



HEALTH AND SAFETY
AUTHORITY



A Review of Work-Related Fatalities in Agriculture in Ireland **2011-2020**

Our Vision: **Healthy, safe and productive lives and enterprises**

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Glossary of Acronyms

CSO	Central Statistics Office
ESAW	European Statistics on Accidents at Work
HSA	Health and Safety Authority
NACE	Statistical Classification of Economic Activities in the European Community
NUTS	Nomenclature of Territorial Units for Statistics

FOREWORD



Dr Sharon McGuinness
Chief Executive Officer

Agriculture has been a key sector in the Irish economy for generations, with the size of the labour force remaining largely stable over the past decade. This review analyses the characteristics of the 208 work-related fatalities in Agriculture from 2011-2020. By understanding and highlighting the circumstances of these untimely fatalities, we can continue to work together with key stakeholders to ensure we inform and protect those people working in Agriculture in Ireland.

More people died in Agriculture during 2011-2020 compared with any other economic sector. This review found that of the 495 work-related fatalities in Ireland during this period, 42% occurred in Agriculture. While fatalities in all other economic sectors have declined from peaks in the 2000s, the number of fatalities in Agriculture has increased, with more work-related fatalities in Agriculture recorded in 2014 and 2017 than in all other economic sectors combined for those years.

Of the 208 people who died in work-related incidents in the Agricultural sector from 2011-2020, 47% of the victims were aged 65 years or older. This is concerning and emphasises the need for all workers, including farmers, to recognise their own limitations as they age, and adjust their work practices accordingly to avoid injury and stay safe. Older farmers may be less agile and more likely to suffer incidents such as cattle attacks or falls, and may be less likely to survive the injuries they sustain.

Tragically, 21 of the 208 fatalities in the past decade occurred to victims aged under 18. We must be particularly vigilant when children are around a farm and all precautions must be in place to keep children away from dangerous areas and ensure they are never left unsupervised.

There was a notable increase in fatalities in Agriculture during spring and summer months, with 16% of all fatalities occurring in July. Almost half of all fatalities to children occurred during the summer months. In an effort to reduce these incidents, farmers are encouraged to keep children away from farm activity where possible, and to plan work and have systems in place to minimise risk particularly during the summer season.

Farming is a high-risk industry. Those working in the sector are potentially exposed to many dangers, such as large animals, heavy machinery, large vehicles on rough terrain, and liquids such as slurry and gas emitting materials. Most farmers are self-employed, working predominantly alone, and are engaged in a wide variety of tasks. These are the people who have the most to lose if they have an incident or serious illness. This is why they must make health and safety their number one priority.

Each year many farm-related fatalities, and many more serious incidents, are linked to tractors and other vehicles. The movement of vehicles and machinery, whether in the yard or in a field, can be hazardous and farmers need to be aware of the risks, particularly if there are young people living on or visiting the farm. Other fatalities and serious incidents involved animals, particularly newly calved cows, bulls and cattle; others occur as a result of falls, most commonly falls through fragile roofs. Life changing injuries can be prevented and lives can be saved if farmers and contractors plan their work in advance, ensure important precautions are taken and make safety their number one priority.

I express my deepest condolences to the families of all the victims. It is our mission at the Health and Safety Authority to ensure all workplaces, including farms, protect their workers from work-related injury and ill-health, and all work environments are safe. The Health and Safety Authority has many free tools, courses and supports available, including our free health and safety courses on [HSA Learning.ie](https://www.hsalearning.ie) and farm risk assessment tool [farmsafely.com](https://www.farmsafely.com). I would encourage all those working in Agriculture to avail of them or to contact the HSA for advice. No job is worth a loss of life, injury or illness.

Dr Sharon McGuinness
Chief Executive Officer

Executive Summary

Farming involves diverse kinds of work including driving vehicles on rough ground, working with large animals such as cattle, maintaining heavy machinery, repairing farm buildings, storing heavy loads, dealing with liquids such as slurry, working with gas-emitting materials, and felling trees. These tasks, if not managed properly, expose farmers to a wide range of dangers.

More work-related fatalities occur in Agriculture than any other economic sector in Ireland. In the ten-year period 2011 to 2020, 208 of the 495 work-related fatalities in the Republic of Ireland occurred in Agriculture.

While fatalities in all other economic sectors have declined from peaks in the 2000s, the number of fatalities in Agriculture has increased, with more work-related fatalities in Agriculture in 2014 and 2017 than in all other economic sectors combined.

This report focuses on the characteristics of the 208 work-related fatalities in Agriculture, and is based on comprehensive data on all work-related incidents that resulted in a fatality.

Key Findings

Age

Victims of work-related fatalities in Agriculture were disproportionately older people: 47% of victims were aged 65 years or older. The high rate of work-related fatalities to older workers indicates that older farmers may need to take special precautions to avoid serious injury or fatality when engaged in certain farming activities.

Twenty-one work-related fatalities involved people under 18 years of age, of whom 16 were non-workers. Most incidents involving children and young people happened when the victims were simply near to farming activity, or riding farm vehicles as passengers, and not when they were working on the farm. Almost half of the work-related fatalities to children and young people occurred during the school summer holiday months of July and August, and of these incidents, all but one involved vehicles.

Vehicles

Almost half of all work-related fatalities in Agriculture involved vehicles (93 incidents). This makes vehicle-related incidents by far the single most common type of incident leading to fatalities in Agriculture. Thirty-nine work-related fatalities involved vehicles striking people on foot or on bicycles. Of these, 23 occurred when parked vehicles rolled because the handbrake was faulty or insufficiently engaged. This means that over one in ten of all work-related fatalities in Agriculture were caused by parked vehicles rolling out of control and striking people. Work-related fatalities involving vehicles peaked during the summer months, probably reflecting increased activity during this period. Tractors were involved in over half of all work-related fatalities involving vehicles, with some tractors several decades old at the time of the incident.

Cattle

There were 37 work-related fatalities involving cattle. Most were caused by attacks by cows with calves (13), by the victim being knocked over by cattle without aggression (nine), or attacks by bulls (six). Most victims of work-related fatalities involving cattle were older people, with 70% occurring to those aged 65 years or older.

Falls

There were 21 work-related fatalities in Agriculture involving falls. The most common of these involved victims falling through fragile roofs. These incidents mainly occurred when victims climbed onto the roofs of farm buildings to repair or clean them and stood on fragile roof surfaces such as Perspex skylights or rotten roof beams, or fell through unfinished gaps in the roof. Falls predominantly affected older victims, with over half of all fatal falls occurring to victims aged 65 years or older.

Machinery

Seventeen work-related fatalities in Agriculture involved machinery. A large number of different types of agricultural machinery were involved, including compressed air gates in sheds, diet feeders, a baler and a topper. Unlike most other incidents leading to work-related fatalities in Agriculture, machinery incidents mainly affected victims aged under 65 years.

Loads

Fifteen work-related fatalities involved the collapsing of loads onto the victim. Seven involved the falling of bales and three involved the slipping of vehicles under maintenance onto the victim. The most common type of incident with bales involved the victim working in a shed when stored bales became dislodged.

Drowning

Thirteen work-related fatalities involved drowning, with eight victims drowning in slurry. In four cases victims fell into temporarily opened slurry tanks during agitation or extraction of slurry. Other drowning incidents involved a water tank, a pond and a river, as well as a silage pit and liquid feed tank.



**Almost half of
all work-related
fatalities in
Agriculture
involved vehicles
(93 incidents)**

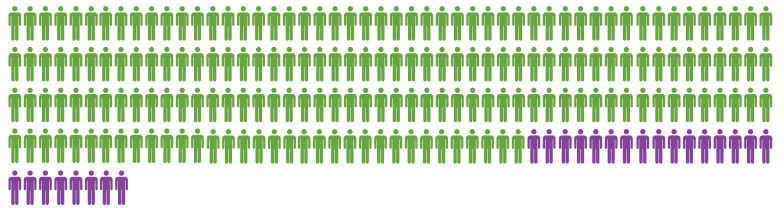


Work-related fatalities in Agriculture 2011-2020



42% of all work-related fatalities occurred in Agriculture

208 work-related fatalities in Agriculture

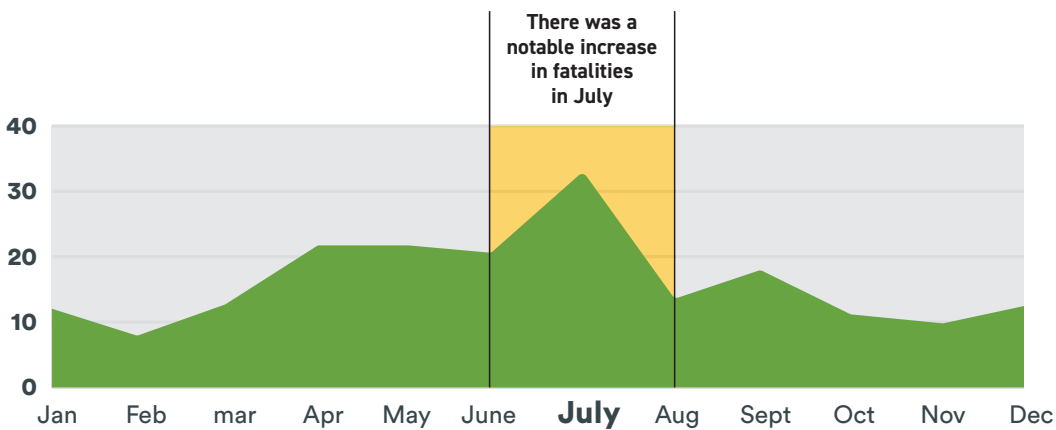


67% of non-worker victims were aged **under 18 years**



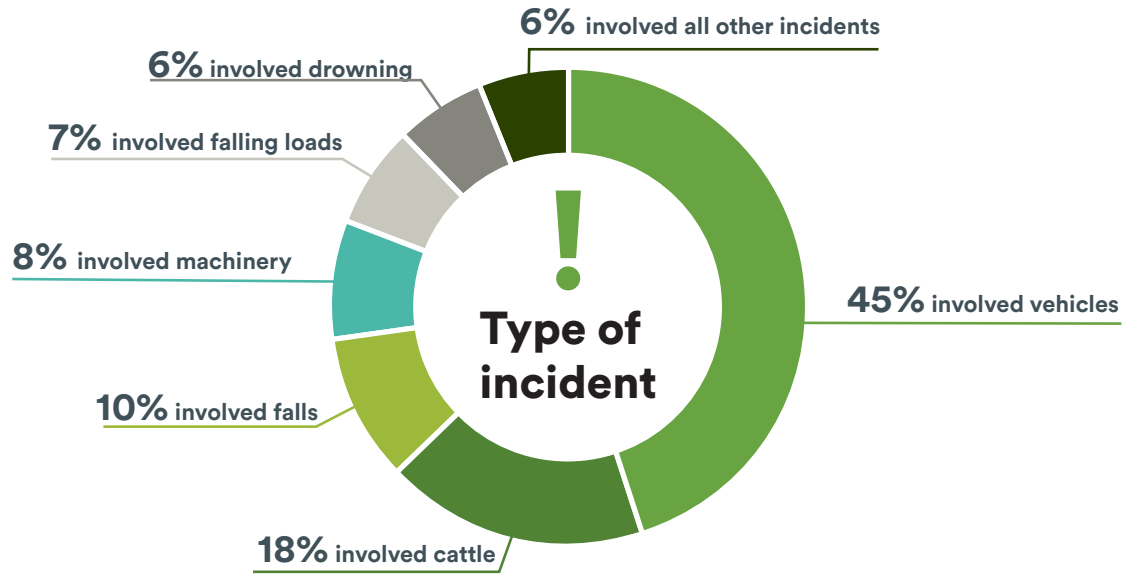
88% of victims were workers
12% of victims were non-workers

51% of worker victims were aged **65 years or older**



There was a notable increase in fatalities in July

16% of fatalities occurred in July



Vehicle - 93 fatalities



55% involved tractors



14% involved loaders/telehandlers



14% involved quad bikes



29% involved vehicle crashes



25% involved parked vehicles that rolled, striking victims

42% of victims were 65 years or older

18% of victims were under 18 years

81% of vehicles were 10 years old or older

Cattle - 37 fatalities

68% involved attacks by cattle

24% involved victims being knocked over by cattle without aggression

70% of victims aged 65 years or older

13% attacks by cows with calves

85% of attacks by cows with calves occurred between February and May

Machinery - 17 fatalities



15 types of machine involved

2 compressed air-operated gates
in shed

2 diet feeders

13 other machines

53% of victims aged 40-64 years

18% of victims aged 65 years or older

Falls - 21 fatalities

33% of victims fell through fragile roofs

14% of victims fell from
stationary vehicles

14% of victims fell from cliffs/
mountains

14% of victims fell from ladders

14% of victims fell into bales,
trapped in bales

52% of victims aged 65 years or older

40% of victims doing building repair
when fall occurred

Loads - 15 fatalities

47% involved bales falling on victims

20% involved vehicles under
maintenance falling on victims

67% of victims aged 65 years or older

Drowning - 13 fatalities



62% drowned in slurry

46% of victims aged 65 years or older

SECTION 1

TRENDS AND DEMOGRAPHICS

1.1 Trend, 2011-2020

In the ten year period from 2011 to 2020 there were 208 work-related fatalities in Agriculture. Figure 1.1a shows the number of fatalities in Agriculture compared with all other economic sectors since 2011.

