

PRIMARY INDUSTRIES HEALTH AND SAFETY PARTNERSHIP



Mapping Work Health and Safety Risks in the Primary Industries

JANUARY 2015

RIRDC Publication No. 14/127





Australian Government

**Rural Industries Research and
Development Corporation**

Mapping Work Health and Safety risks in the Primary Industries

by Tony Lower

January 2015

RIRDC Publication No 14/127
RIRDC Project No PRJ-009458

© 2015 Rural Industries Research and Development Corporation.
All rights reserved.

ISBN 978-1-74254-744-2
ISSN 1440-6845

Mapping work health and safety risks in the primary industries
Publication No. 14/127
Project No. PRJ-009458

The information contained in this publication is intended for general use to assist public knowledge and discussion and to help improve the development of sustainable regions. You must not rely on any information contained in this publication without taking specialist advice relevant to your particular circumstances.

While reasonable care has been taken in preparing this publication to ensure that information is true and correct, the Commonwealth of Australia gives no assurance as to the accuracy of any information in this publication.

The Commonwealth of Australia, the Rural Industries Research and Development Corporation (RIRDC), the authors or contributors expressly disclaim, to the maximum extent permitted by law, all responsibility and liability to any person, arising directly or indirectly from any act or omission, or for any consequences of any such act or omission, made in reliance on the contents of this publication, whether or not caused by any negligence on the part of the Commonwealth of Australia, RIRDC, the authors or contributors.

The Commonwealth of Australia does not necessarily endorse the views in this publication.

This publication is copyright. Apart from any use as permitted under the *Copyright Act 1968*, all other rights are reserved. However, wide dissemination is encouraged. Requests and inquiries concerning reproduction and rights should be addressed to RIRDC Communications on phone 02 6271 4100.

Researcher Contact Details

Name: A/Prof Tony Lower
Address: PO BOX 256 Moree NSW 2400

Phone: (02) 6752 8210
Fax: (02) 6752 6639
Email: tony.lower@sydney.edu.au

In submitting this report, the researcher has agreed to RIRDC publishing this material in its edited form.

RIRDC Contact Details

Rural Industries Research and Development Corporation
Level 2, 15 National Circuit
BARTON ACT 2600

PO Box 4776
KINGSTON ACT 2604

Phone: 02 6271 4100
Fax: 02 6271 4199
Email: rirdc@rirdc.gov.au
Web: <http://www.rirdc.gov.au>

Electronically published by RIRDC in January 2015
Print-on-demand by Union Offset Printing, Canberra at www.rirdc.gov.au
or phone 1300 634 313

Foreword

Work health and safety issues continue to be an issue within both the agricultural and fishing sectors. While improvements in health and safety have been made, too many individuals incur injuries or are fatally injured. Being able to go to work and come home to family and friends in a safe and injury free capacity is an ideal that everyone supports.

To assist the agricultural and fishing sectors in improving health and safety, high quality information is required to define the most critical and high-risk issues that must be addressed. This study draws on the available evidence to provide a summary of health and safety risks across the sectors. The information will be central to the development and targeting of cost-effective approaches to assist farmers and fishers in further implementation of relevant health and safety actions.

The results pinpoint the major risks and also define some available resources to assist farmers and fishers in meeting their health and safety obligations. Recommendations are provided to improve the quality and coverage of the information in respect to health and safety.

A key finding is that existing data should be used to ensure that pro-active actions to manage and control risks are put in place. This will lead to a genuinely safer workplace.

This report, an addition to RIRDC's diverse range of over 2000 research publications, forms part of our Primary Industries Health and Safety Program, which aims to drive sustainable improvements to work health and safety outcomes.

Most of our publications are available for viewing, downloading or purchasing online through our website:

- downloads at www.rirdc.gov.au/fullreports/index.html
- purchases at www.rirdc.gov.au/eshop

Craig Burns

Managing Director

Rural Industries Research and Development Corporation

Acknowledgments

My thanks are extended to the staff of the National Coroners Information System for on-going assistance with the coronial records. Additionally, I thank Sue Barker and Majid Hmeidan from Safe Work Australia for their considerable assistance with the Workers Compensation data. Finally, the inputs of farmers and fishers through the various workshops and discussions, plus the representatives of the Primary Industries Health and Safety Partnership are greatly appreciated.

Abbreviations

ABS	Australian Bureau of Statistics
ACAHS	Australian Centre for Agricultural Health and Safety (University of Sydney)
ANZSIC	Australian and New Zealand Standard Industrial Classification Code
NCIS	National Coroners Information System
PIHSP	Primary Industries Health and Safety Partnership
PTO	Power Take Off
WHS	Work Health and Safety

Contents

Foreword..... iii

Acknowledgments iv

Abbreviations iv

Executive Summary vii

Introduction..... 1

Objectives 1

Methodology 2

Results 4

Implications 18

Recommendations..... 23

Appendices..... 25

References..... 43

Tables

Table 1:	Commodity Specific fatalities 2001-2010 in comparison to all agricultural fatalities.....	4
Table 2:	Commodity specific fatalities 2001-2010 by agent.....	4
Table 3:	Fatalities within the fisheries sector 2003-2013	5
Table 4:	Fatalities in the fisheries sector 2003-2013 by agent	5
Table 5:	Claims by industry sector 2008-09 to 2011-12 for short-term (0-4 days) and serious (5+days) incidents.....	6
Table 6:	Cumulative incidence of all claims by industry sector for the period 2008-09 to 2011-12 ..	7
Table 7:	Rank order for nature of injury by industry sector 2008-09 to 2011-12 for short-term (0-4 days) and serious (5+ days) claims	8
Table 8:	Aquaculture - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims	9
Table 9:	Cotton - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims	10
Table 10:	Grains - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims	11
Table 11:	Grains-sheep & grains-beef - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims	12
Table 12:	Marine - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims	13
Table 13:	Sugar - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims	14
Table 14:	Time lost due to Injury claims and associated costs in agriculture and fisheries 2008-09 to 2011-12	15
Table 15:	Cumulative incidence of weeks lost for all claims by industry sector for the period 2008-09 to 2011-12	16
Table 16:	Serious (5+ days) claims as a proportion of total time lost and costs within each sector (2008-09 to 2011-12).....	17
Table 17:	Self-reported data on injury and near-miss incidents by agent	17
Table 18:	Summary of highest risk issues by industry	19
Table 19:	State/Territory Work Health Authorities for further information	20
Table 20:	Sector specific information sources.....	21

Executive Summary

What the report is about

The Work Health and Safety (WHS) records for both agriculture and fisheries are less than optimal and require improvement. Having accurate evidence upon which to base intervention approaches is the cornerstone of injury prevention. Consequently, the basis of this study is to assist those in positions of influence within the agricultural (cotton, grains, sugar) and fishing sectors in making informed WHS decisions for their industry.

Aims/objectives

The report has five main objectives to help the industries in developing WHS:

1. A concise and consistent description of the WHS priorities for the primary industries, which can be updated periodically as priorities are addressed.
2. Contextualisation of WHS priorities in terms of nominated sectors, allowing those sectors to plan a targeted approach to addressing the priorities and comparison of priorities across sectors.
3. A 'library' of existing strategies, products tips and tools addressing WHS priorities.
4. A model by which additional primary industry sectors can be assessed in the future in terms of WHS risks.
5. Recommendations on future work to address gaps in current arrangements, thereby delivering improved WHS.

Methods used

To attain the information three levels of investigation were used drawing on coronial information, workers compensation data and finally injury self-report / near-miss incidents. All three levels of information were assessed to determine the most relevant high-risk issues upon which to focus in each sector.

Results/key findings

Although there were limitations with the available coronial data, the results indicate that there is a range of risks specific to each of the sectors. Additionally, although the workers compensation data significantly under-estimates the true burden of injury in these sectors, there are major costs associated with workplace injury.

Drawing on all of the available data, the focal risks that could be addressed through a comprehensive campaign in each of the sectors may be selected from the following issues:

- Aquaculture - Drowning (personal flotation devices), diving, electricity (pumps /aerators), quads
- Cotton - Motor vehicles (including utes, cars, quads, trucks), electricity
- Grain - Motor vehicles (including utes, cars, quads, trucks), grain augers/PTOs, electricity
- Marine - Drowning (personal flotation devices), diving
- Sugar - Tractors (rollover/runover/collision), motor vehicles (including utes, quads, haul out trucks)

Implications for relevant stakeholders

It is vital to note that each business will have its own production system in place and hence will have a diversity of risks beyond those listed. Attention to consider and address all high-risk issues in each business is a WHS requirement.

WHS resource materials to assist those involved in the primary industries are relatively restricted. While there is generic information covering WHS and approaches to manage risk available from the respective state/territory jurisdictions, sector specific information is less extensive. Where information is available, relevant links are provided.

The model suggested for future assessments builds upon that used in this study. Coronial, workers compensation and injury self-report/near-miss data all add to the evidence base to provide a comprehensive view. While each data source has its own limitations, it is the integration of this information which can provide the clearest picture of WHS in each sector. In addition to these elements, further practical data on key risks and how they are managed (specifically in the fishing sector) are required. Information from this process should be made available on an annual basis to key stakeholders in each commodity sector.

Recommendations

Several recommendations are made to enhance the quality and coverage of the information in respect to WHS for these sectors. However, the key point is to stimulate pro-active actions to manage and control risks leading to a genuinely safer workplace. From this perspective, the most important factor is how these data are used to action WHS controls, as simply providing more data without action will not have an impact in improving WHS. The recommendations are:

1. ACAHS to formally write to the National Coroners Information System to enhance ANZSIC coding for all fatal cases.
2. Annual Workers Compensation data is accessed nationally through Safe Work Australia and collated by ACAHS for each sector.
3. PIHSP should fund an on-going data capture project to access and work with some of the larger companies to ascertain the nature and rates of injury in their workforces.
4. As a secondary priority sentinel studies in strategic locations (e.g. ED data from selected hospitals in relevant locations i.e. sugar - Far North Queensland or fisheries - major fishing port) should be funded by PIHSP and conducted. Extrapolating data from existing sources will also be feasible in some instances and would be cost-effective.
5. PIHSP should fund on-going (at least annual) assessment of the impacts that changes in technology and new practices are having in each sector, this will require direct discussions with farmers and fishers.
6. PIHSP should fund an industry survey of WHS risk status every 3-5 years that is randomised and enables longer-term tracking of known risks and practices. The fisheries sector needs a baseline from which progress could be measured and hence this should be a priority for this sector. The agricultural commodities should plan to re-conduct the Health and Safety on Australian Farms survey by no later than 2016.
7. An annual summary of sector specific data be funded by PIHSP and compiled which triangulates the data from the coronial files, Workers Compensation and industry feedback as a minimum. This should be enhanced by data from the WHS risk survey (where available) and also the ABS work-

related survey results which are due for release in 2015. If suitable trauma (ED) data is available that must also be incorporated. This information would be made available to key stakeholders in each sector.

