metadata documentation is collated where already available or created where needed. In the initial phases of the project data from a range of sources may be included in the NSIDA, and the different data standards, data formats and terminology in use between data sources will need to be captured.

In order to aggregate data for analysis and reporting, work to map and standardise different data standards across data sources will be required. It is likely that this process will take substantial effort and several iterations.

Creating a new data collection tool for community sports injury data

In parallel with the collection of data from existing sources, a new online sports injury data collection tool will be developed to attempt to fill the substantial data gap in the area of community sport organisation incident reporting. An anonymous version of the tool with no collection of identifying information (no name, date of birth, address or registration number) will be piloted in 2022.

The data collection tool aims to provide a simple way to record injury on a smartphone, tablet or computer, using dropdowns and buttons as much as possible to minimise text entry. The tool will be online and optimised for mobile devices to ensure it is easily accessible by participants from all levels of community sport. Ideally, data entry should take no longer than 5 minutes to minimise participant burden and increase the likelihood of timely reporting.

A minimum set of questions will be developed as a minimum data set. Options could be available for additional details to be provided beyond a minimum set of data.

The proposed tool would collect anonymous data in the pilot using variables as shown in Table 6.1.

Table 6.1: Proposed injury data collection tool data elements for pilot testing

Information	Variables
Demographics	Age (years) Sex (M/F/non-binary) Role of person entering data (self, coach, manager, trainer, first aider, parent, other)
Location where injury occurred	State, suburb or club Outdoor/indoor, home/ away/ training /other
Injury	Sport (e.g., basketball, football (AFL, NRL, soccer), volleyball etc.) Injury location on the body (e.g., head / knee /foot) Cause of injury (e.g., fall/collision/struck by bat or ball) Timing of injury (e.g., during game/training/other) Treatment required* (e.g., medical attention/first aid /none) If medical attention: what type (e.g., ambulance/ED visit/ hospital admission/GP /physio /trainer /first aid care /self-care) Safety equipment used (have custom options based on sport selected)

*Note – this is at the point in time when the injury is recorded and may not reflect subsequent medical attention required.

The pilot would provide insights to inform the development of a full-capability tool with capability to collect personal identifying information for the NSIDA.

Analysis of the anonymous data in the first phase of data collection will assess which type of participants (for example, players, parents, coaches, administrators) are using the data entry tool, the demographics of those injured, and types of injuries recorded. The number and proportion of injuries would be calculated, and the aggregated data examined via group type entering the data (for example, coach), sport, sex, geographic region and so forth.

Specific feedback from users would be obtained and used to inform modifications to the tool. The modifications made (number, type and functionality changes) would be monitored and the impacts of the changes assessed by quantitative and qualitative feedback. Monitoring and feedback on the quality and quantity of communications from the AIHW and partnering sport organisations would also be assessed to inform a broader roll out.

The data would be securely held on AIHW servers (see Chapter 7) with the potential for analysis and reports containing aggregated data to be provided back to the relevant sporting organisations to enable them to benefit from the insights gained. The ability to provide de-identified aggregated data would be dependent on the numbers of injury reports made.

Users will have the option to receive a copy of the form via email. The AIHW, however, will not record the email address after the form was sent. This function would assist in:

- facilitating the communication of the injury details between the injured person or parent, coach or club (should the person entering the data choose to do so)
- reducing the duplication of records for sports trainers or allied health professionals, as the email can be appended to the medical records for that player.

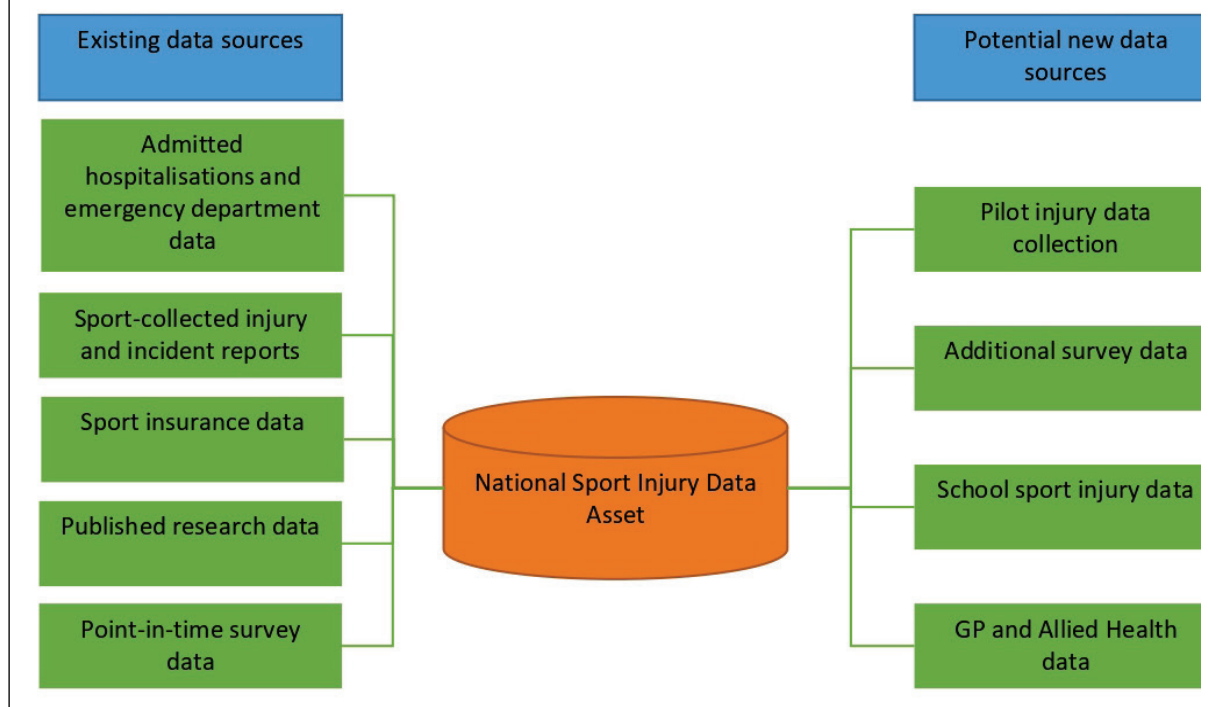
Should a new data collection tool be considered suitable for the NSDIA, further tool features that would need to be considered include how to:

- provide log-in features to
 - minimise 'attacks' from spamming programs, to ensure data was entered by a person
 - allow for linkage to other data sets (for example hospital or MBS data)
 - allow for sports injuries across different sports and life course to be collected
 - work towards a system where participants can view their own injury history records
- identify if the data entry was made in Australia or another location
- have the ability to link to websites with best practice advice on the injuries reported (for example, advising when first aid or other types of medical attention may be required).

Collating data

Data for included data elements from all available data sources (see Figure 6.1) will be collated by the AIHW to form the NSIDA. It is possible that aggregated data on the number, type and cause of injuries could be obtained from community sources under a memorandum of understanding agreement and a comprehensive range of privacy, confidentiality and security controls, which are detailed in the AIHW's *Data governance framework 2021* (AIHW 2021a). Data would be securely transferred to the AIHW by data providers (see Chapter 7) and at this point the NSIDA would formally commence.

Figure 6.1: Existing and proposed sources of data for the NSIDA



Reviewing the NSIDA

New and existing sources will be considered consistent with the principles of good data development and the measures identified in the AIHW's *Data governance framework 2021* (Appendix E; AIHW 2021a). Once data collation starts, it will be possible to begin to assess the NSIDA for a range of factors, such as:

- completeness of data
- availability of suitable data standards and metadata
- compliance with data standards
- how easy or difficult it is to collect data
- persistent data gaps
- other limitations of the data or data collection process.

Other aspects of reviewing the NSIDA include:

- provider satisfaction with the data being provided back to them
- researcher and policymaker feedback
- effectiveness of secure infrastructure for data access
- opportunities for enhancement are identified
- key stakeholders are actively engaged.

Analysing and reporting data

It is anticipated that the AIHW will analyse and report on the aggregated data and findings as sufficient data becomes available. These could be data tables as well as focused analytical

web reports. Reports would be published in a 'Sports injury' section of the AIHW injury web page (AIHW 2021b). Further de-identified and disaggregated data would be available to researchers following ethics approvals and consideration of the Five Safes model (AIHW 2021g; Desai et al. 2016).

Potential focus areas for ongoing monitoring

The NSIDA will be useful in providing contextual information to allow monitoring on a range of focus areas of interest in sports injury and sports injury prevention. It is anticipated that the data asset would allow for reporting on the priority focus areas proposed in Table 6.2. Two phases for reporting of the indicators are being recommended due to the time to develop access to data. The areas to be monitored will evolve as the multiple potential data sources are assessed and the data within the data asset matures.