While fatalities in all other economic sectors have declined from peaks in the 2000s, the number of fatalities in Agriculture has increased. In 2014 and 2017 there were more work-related fatalities in Agriculture than in all other economic sectors combined.

Figure 1.1a:

Number of work-related fatalities in Agriculture and all other economic sectors by year, 2011-2020.

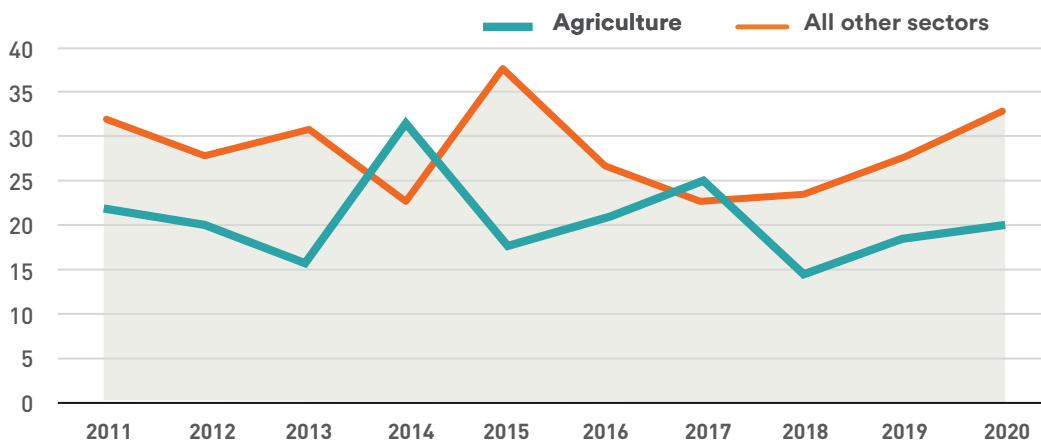
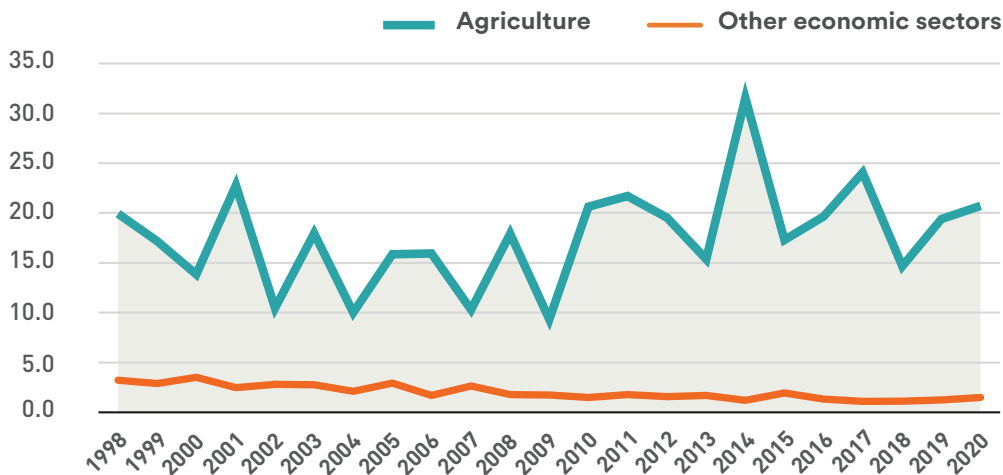


Figure 1.1b shows the rate of work-related fatalities in Agriculture and in all other economic sectors, since 1998.¹

Figure 1.1b:

Rate of work-related fatalities in Agriculture and all other economic sectors per 100,000 workers, 1998-2020.



1.2 Age and employment status of victim

Workers accounted for 184 (88%) of the 208 victims of work-related fatalities in Agriculture (Table 1.2).

Table 1.2:

Work-related fatalities in Agriculture by age band, 2011-2020.

	Work-related fatalities			%
	Worker	Non-worker	Total	
0-17 years	5	16	21	10%
18-24 years	3	0	3	1%
25-34 years	10	0	10	5%
35-44 years	10	1	11	5%
45-54 years	27	0	27	13%
55-64 years	36	3	39	19%
65-74 years	53	3	56	27%
75-84 years	31	1	32	15%
85-94 years	9	0	9	4%
Total	184	24	208	100%

¹ Rates are calculated using data from the CSO's Labour Force Survey, which may underestimate the number of people working in Agriculture. In 2010, the Labour Force Survey reported 102,050 workers in Agriculture, but the CSO's Census of Agriculture counted 155,935, or 272,016 including family workers, for the same year. As such, comparisons between the rate of work-related fatalities in Agriculture and other economic sectors should be taken with caution.

Figure 1.2 separates age bands into workers and non-workers.

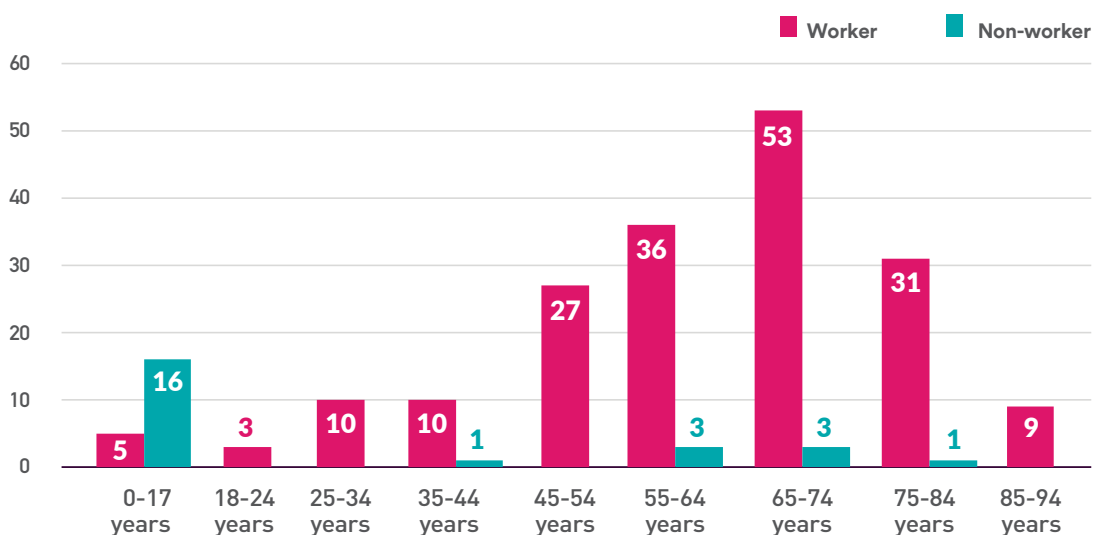
- ▶ Over two thirds of all non-worker victims were under 18 years of age (16, 67%). This shows the significant risk that agricultural work poses to children and young people who spend time around farms.
- ▶ Worker fatalities were strongly concentrated among older age groups, with over half of all fatalities occurring to workers aged 65 years or over (93, 51%).
- ▶ 17% of fatalities occurred to those aged 75-84 years while 5% occurred to those aged 85-94 years. These included both self-employed farmers continuing to work their own farms and family workers, typically retired farmers who contributed informal labour on the family farm.

Section 2 shows that older people made up the majority of victims in most of the main fatality categories, particularly falls and cattle.

It is notable that work-related fatalities in other economic sectors do not affect older workers to the same extent as in Agriculture. In other sectors 8% of worker fatalities involved victims aged 65 years or older, compared with 51% in Agriculture. This may be due to the high proportion of older people who continue to work in Agriculture, compared with other sectors. In 2020, 23% of workers in the Agriculture, Forestry and Fishing sector were aged 65 years or over², a much greater proportion than the 4% in the Irish economy as a whole (Eurostat, 2021).

Figure 1.2:

Work-related fatalities of workers and non-workers in Agriculture by age band, 2011-2020.



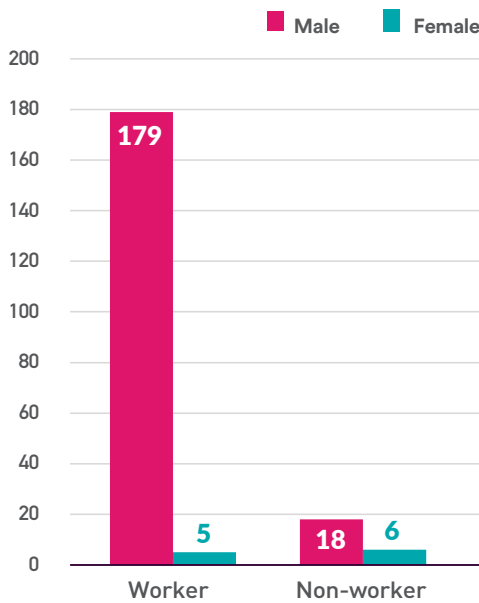
² CSO Labour Force Survey, available: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsq_egan2&lang=en.

1.3 Gender of victim

Ninety-seven percent of worker victims of work-related fatalities in Agriculture were men (Figure 1.3a). It is noteworthy that the 2010 Census of Agriculture found that 12% of farm holders were women and, when family workers and employees were included, women comprised 27% of the Agriculture workforce (CSO, 2010).³ This shows that men experienced a significantly higher rate of work-related fatalities than women.

Figure 1.3a:

Fatalities in Agriculture of worker and non-worker victims, by gender, 2011-2020.



It is notable that most non-worker victims were also male. Of 16 non-worker fatalities of those under 18 years of age, 12 (75%) were boys.

Figure 1.3b:

Fatalities in Agriculture of non-worker victims, by gender and age band, 2011-2020.



³ Census of Agriculture, Table 39: <https://www.cso.ie/en/media/csoie/releasespublications/documents/agriculture/2010/full2010.pdf>

1.4 Region of incident

Figure 1.4a shows that by far the highest number of work-related fatalities in Agriculture took place in Cork (36), followed by Tipperary (15). The lowest number of fatalities occurred in Dublin (one), Louth (one) and Sligo (one). The number of fatalities is affected by the amount of agricultural activity happening in each county.

Figure 1.4a:

Work-related fatalities in Agriculture of worker and non-worker victims, by county, 2011-2020.