8. The WHS risks defined in this review must be integrated with the PIHSP funded work that is being undertaken to assess issues in relation to adoption. Determining actions to assist farmers and fishers to introduce / extend WHS systems is integral for effective utilization of these data.

9. It is recommended that the fisheries sector establishes a position to improve coordination of WHS within the sector.

Introduction

Having accurate evidence upon which to base intervention approaches is the cornerstone of injury prevention. This document has been developed for those in positions of influence within the agricultural and fishing sectors to assist in making informed WHS decisions for their industry.

While primary production has a mixed record on WHS, there have been significant improvements over the past 20 years with annual deaths in agriculture falling from around 150/year to 60/year.[1-3] Similarly, for the commercial fishing sector the numbers have fallen from around 14/year in the early 1980's to 5/year between 2011-13.[4, 5] Notwithstanding reductions in workforce numbers in both sectors over this period, these raw numerical data illustrate positive progress, however it is evident that the numbers continue to be far too high given the potential capacity for preventing all if not most of these cases. Steps can be taken to further enhance this situation and the impacts that both deaths and injuries have on productivity and social aspects in rural communities.

Objectives

This report has five specific objectives:

1. A concise and consistent description of the WHS priorities for the primary industries, which can be updated periodically as priorities are addressed.
2. Contextualisation of WHS priorities in terms of nominated sectors, allowing those sectors to plan a targeted approach to addressing the priorities and comparison of priorities across sectors.
3. A 'library' of existing strategies, products tips and tools addressing WHS priorities.
4. A model by which additional primary industry sectors can be assessed in the future in terms of WHS risks.
5. Recommendations on future work to address gaps in current arrangements, thereby delivering improved WHS.

Methodology

To define the relevant information, three levels of investigation were used:

1. Coronial data
2. Workers compensation
3. Injury self-report / near-miss incidents

Coroners Data

The National Coroners Information System (NCIS) is the sentinel repository of all deaths in Australia. Operating since 2001 it provides data from each of the state/territory jurisdictions into a national electronic database. Following a fatality a case file is made for each incident. These are uploaded, usually within seven days of the incident, with additional details (police reports, autopsy reports, toxicology etc.) added as they become available. Coronial findings are eventually uploaded once the relevant coroner has assessed the case. Once this is done and the case is “closed” (which in some instances can take 3-5 years), the Australian Centre for Agricultural Health and Safety (ACAHS) has access to the “closed” reports to inform its safety recommendations. The ACAHS is the only agriculturally focused agency with this access and is subject to strict ethical requirements in terms of data access and use.

While the NCIS is a genuinely valuable repository of factual information, this information is sometimes incomplete and/or may be limited in detail. Consequently, while the causal mechanism is usually clearly defined some other aspects that may have a bearing on the incident e.g. whether a Rollover Protection Structure was present on a tractor or if a helmet was worn by an individual riding a horse may not be present. Similarly, although there is an industry coding field (in which the relevant Australian and New Zealand Standard Industrial Classification Code - ANZSIC should be included), this is often incomplete or not specified in the records. As such, determining precisely those events that have occurred in the respective industry sectors (cotton, grains, sugar) is problematic.

Although Safe Work Australia do collect all work-related fatality data, this under-numerates the true burden of injury in the agricultural sector. This is a fundamental weakness of the Safe Work Australia data as it does not account for those that live and work on farms and is likely to underestimate fatalities by an estimated 20-30%. This is based on the non-inclusion of child cases and those individuals that are visiting but not working for income on the property e.g. recreational use of a quad, horse or two-wheel motorcycle etc. In contrast, the Safe Work Australia data within the fishing sector, will be far more robust and valid. However, as for agriculture the data for onshore aquaculture are also likely to be slightly under-numerated for the same reasons previously outlined.

The NCIS data from 2001-2010 are currently being fully quality assured in an extensive review and consequently until complete, the data presented here represent the existing best estimates on fatal cases. In general terms across all primary industry (agricultural) sectors, the leading agents of injury related fatalities are tractors, quads, farm utes, drowning (dams / waterways) and two-wheel motorcycles. These five agents represent approximately 50% of all fatal incidents.[2] More recent data obtained via media assessments also reflect a similar pattern for the period 2011-2014, with quads now overtaking tractors as the leading agent of fatal injury.[3, 6-8] Given these data there is no doubt that these issues must be addressed in any WHS preventive program.

Agriculture

For all NCIS cases that occurred within agriculture, the specific commodity sector where available (ANZSIC Code) was noted. The commodities of relevance for this report were cotton, grains and sugar, with data for aquaculture and marine fisheries being managed separately. This is also further complicated by those farms where mixed production is undertaken including grain-sheep and grain-beef, both of which were included in the data. Where an ANZSIC code was not available an “unknown” code was entered.

Fishing

For the fisheries sector, fatality data are available for the period 2003 - 2013 from NCIS and Safe Work Australia. As per the agricultural sector, there are several different categories which may be reported on dependent on the nature of the business. While all of the available fatality data is reported based on the ANZSIC, the changes in ANZSIC coding in 2006 has meant that variations with earlier data arise. For the fishing sector a synopsis of these coding variations and the data presented using the more recent ANZSIC are included as Annex 2. However, while the variations in codes for fatal injuries in the industry have been completed (also presented within Annex 2), these changes have as yet not been finalised for the Workers Compensation data. Consequently to enable some comparability throughout the report (and also with previous reports) the pre-2006 ANZSIC codes have been used in the body of the report.[10] Further detail on age and gender are also summarized in Annex 1.

Workers Compensation Data

Workers Compensation data were accessed through Safe Work Australia for the four year period 2008-09 to 2011-12. Data for 2011-12 is provisional in nature and it is expected that further cases will be added in time. Additionally, the data are limited in terms of the details for each specific incident and as such only broad observations may be made. It is estimated that only 50-60% of agricultural injuries are recorded in the Workers Compensation system as owner-operators are not eligible to claim. For similar reasons, the data for the aquaculture and marine sectors will also be significantly under-reported due to catch-share arrangements under which many vessels operate.

The relatively small number of cases annually in each sector, means that there are fluctuations in case numbers and for this reason a four-year aggregated incidence rate has been calculated. Further, there will be significant variability on the rates between sectors which will be dependent on factors including the number of workers employed (as opposed to owner-operators) and the systems in place to report and record injuries in different sectors, notwithstanding the legal WHS requirements to do so.

As noted previously a further restriction on the data for the fisheries sector is that the National Data Set that is the core source of information for Workers Compensation, has currently not been coded against the most recent ANZSIC codes. Hence, for the purposes of this report, attention will be paid to aquaculture (which includes both onshore and offshore) and marine (inclusive of all remaining sectors of the industry), throughout the report.

To provide some further context for how the agricultural industry is performing, data for both the grains sector and the mixed grains-beef & grains-sheep sector are provided separately, along with the overall figures for all agriculture.

Injury Self-Report and Near-Miss Data

Information has been collected by feedback directly from those individuals involved in the respective industry sectors where they were requested to report on injuries which they had sustained in the past 10 years and also to recall any near-miss experiences. Near-miss data is important as it can provide context to other potential hazards and risks plus emerging issues that may need addressing.

In addition, discussion with Work Health and Safety inspectors in several states has been undertaken to obtain a regulator's perspective on common risks requiring attention.

Results

Coronial Data

As indicated in Table 1, of the 766 agricultural related fatalities in the period 2001-2010, there were 409 where the sector could not be determined (53%). As such, it is likely that these data underestimate the actual numbers that may be apportioned to each of the commodity sectors under investigation in this report. This may also impact on the determination of specific agents of injury in some cases. However, there is no suggestion of any systematic bias in relation to why these codes were or were not included in the coronial data available (Table 2). Further detail on age and gender are also summarised in Annex 1.

Table 1: Commodity Specific fatalities 2001-2010 in comparison to all agricultural fatalities

Year	Cotton	Grains	Sugar	Unknown	Total No. Cases
2001	1	1	-	65	106
2002	-	6	1	63	105
2003	1	8	1	63	110
2004	-	3	-	49	99
2005	-	3	2	28	64
2006	2	2	-	45	63
2007	3	3	3	41	74
2008	-	3	-	21	52
2009	-	7	1	18	50
2010	-	3	-	17	43
TOTAL	6	39	8	410	766

Source: National Coroners Information System - ACAHS Database 2014[9]

Table 2: Commodity specific fatalities 2001-2010 by agent

Commodity Sector	Agents of Fatality
Cotton (n=6)	Module builder (2), forklift, machinery, ute, water pump
Grains (n= 39)	Aircraft (5), drowning - dam (4), electricity (4), grain auger (4), tractor (4), silo (3), hay bale (2), PTO (2), spreader (2), ute (2), angle grinder, chisel plough, field bin, firearm, header, tractor (fire), tree
Sugar (n =8)	Tractor (4), electricity (2), spreader, car

Source: National Coroners Information System - ACAHS Database 2014[9].

Fatality data for the fisheries sector are available for the period 2003 - 2013 from NCIS and Safe Work Australia. As previously outlined, the coding for fatalities has been updated to reflect the new ANZSIC codes introduced in 2006 and are presented in the data below. Further detail on age and gender are also summarised in Annex 1.