Table 6.2: Potential focus areas for sports injury monitoring

Phase 1		
No.	Focus area	Potential definition and reporting level
1	Hospitalised sports injuries	Proportion or number of participants who have a hospital admission due to a sports injury National; disaggregated by state, Statistical Area 3 (SA3), sport Explore disaggregation at geographies relevant to that sport, with several years combined if needed
2	ED sports injuries	Proportion or number of participants who have an ED presentation due to a sports injury By states that code for activity (QLD and Vic), SA3, sport Explore disaggregation with several years combined if needed
3	Injury reporting	Proportion or number of participants who have reported any injury* via sport organisation supplied data or an AIHW tool AIHW report aggregated data back to sporting organisations (where organisations are able to identify their own sport only)
4	Denominator/s	Number of participants, sport, state/region, age and sex as provided by sport organisations and by survey data such as AusPlay
5	Use of preventive measures	Proportion or number of participants who have reported any injury via sport organisation supplied data who also identified injury prevention programs, policies or rules changes to reduce injury AIHW report aggregated data back to sporting organisations (where organisations are able to identify their own sport only)
6	Proportion of the population with a sports injury	Estimated population proportion or number of participants who have reported an injury in a survey National; disaggregated by state, SA3, sport, cause
7	Injury reporting culture within the organisation	Estimated proportion or number of participants who had an injury, and report it to their organisation AIHW report aggregated data back to sporting organisations (where organisations are able to identify their own sport only) This will be limited to organisations that collect and share or publish data
8	Number and % of participants reporting specific types of injury: concussion	Number and % of participants who report a concussion across hospital admission, ED, sport organisations and a sport injury reporting tool (along with proportions provided by each data source)

continued

*Measures of what proportion or number of participants report any injury may not reflect all injuries when a voluntary system is used.

Table 6.2 (continued): Potential focus areas for sports injury monitoring

Phase 2		
1	GP attendances for sports injuries	Proportion or number of participants seen for a sports injury National; disaggregated by state, SA3, sport
2	Allied health attendances for sports injuries	Proportion or number of participants seen for a sports injury National; disaggregated by state, SA3, sport

Phase 2: Future refinement of the NSIDA

Over the longer term, a review of definitions, standards and the coding of free-text fields will require further detailed stakeholder consultation. Following consultation, long-term plans may need to be developed for incorporating further data collection or coding processes.

Medium and long-term outcomes can then be assessed, including:

- sound evidence for the utility of the data asset, to justify expansion
- researcher access and ability to build capacity in injury prevention research
- ability to provide data for economic analyses of sport injury
- improvement in national indicators reflecting population health and sports injury prevention
- opportunities to use identifiable data to integrate with other data sets such as NHMD, ED, or MBS data.

Chapter 7: Implementation

A phased approach

A phased approach to identify and collect data elements is suggested due to the data development required. Additional data elements can be added once the collection and collation of the minimum data set become established.

A phased approach to data collection also allows the set of standardised data elements to start small and be expanded over time with improvements in data collection. The consultation process undertaken by the AIHW in 2021 will inform the selection and prioritisation of data elements.

Following the minimum data elements listed in Table 6.1, minimum data elements could be collected in a second phase (once collection of minimum data phase one has been established) as outlined in Table 6.2. Data elements will likely require substantial and concentrated efforts to develop and/or refine. Some may be tested in a proof-of-concept for the data asset. For some elements listed for phase two development, the data may be dependent on other long-term initiatives to improve the availability of primary care and allied health data, for which the data quality for sports injury reporting is unknown. Ongoing work occurring in other areas of the AIHW will assist in determining the best methodology to extract and collate data that are already collected as part of electronic health records. Table 7.1 presents the options for data collection and timing along with their advantages and challenges.

Table 7.1: Summary of data collection timings, advantages and challenges

Data collection method	Implementation timeframe	Advantages	Challenges
Collating existing available data	Short term (within 6–12 months)	Ability to report data now Large expansion in sports injury data by providing ED data Low cost No change in current processes for trainers/ coaches or participants	Variability in data availability, and standards which could impact interpretation and the ability to compare data. Difficult to influence what is collected in the larger hospital data (e.g., due to IT system limitations/resources to collect additional data) ED data only coded by QLD (selected hospitals) and VIC (all hospitals)
Developing a sports injury data collection tool	Short term (within 12 months) for a pilot group Medium to long term to roll out finished product	Ability to understand the nature and prevalence of less serious sporting injuries Application to community level sports Accessible to all users via mobile Data items can be added or amended as needed Ability to tailor advice on first aid, prompt seeking of medical attention and communicate entered data to health professionals If identifiers are used, ability to track a participant over time	Time requirement for data collection could make it harder to get buy in from sporting clubs and participants Need to provide a feedback mechanism with value for those entering data, or other incentives provided for injury recording Threshold for injury reporting would need to be clear Education on how to use the tool and maintaining its development and application Different levels of enthusiasm at the club year-to-year or overcoming a previous poor experience could lead to variability in entry, and could provide misleading trends over time Could take 1–3 years to build a sufficient number of cases for reporting by sport or demographic variables

continued

Table 7.1 (continued): Summary of data collection timings, advantages and challenges

Data collection method	Implementation timeframe	Advantages	Challenges
Collecting sports injury data from existing surveys	Short to medium term (1–3 years)	Can compare other contextual and demographic variables at the same time	Variability in data collected, availability, and comparability across data surveys Most often cross-sectional point-in-time (e.g., done annually or triennially) with no long-term follow-up Recall bias
Extraction of health service data from text fields	Long term	Broadest coverage of injury receiving medical treatment	Dependent on other projects Expensive Different software platforms for GPs, specialists and allied health

Early in the first year of implementation of an NSIDA, an advisory group and technical group would be formed to oversee the implementation of the data asset. As new data are available, it will be assessed for quality and appropriateness to be incorporated into the NSIDA.

Data will also be assessed from a pilot (proposed to commence in 2022) of anonymous sports injury data collected in a high-participation sport where injury data are not routinely collected. The pilot data and implementation learnings would be used to inform further development of a new data collection tool that can personalise an individual’s injury data, and potentially be linked to future recurrences or costs.

The pilot version of the data collection tool will be accessible by either a web link or using a smart phone camera to read a QR code. The pilot version of the tool can be found at the following link or QR code: <https://survey.websurveycreator.com/s.aspx?t=0093ba5c-d871-4fee-8154-9cf45937c539&lang=en>

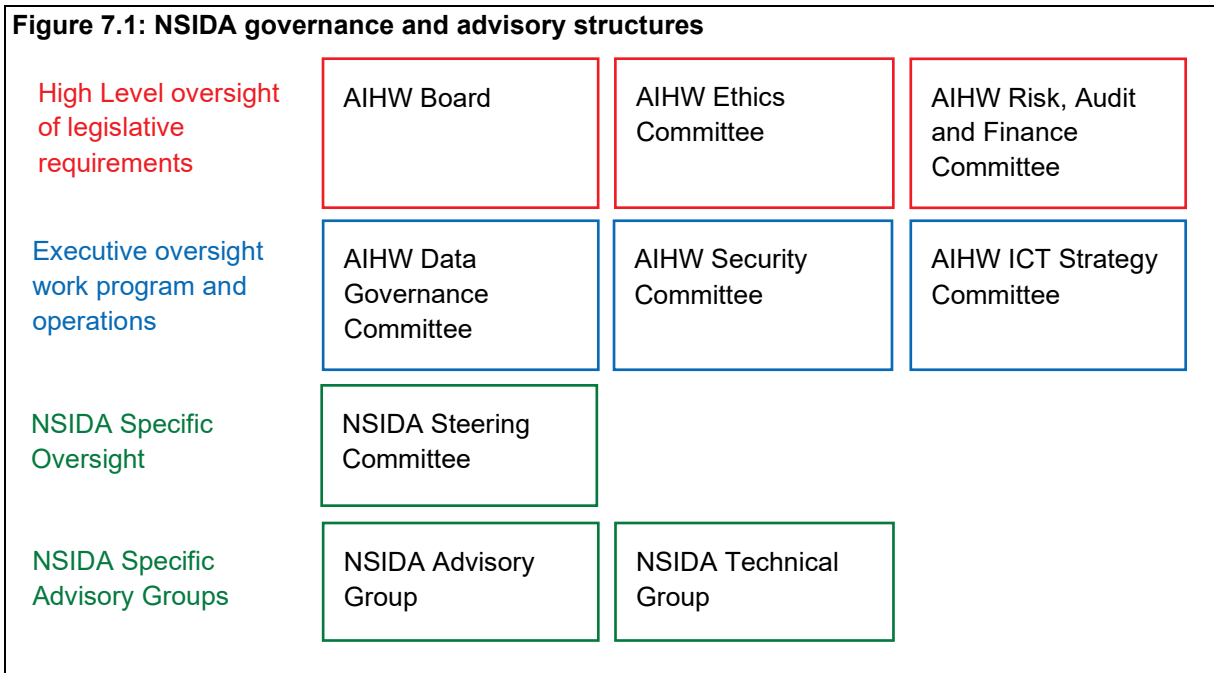


Implementing the data development strategy

The AIHW will be the lead agency in implementing the data development strategy. The AIHW will leverage their capabilities, work with stakeholders to access data sources, and bring together a proof-of-concept data asset that can demonstrate value back to stakeholders and data providers.