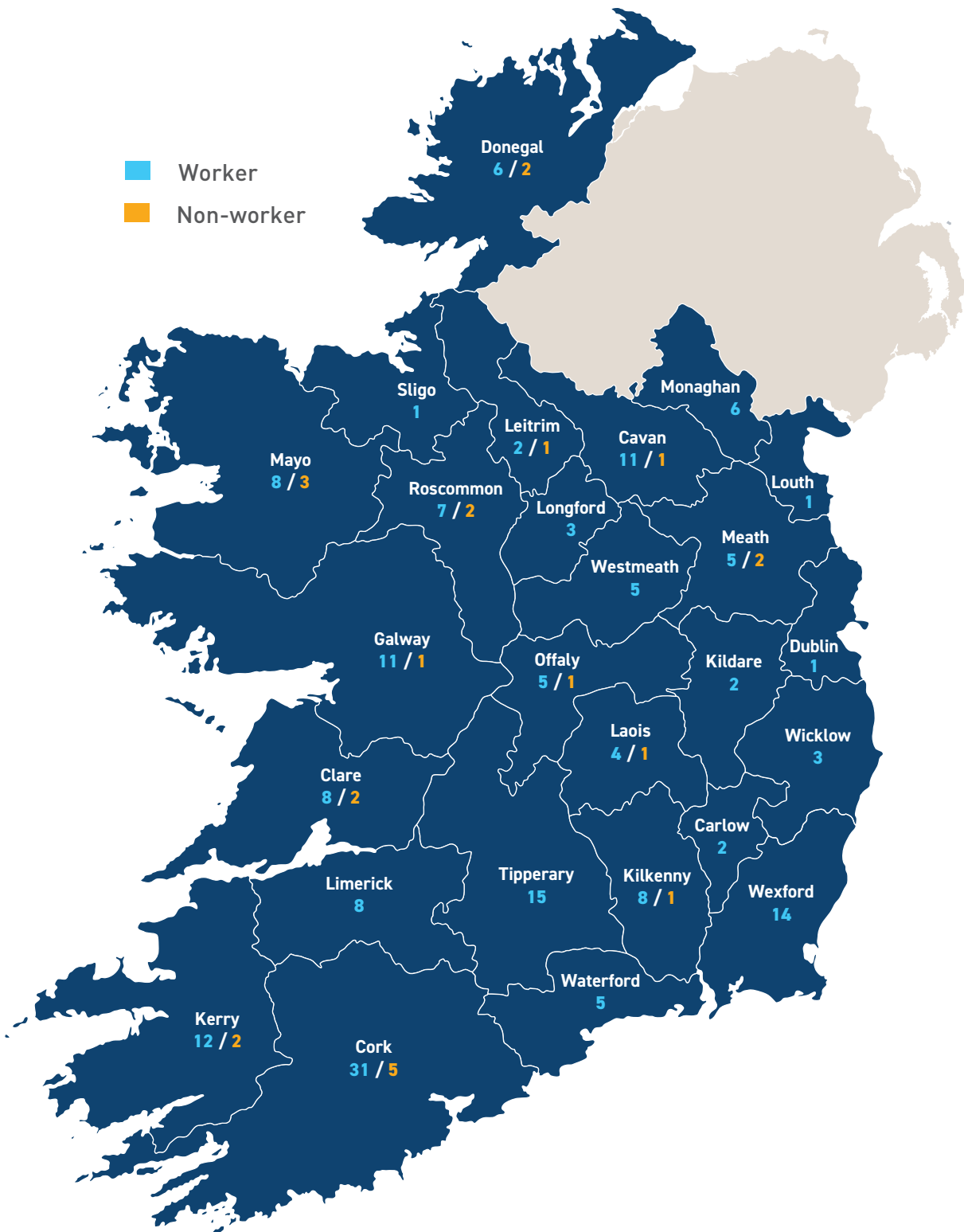
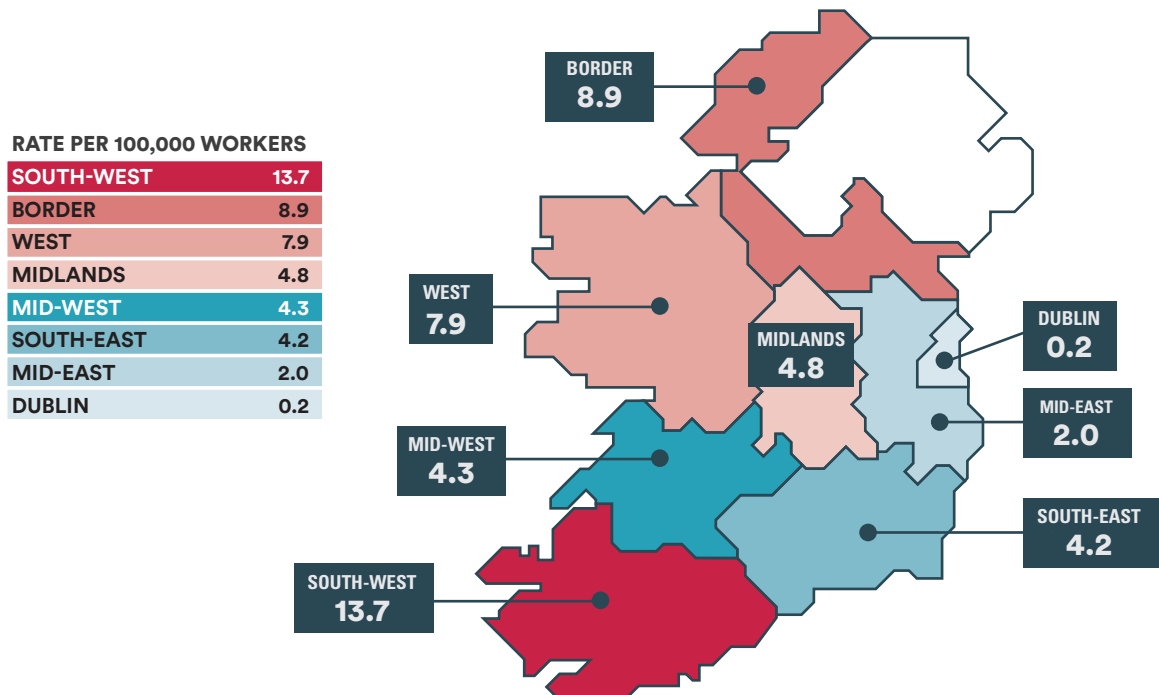


Figure 1.4b shows the rate of work-related fatalities in each NUTS 2016⁴ region of Ireland.⁵

- ▶ Rates were highest in the south-west region of Kerry and Cork (13.7 per 100,000 employed), followed by the border region of Cavan, Donegal, Leitrim, Monaghan and Sligo (8.9 per 100,000 employed).
- ▶ Rates were lowest in Dublin (0.2 per 100,000 employed) and the mid-east region of Kildare, Meath, Wicklow and Louth (2.0 per 100,000 employed).

Figure 1.4b:

Estimate of work-related fatality rates by region from 2011-2020 per 100,000 workers.



Differences in the rates of work-related fatalities by region could also be affected by the type of agriculture being undertaken in those regions. For example, the 2010 Census of Agriculture showed that agriculture in Dublin had more tillage than other counties (25%, compared with a national average of just 3%), and Dublin had the lowest level of beef farming (28%) of any region, compared with a national average of 56% (CSO, 2010).⁶ It is likely that some agricultural activities carry higher risks than others.

⁴ Nomenclature of territorial units for statistics (NUTS) is the European Union’s system for dividing up the territory of EU member states. The current classification is NUTS 2016.

⁵ Rates are calculated as annual average number of fatalities in each region 2011-2020 divided by the number engaged in farming in 2010, which is taken from the most recently available Census of Agriculture.

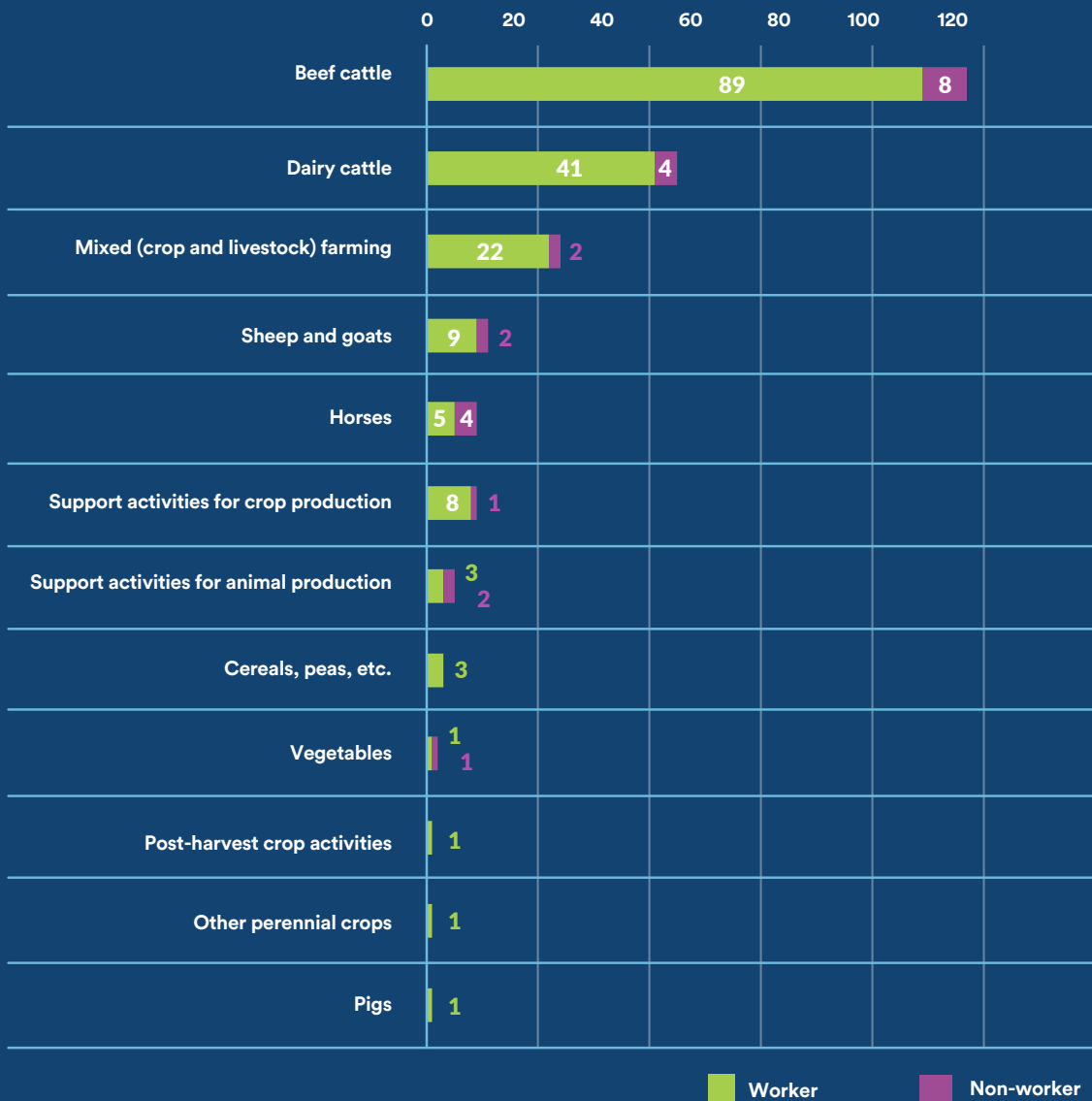
⁶ Census of Agriculture 2010, Table 2.

1.5 NACE economic sector

Most of the victims of work-related fatalities in farming were involved in cattle farming (Figure 1.5a). Beef farming was the main economic activity associated with 97 (47%) work-related fatalities, followed by dairy farming with 45 work-related fatalities (22%). A further 24 work-related fatalities (12%) occurred in mixed farming, which involves farms incorporating both livestock and crop activities; since most of these involved cattle, it can be stated that around 80% of all work-related fatalities in farming were associated with some form of livestock farming.

