

Looking at your project findings and presenting them clearly

Paul Cullinan  
FoM  
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- A comparison of the prevalence of musculoskeletal symptoms between filling & packing and formulation operators in pesticide formulation using a questionnaire survey (**cross-sectional survey**)
- A **case referent** study of drivers with type 1 diabetes who have a recent history of road traffic incidents
- How to encourage better readjustment? (**RCT**)
- A **Systematic Review** of Productivity Loss in Irritable Bowel Syndrome Sufferers
- An **audit** of the understanding and practice of UK occupational physicians in relation to the data protection act and the access to medical reports act

**Aggression in boatbuilders** (**case-control analysis of cross-sectional survey**)

## Start with a skeleton ...

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- introduction
- methods
- findings
- discussion
- conclusions

... and add the bones

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- introduction

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- methods

easiest: test run

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- findings

start here

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- 
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- discussion

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- 
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- conclusions

## Your introduction

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- Begin by clearly identifying the *subject area of interest*. You might want to include some key words from your title in the first few sentences to get it focused directly on topic at the appropriate level.
- Establish the *context* by providing a brief and balanced review of the pertinent published literature. The key is to summarise what was known about the problem *before* you did your study. Do not include very specific, lengthy explanations that you will probably discuss in greater detail later in the Discussion.
- State clearly the *purpose and /or hypothesis* that you investigated. It is most usual to place the statement of purpose near the end of the Introduction, often as the topic sentence of the final paragraph.
- State briefly *how* you approached the problem; and why you used a particular design.

## Your methods

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- Begin by describing the *population* you studied:
  - where
  - who (with response rates here?)
  - when
  
- Follow this be a description of *what you did* to them. Supposedly this is to allow readers to repeat your study should they want to; in practice it allows them to picture exactly what you did.
  - the level of detail is a matter of judgment
  - you may want to put questionnaires into an Appendix
  
- Add a section on '*analysis*'
  - statistical methods of description
  - statistical methods of analysis
  - power calculations
  
- here is a good place to mention any *ethical review*

*Tip; write down what you did when you did it otherwise you'll forget*

## Your findings

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- a good way to start this section is by thinking about your Tables and Figures ....
- ... and then filling in the text
  
- start at the beginning, with descriptive tables

total participants	100
men: n(%)	75 (75%)
women: n(%)	25(25%)
age: mean (sd)	35.4 (6.8)
months of employment: mean (sd)	18.2 (16.1)
aggression score: mean (sd)	35.6 (7.2)
styrene level: mean (sd)	0.36 (0.04)

## Thinking about your findings

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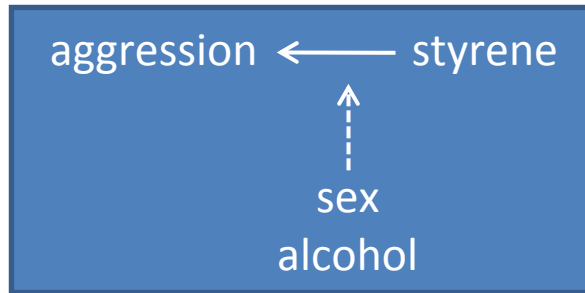
remind  
yourself of  
your  
conceptual  
framework

outcome ← exposure  
↑  
confounder(s)  
modifier(s)

remind yourself whether  
your variables are  
'continuous' or  
'categorical'

## Thinking about your findings: an example

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- outcome = aggression, measured on an aggression scale for 0-100
- hence aggression = continuous variable
- categorising a continuous variable:
  - use a pre-determined, clinically validate cut-off ...
  - or, use your own data
    - observe distribution of aggression scale scores
    - top 25% = 'aggressive'

## Thinking about your findings: an example

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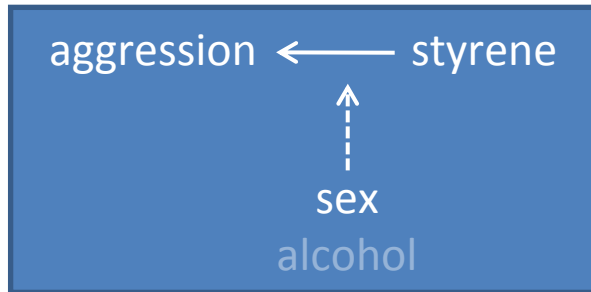
aggression ← styrene

	aggressive	not aggressive	
high styrene	20 (75%)	35 (47%)	55
low styrene	5 (25%)	40 (53%)	45
	25	75	100