NSIDA data governance

Data governance describes the source of authority for making decisions about data and the basis upon which those decisions are made (AIHW 2021a). Strong data governance is key in ensuring compliance with legal, privacy and ethical obligations, in ensuring accountability, and obtaining the trust of stakeholders. This chapter details the governance structures and expert advisory support in place for the NSIDA. Figure 7.1 provides a summary. Further detail on the relevant sources of authority can be accessed from the AIHW website.



Appendix E provides the overarching principles that AIHW applies to the collection and governance of data.

Role of the AIHW

The leader of this project, the AIHW, is a major national agency established under the *Australian Institute of Health and Welfare Act 1987 (Commonwealth)* as an independent statutory body to collect and produce information and statistics on Australia’s health and welfare. The AIHW produces authoritative and accessible information and statistics to inform and support better policy and service delivery decisions, leading to better health and wellbeing for all Australians.

The AIHW manages data professionally, with due respect for its sensitivity, through rigorous data policies and procedures, which are routinely monitored for compliance, and are subject to the scrutiny and oversight of the AIHW Ethics Committee, which is properly-constituted under the National Statement on Ethical Conduct in Human Research and registered with the National Health and Medical Research Council. These features are described in AIHW’s *Data governance framework 2021*(AIHW 2021a).

The AIHW has an exemplary record of protecting the data in its custody. Stakeholders can be confident that the AIHW uses its data in ways that benefit the public, while protecting the confidentiality of the data and minimising any risk of inappropriate use and access. The AIHW complies with the *Privacy Act 1988 (Commonwealth)*, and the rigorous confidentiality provisions of the AIHW Act which provide for criminal penalties for breach of these obligations.

These data governance arrangements apply to data collected and/or enhanced by the AIHW, collected on the AIHW’s behalf (for example under collaborative or sub-contractual agreements), and data obtained from all external sources. Data governance compliance at the AIHW is overseen by the AIHW Board, AIHW Ethics Committee, Risk, Finance and Audit Committee, Data Governance Committee, Security Committee and the AIHW ICT Strategy Committee.

NSIDA advisory support

NSIDA Steering Committee (NSIDASC)

The National Sports Injury Data Steering Committee (NSIDASC), convened by the AIHW since February 2020, includes a range of experts from the field and representatives from key stakeholder groups. The NSIDASC will oversee the development of the long-term work plan for the project and the implementation of the data asset. The committee will be kept informed of all data reporting and collection activities and assist with decision making for data requests and ethics committee referrals as appropriate. Members of the NSIDASC are listed in the acknowledgments.

NSIDA Advisory Group

The NSIDA Advisory Group will be formed, comprising representatives from data providers, consumers, sports injury data experts, Commonwealth and state and territory health department representatives, and sporting organisations. This group will have expertise with their data collections to advise on their data collections, access to data and the types of data that are outstanding data gaps that need further development to address.

NSIDA Technical Data Working Group

A technical data working group will be established to assist with the functions of data management and provision, data specifications, standards and cyclical data improvements. The Technical Data Working Group will have specialist knowledge of health information systems, data development, data governance and data collection management.

Data custodianship

Data held at AIHW is managed and protected by an AIHW data custodian. The data custodian is a senior AIHW staff member with delegation from the AIHW Chief Executive Officer to exercise overall responsibility for a specified data collection, in accordance with policies, guidelines and any specific conditions for use applicable to that data collection, and in accordance with the AIHW's data collection management principles (AIHW 2021a).

NSIDA data provided from non-AIHW sources (for example, insurers and sporting organisations) will also have their own data governance arrangements in place and these will need to be reflected in the NSIDA data governance arrangements to ensure that both the governance obligations of the data provider and those of the AIHW are being met.

Privacy and consent

At all stages of the NSIDA project – data collection, data storage, data analysis and data reporting – the privacy and confidentiality of individuals and organisations will be protected in accordance with the AIHW Act, the Privacy Act, the Australian Privacy Principles (APPs) and, where applicable, relevant state and territory privacy legislation and policies.

Some NSIDA data will contain information that may either directly or indirectly identify individuals. In these circumstances, consent for the collection and use of their data will have been sought from those individuals consistent with the requirements of the APPs and the National Statement on Ethical Conduct in Human Research. As part of this process, different levels of health literacy among Australian consumers will be considered, to ensure that participants can reasonably understand the use of the data and privacy protections and will have the ability to not participate if they choose.

Consent is not required under the Privacy Act for the collection of de-identified data via the NSIDA collection tools. Much of the NSIDA data will be 'secondary use' data. That is, the data have another primary use (for example, clinical care or insurance claiming). However, it may be desirable to instil confidence in the scheme to advise individuals if their de-identified data are being used for secondary purposes and to include functionality to ensure that patients who do not agree to secondary use of their data are removed from the data set during the data extraction process.

There is also a need to consider the social licence and level of community support for the collection and use of the data. This will be achieved through consultation with the sports organisations and ensuring that the data collected is fit for purposes to benefit sports organisations and their participants in the long term.

Data will only ever be published as non-identified aggregated data, regardless of whether it was identifiable or not when received by the AIHW.

Data security

The AIHW secures all data it holds. To gain access to data held by the AIHW requires multiple levels of approval. A person is provided with approved access to the level necessary. Access is audited and logged and permissions removed from those who no longer require access.

The *AIHW Security Plan* aims to protect Institute staff in the course of their duties and protect official information from compromise or unauthorised disclosure and protect official assets from compromise, theft, loss and/or damage.

AIHW Secure Messaging is used by the AIHW's clients to securely send email, data or other files to the AIHW.

Data access and release

Access to NSIDA data will comply with the requirements of the AIHW De-identification Policy which incorporates the Five Safes model (AIHW 2021g), which is an approach to assessing and managing risks associated with data sharing and release. The model is an internationally recognised approach to considering strategic, privacy, security, ethical and operational risks as part of a holistic assessment for data sharing or release. The five risk (or access) dimensions of the Five Safes model are:

1. Safe projects: is this use of the data appropriate?
AIHW interpretation: use of the data is legal, ethical and the project is expected to deliver public benefit.
2. Safe people: can the researchers be trusted to use it in an appropriate manner?
AIHW interpretation: researchers have the knowledge, skills and incentives to act in accordance with required standards of behaviour.
3. Safe data: is there a disclosure risk in the data itself?
AIHW interpretation: data has been treated appropriately to minimise the potential for identification of individuals or organisations.
4. Safe settings: does the access facility limit authorised use?
AIHW interpretation: there are practical controls on the way the data are accessed – both from a technology perspective and considering the physical environment.

5. Safe outputs: are the statistical results non-disclosive?
AIHW interpretation: a final check can be required to minimise risk when releasing the findings of the project.

Appendix A: Previous government sports injury initiatives

Table A1: National government initiatives and reports

Year/title	Methods/description	Findings/recommendations
1986–1994: Commonwealth	A detailed general injury data collection from sentinel emergency departments began in 1986 but became unsustainable by 1994 with the shift in focus to universal patient management systems in emergency departments. This led the National Injury Surveillance Unit to develop a minimum data set, known as the National Data Set for Injury Surveillance, which could be used within the current data management systems. In view of the difficulties involved in obtaining high quality data in a clinical setting without additional resources, the Commonwealth funded a feasibility study for a nationally representative emergency department surveillance system.	Universal data collection of more than 2 million injury cases was deemed inefficient due to high costs and difficulties with quality control. A sample-based system, aimed at collecting high quality data from a relatively limited number of cases, was preferred. This system would provide national estimates of injury but would not necessarily provide information specific to states and territories.
1995: <i>Feasibility of improved data collection methodologies for sports injuries</i> (Finch et al. 1995)	A survey of over 100 sporting and sports medicine individuals and organisations, literature review and assessment of the availability and quality of existing databases in Australia. Analyses of data in Victoria used as an example to describe the problem. Discussions with authorities around data collection systems and improvements. Involvement of sporting and sports medicine organisations to ensure relevant outcomes.	Data are fragmented in Australia and there is a lack of data about the circumstances of injury to inform prevention efforts. Comprehensive information is needed on participation and exposure hours to inform relative risks. A sports injury surveillance system is needed with: <ul style="list-style-type: none"> • a lead agency identified and collaboration between health and sport sectors • involvement of sports bodies in data collection • infrastructure support for these activities, and enhancement of government data collection • development of standardised data collection procedures and coding systems and good training
1995: <i>SportsSafe Australia: a national sports safety framework</i> (1997) by the Australian Sports Injury Prevention Taskforce (ASIPT)	Established in 1995 by the Commonwealth Department of Human Services and Health, and the Australian Sports Commission as an advisory and coordinating body.	The report provides broad guidelines for Australians to participate in sport in the safest possible environment. The sport safety framework was developed for sport participants, coaches, officials, facility planners and managers. The report highlights the respective responsibilities of government agencies, sporting organisations and facility providers to add value to the sporting experience by reducing injuries and delivering a 'duty of care' to all involved.