Figure 1.5a:

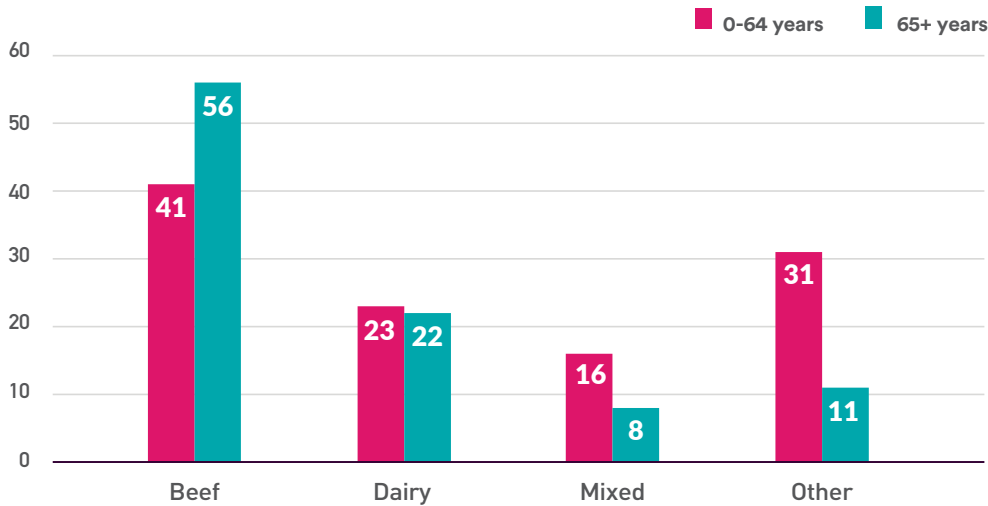
Work-related fatalities to workers and non-workers in each NACE economic activity, 2011-2020.



Work-related fatalities in beef farming primarily occurred to older victims, with 56 (58%) of work-related fatalities occurring to victims aged 65 years or older (Figure 1.5b).

Figure 1.5b:

Work-related fatalities to victims aged 0-64 years and 65 years or older, by economic activity, 2011-2020.



1.6 Time of day incident occurred

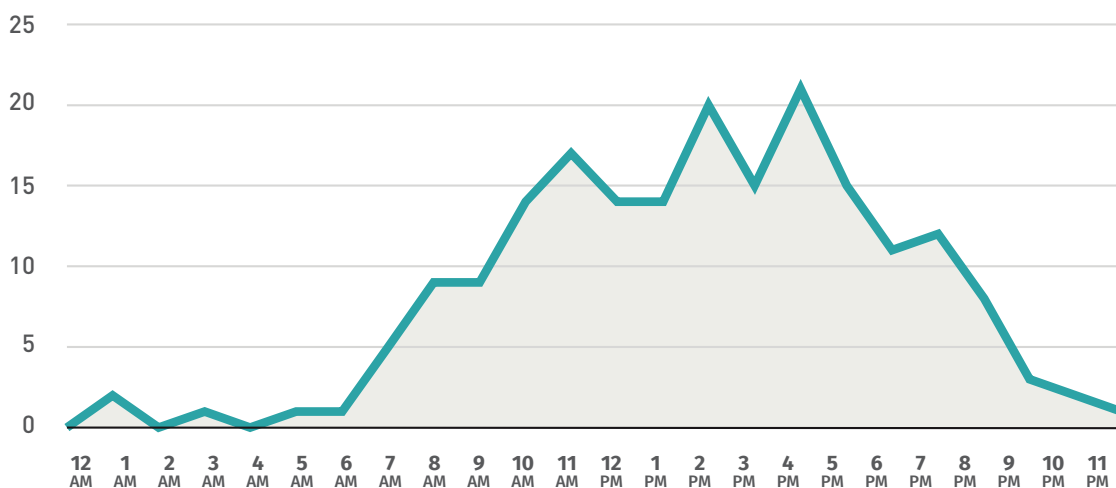
Figure 1.6 shows the number of work related fatalities by the time at which the incident occurred.

- ▶ Most incidents occurred during normal working hours between 8am and 6:59pm (159, 76%).
- ▶ Only 10 incidents (5%) occurred in the night or early morning between midnight and 7:59am.
- ▶ However, from 7pm to midnight there were 26 incidents (13%), reflecting continued farm activity late in the evening.

For 13 work-related fatalities the time was unknown. These were typically cases where a victim was discovered some hours after the incident. These incidents have been excluded from Figure 1.6.

Figure 1.6:

Work-related fatalities by time of incident, 2011-2020.



1.7 Month of incident

Figure 1.7a shows the number of work related fatalities by month.

- ▶ Work-related fatalities were generally more frequent in spring and summer, with the highest number in July (34, 16%), April (23, 11%) and May (23, 11%).
- ▶ The lowest number of work-related fatalities occurred in February (nine, 4%) and November (11, 5%).

This pattern may be related to the intensity of farming activity during spring and summer months.

- ▶ Work-related fatalities involving people under 18 years of age were most common during the summer months, particularly August (five, 24%) and July (four, 19%).

This suggests that children and young people are at most risk during the summer holidays, perhaps because they are spending more time at home, in proximity to dangerous farm activities.

Figure 1.7a:

Work-related fatalities by month, 2011-2020.

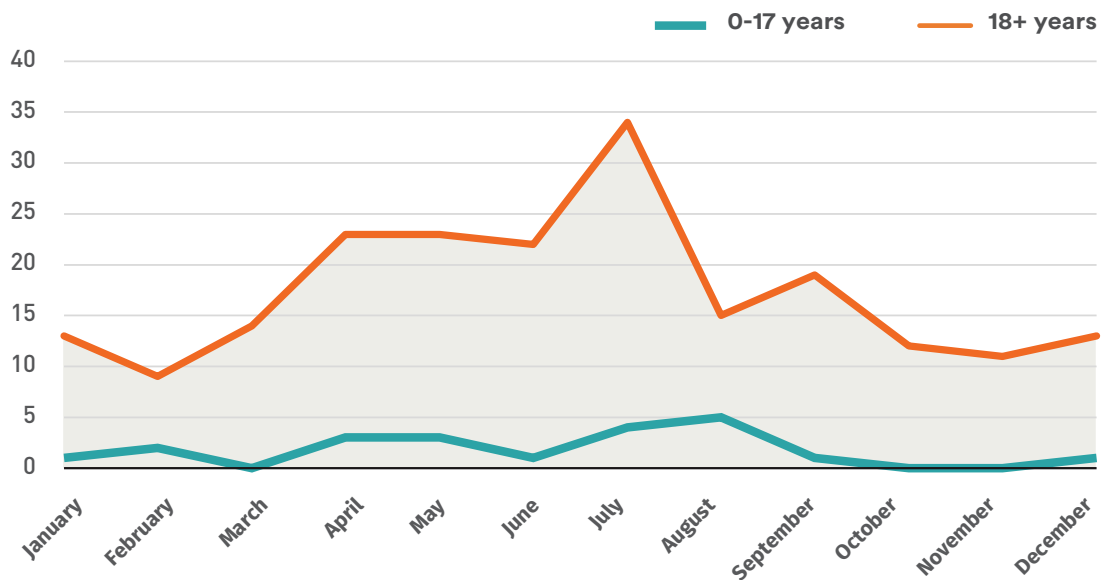


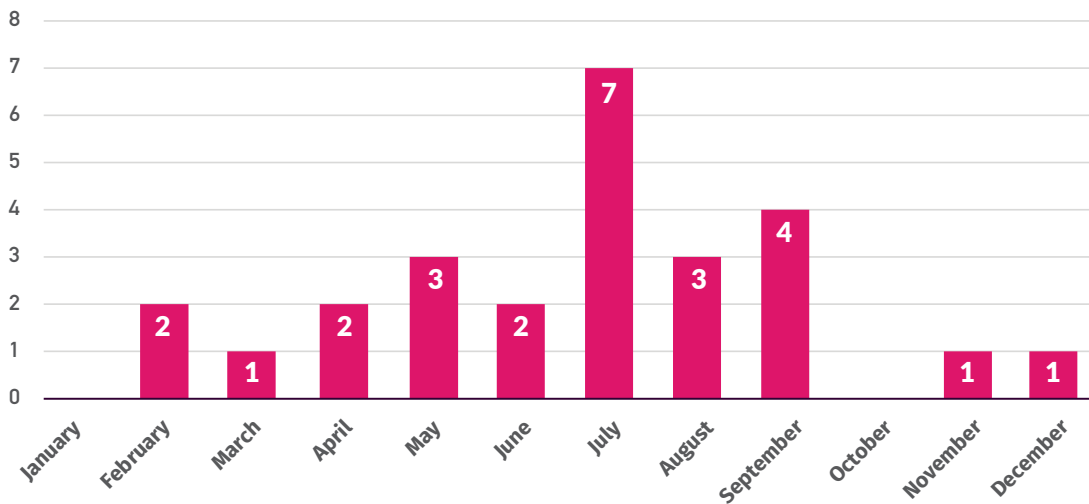
Figure 1.6 showed that there were 26 work-related fatal incidents in Agriculture between 7pm and 11:59pm. This is broken down by month in Figure 1.7b.

- ▶ Incidents after 7pm were most common in summer (especially July (seven)) and early autumn, (September (four)).

The proportion of all fatal incidents that occurred after 7pm was also higher during the summer months than during other times of year. Longer working days during the summer months may increase the risk of incidents due to fatigue, which might be expected to worsen in the evening.

Figure 1.7b:

Work-related fatalities occurring between 7pm and 11:59pm, by month, 2011-2020.



Longer working days during the summer months may increase the risk of incidents due to fatigue, which might be expected to worsen in the evening



SECTION 2

ANALYSIS OF INCIDENTS

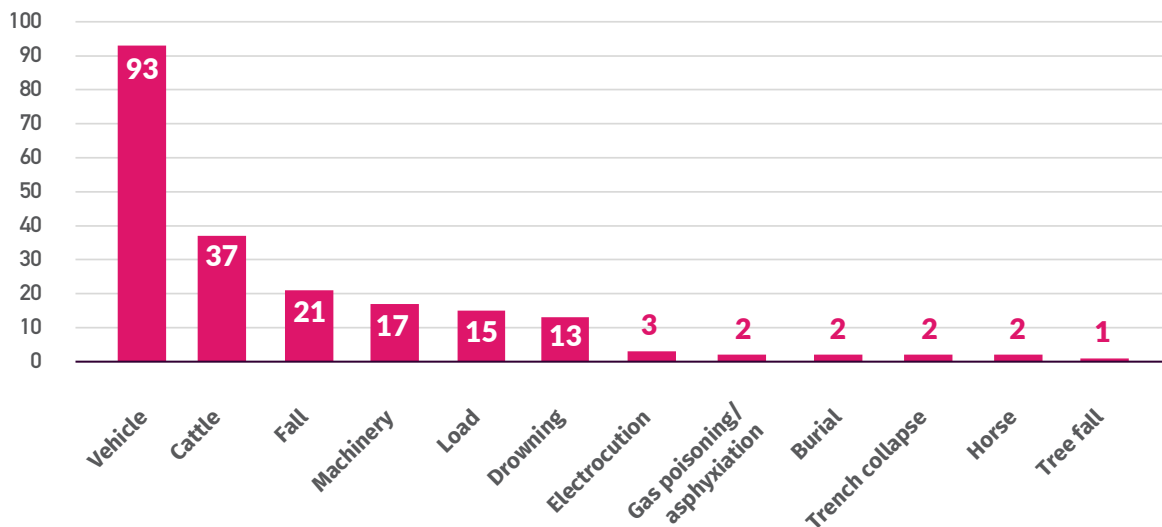
2.1 Incident categories

Figure 2.1 breaks down the work-related fatalities in Agriculture from 2011 to 2020 into 12 categories.

- ▶ Vehicles were involved in 93 work-related fatalities (45%).
- ▶ Cattle were involved in 37 (18%) work-related fatalities.
- ▶ Falls led to 21 (10%) work-related fatalities. These exclude falls that led to drowning in fluids, which were counted separately as drowning incidents.
- ▶ Machinery was involved in 17 (8%) work-related fatalities.
- ▶ Heavy loads or objects that fell on victims were involved in 15 (7%) of work-related fatalities.
- ▶ Drowning incidents led to 13 (6%) of work-related fatalities.
- ▶ A further 12 work-related fatalities were spread across six additional categories.