Table 3: Fatalities within the fisheries sector 2003-2013

Year	Aquaculture	Finfish Trawling	Line Fishing	Marine	Marine (nec)	Prawn Fishing	Rock Lobster	Squid Jigging	Total No. Cases
2003						2			2
2004	2			6	2	1			11
2005		2		3	1				6
2006				5					5
2007					3				3
2008		2			1	4	2		9
2009	2	2				5			9
2010			1						1
2011	1	1		1	2		1		6
2012	1				2				3
2013		1	2		1	2			6
TOTAL	6	8	3	15	12	14	3		61

Source: National Coroners Information System - Safe Work Australia Database 2014[5]

Table 4: Fatalities in the fisheries sector 2003-2013 by agent

Commodity Sector	Agents of Fatality
Aquaculture (n=6)	Electricity - pumps/aerators (2), drowning (diving-related) (2), crane, drowning (trapped by mower)
Finfish Trawling (n=8)	Drowning (boat capsized) (4), drowning (fell from boat) (2), entanglement (2)
Line Fishing (n=3)	Drowning (fell from boat) (2), electricity
Marine (n=15)*	Drowning (4), drowning (fell from boat) (4), drowning (entangled in net) (3), drowning (nets caught capsizing boat) (2), drowning (scuba-related), electricity
Marine (nec) (n=12)*	Drowning (capsize) (3), diving (shark attack) (2), fire (2), drowning (fell from boat) (2), drowning (diving & entanglement), drowning (washed overboard), unknown
Prawn Fishing (n=14)	Drowning (nets caught capsizing boat) (5), drowning (fell from boat) (2), drowning (boat capsized) (2), drowning (collision at sea), pulley/winch, drowning, boat fire/drowning, tractor
Rock lobster (n=3)	Head injury (waves) (2), drowning (fell from boat)

Source: National Coroners Information System - Safe Work Australia Database 2014[5]

*Note - the "Marine" classification is the overarching category and is used when specific detail of the sector is unknown from the data. The "Marine (nec)" classification is used when another type of known fishing has been involved, but is not listed.

Workers Compensation Data

Claims by sector

The numbers of claims approved by sector are described in Table 5.

Table 5: Claims by industry sector 2008-09 to 2011-12 for short-term (0-4 days) and serious (5+days) incidents

Time Lost	Industry class	2008-09	2009-10	2010-11	2011-12p	TOTAL
0-4 Days						
Agriculture	Cotton	41	20	14	52	127
	Grain growing	24	33	27	51	135
	Grain-sheep & Grain-beef	173	188	178	174	713
	Sugar	11	11	8	12	42
	All Agriculture	2,143	1,920	1,960	2,278	8,301
Fishing	Aquaculture	124	115	138	142	519
	Finfish trawling		1	2	2	5
	Line fishing	1	2		4	7
	Marine (nec)	62	29	43	35	169
	Prawn fishing	7	6	1		14
	Rock lobster fishing	2	1	3	1	7
	Squid jigging					
	All Fishing	196	154	187	184	721
5+ Days (serious claims)						
Agriculture	Cotton growing	28	25	46	43	142
	Grain growing	71	66	54	80	271
	Grain-sheep & Grain-beef	368	365	295	295	1,322
	Sugar	25	33	32	39	129
	All Agriculture	3,137	2,858	2,832	2,883	11,710
Fishing	Aquaculture	139	164	140	127	570
	Finfish trawling	7	3	7	2	19
	Line fishing	4	6	6	4	20
	Marine (nec)	36	50	29	43	158
	Prawn fishing	6	6	4	5	21
	Rock lobster fishing	13	7	8	4	32
	Squid jigging				1	1
	All Fishing	205	236	194	186	821

Source: Safe Work Australia 2014[5]

A further analysis of these data drawing on incidence per 1,000 employees was undertaken, using available ABS data as the denominator (Table 6).[5] Extreme caution is required in interpreting these data given the previously noted under-reporting of injuries (this includes employees only and not owner-operators), plus the variations in reporting systems across industry sectors.

Table 6: Cumulative incidence of all claims by industry sector for the period 2008-09 to 2011-12

Industry class	Claims (0-4 Days) / 1,000 employees	Claims (5+ Days) / 1,000 employees	Total All Claims /1,000 employees	Ratio of serious/minor claims
Cotton	23.6	26.4	50.1	1.1
Grain growing	4.9	9.9	14.8	2.0
Grain-sheep & Grain-beef	15.0	27.8	42.7	1.8
Sugar	2.5	7.6	10.1	3.0
All Agriculture	14.1	19.9	34.0	1.4
Aquaculture	24.6	27.0	51.7	1.1
Marine	37.4	34.9	72.3	0.9

Source: ABS & Safe Work Australia 2014[5]

These results illustrate that over the period 2008-09 to 2011-12:

- Within agriculture the grain-beef and grain-sheep mixed production entities had the highest number of short (0-4 days) and serious (5+ day) incidents.
- While the cotton sector had the highest incidence of agricultural claims, the distribution between minor and serious claims was more evenly spread than any of the other agricultural sectors (ratio 1.1). In contrast, sugar had the lowest overall number of claims but had the highest ratio of serious: minor claims (ratio 3.0).
- Within the fishing sector, the incidence of claims was high for both aquaculture and marine, however the ratio of serious: minor claims were approximately equal. This suggests that many of the injuries incurred are of a relatively lesser severity.

Claims by sector and nature of injury

The complete listing of accepted short term (0-4 days) and serious (5+ days) claims by nature of injury is provided in Annex 3. However, to summarise these data for the six respective sectors the following information has been extracted. The data present the five most common claim types by sector.

Table 7: Rank order for nature of injury by industry sector 2008-09 to 2011-12 for short-term (0-4 days) and serious (5+ days) claims

	Cotton	Grain	Grain-beef & grain-sheep	Sugar	Aquaculture	Marine
0-4 Days						
Rank 1	Sprains/strains (43)	Sprains/strains (43)	Sprains/strains (227)	Sprains/strains (13)	Sprains/strains (233)	Sprains/strains (64)
Rank 2	Open wound (29)	Open wound (32)	Open wound (167)	Open wound (9)	Open wound (95)	Open wound (34)
Rank 3	Contusion (14)	Contusion (10)	Contusion (82)	Foreign Body (9)	Contusion (58)	Muscle disorders (20)
Rank 4	Foreign body (11)	Foreign body (10)	Fracture (73)	Burns (3)	Muscle disorders (23)	Contusions (17)
Rank 5	Fracture (11)	Superficial injury (7)	Foreign body (29)	Contusion (3)	Diseases of skin (22)	Fracture (7)
All Injuries	127	135	713	42	519	169
% of All Injuries #	85.0	75.5	81.0	88.0	83.0	84.0
5+ Days						
Rank 1	Sprains/strains (50)	Sprains/strains (98)	Sprains/strains (457)	Sprains/strains (40)	Sprains/strains (266)	Sprains/strains (50)
Rank 2	Fracture (29)	Fracture (39)	Fracture (270)	Fracture (24)	Open wound (73)	Contusion (25)
Rank 3	Open wound (13)	Open wound (32)	Open wound (168)	Open wound (17)	Fracture (48)	Muscle disorders (19)
Rank 4	Contusion (9)	Contusion (24)	Contusion (96)	Contusion (10)	Contusion (42)	Open wound (19)
Rank 5	Deafness (4) / Dislocation (4)	Muscle disorders (12)	Dislocation (41)	Hernia (7)	Muscle disorders (37)	Fracture (18)
All Injuries	142	271	1,320	129	638	185
% of All injuries*	76.7	75.6	78.1	75.9	73.0	70.8

Source: Safe Work Australia 2014[5]

* Calculated as top five ranking types of claim as a percentage of total number of claims (all injuries)

These results illustrate that over the period 2008-09 to 2011-12:

- The five leading types of injuries consistently accounted for around 75% of all injury claims in both short (0-4 days) and serious (5+days) claims for all sectors. This illustrates that addressing issues associated with these types of injuries will have a significant impact on the overall burden of injury.
- Sprains and strains accounted for around one-third of both short term (0-4 days) and serious (5+ days) injury claims in all sectors with the exception of aquaculture, where this was raised to between 45% (0-4 days) and 42% (5+ days).
- For the more serious injuries (5+ days), apart from sprains and strains, fractures, open wounds and contusions were most common.

Claims by sector and mechanism of injury

The complete listing of accepted short term (0-4 days) and serious (5+ days) claims in relation to the mechanism of injury is provided in Annex 2. However, to summarise these data for the six respective sectors the following data have been extracted (Tables 8-13). The data present the five most common mechanisms for each claim type by sector.

Table 8: Aquaculture - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims

Aquaculture					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being hit by moving objects	9	10	12	12	43
Falls on the same level	21	14	37	29	101
Hitting moving objects	13	13	12	13	51
Muscular stress while handling objects other than lifting, carrying or putting down objects	20	19	16	24	79
Muscular stress while lifting, carrying, or putting down objects	14	14	16	14	58
TOTAL ALL CASES	123	115	138	142	518
5+ Days Time Lost					
Being hit by moving objects	4	8	10	10	32
Falls on the same level	28	45	25	19	118
Hitting moving objects	6	19	6	7	38
Muscular stress while handling objects other than lifting, carrying or putting down objects	39	35	26	20	120
Muscular stress while lifting, carrying, or putting down objects	28	26	15	21	90
TOTAL ALL CASES	168	186	147	137	638

Source: Safe Work Australia 2014[5]

Table 9: Cotton - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims

Cotton					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being hit by moving objects	9	4	2	9	24
Falls on the same level	7	1	1	4	13
Hitting stationary objects	8		2	9	19
Muscular stress while handling objects other than lifting, carrying or putting down objects	4		3	5	12
Muscular stress while lifting, carrying, or putting down objects	1	2	1	3	7
TOTAL ALL CASES	41	20	14	52	127
5+ Days Time Lost					
Being hit by moving objects	2	3	4	4	13
Falls from a height	3	1	4	11	19
Hitting stationary objects	2	4	6	1	13
Muscular stress while handling objects other than lifting, carrying or putting down objects	4	3	4	2	13
Muscular stress while lifting, carrying, or putting down objects	4	4	4	3	15
TOTAL ALL CASES	28	25	46	43	142

Source: Safe Work Australia 2014[5]