continued

Table A1 (continued): National government initiatives and reports

Year/title	Methods/description	Findings/recommendations
1996: Council of Australian Governments	National Health Priority Areas – Injury (including but not limited to sport)	The <i>First report on national health priority areas 1996</i> (AIHW & DHFS 1997) emphasised that injury is preventable, and that primary prevention is the best means of injury control. Two indicators were proposed but not implemented: indicator 4.6.1 was for hospital separation rate while indicator 4.6.2 was for non-hospitalised sport- and recreation-related injuries.
1997: SportSafe Australia	Located at the Australian Sports Commission initially and then outsourced to Sports Medicine Australia.	Provided a program to progress sports safety nationally through the development of resources and educational material. A SportSafe initiative within Active Australia at the Australian Sports Commission was taking responsibility to prioritise and implement the recommendations of the framework report.
1997–1999: <i>The Australian sports injury data dictionary</i>	The Australian Sports Injury Data Working Party was established by ASIPT to oversee the development of guidelines for injury data collection and classification for the prevention and control of injury in sport.	The <i>Australian sports injury data dictionary</i> (ASIDD) was published in 1998 as a standard data collection coding scheme and a simple-to-use data form (Australian Sports Injury Data Working Party 1998).
2000: <i>How to become a SportSafe Club</i>	SportSafe Australia, Healthway (Western Australia) and Living Health (South Australia) funded Sports Medicine Australia to produce guidelines on sport safety for community sports clubs.	The <i>How to become a SportSafe club</i> guidelines were developed to provide assistance to clubs and sports association to implement sport safety practices. They were distributed to all Sports Medicine Australia state branches for dissemination to sports associations and sports clubs and were designed to be easily utilised by sports administrators, coaches and players.
2003: <i>Sports safety in Australia: an update</i>	Reviewed sport safety policies and sports injury surveillance activity since 1997. Examined the incidence of sports injury by rate and nature of injury for various sports. Examined risks and protective factors. Estimated the costs of injury. Prevention strategies.	The 2003 report (Department of Health and Ageing 2003) found that most Australian sports injury prevention research has been done in elite athletes, but: <ul style="list-style-type: none"> the majority of sports injuries occur to community sport and other physical activity participants data on elite athletes may not be applicable to community sport and physical activity because of different injury types and risk factors there is no central data collection or collation agency. Other issues identified in the report included: <ul style="list-style-type: none"> a lack of standardised definitions and data collection methodologies, data on injury trends over time, data about the factors associated with injury occurrence (to inform cause and prevention programs) and a heavy reliance on self-reported data a lack of commitment or training for those responsible for collecting, collating, or publishing data incomplete insurance coverage for sports and few incentives for insurance companies to contribute to prevention activities.
2018–19 Australian Government Federal Budget	\$6.3 million over 4 years was allocated to develop the Safe Sports Australia Program and a national sports injury data asset to improve the safety of sports for young people.	This initiative led to a portion of these funds being used to commission the AIHW to perform this work over 2020–21 to 2021–22.

Table A2: State/territory initiatives

Year/title	Methods/description	Findings/recommendations
1978–2010: New South Wales (NSW)	<p>The NSW Sporting Injuries Committee was a non-profit, self-funded statutory organisation established in 1978 by the NSW Government to provide affordable sports injury insurance and to promote safe sport practices to the sporting community.</p> <p>The Committee delivered its legislative responsibilities under the Sporting Injuries Insurance Act 1978 through 4 different schemes:</p> <ul style="list-style-type: none"> • Sporting Injuries Insurance Scheme – provided affordable serious injuries insurance to sporting organisations under WorkCover • Supplementary Sporting Injuries Benefits Scheme – provided state government-funded serious injuries (permanent loss of use and death) cover to all NSW public and private school children (since 1983). Covers authorised school sporting or athletic activities such as physical education classes, school lessons, carnivals, competitions and training. • NSW Sports Safety Awards Scheme – introduced in 1998 to reward outstanding achievement in research, development of injury preventative measures and the education and promotion of safe sport practices. • Research and Injury Prevention Scheme – provided grants for research into sports injury preventative measures. 	<p>26 annual reports of the NSW Sporting Injuries Committee were published up to 30 June 2010. The committee was abolished immediately upon enactment of the Safety, Return to Work and Support Board Act 2012, with any assets or liabilities moving to WorkCover (whose insurance functions moved to iCARE in 2015).</p> <p>Note that some of the insurance functions were taken over by iCARE, which commenced in 2010–11.</p> <p>There is no available evidence that the NSW Sports Safety Awards Scheme was continued.</p>
1985: South Australia	<p>The South Australian Health Commission's Injury Surveillance and Control Unit has been undertaking injury surveillance, through hospital and mortality data and sentinel emergency department data collection systems, since 1985.</p>	<p>Introduction of a playground-safety surface standard.</p>

continued

Table A2 (continued): State/territory initiatives

Year/title	Methods/description	Findings/recommendations
1994: Victoria	The Victorian intersectoral plan for injury prevention Taking Injury Prevention Forward was launched in 1994.	The Victorian Department of Human Services has administered regional injury prevention grants for a variety of community-based initiatives to assist in identifying effective preventive strategies and to increase the capacity of communities to undertake injury prevention. One of the larger projects is a sports injury prevention initiative in the City of Hume. The project focuses on evaluating the impact of club or association safety policies on sports injuries. Sport injuries were 1 of 3 future focus areas for the injury control section of the Victorian Department of Human Services.
1996: Australian Capital Territory	The Intersectoral Australian Capital Territory Injury Prevention and Control Taskforce commenced in 1996, following the recommendation by the ACT Health Outcomes Reference Group in 1995 that injury be taken up as a priority area, due to its multi-sectoral nature and the fact that there was no existing program structure to address injury issues.	The Taskforce identified sports and recreation injuries and bicycle injuries as 2 of 4 key areas.
2007: Western Australia	Decentralised injury control system within Public Health Units. The Western Australian Health Promotion Strategic Framework 2007–2011, 2012–2016 and 2017-2021 aim to prevent avoidable injury through improvements in health behaviours and environments, including physical activity (DoH WA 2013).	Seeding money for model projects such as those addressing exercise as a falls prevention strategy for older people, and bike helmet promotion. Transport-related injuries include traffic and off-road use of motor vehicles, motorcycles and bicycles as well as pedestrian activities that are identified as road crashes. A 2015 publication (DoH WA 2015) showed that falls were the top cause of hospitalisation on both 0–4 and 5–14 year old groups in the 2008–12 period. Creating safer environments in WA to prevent injuries from falls in the home and from playground equipment are priorities for injury prevention for children 0–14 years.
1997: Queensland	The Injury Health Outcomes Plan was completed in 1998.	A comprehensive campaign addressing pool drownings is in progress. Laurie Lawrence has championed the Kids Alive: Do the Five program and created a high profile for toddler drowning awareness.