Figure 2.1:

Work-related fatalities in Agriculture by type of incident, 2011-2020.



2.2 Vehicle-related incidents

With 93 fatalities, vehicles were involved in close to half of all work-related fatalities in Agriculture from 2011 to 2020. Vehicle related incidents are defined as those that occurred as a result of moving or static vehicles⁷ and exclude incidents where vehicles were considered a secondary aspect of the incident, such as falls from stationary vehicles.

Figure 2.2a shows the types of vehicles involved in work-related fatalities.

- ▶ Tractors were by far the most common vehicle to be involved in work-related fatalities, featuring in 51 incidents, 55% of all vehicle work-related fatalities.
- ▶ Loaders/telehandlers were involved in 13 work-related fatalities.
- ▶ Quad bikes were also involved in 13 work-related fatalities.

Figure 2.2a:

Work-related fatalities involving each type of vehicle, 2011-2020.

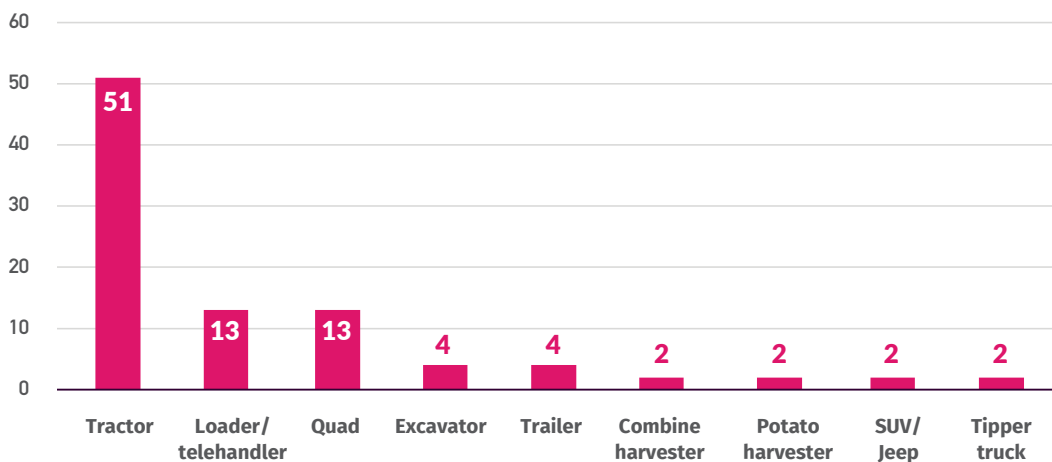


Table 2.2 breaks down the main types of incidents involving vehicles.

- ▶ The single most common type of vehicle incident was the striking of people on foot or, in one case, striking a cyclist. These led to 39 work-related fatalities (42% of all vehicle fatalities in Agriculture).
 - Of these, 23 involved parked vehicles rolling out of control, either because the vehicle's handbrake was faulty or was not engaged properly.
 - Six work-related fatalities involved people on foot being struck by reversing vehicles.
 - A further nine fatalities involved other people on foot being struck by vehicles, and one incident involved a cyclist being struck by a vehicle.
- ▶ Twenty-seven work-related fatalities involved vehicle crashes where victims lost control of their vehicles and crashed them.
- ▶ Eleven victims fell from moving vehicles. Seven of these occurred to passengers while four occurred to drivers who fell or were thrown from tractor cabs while driving.
- ▶ In seven cases victims became crushed by hydraulic attachments. In four of these cases, the victim operated the attachment from outside the vehicle and became crushed by their proximity to the moving attachment. In two of the remaining three cases, the victims accidentally released hydraulic oil from attachments under maintenance, causing them to collapse.

Some simple precautions could have avoided some of these fatal incidents, such as properly engaging handbrakes on vehicles, ensuring that brakes were functional, and ensuring that driver and passengers were properly seated and wearing seatbelts.

⁷ Fatalities that occurred as a result of machinery powered by vehicles, vehicle attachments, towed equipment etc. are not included in this category. Fatalities involving the collapse of vehicles under maintenance are included in the Load category.

Table 2.2:

Work-related fatalities involving vehicles by type of incident, 2011-2020.

	Fatalities	
	Number	%
Person on foot/cycling struck by vehicle	39	41.9%
- Struck/crushed by parked vehicle that rolled	23	24.7%
- Pedestrian struck by vehicle	9	9.7%
- Reversing vehicle over victim	6	6.5%
- Cyclist struck by vehicle	1	1.1%
Vehicle crash/collision	27	29.0%
Fall from moving vehicle	11	11.8%
Attachment crushed victim	7	7.5%
Explosion of tyre while inflating	4	4.3%
Heavy load/falling object	3	3.2%
Cut on sharp object	1	1.1%
Crushing	1	1.1%
Total	93	100.0%

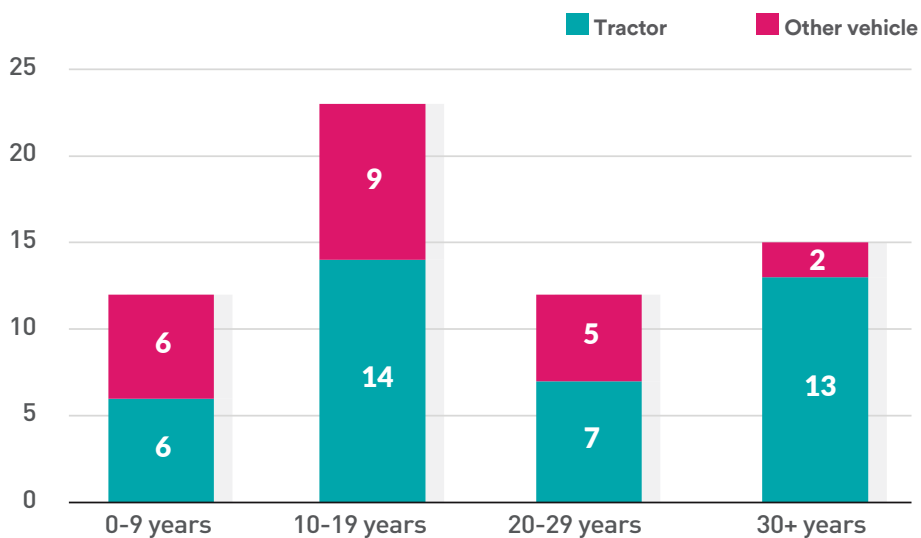
Age of vehicle

In 62 of the 93 vehicle incidents, the age of the vehicle was known. For a few older vehicles only a general estimate of age was provided, e.g. to the nearest decade.

- ▶ Most vehicles involved in work-related fatalities (50, 81%) were ten years old or more.
- ▶ 13 tractors were over 30 years old at the time of the incident.

Figure 2.2b:

Work-related fatalities involving tractors and other vehicles, by age of vehicle, 2011-2020.



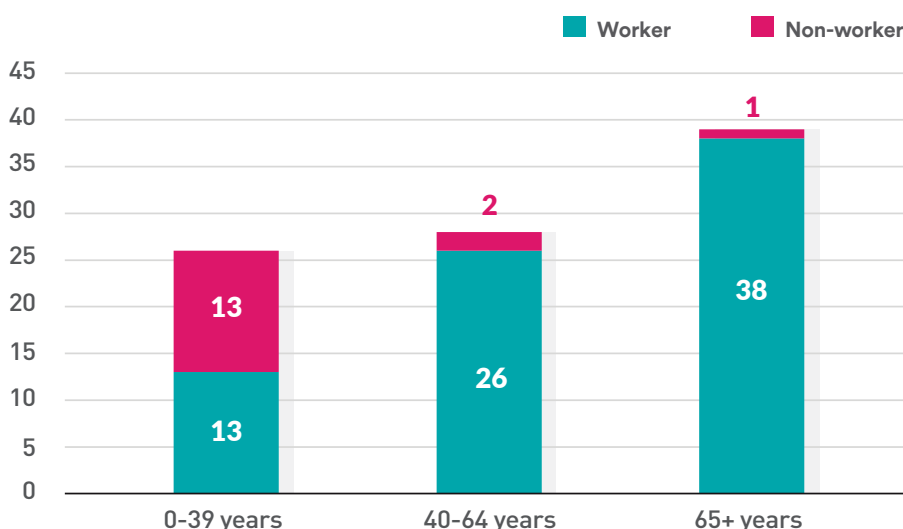
Age of victims of vehicle-related fatalities

Figure 2.2c shows the number of victims of work-related fatalities in Agriculture involving vehicles, by age band and employment status.

- ▶ Thirty-nine work-related fatalities involving vehicles occurred to victims aged 65 years or older (42%). All but one of these were workers.
- ▶ Twenty-six work-related fatalities involving vehicles occurred to victims aged under 40 years (28%). Half of these were non-workers.
 - All of the non-worker victims under 40 years were children or people under 18 years of age.
 - Altogether, 17 work-related fatalities occurred to victims under 18 years involving vehicles. Six of these occurred to young people on foot (five) or cycling (one) who were struck by vehicles. Five involved vehicle crashes, where the young victims were passengers. Five involved young victims falling from moving vehicles, including falling from hay bales in a trailer and falling from the exterior footstep of a moving vehicle. One involved a loader bucket that disconnected and fell onto the young victim.
 - These incidents illustrate the danger that agricultural vehicles pose to children and young people on farms.

Figure 2.2c:

Work-related fatalities involving workers and non-workers, by age of victim, 2011-2020.



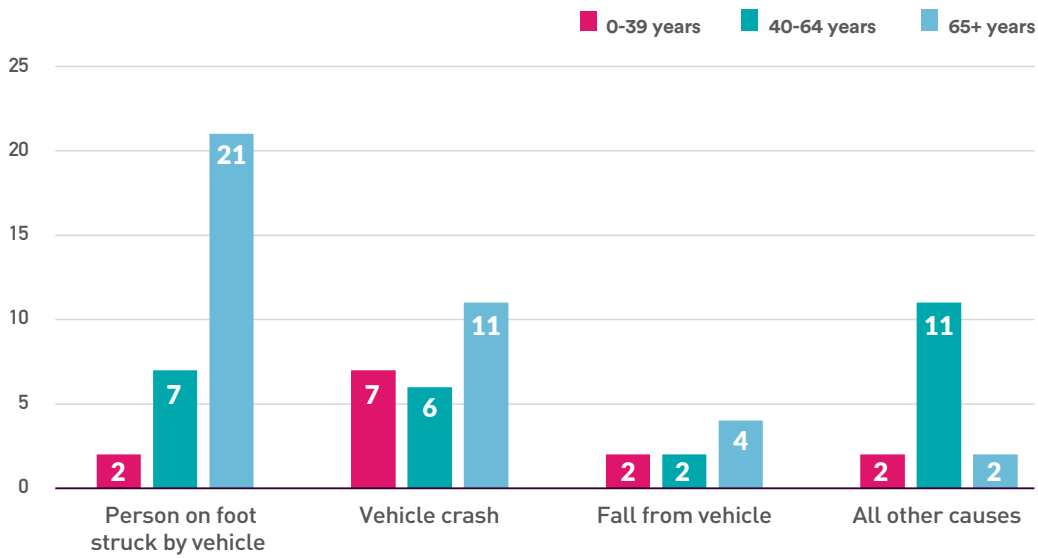
Vehicle-related incidents and older workers

Of 93 work-related fatalities involving moving vehicles, 77 occurred to workers. Figure 2.2d shows the most common types of worker fatalities involving vehicles, by age of the victim.

- ▶ Older workers aged 65 years or older comprised 21 (70%) of the 30 victims struck by vehicles.
 - Of the 23 work-related fatalities of workers where parked vehicles rolled out of control, 15 (65%) struck worker victims aged 65 years or older.
- ▶ Older workers were also strongly represented among victims where vehicles were crashed, accounting for 11 (46%) victims in this case. In most cases the victims were driving the vehicles that crashed.