- outcome = aggression
- exposure = styrene
- both are categories/have been categorised
- the odds of having a high styrene if you are aggressive are:  $20/5 = 4$
- the odds of having a high styrene if you are not aggressive are:  $35/40 = 0.9$
- the corresponding odds ratio is  $4/0.9 = 4.4$

## Thinking about your findings: next steps - stratification

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	men	women	p
total participants	75	25	
age: mean (sd)	35.4 (6.8)		
months of employment: mean (sd)	18.2 (16.1)		
aggressive: n(%)	20 (27%)	5 (25%)	
styrene high: n(%)	41 (55%)	13 (52%)	

## Thinking about your findings: stratified analysis

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	men	
	aggressive	not aggressive
high styrene	16	25
low styrene	4	30
	20	55

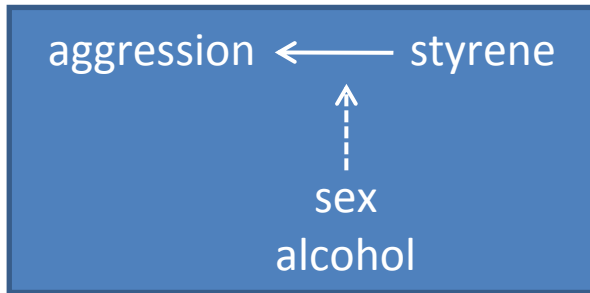
- odds of high styrene in aggressive men :  $16/20 = 4$
- odds of high styrene in not aggressive men:  $25/30 = 0.9$
- the corresponding odds ratio is  $4/0.9 = 4.4$

	women	
	aggressive	not aggressive
high styrene	4	9
low styrene	1	11
	5	20

- odds of high styrene in aggressive men :  $4/1 = 4$
- odds of high styrene in not aggressive men:  $9/11 = 0.8$
- the corresponding odds ratio is  $4/0.8 = 4.9$

## Thinking about your findings: several stratified analyses

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- basic exposure:outcome
- stratified by potential confounding variables separately
- several strata simultaneously: regression

## Some thoughts about statistics

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- less haste, more speed: *describe your data*
- variables are either:
  - categorical
  - or continuous ...
- ... and need to be summarised appropriately:
  - categories: n(%)
  - continuous variables are:
    - normally distributed ('parametric'): mean (sd)
    - or non-normally distributed ('non-parametric'): median (range or IQR)

men: n(%)	178 (79%)
age: mean (sd)	35.4 (6.8)
months of employment: mean (sd)	18.2 (16.1)

## Some thoughts about statistics

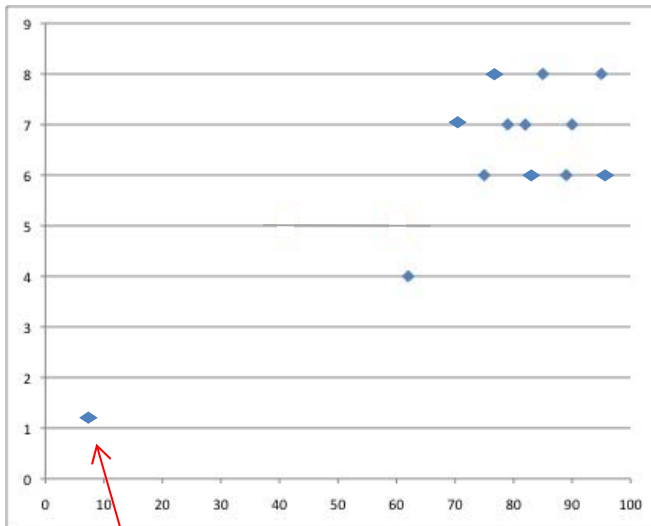
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- use tests of statistical significance sparingly
- and use the right ones: parametric vs non-parametric
- remember that p values tell you no more than ‘what was the play of chance in your findings’
- they tell you nothing about the size of any difference ...
- ... but confidence intervals do
  
- $p < 0.05$  is arbitrary
- put in all your p values; we’re interested in  $p = 0.06$
- remember the potential dangers of multiple testing
- don’t be dismayed by ‘negative’ findings
  