Table 10: Grains - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims

Grains					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being hit by moving objects	3	8	8	11	30
Falls from a height	3	1	1	8	13
Falls on the same level		3	1	8	12
Hitting stationary objects	2	3	2	3	10
Muscular stress while handling objects other than lifting, carrying or putting down objects	2	3	2	5	12
TOTAL ALL CASES	24	33	27	51	135
5+ Days Time Lost					
Being hit by moving objects	7	5	4	6	22
Falls from a height	10	10	8	7	35
Falls on the same level	4	8	7	9	28
Muscular stress while handling objects other than lifting, carrying or putting down objects	5	8	10	6	29
Muscular stress while lifting, carrying, or putting down objects	9	4	4	6	23
TOTAL ALL CASES	71	66	54	80	271

Source: Safe Work Australia 2014[5]

Table 11: Grains-sheep & grains-beef - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims

Grains-sheep & Grains-beef					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being hit by an animal	24	18	18	16	76
Being hit by moving objects	18	30	30	33	111
Falls from a height	14	22	22	11	69
Hitting stationary objects	15	16	15	11	57
Vehicle accident	17	18	9	16	60
TOTAL ALL CASES	173	188	178	174	713
5+ Days Time Lost					
Being hit by an animal	46	46	30	26	148
Falls from a height	51	49	33	36	169
Falls on the same level	24	37	35	31	127
Muscular stress while handling objects other than lifting, carrying or putting down objects	31	50	25	29	135
Vehicle accident	49	38	33	32	152
TOTAL ALL CASES	368	365	295	295	1322

Source: Safe Work Australia 2014[5]

Table 12: Marine - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims

Marine					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being hit by moving objects	6	2	5	3	16
Falls on the same level	5	3	5	5	18
Hitting moving objects	9		5	3	17
Muscular stress while handling objects other than lifting, carrying or putting down objects	8	7	8	5	28
Muscular stress while lifting, carrying, or putting down objects	10	3	1	4	18
TOTAL ALL CASES	62	29	43	35	169
5+ Days Time Lost					
Being hit by moving objects	3	2	4	6	15
Being trapped between stationary and moving objects	2	4	4	5	16
Falls on the same level	12	9	4	3	29
Muscular stress while handling objects other than lifting, carrying or putt	9	5	4	6	25
Muscular stress while lifting, carrying, or putting down objects	4	9	2	2	17
TOTAL ALL CASES	43	59	34	49	185

Source: Safe Work Australia 2014[5]

Table 13: Sugar - leading mechanisms of injury short term (0-4 days) and serious (5+ days) claims

Sugar					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being hit by moving objects	3	2	1		6
Hitting moving objects		2		3	5
Hitting stationary objects	1	2	1	1	5
Muscular stress while handling objects other than lifting, carrying or putting down objects	1	1	1	3	6
Unspecified mechanisms of injury	1		3		4
TOTAL ALL CASES	11	11	8	12	42
5+ Days Time Lost					
Falls from a height	2	4	7	6	19
Falls on the same level	3	4	2	5	14
Hitting moving objects	2	2	3	5	12
Muscular stress while handling objects other than lifting, carrying or putting down objects	1	8	2	2	13
Muscular stress while lifting, carrying, or putting down objects	5	3	2	5	15
TOTAL ALL CASES	25	33	32	39	129

Source: Safe Work Australia 2014[5]

The results illustrate a highly consistent pattern not only within each sector for the short term and more serious claims, but also across industries. For all industries:

- The most common mechanisms for injuries requiring 0-4 days absence were being hit by moving objects, muscular stress other than lifting and falls on the same level (in that order).
- For the more serious claims (5+ days) being hit by moving objects, muscular stress other than lifting, muscular stress lifting, falls on the same level and falls from height (in that order), were most frequently reported.

Claims by productive time lost and costs

The following data summarizes the time lost (weeks) by each sector. It also provides information on the costs associated with claims including the average and total costs to industry over the period 2008-09 to 2011-12. For the agricultural based sectors, a comparison with the data for all agricultural production is also provided as are the incidence rates for weeks lost per 1,000 employees.

Table 14: Time lost due to Injury claims and associated costs in agriculture and fisheries 2008-09 to 2011-12

	Total Time (All Accepted) (Weeks)	Median Time (All Accepted) (Weeks)	Total Cost (All Accepted) (\$,000)	Median Cost (All Accepted) (\$,000)
Cotton				
2008-09	473	0.4	2,312	0.8
2009-10	591	1.2	641	1.1
2010-11	622	3.0	1,301	5.6
2011-12	390	0.8	750	1.1
TOTAL	2,076	1.35	5,005	2.15
Grains				
2008-09	1,154	1.8	2,377	5.8
2009-10	796	7.1	1,849	3.2
2010-11	682	4.7	1,399	3.3
2011-12	1,062	3.0	1,731.0	4.8
TOTAL	3,696	4.15	7,357	4.28
Grain-sheep & Grain-beef				
2008-09	7,126	6.4	14,677	3.6
2009-10	6,133	6.1	10,632	3.2
2010-11	4,460	5.4	7,554	3.2
2011-12	3,491	2.0	6,612	4.7
TOTAL	21,211	4.95	39,476	3.65
Sugar				
2008-09	316	2.2	1,277	3.4
2009-10	445	4.4	752	6.4
2010-11	342	2.2	559	3.7
2011-12	401	3.3	606	4.3
TOTAL	1,506	3.05	3,195	4.5
All Agriculture				
2008-09	57,937	5.2	102,015	6.0
2009-10	47,339	5.2	73,664	7.1
2010-11	44,074	6.0	67,791	7.3
2011-12	33,207	5.9	52,586	8.1
TOTAL	182,559	5.6	296,057	7.1
Aquaculture				
2008-09	2,297	1.2	3,348	1.8
2009-10	2,444	1.2	5,562	1.9
2010-11	1,433	1.0	2,873	1.8
2011-12	1,163	0.7	2,281	2.1
TOTAL	7,338	1.0	14,065	1.95
Marine				
2008-09	1,572	0.8	2,197	0.9
2009-10	1,282	11.9	2,138	2.7
2010-11	386	5.2	740	1.1
2011-12	493	1.0	847	3.7
TOTAL	3,735	4.7	5,923	2.1

Note - All figures rounded

Source: Safe Work Australia 2014[5]

Injuries are associated with a large amount of lost productive time, with sugar (1,506 weeks) and cotton (2,077 weeks) being the best numerical performers among the sectors assessed. Unsurprisingly, given the large number of grain-sheep and grain-beef businesses, this sector reported the highest volume of lost production time (21,211 weeks). Given the relative size of the aquaculture sector, this too also performed sub-optimally (7,338 weeks). Notwithstanding the relatively large number of weeks off work in aquaculture, the median injury claims duration were the lowest in this sector (1.0 week). Similarly, the cotton sector performed well (1.35 weeks).

Overall costs associated with injuries were reflective of the weeks lost, with grain-sheep and grain-beef businesses (\$39,476,000) and aquaculture (\$14,065,000) having the highest total costs. In contrast, sugar (\$3,195,000) and cotton (\$5,005,000) incurred the lowest costs.

With accurate denominator data on the number of businesses in each sector and the number of persons employed compromising the capacity to define genuine exposure rates, the median cost estimates provide arguably the most robust indicator of injury. These data reinforce that aquaculture while having a relatively large volume of weeks off work has the lowest overall median cost (\$1,950) and may reflect less serious injury in broad terms. Similarly, both marine (\$2,100) and cotton (\$2,150) have comparatively lower median costs associated with their injuries.

Ideally, the best indicator would be the sector with the lowest overall time off work and median cost. In this regard the cotton sector performed more strongly than any of the others assessed, with median time off work approximately 75% lower than the all agriculture estimates and median costs around 65% lower.

While noting the limitations as described above in assessing incidence rates, a further analysis on the weeks lost by claims in each sector was completed. Again the limitations with use of the ABS employee numbers must be noted and findings treated with due caution.

Table 15: Cumulative incidence of weeks lost for all claims by industry sector for the period 2008-09 to 2011-12

Industry class	Total All Claims (Weeks Lost)	Incidence of Weeks Lost / 1,000 employees
Cotton	2,077	387
Grain growing	3,696	135
Grain-sheep & Grain-beef	21,211	445
Sugar	1,506	89
<i>All Agriculture</i>	182,559	310
Aquaculture	7,338	348
Marine	3,735	826

Source: ABS & Safe Work Australia 2014[5]

These data indicate that sugar is the best performing of the sectors (89 weeks lost / 1,000), with marine (826 weeks lost / 1,000) being significantly elevated in comparison to all other sectors.

From a WHS perspective it is vital that those incidents which have the potential for the greatest harms, time off work and costs are addressed as a priority. To this end an analysis of the time lost and costs as they relate to the serious (5+ day) claims was undertaken.

Table 16: Serious (5+ days) claims as a proportion of total time lost and costs within each sector (2008-09 to 2011-12)

Sector	% of all time lost (weeks) due to serious claims	% of all costs (\$,000) due to serious claims
Aquaculture	98.2%	95.1%
Cotton	98.6%	97.0%
Grains	97.2%	97.0%
Grains-sheep & Grains-beef	97.8%	97.0%
Marine	93.1%	96.2%
Sugar	99.1%	98.7%
All agriculture	99.2%	96.0%

Source: Safe Work Australia 2014[5]

Workers Compensation costs for each industry sector are performance-based and are set each year by the respective state/territory. Consequently, premiums for Workers Compensation reflect the capacity of a sector to manage risks and reductions in premiums will only eventuate if a whole of sector approach to WHS is adopted. As identified in Table 16 over 90% of all time off and costs associated with workplace injuries result from those events resulting in claims of 5+ days duration. Hence, prevention efforts should focus on reducing serious incidents. This is a critical message that needs to be emphasised in any WHS program - start with and address the highest risk issues (i.e. those that kill or maim) before focusing on less critical aspects.

A summary of the findings are presented in Table 17.