Figure 2.2d:

Worker fatalities involving vehicles by age of worker and type of incident, 2011-2020.



Month of vehicle incidents

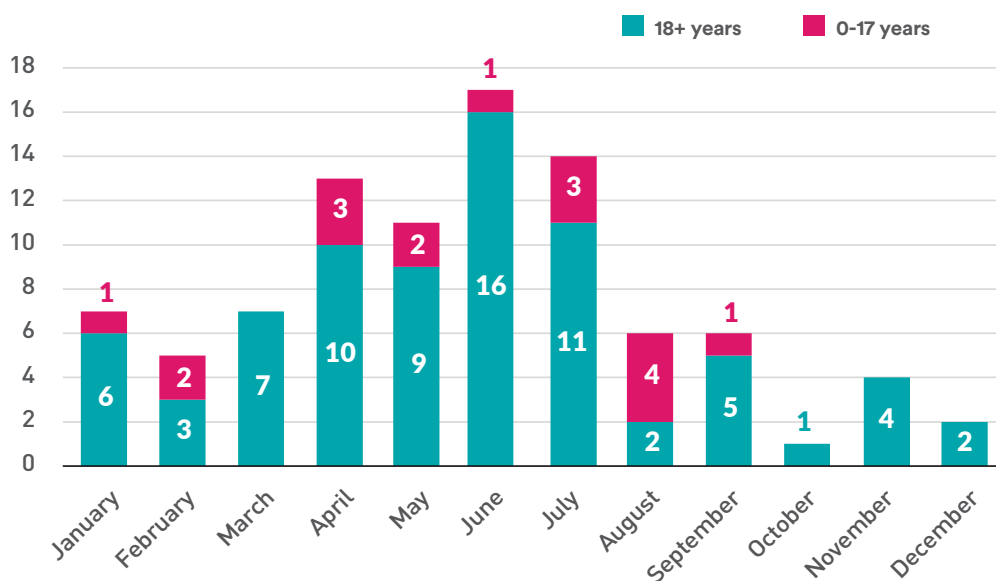
Figure 2.2e shows the month of work-related fatalities involving vehicles, broken down by adult victims and victims under 18 years.

- ▶ The highest number of fatalities occurred in June (17, 18%) and July (14, 15%), perhaps reflecting increased farming activity during the summer months.
- ▶ The highest number of fatalities involving people aged under 18 years occurred in August (four), July (three) and April (three).

Figure 2.2e shows that a considerable number of work-related fatalities occurring to people aged under 18 years involved vehicles. In fact, 17 (81%) of all work-related fatalities in Agriculture to victims under 18 years involved vehicles. This shows the serious risks that farm vehicles pose to younger people and children on farms.

Figure 2.2e:

Work-related fatalities involving vehicles by month and age band, 2011-2020.



2.3 Cattle

Thirty-seven work-related fatalities in Agriculture involved cattle.

- ▶ 25 work-related fatalities involved cattle attacks.
 - Cows with calves were involved in 13 incidents. These cows became aggressive after the farmer approached their calves. In some cases farmers were attempting to treat or tag calves, while in others the farmer was simply in the area when the cow became agitated.
 - Six work-related fatalities involved attacks by bulls. In two cases, farmers were attempting to separate cows from the bull when the attack occurred.
 - Four work-related fatalities involved attacks by multiple cattle.
- ▶ Nine work-related fatalities involved cattle that knocked the victim over accidentally after becoming startled or changing direction unexpectedly. In these cases, the important factor was the size and strength of the cattle.

Table 2.3a:

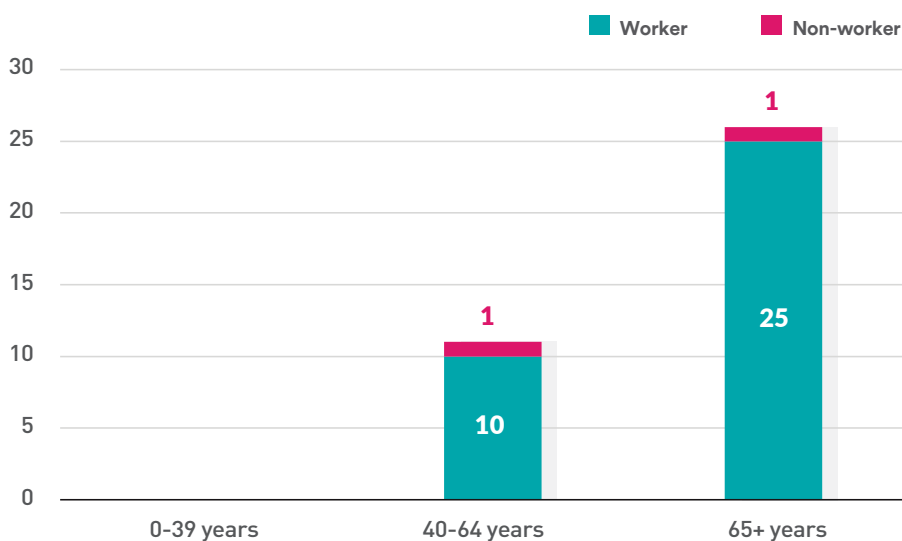
Work-related fatalities involving cattle by type of incident, 2011-2020.

	Fatalities	
	Number	%
Attacked by cattle	25	67.6%
- Cow with calves	13	35.1%
- Bull	6	16.2%
- Multiple cattle	4	10.8%
- Other	2	5.4%
Knocked over by cattle	9	24.3%
Other	3	8.1%
Total	37	100.0%

Work-related fatalities involving cattle were strongly concentrated among older aged victims, with 26 (70%) occurring to victims aged 65 years or older. No victims were under 40 years of age.

Figure 2.3a:

Work-related fatalities involving cattle by age of victim, workers and non-workers, 2011-2020.



This is explored in more detail in Figure 2.3b.

- ▶ Of 13 work-related fatalities caused by attacks by cows with calves, eight victims (62%) were aged 65 years or older.
- ▶ Of nine work-related fatalities caused by cattle knocking their victims over without aggression, seven victims (78%) were aged 65 years or older.
- ▶ Five out of the six work-related fatalities caused by attacks by bulls involved victims aged 65 years or older (83%).

It is possible that older farmers are less agile than younger farmers, and might struggle to escape dangerous cattle quickly. Therefore, older farmers may need to take special precautions when working with cattle.

Figure 2.3b:

Work-related fatalities involving cattle by age of victim and type of incident, 2011-2020.

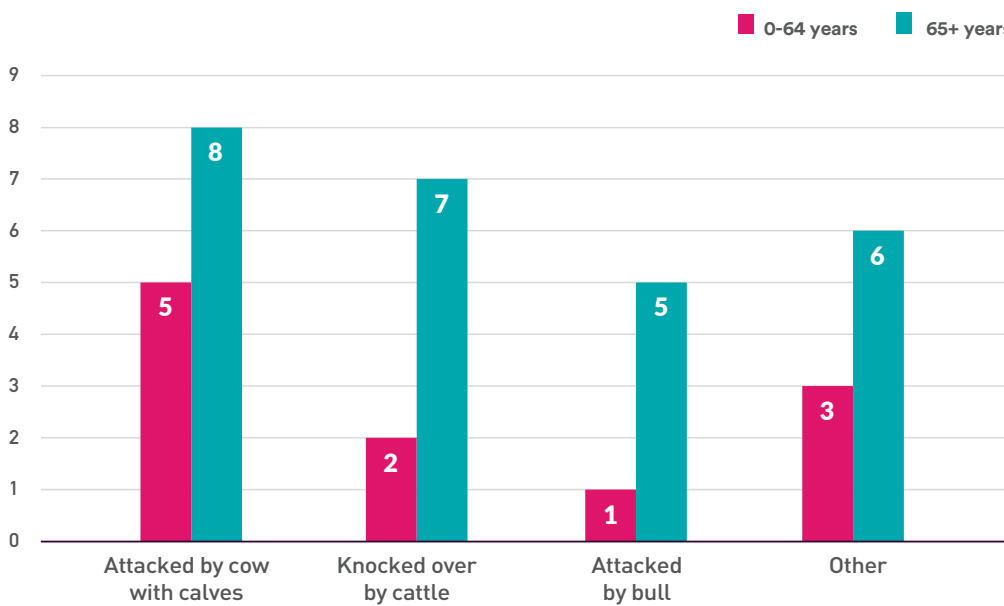
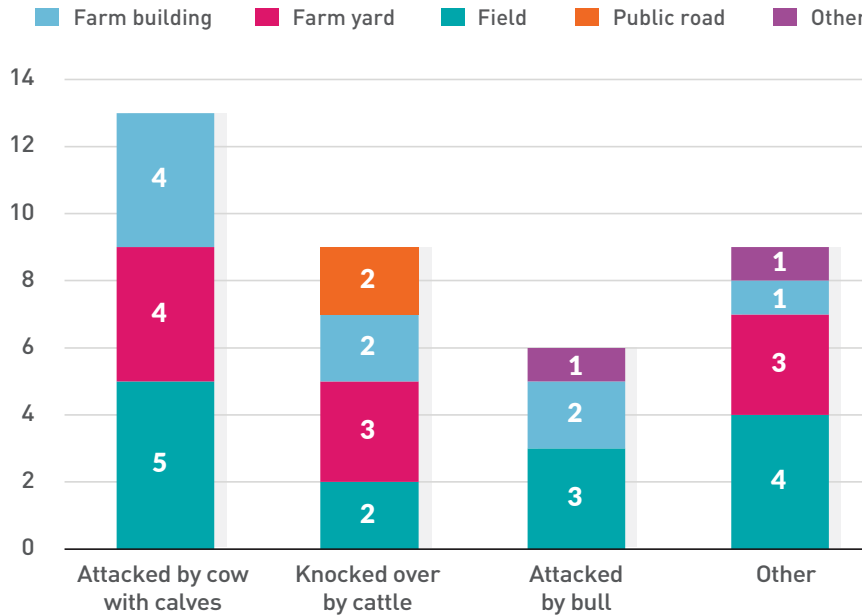


Figure 2.3c shows that work-related fatalities involving cattle occurred primarily in fields (14, 38%), farm yards (10, 27%) and farm buildings (nine, 24%).

Figure 2.3c:

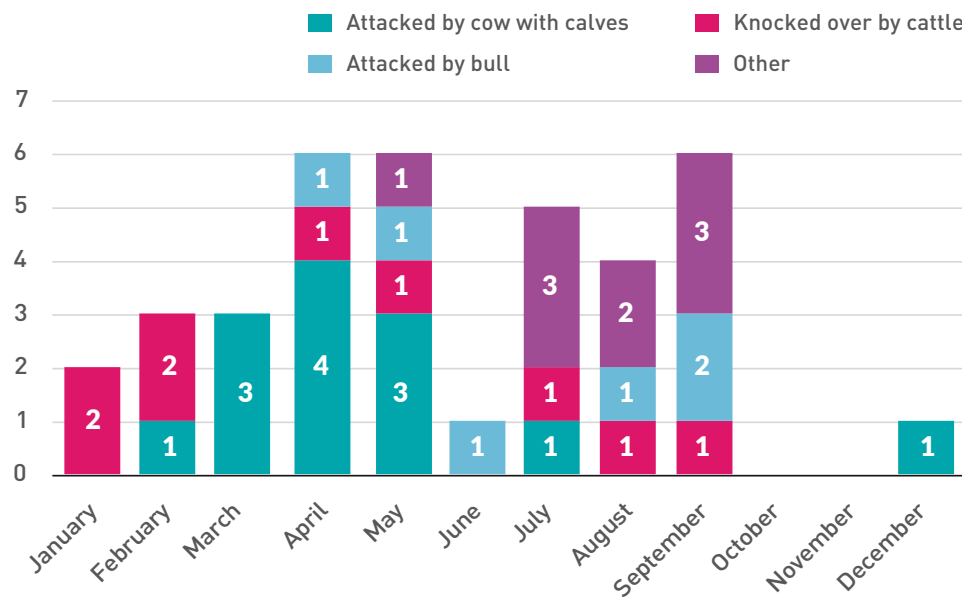
Work-related fatalities involving cattle by type of incident and location, 2011-2020.



