

Keep away from horses

Purpose:

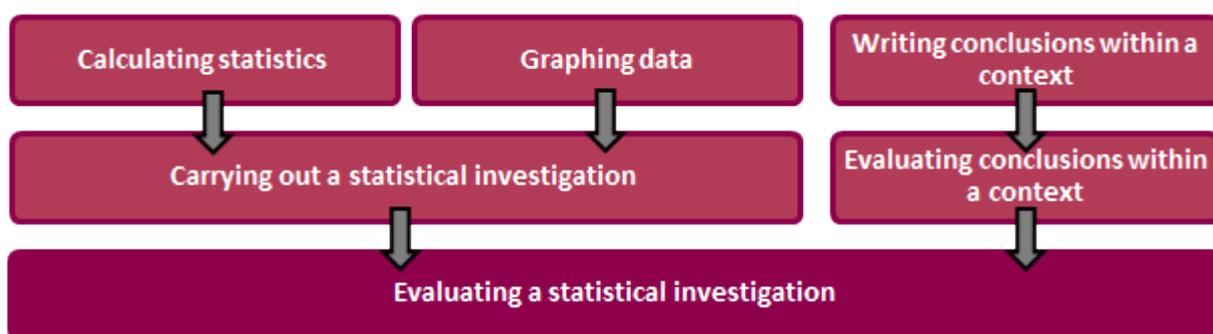
To engage the students in a critical evaluation of a statistical investigation, commenting on the validity and relevance of the findings presented graphically, and of the conclusions drawn.

Achievement Objectives:

S5-2: Evaluate statistical investigations or probability activities undertaken by others, including data collection methods, choice of measures, and validity of findings.

Description of mathematics:

This background knowledge and skills that need to be established before and/or during this task are outlined in the diagram below:



This task may be 'scaffolded' with either a focus on the validity of the mathematical statements, or by encouraging students to respond to the value of the conclusions with respect to the context. The approach should be chosen in sympathy with their skills and depth of understanding.

Activity:

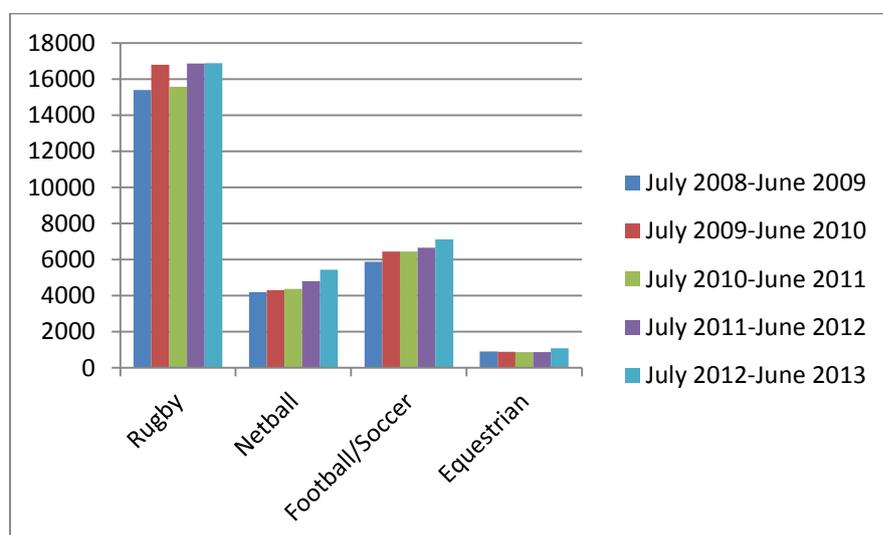
Task: This statistical report on injury rates in various sports was prepared by a group of students for a school newsletter.

Evaluate the validity of their conclusions.