Table 17: Self-reported data on injury and near-miss incidents by agent

Industry	Agent of Injury / Near-miss
Aquaculture	Diving related, electricity (pumps/aerators), hand infections, knife lacerations, quads, sharks/crocodiles
Cotton	Motor vehicles, quads, pickers, module builders, workshop, tractors, anhydrous ammonia, spray rigs, aircraft, excavator/grader Picker and module builder fires, plus crashes from loss of control of quads were all noted as common by respondents and are likely under-estimated in figures above
Grain	Motor vehicles, workshop, quads, electricity, augers/PTO's
Sugar	Harvesters, electricity (poles/wires), haul-out trucks, locomotives, tippers (rollover), quads
Marine	Knife lacerations, back injury, electricity, entanglement in netting, generators (unguarded), hoists/cranes, drowning (overboard scenarios)

Implications

Factors of Highest Risk by Industry

Drawing on previously collected information and on the data presented within this report, specifically the evidence pointing to the significant impact that the more serious injuries incur in relation to time off and associated costs, high-risk issues have been defined for each sector (Table 18).[10-14] These high-risk activities/agents should provide some guidance to the typical issues that need consideration. However, it is vital to note that each business will have its own production system in place, and hence will have a diversity of risks beyond those listed here. Attention to consider and address all high-risk issues in your business is a WHS requirement.

In considering what issues should be given greatest attention, it is relevant to draw on Australian data compiled by McDonald. His assessment breaks injury into three distinct classes, Class I permanent alteration of life (fatal and non-fatal), Class II temporary alteration of life and Class III insignificant alteration of life. Significantly the major burden (>90%) is incurred from Class I events and hence, this should be the priority for control measures.[15]

Table 18: Summary of highest risk issues by industry

Sector	High-Risks
Aquaculture	<ul style="list-style-type: none"> • Aquaculture ponds/diving (drowning) • Aerators/pumps (electricity/ entanglement) • Harvesting (cuts/ piercing/ infection / poisoning) • Muscle strain (high frequency) • Quads (collisions/ falls/ rollover)
Cotton	<ul style="list-style-type: none"> • Electricity (overhead powerlines - pickers, module builders, spray rigs) • Excavators • Farm utes/vehicles (collisions) • Irrigation channels (drowning) • Module builders (falls/ crush injury/ suffocation) • Pumps (entanglement) • Quads (collisions/ falls/ rollover)
Grains	<ul style="list-style-type: none"> • Aircraft (crash) • Chaser bins (entanglement/ runover) • Drowning (children in dams) • Farm utes/vehicles (collisions) • Grain augers (entanglement/ electricity) • Headers (crush injury/ entanglement/ runover/ electricity) • PTO drives • Quads (collisions/ falls/ rollover) • Round bale lifters (crush injury) • Silos (falls) • Tractors and trailed equipment (entanglement/ runover) • Tyre repair (crush under vehicle)
Marine	<ul style="list-style-type: none"> • Boats (drowning) • Hooks, spikes and knives (hand injury) • Marine animals (cuts/ piercing/ infection / poisoning) • Netting (entanglement/ drowning) • Diving (drowning) • Electricity • Cranes/hoists
Sugar	<ul style="list-style-type: none"> • Cane firing • Cane harvesters (collision/ runover) • Electricity (overhead powerlines) • Farm utes/vehicles (collisions) • Haul out trucks (collisions) • Muscle strain (high frequency) • Quads (collisions/ falls/ rollover) • PTO drives • Tractors (rollover/ runover/ collisions) • Trains (collisions) • Tyre repair (crush under vehicle) • Water (irrigation channels / wells)

Complementing the data attained in this study, further reference is also made to previous RIRDC reports that outline additional information on industry specific risks. For the fisheries sector the information provides an analysis over time of relevant issues and trends related to risks ([Health and Safety in the Australian Fishing Industry](#)).[10] For agriculture, the information provides detailed commodity information from over 700 primary producers on their knowledge, attitudes and practices in respect to WHS ([Health and Safety on Australian Farms](#)).[16] This agricultural document is particularly useful in identifying specific risk factors and in determining the WHS status of the industry as it reports on the factors underpinning risks which require attention, rather than merely reporting on the epidemiology of injury in the sector.

Drawing on all of the available data, the focal risks that could be addressed through a comprehensive campaign in each of the sectors may be selected from the following issues:

- Aquaculture - Drowning (personal flotation devices), diving, electricity (pumps / aerators), quads
- Cotton - Motor vehicles (including utes, cars, quads, trucks), electricity
- Grain - Motor vehicles (including utes, cars, quads, trucks), grain augers/PTOs, electricity
- Marine - Drowning (personal flotation devices), diving
- Sugar - Tractors (rollover/runover/collision), motor vehicles (including utes, quads, haul out trucks)

RESOURCE INFORMATION

The range of available resources to assist those involved in the primary industries is relatively restricted. There is generic information covering WHS and approaches to manage risk that are available from the respective state/territory jurisdictions (Table 19). These comply with the general obligations of all worksites to manage and control risks. For the fisheries sector there is also the additional complementary requirement as defined under the [National Standard for Commercial Vessels](#) to ensure safety.[17]

Table 19: State/Territory Work Health Authorities for further information

Australian Capital Territory Worksafe ACT (02) 6207 3000 worksafe@act.gov.au	New South Wales WorkCover NSW 13 10 50 contact@workcover.nsw.gov.au
Northern Territory NT WorkSafe 1800 019 115 ntworksafe@nt.gov.au	Queensland Workplace Health and Safety Queensland 1300 369 915 WHS Enquiry Form
South Australia SafeWork SA 1300 365 255 help@safework.sa.gov.au	Tasmania WorkSafe Tasmania 1300 366 322 wstinfo@justice.tas.gov.au
Victoria WorkSafe Victoria 1800 136 089 info@worksafe.vic.gov.au	Western Australia WorkSafe 1300 30 78 77 safety@commerce.wa.gov.au

Although there is less specifically targeted information for each of the commodity sectors, further information is available and has broadly been denoted as primary and secondary source information (Table 20).

Table 20: Sector specific information sources

Sector	Primary	Secondary
Fisheries	Australian Maritime Safety Authority (AMSA)	<p><i>Government Departments</i></p> <p>Marine & Safety Tasmania Maritime Safety Victoria NSW Maritime NT Department of Transport - Marine Safety Branch QLD Maritime Safety SA Boating & Marine WA Department of Transport - Marine</p> <p><i>Industry</i></p> <p>NT Primary Industries Training Advisory Council Southern Rock Lobster Clean and Green Program Western Australian Fishing Industry Council Inc.</p>
Cotton	Cotton Australia (myBMP)	Australian Centre for Agricultural Health and Safety Cotton Research & Development Corporation
Grains	Rural Industries Research & Development Corporation	Australian Centre for Agricultural Health and Safety Grains BMP Grains Research & Development Corporation
Sugar	Smartcane BMP (Canegrowers)	Australian Centre for Agricultural Health and Safety Canegrowers Sugar Research Australia

A full listing of commodity specific tools for cotton, grains and sugar including relevant checklists and all the required record keeping instruments are freely available at the [Australian Centre for Agricultural Health & Safety](#) website.

Within the electronic media there are a number of new tools being released that may assist those working in the primary industries. This is an area that is evolving rapidly and will undoubtedly grow exponentially in the coming years. While many of the products are commercial in nature and are available for purchase, they can be modified to suit a particular business e.g. WHS planning and monitoring systems. There are also some tools that are available at no-cost. For example, a recent smartphone application to assist with farm safety inductions is available from [Farmsafe Australia](#).

MODEL FOR ASSESSING WHS RISKS

Central to any model of WHS risks is the recognition that it is the deaths and serious injuries that have the most significant impact on an industry. Not only are there considerable physical trauma and economic costs associated with these events, they also have a major detrimental social and psychological impact on the individuals (if they survive), their fellow workers, families and whole communities. Given the data reported in this analysis it is critical that efforts to reduce these serious incidents takes precedence in assessing WHS risks.

It is also important to include work and non-work injury given the nature of the businesses being assessed and it is inappropriate to discount such non-work outcomes. This is particularly true in the farm context and will also apply in some circumstances for land-based aquaculture production where

the business is also a family home. While work and non-work injuries may be reported separately, the risks to family members and visitors do arise because of exposure at a worksite (farm / aquaculture). With over 90% of Australian farms being family owned and operated businesses, it is disingenuous to artificially delineate between work and non-work as by law, risks (i.e. provision of a safe workplace), must be addressed for whoever enters that worksite.

Based on these principles the preferred model for assessing WHS risk should include the following factors:

1. Draws on data from the National Coroners Information System relevant to specific commodities as this is the most robust and valid information available in relation to the highest risks.
2. Utilizes the available Workers Compensation data (acknowledging this is significantly under-reported in both agriculture and fisheries), in respect to time off work, related costs and mechanism of injury for each commodity.
3. The Workers Compensation data provides only broad evidence regarding the mechanism of the injury event (e.g. falls at height, sprain/strain etc) and this information is generally not specific enough to clearly pinpoint risks in a detailed manner. Consequently, feedback from those working in each sector will be required to more specifically highlight key risks. To this end, it is recommended that every 3-5 years that a risk based survey of each sector be undertaken as has previously been completed for the agriculture sector ([Health and Safety on Australian Farms](#)). This will enable genuine tracking of risks and trends over time. For the fisheries sector which does not appear to have information that clearly monitors the key risks, this should be a short-term priority. Additional elements may include hospital Emergency Department data and/or information derived through General Practice, however the additional clarity on risks that this may provide needs to be balanced against the costs and efforts to attain these data.
4. In many of the sectors in question there are technological advances that are impacting on the manner in which work is being undertaken. Feedback from farmers and fishers via existing producer networks should be attained on any potential WHS issues that may be arising from these changes. If this can be done in a timely manner it will reduce any negative WHS consequences that technological developments may have on the industries.

In summary, information from this relatively straightforward four-step system should be made available on an annual basis to key stakeholders in each commodity sector. While some financial support to ensure items 1, 2 and 4 above can be defined on an annual basis is required, these are minor inputs. In contrast, more significant funding would be required to facilitate the completion of item 3 on a 3-5 year interval.

Recommendations

In making recommendations it is crucial to highlight that the intent of this project in mapping risks is to provide an evidence-based approach to managing and controlling those risks leading to a genuinely safer workplace. From this perspective, the important factor is how these data are used to action WHS controls, as simply providing more data without action will not have an impact in improving WHS. The following recommendations are provided to further enhance this capability in the participating agricultural and fishery sectors.