While there was no clear seasonal pattern to most types of incident leading to work-related fatalities involving cattle, attacks by cows with calves were noticeably more prevalent during the spring time. All but two of the 13 attacks by cows with calves occurred between February and May.

Figure 2.3d:

Work-related fatalities involving cattle by type of incident and month, 2011-2020.



2.4 Falls

Figure 2.4a shows that there were 21 work-related fatalities in Agriculture caused by falls. These exclude falls from moving vehicles – such as cases where victims have fallen from tractor cabs in motion (as these are classified as vehicle incidents) – but include falls from stationary vehicles.

- ▶ Seven (33%) involved falling through fragile roofs.
- ▶ Falls from static vehicles, falls from cliffs or mountains, falls from ladders and falls into stacked bales – where the victim became trapped in the gaps between stored bales – each accounted for three work-related fatalities.

Figure 2.4a:

Work-related fatalities involving falls by type of incident, 2011-2020.

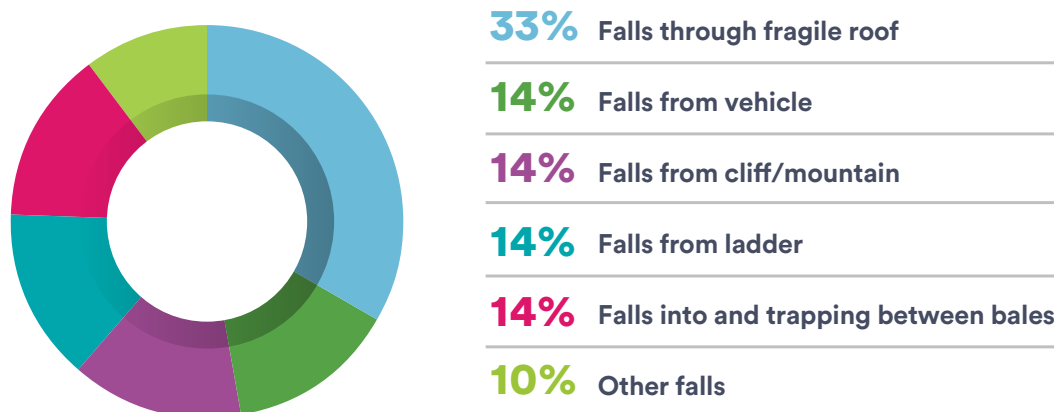


Table 2.4 breaks these incidents down.

- ▶ Falls through fragile roofs included falls through Perspex skylights (three), through rotten timber roof beams (one), through asbestos roofing (one), through an empty skylight, when the victim was fitting skylights (one), and through an empty roof opening, when the victim was replacing corrugated sheeting (one).



There were 21 work-related fatalities in Agriculture caused by falls

Table 2.4:**Work-related fatalities associated with types of fall, 2011-2020.**

	Work-related fatalities	
	Number	%
Falls through fragile roof	7	33.3%
- <i>Perspex skylight</i>	3	14.3%
- <i>Rotten timber roof beam</i>	1	4.8%
- <i>Asbestos roof</i>	1	4.8%
- <i>Empty skylight</i>	1	4.8%
- <i>Empty roof opening</i>	1	4.8%
Falls from vehicle	3	14.3%
- <i>Fall from tractor</i>	1	4.8%
- <i>Fall from bucket of telehandler</i>	1	4.8%
- <i>Fall from horsebox</i>	1	4.8%
Falls from cliff/mountain	3	14.3%
Falls from ladder	3	14.3%
Falls into and trapping between bales	3	14.3%
Fall from roof	1	4.8%
Fall on same level	1	4.8%
Total	21	100.0%

As with other types of incident, falls disproportionately affected older victims, with 11 (52%) aged 65 years or older.

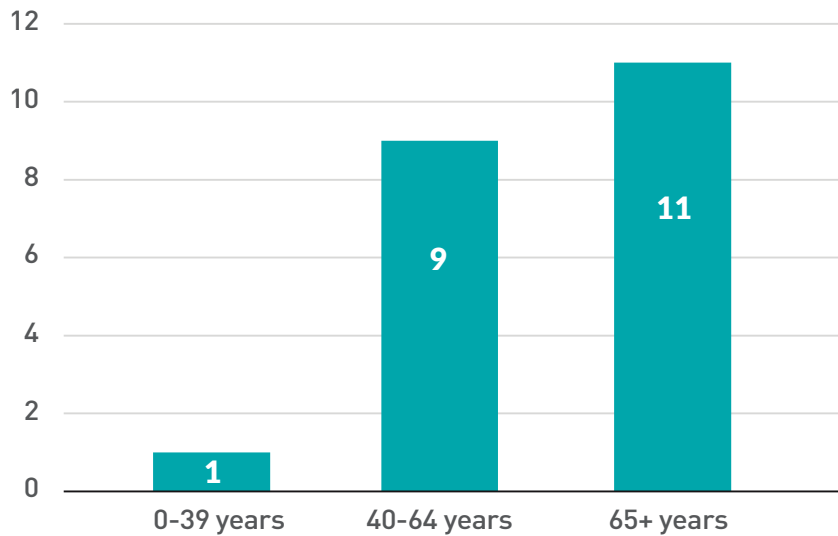
The Health Service Executive notes that the risk of falling increases with age and one in three people aged over 65 experience a fall every year (HSE, 2008). These falls can be caused by the weakening of muscles with age. Central Statistics Office data on the causes of all fatalities in Ireland show that fatalities due to falls,⁸ including falls from beds and wheelchairs, falls on stairs and falls on the same level, occurred predominantly to older people, with 78% aged 65 years or older (CSO, 2018).

Since fatalities due to falls are more common among older groups in general, older workers may be more likely to experience falls, and more likely to sustain serious injuries. Thus, older workers may need to take special precautions to avoid falls, especially falls from height.

8 Codes W00 to W19 in ICD-10, see: <https://icd.who.int/browse10/2016/en#/W00-W19>.

Figure 2.4b:

Work-related fatalities involving falls by age of victim, 2011-2020.

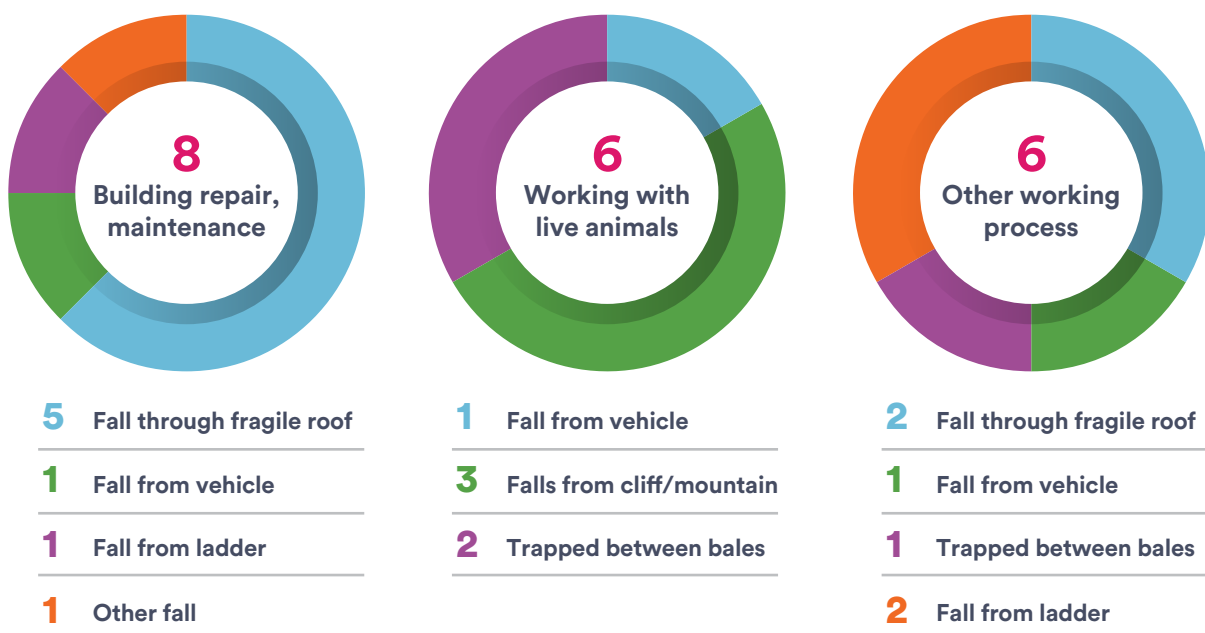


To identify the types of work that victims were doing when they fell, Figure 2.4c compares the types of falls with the victims' working processes for the 20 work-related fatalities to workers. Non-workers are not assigned a working process, so one non-worker fatality has been excluded in this category.

- ▶ Of 20 work-related fatalities to workers involving falls, eight (40%) occurred during building maintenance or repair.
 - Of these, five were associated with falls through fragile roofs.
- ▶ Six work-related fatalities were falls involving work with live animals.
 - Three of these involved falls on cliffs or mountains while working with animals.
 - Two involved victims falling into, and becoming stuck between stacked bales.

Figure 2.4c:

Work-related fatalities involving falls by type of incident and working process of victim, 2011-2020.



2.5 Machinery

Seventeen work-related fatalities in Agriculture involved machinery. Table 2.5 shows the types of machinery involved.

- ▶ Two work-related fatalities involved air-operated gates, in which farmers became trapped.
- ▶ Two work-related fatalities involved diet feeders, where victims fell into the operating feeders.

All other machinery incidents involved different types of machines.

Table 2.5:

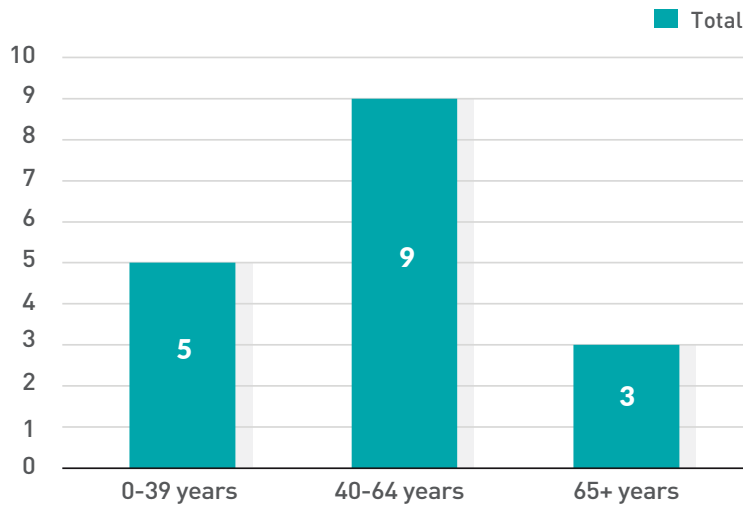
Work-related fatalities involving machinery by type of machine, 2011-2020.

	Work-related fatalities	
	Number	%
Air-operated gate	2	12%
Diet feeder	2	12%
Slurry agitator	1	6%
Bale wrapper	1	6%
Baler	1	6%
Fertiliser spreader	1	6%
Hedge cutter	1	6%
Mower	1	6%
Plough	1	6%
Potato conveyor belt	1	6%
Swather	1	6%
Topper	1	6%
Trailer	1	6%
Water hose	1	6%
Wood chipper	1	6%
Total	17	100%

While older victims aged 65 years or older were over-represented for many types of incident, most work-related fatalities involving machinery affected the 40-64 years age group (Figure 2.5).

Figure 2.5:

Work-related fatalities involving machinery by age of victim, 2011-2020.



2.6 Loads

Fifteen work-related fatalities involved the collapsing of loads onto the victim. The main types of loads involved are shown in Figure 2.6a.