continued

Table A2 (continued): State/territory initiatives

Year/title	Methods/description	Findings/recommendations
2009: Tasmania	<p>Tasmania commissioned a report on The value of Sport and Physical recreation to Tasmania (Muller et al. 2009) which was culmination of 3 years work and a partnership between the State Government, the Australian Innovation Research Centre and the University of Tasmania.</p> <p>Sport and Recreation Tasmania provided Risk Management for Tasmanian Sport and Recreation Organisations – risk management resources (last updated in 2012). Information sheets discussed risk management in accordance with the Australian Standard on Risk Management. The risk management resources include references to Sports Medicine Australia’s Smartplay, Sports Injury Tracker and Safe-Sports courses as well as the Work Health and Safety Act 2012 (Tasmania).</p>	<p>A cost benefit analysis found that every \$1 invested in Sport yielded a \$4 benefit. It found that a 10 per cent increase in participation rates (for the 2008-09 financial year) would generate an additional \$903.5 million in annual benefits to Tasmania. The report estimated that sports injury accounted for 0.13% of all health-care expenditure.</p> <p>Provision of ongoing support to non-government organisations that provide state-wide injury prevention services, including Kidsafe, the Tasmanian Injury Coalition and the Tasmanian Injury Surveillance and Prevention Program.</p>
2013: Victorian Sports Injury Prevention Taskforce	<p>The Victorian Government established a Sports Injury Prevention Taskforce to examine the sports injury related barriers that prevent people from leading a more active lifestyle and to provide advice on improving risk management strategies and sports injury prevention.</p>	<p>The Sports Injury Prevention Taskforce has estimated that each year in Victoria approximately 4,500 people drop out from participation in 5 of the top team-based sports due to sport injuries. It made the following recommendations:</p> <ul style="list-style-type: none"> • Build public and sector awareness and increase acceptance of how injury prevention and management positively impact performance and participation. • Support coaches by implementing a more systemic approach to injury prevention and management. • Utilise the role and influence of coaches to build a positive culture around sports injury prevention and the management of injuries to increase participation and improve performance. • Ensure sports injury prevention is actively supported by policies, practices and reward and recognition systems. • Continue efforts to improve sports injury data and partner in sports injury prevention research to build a stronger evidence base to make more informed decisions

Appendix B: Data needs

Table B1 proposes the minimum and desirable data needs across demographic, injury, cause and treatment data.

Table B1: Minimum and desirable variables for the NSIDA

Variable	Data field type	Minimum	Desirable
Age of person injured	Number	✓	
Gender	Checkboxes	✓	
Date of injury	Date	✓	
Sport	Dropdown	✓	
Club or region*	Dropdown based on sport	✓	
Place injury occurred	Home or away game, address or geocode	✓	
Cause (for example, fall, struck)	Dropdown based on sport	✓	
Body part(s) injured	Checkboxes	✓	
Sudden or gradual onset	Checkboxes	✓	
Injury type (for example, suspected sprain, concussion, skin wound, muscle, broken bone)	Dropdown based on body part injured	✓	
Protective equipment or program used	Dropdown based on sport	✓	
Recurrence of a previous injury?	Checkboxes		✓
Role when injured (for example, player, referee)	Dropdown based on sport		✓
Indoor/outdoor surface	Dropdown based on sport		✓
Competition level	Dropdown based on sport		✓
Contributing factors (for example, foul play, heat, poor lighting, faulty equipment)	Dropdown		✓
Severity assessment	Checkboxes		✓
Incident description	Categories +/- free text		✓
Treatment	Checkboxes		✓
Treating person (for example, coach, trainer, paramedic)	Dropdown		✓
Referral (for example, ambulance, emergency department, general practitioner, physio, other)	Checkboxes		✓
Treatment	Checkboxes		✓
Who entered injury data?	Dropdown		✓
Personal identifiers (e.g., names) **	Text		✓

*Allows de-identified or aggregate reports provided back to club or region.

**Identifiers would enable follow-up of participants over time and across sports, and potentially link to other centrally held data such as hospital, MBS or PBS data to add additional value. Identifiers would require a higher level of security and any potential linkages will require content and/or appropriate ethics committee approvals. Any data would be analysed in de-identified forms (i.e., without names, DOB or address), and only aggregated and de-identified data would be published. To allow linkage over time, across sports, and potentially to medical data. Identifiers may also allow for participant log-ins to so they can view their own injury data. Any use of identifiers would need to be balanced with privacy, consent and governance considerations.

Appendix C: Stakeholder consultation

Table C1: Strategy for NSIDA consultation phases

Phase 1 – DISCOVERY: February to October 2021		
Objectives	Target stakeholders	
Inform stakeholders about the project and the process.	Selected high-participation national sporting organisations	
Identify priority uses of the data asset, data gaps and options for filling gaps.	Sports medicine physicians and allied health professionals	
Establish collaborations, build trust and share knowledge.	Victorian Injury Surveillance Unit and Queensland Injury Surveillance Unit	
Identify initial concerns and potential obstacles that may impact the data asset's implementation and operation.	Sports organisations with injury data collection systems	
Gather information on current developments in the sector that may assist development of the data collection.	Sports insurers Selected sports injury researchers	
Phase 2 – DRAFTING: May to November 2021		
Obtain advice and feedback on this draft strategy.	National Sports Injury Data Steering Committee Sport Australia Australian Institute of Sport	
Phase 3 – CONSULTATION: July 2021 to June 2022		
Objectives	Stakeholders	Actions
Seek feedback on this draft strategy	Representatives from all stakeholder groups including (but not limited to): Sporting organisations Federal and state or territory sport, recreation and health departments Sports injury researchers Commonwealth, State and Territory Education and Health Departments Sports injury medical practitioners and allied health professionals Coaches, parents, sporting participants	Conduct online survey to test data collection assumptions (July–August 2021)
Define the data elements or measures the data asset needs to support		Conduct second online survey to understand injury prevention programs
Prioritise measures and data elements		Consult on survey design and optimisation
Seek proposed data uses for policy and program planning		Engage a volunteer group to be involved in pilot data collection
Understand the potential data options, whether existing or new developments		Conduct online workshops to promote the data collection tool and focus groups to provide feedback for optimisation
Identify strengths and limitations of different data collection options		Communicate the project and updates through the AIHW webpage
Understand preferred governance structures		Hold further discussions with sport organisations, researchers and governments to collect existing data
Phase 4 – PILOT DATA COLLECTION: September 2021 to June 2022		
Collect and assess data from existing data sources	Community sport administrators, trainers, coaches, managers, researchers	Provide user testing with this group and then a broader trial group
Develop and optimise a data collection tool for a pilot	Allied health providers such as physiotherapists	Iterate based on feedback
Collect data from the pilot	Sport participants Potential users of a data collection tool (community sport administrators, trainers, coaches, managers, players)	Develop training and advertising materials on how to use and access the tool Increase awareness of pilot to community sport administrators, and through Sport Clearinghouse and AIHW channels