1. ACAHS to formally write to the National Coroners Information System to enhance ANZSIC coding for all fatal cases. This will increase capacity to more clearly define all of the highest risks that are resulting in fatalities.
2. While recognising that Workers Compensation data in these sectors significantly under-reports cases, these data still provide a quantifiable indicator of the impact on individuals and productivity for each sector. Annual Workers Compensation data is accessed nationally through Safe Work Australia and collated by ACAHS for each sector.
3. As has been previously recommended within the fisheries sector, PIHSP should fund an on-going data capture project to access and work with some of the larger companies to ascertain the nature and rates of injury in their workforces (which will generally be more highly regulated than those of owner-operators). Such data will also provide scope for broader extrapolation across the industry.
4. There is a lack of available data in relation to medical treatments (outside of those covered by Workers Compensation). Given the low rates of Workers Compensation coverage in these sectors, there is likely to be a considerable volume of injuries that are currently unaccounted for, yet require medical attention at either an Emergency Department (ED) or via General Practice. Sentinel studies in strategic locations (e.g. ED data from selected hospitals in relevant locations i.e. sugar - Far North Queensland or fisheries - major fishing port) should be funded by PHISP and conducted. Extrapolating data from existing sources will also be feasible in some instances and would be cost-effective, however trauma registries in each jurisdiction vary in their capacity and the validity of records. While such data will add to the epidemiological profile, in a resource-constrained environment it is highly improbable that the overall picture in terms of WHS risks would vary significantly from that already gathered using the Coroners, Workers Compensation and industry feedback information. As such, while good to have these additional data, the collection of such may be seen as a secondary priority for future consideration by PHSIP.
5. The importance of feedback from those working within each of these sectors cannot be underestimated. In particular the identification of injuries (not all of which result in medical care) and near-miss events, does provide useful information to assist with targeting key WHS risks. PIHSP should fund on-going (at least annual) assessment of the impacts that changes in technology and new practices are having in each sector, this will require direct discussions with farmers and fishers.
6. PHSIP should fund an industry survey of WHS risk status every 3-5 years that is randomised and enables longer-term tracking of known risks and practices. The fisheries sector needs a baseline from which progress could be measured and hence this should be a priority for this sector. The agricultural commodities should plan to re-conduct the [Health and Safety on Australian Farms](#) survey by no later than 2016.
7. There is no one single optimal source of data on WHS risks in these sectors and consequently it is recommended that an annual summary of sector specific data be funded by PIHSP and compiled which triangulates the data from the coronial files, Workers Compensation and industry feedback as a minimum. This should be enhanced by data from the WHS risk survey (where available) and also the

ABS work-related survey results which are due for release in 2015. If suitable trauma (ED) data is available that must also be incorporated. This information would be made available to key stakeholders in each sector. The ACAHS is in a position to facilitate this action for the agricultural sector. However, based on this review, it is apparent that there is no existing independent agency with the remit for the collection and collation of such data for the fisheries sector.

8. The WHS risks defined in this review must be integrated with the PIHSP funded work that is being undertaken to assess issues in relation to adoption. *Determining actions to assist farmers and fishers to introduce / extend WHS systems is integral for effective utilization of these data.*

9. The agricultural sector is fortunate to have an independent agency (that does not have a regulatory/enforcement role), with a charter to address WHS issues (ACAHS). This is particularly important in industries with a large number of relatively small enterprises and where economies of scale are difficult to attain. From this perspective, *it is recommended that the fisheries sector establishes a position to fulfil a similar role to improve coordination of WHS within the sector.*

Appendices

ANNEX 1

Agricultural Fatalities by Gender and Age 2001-2010

Gender/Age	Cotton	Grains	Sugar	TOTAL
Male	5	38	8	51
Female	1	1	-	2
0-14		5		5
15-24	2	5		7
25-39	2	4		6
40-54	2	11	2	15
55-69		10	1	11
70+		4	5	9
TOTAL	6	39	8	53

Fishery Fatalities by Gender and Age 2003-2013

Gender/Age	Aquaculture	Finfish Trawling	Line Fishing	Marine	Marine (nec)	Prawn Fishing	Rock Lobster	TOTAL
Male	5	8	3	15	12	14	3	60
Female	1	-	-	-	-	-	-	1
0-14								
15-24	2	1	2	2	2	1		10
25-39	1	2	1	5	3	6		18
40-54	2	3		7	7	4	2	25
55-69	1	2		1		3	1	8
70+								
TOTAL	6	8	3	15	12	14	3	61

ANNEX 2

ANZSIC 1993 Codes
Marine fishing
Rock lobster fishing
Prawn fishing
Finfish trawling
Squid jigging
Line fishing
Marine fishing (not elsewhere classified)

ANZSIC 2006 Codes
Fish Trawling, Seining and Netting
Rock Lobster and Crab Potting
Prawn Fishing
Offshore longline and rack aquaculture
Onshore aquaculture
Line Fishing
Other fishing

Fish industry fatalities 2003-13 based on ANZSIC 2006

ANZSIC06 Industry	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Fish Trawling, Seining and Netting		5	5	5		2	2		2		1	22
Line Fishing								1			2	3
Offshore Longline and Rack Aquaculture		2					2			1		5
Onshore Aquaculture									1			1
Other Fishing		3	1		3	1			2	2	1	13
Prawn Fishing	2	1				4	5				2	14
Rock Lobster and Crab Potting						2			1			3
Total	2	11	6	5	3	9	9	1	6	3	6	61

ANNEX 3

Workers Compensation data nature of injury by sector (0-4 days) time lost

Nature of injury/disease	Cotton	Grain	Grain-beef & grain-sheep	Sugar	Aquaculture	Marine
0-4 days time lost						
Arthropathies and related disorders - disorders of the joints			3		1	2
Burns	2	4	18	3	7	3
Cerebrovascular disease			1			
Contact dermatitis		5				
Contusion with intact skin surface and crushing injury excluding those with fracture	14	10	82	3	58	17
Damage to artificial aid(s)			1		1	
Deafness		1	3			1
Dislocation		3	10		1	
Disorders of muscle, tendons and other soft tissues	3	2	11		23	20
Disorders of nerve roots, plexuses and single nerves					2	
Disorders of the conjunctiva and cornea		1	2		2	
Dorsopathies - disorders of the spinal vertebrae and intervertebral discs		3	9	1	7	4
Effects of weather, exposure, air pressure and other external causes, not elsewhere classified		1			7	
Electrocution or shock from electric currents			2		2	
Foreign body on external eye, in ear or nose or in respiratory, digestive or reproductive system	11	10	29	9	9	3
Fracture of vertebral column with or without mention of spinal cord lesion			3		3	
Fractures	11	6	73	3	12	7
Hernia		2	1		4	2
Injuries to nerves and spinal cord without evidence of spinal bone injury					3	
Intracranial injury, including concussion	1		4		4	2
Mental disorders					4	1
Multiple injuries	1	1	5			

Nature of injury/disease	Cotton	Grain	Grain-beef & grain-sheep	Sugar	Aquaculture	Marine
Needlestick puncture and medical sharps injury			9			
Neoplasms of uncertain behaviour or unspecified nature		1				
Open wound not involving traumatic amputation	29	32	167	9	95	34
Other and unspecified dermatitis or eczema	1					
Other and unspecified injuries	5	1	11		2	
Other diseases	1		1		1	
Other diseases of skin and subcutaneous tissue			4		22	4
Other diseases of the ear and mastoid process					2	
Other diseases of the respiratory system			1			
Other disorders of the eye		1	2			
Other infectious and parasitic diseases			1		1	
Other respiratory conditions due to substances		1				
Poisoning and toxic effects of substances	1		10		4	1
Sprains and strains of joints and adjacent muscles	43	43	227	13	233	64
Superficial injury	4	7	22	1	7	3
Traumatic deafness from air pressure or explosion					2	1
TOTAL	127	135	713	42	519	169

ANNEX 4

Workers Compensation data nature of injury by sector (5+ days) time lost

Nature of injury/disease	Cotton	Grain	Grain-beef & grain-sheep	Sugar	Aquaculture	Marine
5+ days time lost						
Arthropathies and related disorders - disorders of the joints	1	5	7	2	5	4
Asbestosis						1
Asthma		1				
Burns	3	2	28	3	14	3
Cerebrovascular disease						
Contact dermatitis					2	
Contusion with intact skin surface and crushing injury excluding those with fracture	9	24	96	10	42	25
Damage to artificial aid(s)						
Deafness	4	8	14	3	2	4
Diseases of the brain, spinal cord and peripheral nervous system			1			
Dislocation	4	6	41	4	26	6
Disorders of muscle, tendons and other soft tissues	2	12	35	3	37	19
Disorders of nerve roots, plexuses and single nerves			5	1	10	2
Disorders of the conjunctiva and cornea						
Dorsopathies - disorders of the spinal vertebrae and intervertebral discs	3	7	34	3	15	9
Effects of weather, exposure, air pressure and other external causes, not elsewhere classified					8	
Electrocution or shock from electric currents					1	
Foreign body on external eye, in ear or nose or in respiratory, digestive or reproductive system	1	2	9		3	
Fracture of vertebral column with or without mention of spinal cord lesion	3	3	16		1	1
Fractures	29	39	270	24	48	18
Hernia	3	4	25	7	10	5
Injuries to nerves and spinal cord without evidence of spinal bone injury		1	1		1	