- ▶ Seven work-related fatalities involved the falling of bales onto victims.
- ▶ Three work-related fatalities involved the falling of vehicles under maintenance onto the victim, including two trailers and one jeep.
- ▶ Two work-related fatalities involved the falling of metal doors onto the victim.

Figure 2.6a:

Work-related fatalities involving loads by type of load, 2011-2020.

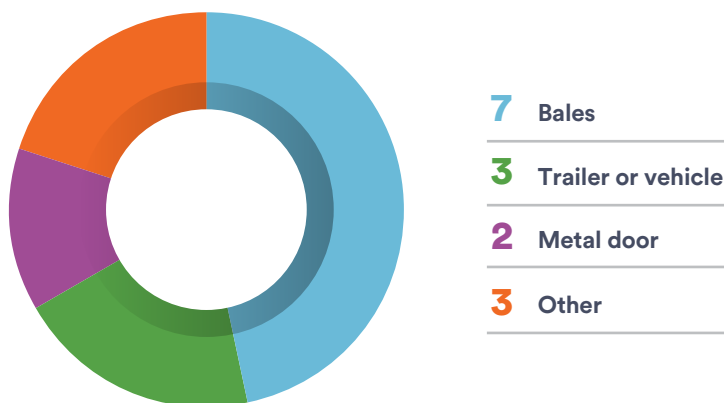


Table 2.6 breaks this down further:

- ▶ Of seven work-related fatalities involving the fall of bales onto victims, four occurred when bales were dislodged as the victim worked in a bale storage shed. Two involved bales slipping from vehicles.
- ▶ Of the two work-related fatalities involving metal doors, one occurred when the victim attempted to free a stuck shed door with a metal bar, causing it to fall. The other occurred while the victim was moving a sheet metal door but lost control and was struck on the head by the door.

These incidents illustrate the dangers of heavy objects, especially where improperly stacked, secured or moved.

Table 2.6:

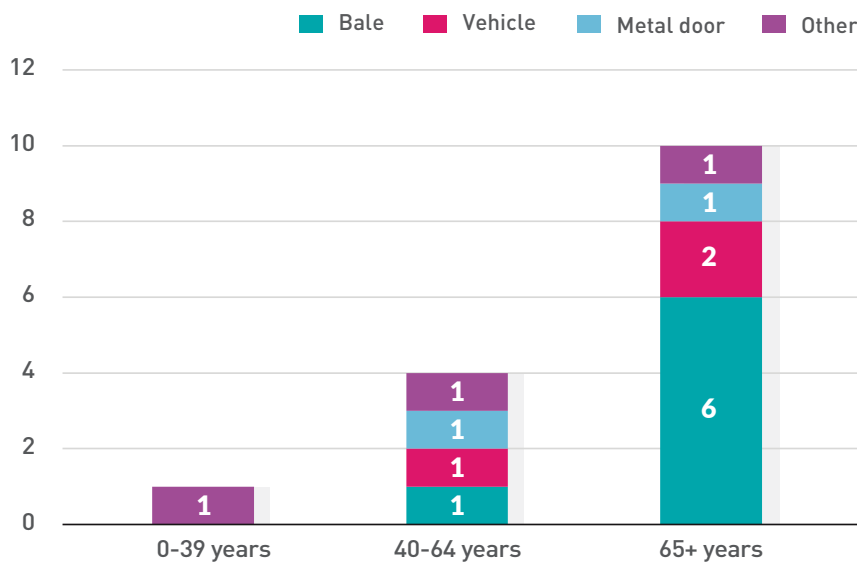
Work-related fatalities involving loads by type of load, 2011-2020.

	Work-related fatalities	
	Number	%
Bale	7	46.7%
- Bale dislodged while working in shed	4	26.7%
- Bale slips from vehicle onto victim	2	13.3%
- Round bale rolling down hill strikes victim	1	6.7%
Trailer	2	13.3%
- Vehicle slips during maintenance, crushing victim	2	13.3%
Metal door	2	13.3%
- Victim struck by metal door while attempting to move it	1	6.7%
- Victim struck by stuck metal shed door after attempting to free it	1	6.7%
Meal bin	1	6.7%
- Homemade meal bin overturns, crushing victim	1	6.7%
Shuttering pan	1	6.7%
- Shuttering pan falls on victim during construction of shed	1	6.7%
Horse box divider	1	6.7%
- Loose horse box divider leaning on building falls on child	1	6.7%
Jeep	1	6.7%
- Vehicle slips during maintenance, crushing victim	1	6.7%
Total	15	100.0%

Of 15 work-related fatalities involving loads, 10 (67%) occurred to victims aged 65 years or older. All but one of the incidents involving bales occurred to victims aged 65 years or older.

Figure 2.6b:

Work-related fatalities involving loads by age of victim and type of load, 2011-2020.



2.7 Drowning

Thirteen work-related fatalities involved drowning, with eight victims drowning in slurry (Table 2.7). These included underground slurry tanks and open slurry pits.

- ▶ Of eight work-related fatalities caused by drowning in slurry, four occurred when farmers fell into temporarily-opened slurry tanks at agitation points. This shows that even when farmers were aware that the tank was open there was a risk of falling into the agitation point.
 - Three work-related fatalities caused by drowning in slurry involved victims falling into open slurry pits.
 - In one incident the victim was poisoned by fumes from the slurry, before falling in.
- ▶ One work-related fatality involved the victim drowning in a liquid feed tank. This may have also involved the victim becoming unconscious due to a build-up of carbon dioxide before falling into the liquid.

These incidents show the dangers of working near slurry tanks and the dangers of gas accumulations in confined areas.

Table 2.7:

Work-related fatalities involving drowning by location and type of drowning incident, 2011-2020.

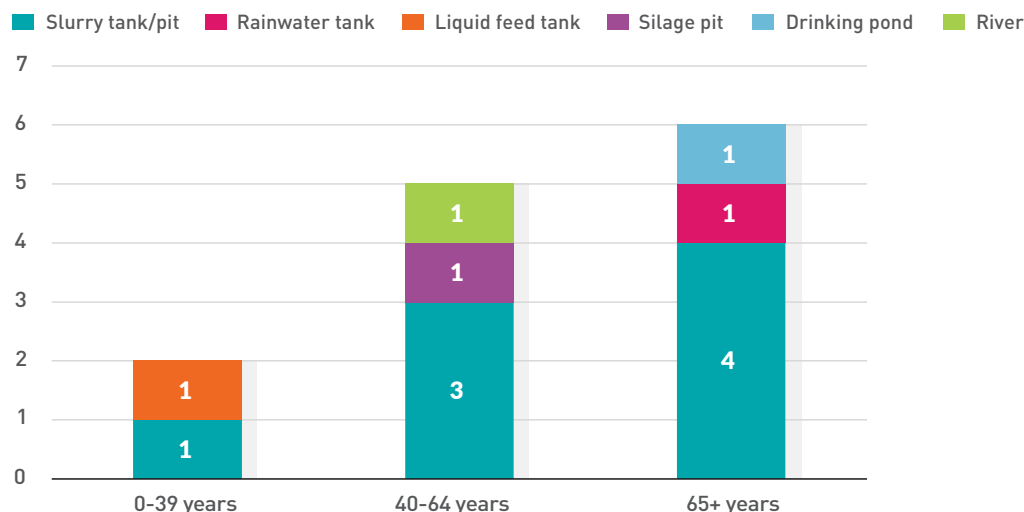
	Work-related fatalities	
	Number	%
Slurry tank/pit	8	62%
- <i>Temporarily opened slurry tank</i>	4	31%
- <i>Open slurry pit</i>	3	23%
- <i>Gas poisoning</i>	1	8%
Water tank/pit	1	8%
Liquid feed tank	1	8%
- <i>Possible CO2 poisoning</i>	1	8%
Silage pit	1	8%
Drinking pond	1	8%
River	1	8%
Total	13	100%

Figure 2.7 shows the age of victims of work-related fatalities caused by drowning. As with other types of incident, fatalities involving drowning were concentrated among older victims.

- ▶ Five victims were aged 40-64 years, of whom three drowned in slurry.
- ▶ Six victims were aged 65 years or older, of whom four drowned in slurry.

Figure 2.7:

Work-related fatalities involving drowning by location of drowning incident and age of victim, 2011-2020.



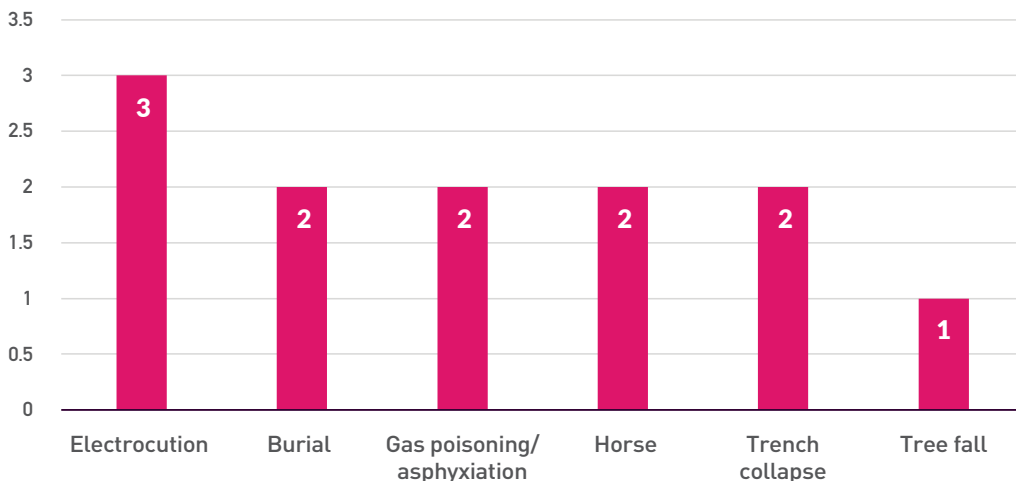
2.8 All other types of incidents

The main types of work-related fatalities in Agriculture from 2011-2020 were: Vehicle; Cattle; Fall; Machinery; Load and Drowning. These six categories were involved in 196 (94%) of the 208 work-related fatalities during that period. The remaining 12 work-related fatalities were spread among six other categories (Figure 2.8). These included:

- ▶ electrocutions (three)
- ▶ burials (two – one in barley grain, one under a collapsing shed under demolition)
- ▶ poisoning or asphyxiation (two – one involving carbon monoxide from wood pellets in a silo, one involving cleaner fumes in a dairy milk cleaning tank)
- ▶ kicks from horses (two)
- ▶ trench collapses (two)
- ▶ tree fall (one where a tree being felled by chainsaw struck the victim).

Figure 2.8:

Work-related fatalities involving all other types of incident, 2011-2020.



Conclusion

In the ten-year period from 2011 to 2020 there were 208 work-related fatalities in Agriculture. This means that Agriculture had the highest number of work-related fatalities of any economic sector for all ten of these years. Agriculture is one of three priority economic sectors identified in the Authority's 2021 Programme of Work and the 2019 - 2021 Strategy.

Work-related fatalities occurred to all age groups, but were particularly common among older people, with over half of all worker fatalities occurring to victims aged 65 years or more. Older farmers may be less agile and vulnerable to unexpected incidents such as cattle attacks. Older people may also be less likely to survive injuries than younger people. This suggests that older farmers must pay particular attention to farming risks in order to avoid injury and death.

Two in three work-related fatalities to people aged under 18 years were non-workers, showing that farms can be dangerous environments for children and young people, even when they are not engaged in farming activity.

It is striking that most work-related fatalities in Agriculture over the 2011 - 2020 period were associated with a relatively small number of causes. Close to half of all work-related fatalities involved vehicles.

It is likely that many of these fatal incidents could have been avoided by taking reasonable steps advised by the Authority, such as keeping vehicles in good condition, ensuring that vehicles are driven only by trained and competent personnel, properly applying handbrakes and operating vehicles only from inside the cab, avoiding working from unprotected heights with fragile roofs, avoiding exposure to agitated cows with calves or to bulls, storing heavy loads with care, and excluding children from access to working areas.

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