Table C2: Stakeholders consulted as of 17 January 2022

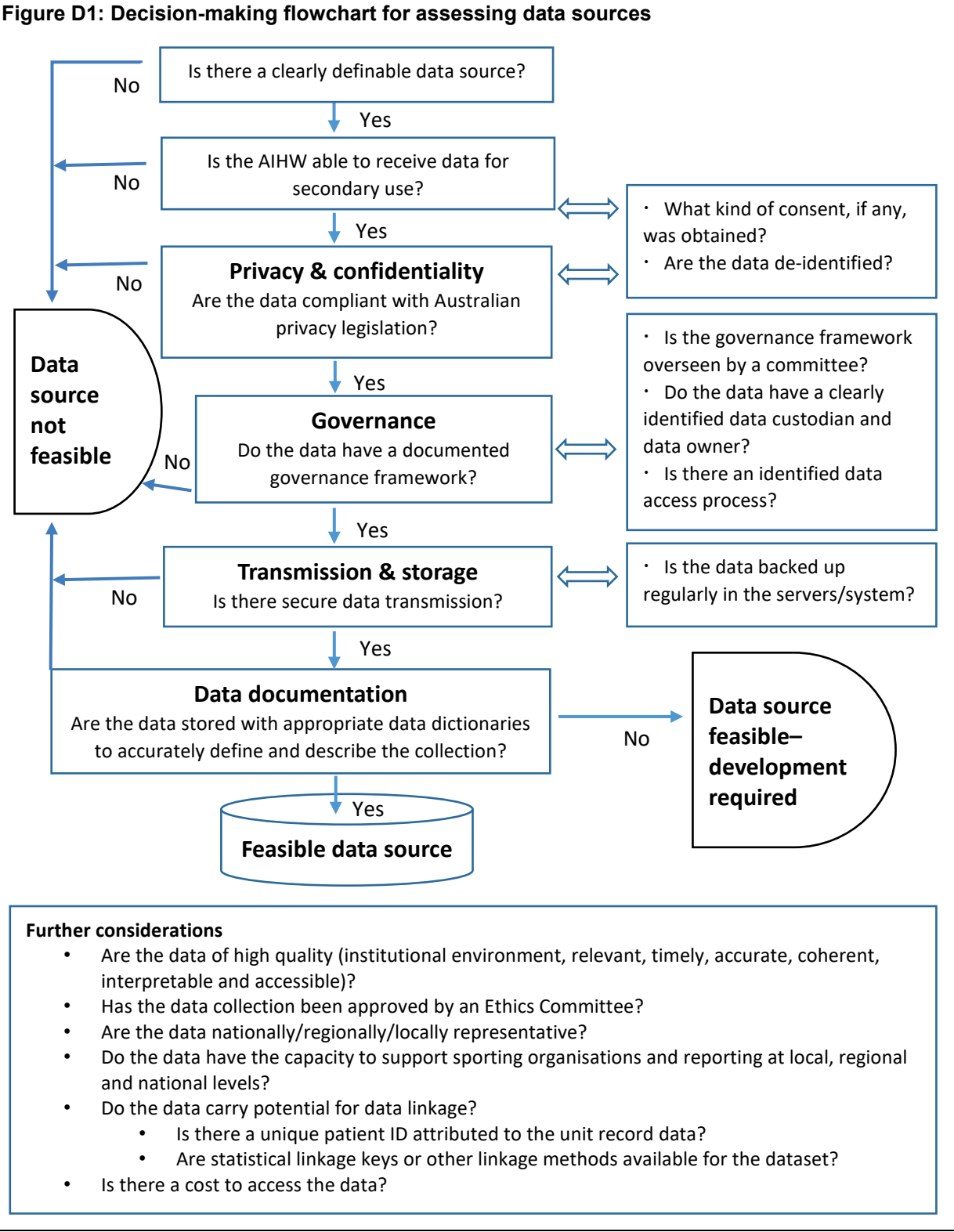
Organisation	Representatives
Health and technology experts	
Australasian College of Sport and Exercise Physicians	Ms Kylie Fitzgerald
Australian Physiotherapy Association	Mr Dan Miles, Ms Jenny Thomson, Ms Lowana Williams
Curve Tomorrow	Mr George Charalambous
Edith Cowan University	Dr Sarah Harris
La Trobe University (Centre of Sport & Social Impact)	Dr Alex Donaldson, Ms Kiera Staley
La Trobe University (Sport and Exercise Medical Research Centre)	Dr Andrea Mosler
Monash University (School of Primary and Allied Health Care)	Dr Christina Ekegren
Murdoch Children's Research Institute	Mr Aaron DeBono, Prof Vicki Anderson
Queensland Injury Surveillance Unit	Dr Ruth Barker, Ms Jesani Catchpoole, Ms Michelle Hillcoat
University of Melbourne (Medicine, Dentistry and Health Services)	Assoc Prof Jane Fitzpatrick
University of the Sunshine Coast	Professor Paul Salmon
University of Sydney	Dr John Orchard
University of Sydney (Faculty of Medicine and Health)	Dr Kerry Peek
University of Wollongong (Faculty of Science, Medicine and Health)	Dr Evangelos Pappas
VALD	Mr Laurie Malone, Ms Anita Sirotic
Victorian Injury Surveillance Unit	Dr Jane Hayman, Dr Janneke Berecki-Gisolf
Western Sydney University (Sport and Exercise Health)	Dr Ric Lovell
Government and industry bodies	
ACT Sport & Recreation	Mr Wayne Lacey
Australian Institute of Sport	Mr Ian Morrow
South Australia Department for Education	Mr David Engelhardt
Sport Australia	Mr Ian Burns, Mr Tony Schofield, Ms Miriam Pollak, Mr Paul Templeman
Sport Australia – AusPlay Team	Mr Laurent Schmutz, Ms Karen Pegrum, Mr Gary Rauber
Vicsport	Mr Tom Dixon, Ms Lisa Hasker
Western Australia Department of Education	Mr Alan Dodson
Insurers	
Evaluate Consulting	Mr Craig Moy
Gow-Gates	Mr Brett Monteverdi, Mr Joe Zammit
iCare	Mr Joel Wales
Private Healthcare Australia	Mr Ben Harris, Mr Julian Lim
V Insurance	Mr Rob Veale, Ms Lucy Willis, Ms Shauna Hewitt
Sports trainers/first aid providers	
Ambulance Services Australia	Mr Michael Rigo
Sports Medicine Australia	Dr Julie Cooke, Mr Jamie Crain, Ms Lynne Sheehan, Mr Mitchell Jarvis

continued

Table C2 (continued): Stakeholders consulted as of 17 January 2022

Organisation	Representatives
Sporting organisations	
Australian Football League	Mr Jonathan Edge, Mr Simon Clarke
Basketball New South Wales	Mr David Watts, Ms Maria Nordstrom
Canberra Region Rugby League	Mr Mark Vergano, Ms Jen Pilosio
Cricket Australia	Dr Alex Kountouris
Equestrian Australia	Ms Meredith Chapman
Football Australia	Dr Matt Whalan, Dr Donna Lu
Football New South Wales	Mr Peter Hugg
National Rugby League	Dr David Heslop, Mr Lachlan Smith
Netball Australia	Ms Alanna Antcliff
Pony Club Australia	Dr Catherine Ainsworth
Surf Lifesaving Australia	Dr Jaz Lawes, Mr Peter George
Tennis Australia	Mr Joey De Beer

Appendix D: Decision-making flowchart for assessing data sources



Appendix E: Data governance principles

The overarching governance principles that will apply to the NSIDA are described in Table E1. Further detail is available in the National Primary Healthcare Data Asset consultation report (AIHW 2019c) and AIHW's *Data governance framework 2021* (AIHW 2021a).

Table E1: Data governance principles

Assurance: protection of the privacy of individuals and providers

Overarching legal and policy environment	National and agency-specific legislation and policy inform the management of data. Data custodian-specific legislation and policies regarding the collection, use and disclosure of data from existing data sets may also apply. The protection of an individual's privacy is central to all legislation and policy and would continue to be where the development of further data governance was required.
Australian Privacy Principles	Consumer and data provider trust are at the forefront of the data asset: the protection of sensitive information is balanced with the safe and efficient sharing of information to ensure its full value is realised. The Australian Privacy Principles (APPs) in the <i>Privacy Act 1988</i> (Cwlth) outline how government must handle, use and manage personal information.
De-identification of data and data that contains personal information	<p>The de-identification approach is applied in the vast majority of existing health-related national minimum data sets and would be appropriate for routine summary-type reporting of data from the data asset.</p> <p>The terms of data access outline the user's conditions and their responsibilities under legislation. Data in a de-identified data set may become identifiable if merged or compared with other data sets, 'creating' identifiable information; this important complexity is taken into consideration by the AIHW in the context of a data asset.</p> <p>The Five Safes model helps to establish safe and functional de-identification.</p> <p>Whether data comprise personal information for the purposes of the Privacy Act, and therefore whether individual consent is required, is usually dependent on whether data are identified or reasonably re-identifiable. In certain circumstances, pursuant to section 95 of the Privacy Act, consent can be waived by a Human Research Ethics Committee (HREC) where the public interest in the research outweighs the public interest in privacy and the impact on the privacy of individuals.</p>
Ethics	Data collection, linkage and release activities conducted by Commonwealth agencies are subject to oversight by a Human Research Ethics Committee (HREC), such as the AIHW Ethics Committee, which is registered by the National Health and Medical Research Council (NHMRC). Ethics processes – coordinated by the Data Custodian – ensure the data asset complies with the appropriate guidelines.

Accountability: controlled management and use of data

Oversight	<p>At the Australian Government level, activities conducted by the Commonwealth Health portfolio (including the AIHW) are overseen by numerous bodies including, for example, the:</p> <ul style="list-style-type: none"> Australian Parliament and its various Committees Health Minister Australian Information Commissioner, Commonwealth Privacy Commissioner and Freedom of Information Commissioner Commonwealth Ombudsman Auditor-General Australian National Audit Office <p>general public.</p>
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continued

Table E1 (continued): Data governance principles

Accountability (continued): controlled management and use of data

Data custodianship	<p>The AIHW is responsible for managing the use, disclosure and protection of source data through the AIHW taking on a Data Custodian role. This includes facilitating data sharing and release while maintaining public trust and actively managing risk. The Data Custodian determines appropriate access to the data for various purposes, and manages analysis of, and/or access to, unit record data for more specific, defined purposes. The Data Custodian is also responsible for managing data quality, including maximising the currency and quality of data and reporting on data quality.</p> <p>The role of the Data Custodian also encompasses the maintenance of infrastructure necessary for ensuring data security, including secure servers and remote access protocols.</p>
Data access and release	<p>Access to the data asset varies according to the user, and according to the intended purpose; that is, data access and output is fit-for-purpose.</p> <p>A 'trusted user' model will be implemented (4.3). This model ensures that only de-identified data and non- re-identifiable information about individuals and providers is made available to data users.</p> <p>Data access would be based on the 'Five Safes' model: a model based on a set of 5 'risk (or access) dimensions':</p> <p>Safe projects: is the use of the data appropriate?</p> <p>Safe people: can the researchers be trusted to use it in an appropriate manner?</p> <p>Safe data: is there a disclosure risk in the data itself?</p> <p>Safe settings: does the access facility limit authorised use?</p> <p>Safe outputs: are the statistical results non-disclosive?</p>
Evaluation and review	<p>Monitoring and evaluation mechanisms should periodically assess whether the uses of the data have met the intended health-related public interest purposes. These functions will be undertaken by the Data Custodian. Evaluation will review the end-to-end processes, outputs, outcomes and data quality. In the first instance, evaluation of the proof-of-concept for the data asset will consider this.</p>