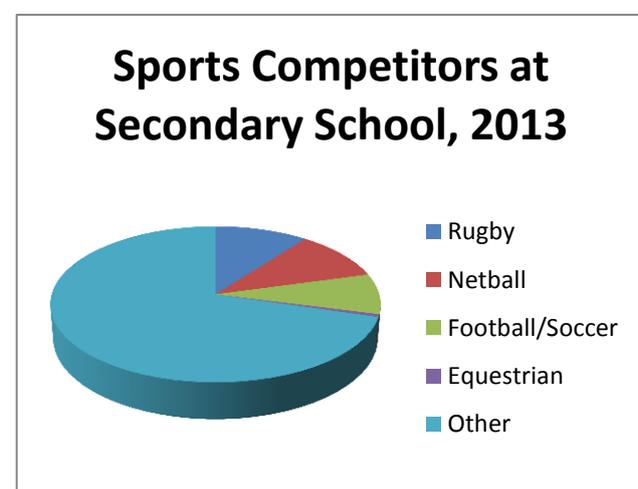


Keep Away from Horses

Rugby may be the Nation's game, but it has a reputation as the most dangerous of school sports. Of the three main sports played in secondary schools in New Zealand, rugby, netball and football/soccer, it is rugby that has the highest injury rate. Around 60% of 15-19 year old rugby players registered injuries with ACC in the July 2012 to June 2013 period. But rugby is no way near as dangerous as equestrian activities. These accounted for over \$450,000 worth of ACC claims for 15-19 year olds in the same period. Those claims were made by the 69% of equestrian competitors who were injured, while taking part in this sport. The rate of horse-riding injuries is shockingly high when compared with the 30% of soccer players and less than 20% of netballers of the same age category who were injured while playing their sport. However, the injury rate is on the rise for both netball and soccer, whereas the number of injury claims per year for rugby remains relatively steady. The number of new sports related injury claims made by young people in New Zealand between the ages of 15 and 19, are shown below.



Of the 277,571 secondary schools that play a school sport in 2013, there were 28,947 students playing rugby and a similar number play netball. Although only 23,354 play football/soccer, there were around 1500 more injuries in soccer than netball. However, nothing compares to the equestrian injury rate. Each year, seven in ten riders can expect to be injured while eventing.



So, if you are wondering which sport to sign up for: with rugby, expect to be injured and out of netball and soccer, it's much safer to choose netball. But to be really safe, keep away from horses!

Sources:

<http://www.acc.co.nz/for-individuals/injury-statistics/index.htm#>

<http://www.nzsssc.org.nz/>

Raw Data:

	July 2008-June 2009	July 2009-June 2010	July 2010-June 2011	July 2011-June 2012	July 2012-June 2013
Rugby	15395	16783	15566	16861	16870
Netball	4193	4300	4376	4805	5426
Football/Soccer	5874	6446	6435	6652	7111
Equestrian	907	896	876	879	1083
	Sports Players at Secondary School, 2013				
Rugby	28794				
Netball	28947				
Football/Soccer	23354				
Equestrian	1569				
Other	196476				

The procedural approach

The student is able to calculate the relevant statistics to confirm the accuracy of the report and to comment on the validity of conclusions drawn.

Prompts from the teacher could be:

1. Read through the report and highlight the main argument and the statistics used to support this argument.
2. List any possible weaknesses in the argument.
3. Check the statistics quoted against calculations from the raw data.
4. Consider the source of the data used in these calculations.
5. Summarise: Are the main arguments in the report supported by valid statistics?

Ideally, the students should check with their teacher at each stage of the investigation, before proceeding to the next stage.

Keep Away From Horses

1. Main Argument: Sport (out of four that Secondary students do) that is most likely to result in injury:

Worst Equestrian (75%)
Next Worst Rugby (60%)

2. Weaknesses could be:

- were all sports considered (others could be mountainbiking)
- how many actual injuries (more people play rugby)
- how often (riding horses every day, all year, but play rugby once a week only in winter?)

3. Percentages given

Equestrian: $\frac{1083}{1569} \times \frac{100}{1} = 69\%$

Rugby: $\frac{16870}{28794} \times \frac{100}{1} = 59\%$

Soccer: $\frac{7111}{23354} \times \frac{100}{1} = 30\%$

Netball: $\frac{5426}{28947} \times \frac{100}{1} = 19\%$

These were rounded in the report, but it said that, so they are all ok.

T: You've suggested mountain biking, why?
S: Well, that or skateboarding, or other sports that kids really do, but aren't always a school organised sport might have higher injury rates, but they haven't been considered.

4. The two sources for the data are different, so the percentage calculated is not giving a percent for just secondary students in 2013. The a.c.c. data is from a different group. The data needs to be from the same group for the percents to be true.

5. Overall, the article is quoting statistics that are not true because they haven't been calculated from the same source. Although it does seem like equestrian and rugby result in higher injury rates than soccer and netball, it is just possible that if the real rates were found, that this might not be the case.