Nature of injury/disease	Cotton	Grain	Grain-beef & grain-sheep	Sugar	Aquaculture	Marine
Internal injury of chest, abdomen and pelvis			5	1	1	
Intestinal infectious diseases					1	
Intracranial injury, including concussion		1	10	2	6	
Ischaemic heart disease			2			
Leptospirosis		1		1		
Mental disorders	2		3	1	11	
Multiple injuries	2	4	17			1
Needlestick puncture and medical sharps injury		1	2			
Neoplasms of uncertain behaviour or unspecified nature			1			
Open wound not involving traumatic amputation	13	32	168	17	73	19
Other and unspecified dermatitis or eczema					1	
Other and unspecified injuries	3	5	21	3	7	2
Other diseases					2	
Other diseases of skin and subcutaneous tissue	1	1	10	3	22	5
Other diseases of the ear and mastoid process					2	1
Other diseases of the respiratory system	1				1	1
Other disorders of the eye						
Other infectious and parasitic diseases						
Other malignant neoplasm	1			1	1	1
Other respiratory conditions due to substances					1	
Other zoonoses			1			
Poisoning and toxic effects of substances		6	3		7	3
Q-fever		1	4			
Sprains and strains of joints and adjacent muscles	50	98	457	40	266	50
Superficial injury	2	2	7		3	1
Traumatic amputation including enucleation of eye (loss of eyeball)		4	26		3	6
Traumatic deafness from air pressure or explosion	5	1			3	
Varicose veins			1		1	
TOTAL	142	271	1,320	129	638	185

ANNEX 5

Claims by Mechanism of injury

Aquaculture					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being bitten by an animal		1			1
Being hit by an animal		1	1		2
Being hit by falling objects	2	4	5	6	17
Being hit by moving objects	9	10	12	12	43
Being trapped between stationary and moving objects	2	8	5	13	28
Being trapped by moving machinery	1	1	8	2	12
Contact with electricity			2	1	3
Contact with hot objects	1		1	2	4
Contact with poisonous parts of plant or marine life		2		1	3
Contact with, or exposure to, biological factors	4	2	2		8
Exposure to environmental heat			1		1
Exposure to single, sudden sound		1			1
Exposure to traumatic event	1			1	2
Falls from a height	5	3	1	4	13
Falls on the same level	21	14	37	29	101
Hitting moving objects	13	13	12	13	51
Hitting stationary objects	17	8	9	5	39
Insect and spider bites and stings	1				1
Muscular stress while handling objects other than lifting, carrying or putting down objects	20	19	16	24	79
Muscular stress while lifting, carrying, or putting down objects	14	14	16	14	58
Muscular stress while lifting, carrying, or putting down objects	4	3	3	4	14
Muscular stress with no objects being handled	1	1			2
Other and multiple mechanisms of injury	2	2	2	3	9
Other variations in pressure		1	1		2
Repetitive movement, low muscle loading				1	1
Rubbing and chafing	2	2		1	5
Single contact with chemical or substance	1	1		1	3
Stepping, kneeling or sitting on objects	1	1	3	3	8
Unspecified mechanisms of injury	1	2	1	2	6
Vehicle accident		1			1
Work pressure	1				1
Blank		1			1
TOTAL	123	115	138	142	518

Aquaculture					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
5+ Days Time Lost					
Being bitten by an animal		1		1	2
Being hit by a person accidentally		1			1
Being hit by an animal	1			2	3
Being hit by falling objects	1		4	7	12
Being hit by moving objects	4	8	10	10	32
Being trapped between stationary and moving objects	14	8	5	4	31
Being trapped by moving machinery	3	1	4	8	16
Contact with cold objects				1	1
Contact with electricity	1	1			2
Contact with hot objects	1	1	3	4	9
Contact with poisonous parts of plant or marine life	2		1	2	5
Contact with, or exposure to, biological factors	3	1			4
Exposure to non-ionising radiation				1	1
Exposure to workplace or occupational violence		1			1
Falls from a height	8	5	7	6	26
Falls on the same level	28	45	25	19	118
Hitting moving objects	6	19	6	7	38
Hitting stationary objects	10	8	4	2	24
Insect and spider bites and stings			1		1
Long term contact with chemicals or substances		1			1
Long term exposure to sounds		1		1	2
Muscular stress while handling objects other than lifting, carrying or putting down objects	39	35	26	20	120
Muscular stress while lifting, carrying, or putting down objects	28	26	15	21	90
Muscular stress with no objects being handled	6	4	10	3	23
Other and multiple mechanisms of injury			4	1	5
Other harassment			1		1
Other variations in pressure	2	4	3	5	14
Repetitive movement, low muscle loading	2	1		4	7
Rubbing and chafing		1			1
Single contact with chemical or substance	3	5	5	1	14
Stepping, kneeling or sitting on objects	1			2	3
Unspecified mechanisms of injury		3	5	2	10
Vehicle accident	4	1	2	1	8
Work pressure		4	1		5
Work related harassment and/or workplace bullying			4		4
TOTAL	168	186	147	137	638

Cotton					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being bitten by an animal			1		1
Being hit by a person accidentally				1	1
Being hit by an animal	1	1		2	4
Being hit by falling objects	2			3	5
Being hit by moving objects	9	4	2	9	24
Being trapped between stationary and moving objects	1	2		3	6
Being trapped by moving machinery	1	1	1		3
Contact with hot objects	1				1
Falls from a height	1	2		2	5
Falls on the same level	7	1	1	4	13
Hitting moving objects	3	2		1	6
Hitting stationary objects	8		2	9	19
Insect and spider bites and stings				1	1
Muscular stress while handling objects other than lifting, carrying or putting down objects	4		3	5	12
Muscular stress while lifting, carrying, or putting down objects	1	2	1	3	7
Muscular stress with no objects being handled		2	1	3	6
Other and multiple mechanisms of injury		2	1		3
Single contact with chemical or substance				2	2
Stepping, kneeling or sitting on objects	1	1		2	4
Unspecified mechanisms of injury	1			1	2
Vehicle accident			1	1	2
TOTAL	41	20	14	52	127

Cotton					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
5+ Days Time Lost					
Being bitten by an animal		1			1
Being hit by an animal		1			1
Being hit by falling objects	1	1	2	4	8
Being hit by moving objects	2	3	4	4	13
Being trapped between stationary and moving objects	1		2	2	5
Being trapped by moving machinery		1	1	3	5
Contact with electricity	1				1
Exposure to ionising radiation			1		1
Exposure to non-ionising radiation				1	1
Exposure to traumatic event			1		1
Falls from a height	3	1	4	11	19
Falls on the same level	4		3	4	11
Hitting moving objects		1	1	3	5
Hitting stationary objects	2	4	6	1	13
Long term contact with chemicals or substances				1	1
Long term exposure to sounds	2	1	1		4
Muscular stress while handling objects other than lifting, carrying or putting down objects	4	3	4	2	13
Muscular stress while lifting, carrying, or putting down objects	4	4	4	3	15
Muscular stress with no objects being handled	2	2	2		6
Other and multiple mechanisms of injury			2		2
Other mental stress factors			1		1
Stepping, kneeling or sitting on objects			1	1	2
Unspecified mechanisms of injury	1				1
Vehicle accident	1	2	6	3	12
TOTAL	28	25	46	43	142

Grains					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being hit by an animal	1	2	2	1	6
Being hit by falling objects	2	2	2	1	7
Being hit by moving objects	3	8	8	11	30
Being trapped between stationary and moving objects	3			1	4
Being trapped by moving machinery	1		1		2
Contact with hot objects	1	1			2
Contact with poisonous parts of plant or marine life		4		1	5
Exposure to non-ionising radiation		1			1
Exposure to single, sudden sound	1				1
Falls from a height	3	1	1	8	13
Falls on the same level		3	1	8	12
Hitting moving objects		1	1	1	3
Hitting stationary objects	2	3	2	3	10
Muscular stress while handling objects other than lifting, carrying or putt	2	3	2	5	12
Muscular stress while lifting, carrying, or putting down objects	3			4	7
Muscular stress with no objects being handled		2	1	1	4
Repetitive movement, low muscle loading	1		1		2
Single contact with chemical or substance		1	2	2	5
Unspecified mechanisms of injury			2		2
Vehicle accident	1	1	1	4	7
TOTAL	24	33	27	51	135

Grains					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
5+ Days Time Lost					
Being hit by an animal		4	2	3	9
Being hit by falling objects	7	2	1	3	13
Being hit by moving objects	7	5	4	6	22
Being trapped between stationary and moving objects	1	1	2	4	8
Being trapped by moving machinery			1	5	6
Contact with hot objects			1	1	2
Contact with, or exposure to, biological factors			1	1	2
Exposure to mechanical vibration	1				1
Exposure to single, sudden sound				1	1
Falls from a height	10	10	8	7	35
Falls on the same level	4	8	7	9	28
Hitting moving objects		3	1	9	13
Hitting stationary objects	5	4	1	3	13
Insect and spider bites and stings	5				5
Long term exposure to sounds	1	4	1	2	8
Muscular stress while handling objects other than lifting, carrying or putt	5	8	10	6	29
Muscular stress while lifting, carrying, or putting down objects	9	4	4	6	23
Muscular stress with no objects being handled	3	1	1	5	10
Other and multiple mechanisms of injury	1				1
Other variations in pressure	1				1
Repetitive movement, low muscle loading	3	1			4
Single contact with chemical or substance		2			2
Stepping, kneeling or sitting on objects		1	4		5
Unspecified mechanisms of injury	3	2	2	1	8
Vehicle accident	5	6	3	8	22
TOTAL	71	66	54	80	271

Grains-sheep & Grains-beef					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being bitten by an animal	1	1	1	2	5
Being hit by an animal	24	18	18	16	76
Being hit by falling objects	8	7	9	2	26
Being hit by moving objects	18	30	30	33	111
Being trapped between stationary and moving objects	5	5	5	8	23
Being trapped by moving machinery	4	7	2	2	15
Contact with cold objects			1		1
Contact with electricity	2	1			3
Contact with hot objects	1	4	3	2	10
Contact with, or exposure to, biological factors	2	2			4
Exposure to mechanical vibration			1	1	2
Exposure to non-ionising radiation		1	1		2
Falls from a height	14	22	22	11	69
Falls on the same level	14	11	6	13	44
Hitting moving objects	20	8	9	15	52
Hitting stationary objects	15	16	15	11	57
Insect and spider bites and stings	1	3	3	3	10
Long term exposure to sounds			1	2	3
Muscular stress while handling objects other than lifting, carrying or putt	9	11	21	15	56
Muscular stress while lifting, carrying, or putting down objects	6	11	9	11	37
Muscular stress with no objects being handled	5	2	4	4	15
Other and multiple mechanisms of injury	1	1	2		4
Other and unspecified contact with chemical or substance		1			1
Repetitive movement, low muscle loading		1	1		2
Rubbing and chafing		1			1
Single contact with chemical or substance	3	3	4	3	13
Stepping, kneeling or sitting on objects	2	3	1	2	8
Unspecified mechanisms of injury	1			2	3
Vehicle accident	17	18	9	16	60
TOTAL	173	188	178	174	713