Harnessing the power of data: preparing and making high quality, insightful data available

Data analysis and reporting	<p>A summary of aggregated sports injury data from the data asset will be produced regularly for the general public and reported by the AIHW. This reporting will aim to meet the needs of a wide range of stakeholders. The Data Custodian is responsible for ensuring high-quality data and reporting. This reporting will be high-level and iterative as data development evolves. Standard terminology will be adopted within and where possible across different sports to minimise misinterpretation of the data.</p> <p>Additionally, third-party researchers will be able to apply for access to de-identified data for approved purposes through the trusted user model.</p>
Interoperability	<p>In order to collect reliable and nationally consistent sports injury data, agreed standards would need to be adopted over a period of time. Additionally, consistent and standardised interface terminology is central to achieving interoperability so that computerised systems can exchange information and make use of (interpret) exchanged information – that is, achieve interoperability.</p>
Maximising use of the data	<p>The inclusion of unit record level data (rather than solely aggregated data) would maximise the utility of the data asset. Strong data governance will be key in increasing the trust of providers regarding data management.</p> <p>Unique participant identifiers are crucial to enable longitudinal analysis of individuals, or linkage with other data sets in future. Unique identifiers would not be provided in the initial phase of the data asset, and the ability to collect these identifiers would be dependent on the level of trust developed through this and other projects, and the benefits that would be gained through longitudinal follow-up and linkage to other key data sets in a safe manner.</p>

Acknowledgments

The AIHW would like to acknowledge the stakeholders listed in Appendix Table C2 who participated in consultation, the 197 stakeholders who participated in an online stakeholder survey (described in Box 4.1), and stakeholders that provided data and case studies to inform our understanding of the data landscape.

The Steering committee

The National Sports Injury Project is led by an expert steering committee. This steering committee includes:

Professor David Hunter (Chair, Professor of Medicine and Consultant Rheumatologist, University of Sydney)

Ms Brooke De Landre (General Manager, Sport Division, Sport Australia)

Dr David Hughes (Chief Medical Officer, Australian Institute of Sport)

Ms Tiali Goodchild (Assistant Secretary, Preventative Health Policy, Department of Health)

Ms Joanna Da Rocha (Assistant Secretary, Office for Sport, Department of Health)

Professor Caroline Finch AO (DVCR & VP Edith Cowan University)

Ms Marne Fechner (Chief Executive Officer, AusCycling)

Ms Jo Setright (Executive Director, Policy, Coalition of Major Professional and Participation Sports)

Mr Ricardo Piccioni (General Manager – Government Relations, Football Australia through December 2021)

Dr Mark Jones (Head of Medical, Football Australia)

Ms Alanna Antcliff (Sports Physiotherapist, Netball Australia)

Dr Adrian Webster (Head, Health Systems Group, AIHW).

Project management team

The project management team manages the implementation of the project and coordinates the work with relevant stakeholders in accordance with the National Sports Injury Data Steering Committee governance arrangements. The work will be managed by the Australian Institute of Health and Welfare (AIHW) and undertaken by AIHW staff, with guidance from the Australian Sports Commission and the Australian Institute of Sport (AIS).

Members include:

Michael Drew (AIS, through December 2021)

Liam Toohey (AIS)

Adrian Webster (AIHW)

Marissa Veld (AIHW)

Sonya Glasson (AIHW)

Stuart John (AIHW).

Abbreviations

ABS	Australian Bureau of Statistics
ACC	Accident Compensation Corporation (New Zealand)
AFL	Australian Football League
AIHW	Australian Institute of Health and Welfare
AIS	Australian Institute of Sport
AMS	Athlete Management System
APP	Australian Privacy Principle
ASC	Australian Sports Commission
ASIPT	Australian Sports Injury Prevention Taskforce
AWISS	All Wales Injury Surveillance System
CHIRPP	Canadian Hospitals Injury Reporting and Prevention Program
CPSC	Consumer Product Safety Commission (United States)
ECDS	Emergency Care Data Set (United Kingdom)
ED	emergency department
EU	European Union
EU-IDB	European Injury Database
GP	general practitioner
ICECI	International Classification for External Causes of Injuries
IRB	inflatable rescue boat
METeOR	Metadata Online Registry
MBS	Medicare Benefits Schedule
NEISS	National Electronic Injury Surveillance System (United States)
NHMD	National Hospital Morbidity Database
NMDS	national minimum data set
High School RIO™	National High School Sports-Related Injury Surveillance System (United States)
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NCAA ISP	National Collegiate Athletic Association Injury Surveillance Program
NCIS	National Coronial Information System
NHS	National Health Survey

NNAPEDCD	National Non-Admitted Patient Emergency Department Care Database
NRL	National Rugby League
NSIDA	National Sports Injury Data Asset
NSIDASC	National Sports Injury Data Asset Steering Committee
NSW	New South Wales
PCA	Pony Club Australia
QISU	Queensland Injury Surveillance Unit
QLD	Queensland
SA3	Statistical Area 3
SLS	Surf Life Saving
SSN	Suncorp Super Netball
Vic	Victoria
VISU	Victorian Injury Surveillance Unit
VEMD	Victorian Emergency Department Dataset
WHO	World Health Organization

Symbols

%	per cent
\$	Australian dollars, unless otherwise specified
<	less than
>	more than
≤	less than or equal to

Glossary

acute care: Care provided to patients admitted to hospital that is intended to cure illness, alleviate symptoms of illness, manage childbirth or treat injury.

administrative data: Data collected by governments or other organisations generated during the routine administration of program or service delivery; while not designed or originally intended for research, these data can be a rich source of information.

administrative data collection: Data set comprising information collected for the purposes of delivering a service or paying the service provider. This type of collection is usually complete (all in-scope events are collected), but may not be fully suitable for population-level analysis because the data are collected primarily for an administrative purpose.

admission: An admission to hospital. The term hospitalisation is used to describe an episode of hospital care that starts with the formal admission process and ends with the formal separation process. The number of separations has been taken as the number of admissions; hence, 'admission rate' is the same as 'separation rate'.

admitted patient: A patient who undergoes a hospital's formal admission process to receive treatment and/or care and ends with a formal separation process.

built environment: The built environment refers to the human-made surroundings where people live, work and recreate. It includes buildings and parks as well as supporting infrastructure such as transport, water and energy networks (Coleman 2017).

burden of disease and injury: The quantified impact of a disease or injury on an individual or population, using the disability-adjusted life year (DALY) measure.

cause of death: All diseases, morbid conditions or injuries that either resulted in or contributed to death – and the circumstances of the accident or violence that produced any such injuries – that are entered on the Medical Certificate of Cause of Death.

child: A person aged 0–14 years unless otherwise stated.

chronic: Persistent and long lasting.

complication: A secondary problem that arises from a disease, injury or treatment (such as surgery) that makes the patient's condition worse and treatment more complicated.

current prices: 'Expenditure at current prices' refers to expenditure that is not adjusted for movements in price (inflation) from one year to another and therefore represents the dollar amount spent in that year.

DALY (disability-adjusted life year): A measure (in years) of healthy life lost, either through premature death – defined as dying before the life span that could be expected at the age of death (YLL) – or through living with ill health due to illness or injury (YLD).

Data governance: Data governance describes the source of authority for making decisions about data; the roles/structures authorised to make decisions; and the basis upon which those decisions are made (AIHW 2021a).

data linkage: Bringing together (linking) information from 2 or more data sources believed to relate to the same entity, such as the same individual or the same institution. This linkage can provide more information about the entity. In certain cases, it can provide a time sequence, helping to tell a story, show pathways and perhaps unravel cause and effect. The term is used synonymously with the terms 'record linkage' and 'data integration'.

de-identification: A process which involves the removal or alteration of personal identifiers, followed by the application of additional techniques or controls to remove, obscure, aggregate, alter and/or protect data so that it is no longer about an identifiable (or reasonably identifiable) individual.

demographics: Statistical data relating to population groups, such as age, sex, economic status, education level and employment status, among others.

determinant: Any factor that can increase the chances of ill health (risk factors) or good health (protective factors) in a population or individual.

Five Safes model: A multi-dimensional approach to managing disclosure risk consisting of Safe People, Safe Projects, Safe Settings, Safe Data and Safe Outputs. Each 'safe' is considered both individually and in combination to determine disclosure risks and to put in place mitigation strategies for releasing and accessing data.

general practitioner (GP): A medical practitioner who provides primary, comprehensive and continuing care to patients and their families in the community.

health: The World Health Organization (WHO) defines health as a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.

health outcome: A change in the health of an individual or population due wholly or partly to a preventive or clinical intervention.

health promotion: A broad term to describe activities that help communities and individuals increase control over their health behaviours. Health promotion focuses on addressing and preventing the root causes of ill health, rather than on treatment and cure.

hospital services: Services provided to a patient who is receiving admitted patient services or non-admitted patient services in a hospital.

hospitalisation: An episode of hospital care that starts with the formal admission process and ends with the formal separation process (synonymous with admission and separation). An episode of care can be completed by the patient's being discharged, being transferred to another hospital or care facility, or dying, or by a portion of a hospital stay starting or ending in a change of type of care (for example, from acute to rehabilitation).

illness: A state of feeling unwell, although the term is also often used synonymously with disease.

incidence: The number of new cases (of an illness, injury or event, and so on) occurring during a given period. Compare with prevalence.

indicator: A key statistical measure selected to help describe (indicate) a situation concisely so as to track change, progress and performance; and to act as a guide for decision making.

injury: A physical harm to a person's body.

injury prevention: Injury prevention can be classified as primary, secondary and tertiary.

Primary prevention is stopping the injury from occurring and may occur through better equipment, preparation or following safe rules.

Secondary prevention is reducing the amount of energy exchanged during an injury event or reducing the harm caused during the injury event. Secondary prevention also relates to enhancing outcomes and recovery after the event.

Tertiary prevention is reducing the harm or long-term impact once an injury event has occurred through treatment or rehabilitation (Hunter et al. 2019).

Medicare: A national, government-funded scheme that subsidises the cost of personal medical services for all Australians and aims to help them afford medical care. The Medicare Benefits Schedule (MBS) is the listing of Medicare services subsidised by the Australian Government. The schedule is part of the wider Medicare Benefits Scheme (Medicare).

METeOR: Australia's central repository for health, community services and housing assistance metadata, or 'data about data'. It provides definitions for data for health and community services-related topics and specifications for related national minimum data sets (NMDSs). METeOR can be viewed on the AIHW website at www.meteor.aihw.gov.au.

metadata: Information about how data are defined, structured and represented. Metadata helps us understand and accurately interpret information. It can provide meaning and context to data by describing how data are captured and the business rules for collecting data.

modifiable risk factor: A risk factor where the level of associated risk can be increased or decreased through changes in behaviours or exposures.

monitoring (of health): A process of keeping a regular and close watch over important aspects of public health and health services, using various measurements, and then regularly reporting on the situation, enabling health systems and society more generally to plan and respond accordingly. The term is often used interchangeably with surveillance, although surveillance may imply more urgent watching and reporting – such as the surveillance of infectious diseases and epidemics. Monitoring can also be applied to individuals, such as hospital care where a person's condition must be closely assessed over time.

morbidity: The ill health of an individual and levels of ill health in a population or group.

mortality: Number or rate of deaths in a population during a given time period.

My Health Record: An online platform for storing the health information of individuals, including their Medicare claims history, hospital discharge information, diagnostic imaging reports and details of allergies and medications.

non-admitted patient: A patient who receives care from a recognised non-admitted patient service/clinic of a hospital, including emergency departments and outpatient clinics.

national minimum data set (NMDS): A set of data elements agreed for mandatory collection and reporting at a national level. It may include data elements also included in other NMDSs.

outcome (health outcome): A health-related change due to a preventive or clinical intervention or service. (The intervention may be single or multiple, and the outcome may relate to a person, group or population, or be partly or wholly due to the intervention.)

out-of-pocket costs: The total costs incurred by individuals for health-care services, over and above any refunds from the MBS, the PBS or private health insurance funds.

participation: Playing a sport or undertaking a given physical activity.

Pharmaceutical Benefits Scheme (PBS): A national, government-funded scheme that subsidises the cost of a wide variety of pharmaceutical drugs, covering all Australians, to help them afford standard medications. The PBS lists all the medicinal products available under the PBS and explains the uses for which subsidies can apply.

person-centred data: An approach to analysis which focuses on the experiences and outcomes of individuals, rather than organising information by specific topics, services or systems.

physical activity: as defined by Australia's Physical Activity and Sedentary Behaviour Guidelines (Department of Health 2017) is any bodily movement produced by one or more large muscle groups, for movement as part of: leisure (including sports, exercise and recreational activities); transport (for example walking or cycling to get to or from places); and occupation (including paid and unpaid work like lifting, carrying or digging). Non-sports physical activities include household, occupational and activities related to daily-living.

population health: Typically, the organised response by society to protect and promote health and to prevent illness, injury and disability. Population health activities generally focus on: prevention, promotion and protection rather than on treatment, populations rather than individuals, and the factors and behaviours that cause illness. It can also refer to the health of particular subpopulations, and comparisons of the health of different populations.

prevalence: The number or proportion (of cases, instances, and so forth) in a population at a given time. Compare with incidence.

prevention: See injury prevention.

primary health care: Services delivered in general practices, community health centres, Aboriginal health services and allied health practices (for example, physiotherapy, dietetic and chiropractic practices) and which come under numerous funding arrangements.

principal diagnosis: The diagnosis established, after study, to be chiefly responsible for an episode of patient care (hospitalisation), residential care or attendance at a health-care establishment. Diagnoses are recorded using the relevant edition of the International statistical classification of diseases and related health problems, 10th revision, Australian modification (ICD-10-AM).

public health: Activities aimed at benefiting a population, with an emphasis on prevention, protection and health promotion (as distinct from treatment tailored to individuals with symptoms). Examples include provision of a clean water supply and good sewerage, conduct of anti-smoking education campaigns, and screening for diseases such as cancer of the breast and cervix.

quality indicators: A statistic (or set of statistics) used to describe the quality of a situation or aspect of society (such as service provision). The assessment of quality is based on values or goals. Quality indicators can be used to measure and track change, progress or performance towards achieving set objectives. Quality indicators may be based on surveys, incidents, complaints monitoring or routine data collection, for example.

quintile: Group derived by ranking a population according to specified criteria (for example, income) and dividing it into 5 equal parts. Can also mean the cut-points that make these divisions – that is, the 20th, 40th, 60th and 80th percentiles – but the first use is the more common one. Commonly used to describe socioeconomic groups based on socioeconomic position. Also used to describe income groups.

rate: One number (numerator) divided by another number (denominator). The numerator is commonly the number of events in a specified time. The denominator is the population 'at risk' of the event. Rates (crude, age-specific and age-standardised) are generally multiplied by a number such as 100,000 to create whole numbers.

risk: The probability of an event occurring during a specific period of time.

risk factor: A factor that represents a greater risk of a health disorder or other unwanted condition or event. Some risk factors are regarded as causes of disease; others are not necessarily so. Along with their opposites, protective factors, risk factors are known as determinants.

SA3 (Statistical Area 3): A geographical area used by the Australian Bureau of Statistics (2021) that represents a region that has 3,000 to 25,000 people.

secondary use of data: Any application of data beyond the reason for which they were first collected (known as the primary use or purpose).

separation: The formal process where a hospital records the completion of an episode of treatment and/or care for an admitted patient.

sport: A broad range of physical activities including informal, unstructured activity such as walking, riding, swimming and running, as well as traditional, structured sport and new and evolving sport and physical activity offerings, such as mixed martial arts, 'ninja'-style obstacle courses and stand-up-paddle boarding (ASC 2018).

sports injury: A physical complaint or observable damage to body tissue produced by the transfer of energy experienced or sustained by an athlete during participation in training, competition or other exercise-related physical activity, regardless of whether it received medical attention or its consequences with respect to impairments (modified from Timpka et al. 2014).

surveillance: Systematic ongoing collection, collation, and analysis of data and the timely dissemination of information to those who need to know so that action can be taken.

YLD (years lived with disability): A measure of the years of what could have been a healthy life but were instead spent in states of less-than-full health. YLD represent non-fatal burden.

YLL (years of life lost): Years of life lost due to premature death, defined as dying before the global ideal life span at the age of death. YLL represent fatal burden.

survey data collection: A data set that results from sampling individual units from the population. No sample will ever be fully representative of the population but, if carefully designed and implemented, it will be highly representative – sufficient to draw conclusions about the characteristics of the whole population.

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Related publications

AIHW 2022. Economics of sports injury and participation – Preliminary results.
AIHW Cat. no. INJCAT 224. Canberra: AIHW.



Australia does not currently have a national sport injury data collection that includes community sport. This report sets out a strategy to improve national sports injury data through the development of a National Sports Injury Data Asset (NSIDA). The proposed NSIDA would benefit individuals, sporting organisations, and the health care system by better informing injury prevention programs and will help Australians to make more informed decisions on participation in sport.

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Stronger evidence,
better decisions,
improved health and welfare