Grains-sheep & Grains-beef					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
5+ Days Time Lost					
Being assaulted by a person or persons		1	1	1	3
Being bitten by an animal	3	1	2	1	7
Being hit by a person accidentally		3			3
Being hit by an animal	46	46	30	26	148
Being hit by falling objects	11	8	13	14	46
Being hit by moving objects	25	21	20	27	93
Being trapped between stationary and moving objects	16	16	12	14	58
Being trapped by moving machinery	10	12	8	11	41
Contact with electricity				1	1
Contact with hot objects	5	4	6	9	24
Contact with, or exposure to, biological factors	7	1	1	1	10
Contact with, or exposure to, biological factors of human origin			1		1
Exposure to mechanical vibration	1			1	2
Exposure to non-ionising radiation			1		1
Exposure to workplace or occupational violence		1	1		2
Falls from a height	51	49	33	36	169
Falls on the same level	24	37	35	31	127
Hitting moving objects	13	7	9	9	38
Hitting stationary objects	16	12	16	13	57
Insect and spider bites and stings	1				1
Long term contact with chemicals or substances		1			1
Long term exposure to sounds	3	4	3	4	14
Muscular stress while handling objects other than lifting, carrying or putt	31	50	25	29	135
Muscular stress while lifting, carrying, or putting down objects	28	32	25	19	104
Muscular stress with no objects being handled	12	9	6	2	29
Other and multiple mechanisms of injury	1	2	2	1	6
Other mental stress factors			1		1
Other variations in pressure			1		1
Repetitive movement, low muscle loading	3	1	1	2	7
Single contact with chemical or substance	1	2	1	2	6
Stepping, kneeling or sitting on objects	5	4	4	4	17
Unspecified mechanisms of injury	5	3	4	4	16
Vehicle accident	49	38	33	32	152
TOTAL	368	365	295	295	1322

Marine					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being hit by an animal	1	1		1	3
Being hit by falling objects	1	1	5		7
Being hit by moving objects	6	2	5	3	16
Being trapped between stationary and moving objects	7	2	3	1	13
Being trapped by moving machinery	5	1		1	7
Contact with hot objects	1				1
Contact with poisonous parts of plant or marine life				1	1
Exposure to non-ionising radiation	1				1
Exposure to traumatic event	1				1
Falls from a height	2	2	1	1	6
Falls on the same level	5	3	5	5	18
Hitting moving objects	9		5	3	17
Hitting stationary objects		5	2	4	11
Long term exposure to sounds				1	1
Muscular stress while handling objects other than lifting, carrying or putt	8	7	8	5	28
Muscular stress while lifting, carrying, or putting down objects	10	3	1	4	18
Muscular stress with no objects being handled	4	1	2	2	9
Other variations in pressure			1		1
Repetitive movement, low muscle loading		1	1	1	3
Single contact with chemical or substance	1		2	1	4
Stepping, kneeling or sitting on objects			2		2
Unspecified mechanisms of injury				1	1
TOTAL	62	29	43	35	169

Marine					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
5+ Days Time Lost					
Being bitten by an animal		1		1	2
Being hit by a person accidentally	1				1
Being hit by an animal				1	1
Being hit by falling objects	2	8	1	3	14
Being hit by moving objects	3	2	4	6	15
Being trapped between stationary and moving objects	2	4	4	5	16
Being trapped by moving machinery	1		1	2	4
Contact with hot objects		1		2	3
Contact with poisonous parts of plant or marine life			1		1
Contact with, or exposure to, biological factors				1	1
Contact with, or exposure to, biological factors of human origin				1	1
Exposure to environmental heat	1			1	2
Falls from a height	4	3	1	3	11
Falls on the same level	12	9	4	3	29
Hitting moving objects	1	4	2	3	10
Hitting stationary objects	1	4	3	1	9
Long term contact with chemicals or substances			1		1
Long term exposure to sounds		1		2	3
Muscular stress while handling objects other than lifting, carrying or putt	9	5	4	6	25
Muscular stress while lifting, carrying, or putting down objects	4	9	2	2	17
Muscular stress with no objects being handled	1	3	3	2	9
Other and multiple mechanisms of injury		1	1		2
Repetitive movement, low muscle loading		1		2	3
Unspecified mechanisms of injury		4	1	1	6
TOTAL	43	59	34	49	185

Sugar					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
0-4 Days Time Lost					
Being hit by falling objects	1	1			2
Being hit by moving objects	3	2	1		6
Being trapped between stationary and moving objects		1			1
Contact with hot objects	1				1
Exposure to non-ionising radiation	1				1
Falls from a height			1		1
Falls on the same level				2	2
Hitting moving objects		2		3	5
Hitting stationary objects	1	2	1	1	5
Insect and spider bites and stings			1		1
Muscular stress while handling objects other than lifting, carrying or putt	1	1	1	3	6
Muscular stress while lifting, carrying, or putting down objects				2	2
Muscular stress with no objects being handled	1			1	2
Single contact with chemical or substance	1	1			2
Unspecified mechanisms of injury	1		3		4
Vehicle accident		1			1
TOTAL	11	11	8	12	42

Sugar					
Mechanism of injury/disease	2008-09	2009-10	2010-11	2011-12p	Total
5+ Days Time Lost					
Being bitten by an animal			1		1
Being hit by an animal		1	1		2
Being hit by falling objects		1	2	2	5
Being hit by moving objects	1	2	1		4
Being trapped between stationary and moving objects	1	1	1	2	5
Being trapped by moving machinery		2	1		3
Contact with hot objects	2	1			3
Contact with, or exposure to, biological factors				2	2
Exposure to non-ionising radiation				1	1
Falls from a height	2	4	7	6	19
Falls on the same level	3	4	2	5	14
Hitting moving objects	2	2	3	5	12
Hitting stationary objects	1	2	1	1	5
Long term exposure to sounds		1	1	1	3
Muscular stress while handling objects other than lifting, carrying or putt	1	8	2	2	13
Muscular stress while lifting, carrying, or putting down objects	5	3	2	5	15
Muscular stress with no objects being handled	1		3	1	5
Repetitive movement, low muscle loading				1	1
Single contact with chemical or substance				1	1
Unspecified mechanisms of injury	2	1	3	1	7
Vehicle accident	3		1	3	7
Work pressure	1				1
TOTAL	25	33	32	39	129

References

1. Franklin, R, Mitchell, R, Driscoll, T & Fragar, L 2000, Farm-related fatalities in Australia, ACAHS, NOHSC & RIRDC: Moree, NSW.
2. Lower, T & Herde, E 2012, 'Non-intentional farm injury fatalities in Australia, 2003-2006', *NSW Public Health Bulletin*, 23(1-2), pp. 21-26.
3. Lower, T, Munro, T & Peachey, K 2014, Farm Related Injuries Reported in the Australian Print Media 2013. http://www.farmsafe.org.au/resources/document/10-02-22_46_18_Farm_Related_Injuries_2013.pdf, Australian Centre for Agricultural Health and Safety: Moree, NSW.
4. Driscoll, T, Ansari, G, Harrison, J, Frommer, M & Ruck, E 1994, Traumatic work related fatalities in commercial fishermen in Australia, *Occupational and Environmental Medicine*, 51, pp. 612-616.
5. Safe Work Australia, 2014, *National Data-Set for Compensation-based Statistics*.
6. Herde, E & Lower, T 2011, *Farm Related Injuries Reported in the Australian Print Media 2010*. http://www.aghealth.org.au/tinymce_fm/uploaded/Research%20Reports/farm_related_injuries_reported_in_the_australian_print_media_2010.pdf, Australian Centre for Agricultural Health and Safety: Moree, NSW.
7. Herde, E & Lower, T 2012, *Farm Related Injuries Reported in the Australian Print Media 2011*. http://www.aghealth.org.au/tinymce_fm/uploaded/Research%20Reports/farm_related_injuries_2011_report.pdf, Australian Centre for Agricultural Health and Safety: Moree, NSW.
8. Herde, E & Lower, T 2013, *Farm Related Injuries Reported in the Australian Print Media 2012*. http://www.farmsafe.org.au/resources/document/11-02-23_18_23_Farm_Related_Injuries_2012_report_FINAL.pdf, Australian Centre for Agricultural Health and Safety: Moree, NSW.
9. Lower, T & Monaghan, N 2014, *Preliminary analysis farm injury fatalities 2001-2010*. 2014, Australian Centre for Agricultural Health and Safety: Moree, NSW.
10. Brooks, K 2011, '*Health and safety in the Australian fishing industry*', RIRDC: Kingston, ACT.
11. Fragar, L, Franklin, R, Allen, C & Harding, W 2001, '*Occupational Health and Safety Risks Associated with sugarcane production*', ACAHS & RIRDC: Moree, NSW.
12. Fragar, L & Lower, T 1996, '*Occupational health and safety risk associated with grain production*', Australian Centre for Agricultural Health and Safety: Moree, NSW.
13. Franklin, R, Fragar, L, Houlahan, J, Brown, P & Burcham, J 2001, '*Health and Safety Risks Associated with Cotton Production*', ACAHS & RIRDC: Moree, NSW.
14. Temperley, J & Fragar, L 2009, '*OH&S Managing grain production safety*', RIRDC: Kingston, ACT.

15. Industry Commission 'Work Health and Safety'. Inquiry into Occupational Health and Safety, Vol I and II, Report No. 47, 11 September 1995, The Industry Commission, LB2 Collins St, Melbourne, Australian Government Publishing Service, Canberra.
16. Lower, T, Fragar, L & Temperley, J 2011, '*Health and safety on Australian farms*' <https://rirdc.infoservices.com.au/items/11-001> RIRDC: Kingston, ACT.
17. Commonwealth of Australia, 2013 '*National Standard for Commercial Vessels*', <http://www.amsa.gov.au/domestic/>: Canberra.