- if you really want a ‘positive’ p value, do a correlation

# Measuring agreement 1

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- correlation and regression analysis both deal with relationships among variables
- the correlation coefficient is a measure of linear association between two variables
- the 'closeness' of the association

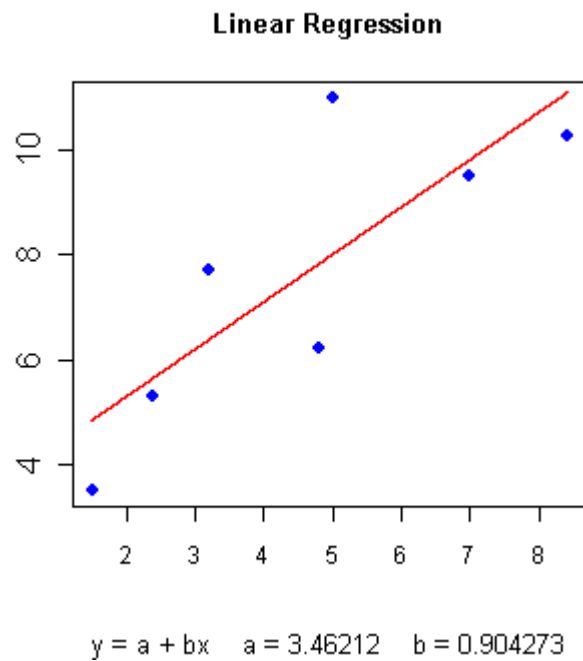


this is an outlier ...

# Measuring agreement 1

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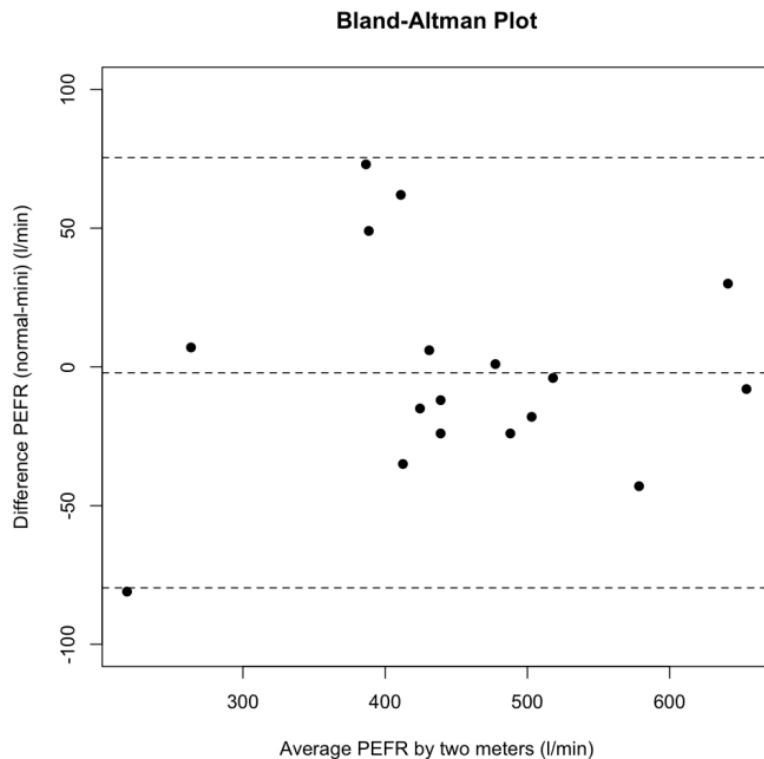
- correlation and regression analysis both deal with relationships among variables
- the correlation coefficient is a measure of linear association between two variables
- the 'closeness' of the association
- regression allows the *prediction* of one variable from another



## Measuring agreement 2

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- a Bland-Altman plots compares two assay methods
- it's used when you have two different methods of measuring the same thing
- it plots the difference between the two measurements on the y axis, and the average of the two measurements on the x axis.



## Back to your findings

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- recalling strata ...
- ... consider 'exposure-response'

total participants	100
men: n(%)	75 (75%)
women: n(%)	25(25%)
age: mean (sd)	35.4 (6.8)
months of employment: mean (sd)	18.2 (16.1)
very aggressive: n(%)	
a bit aggressive: n(%)	
not aggressive: n(%)	

## Back to your findings

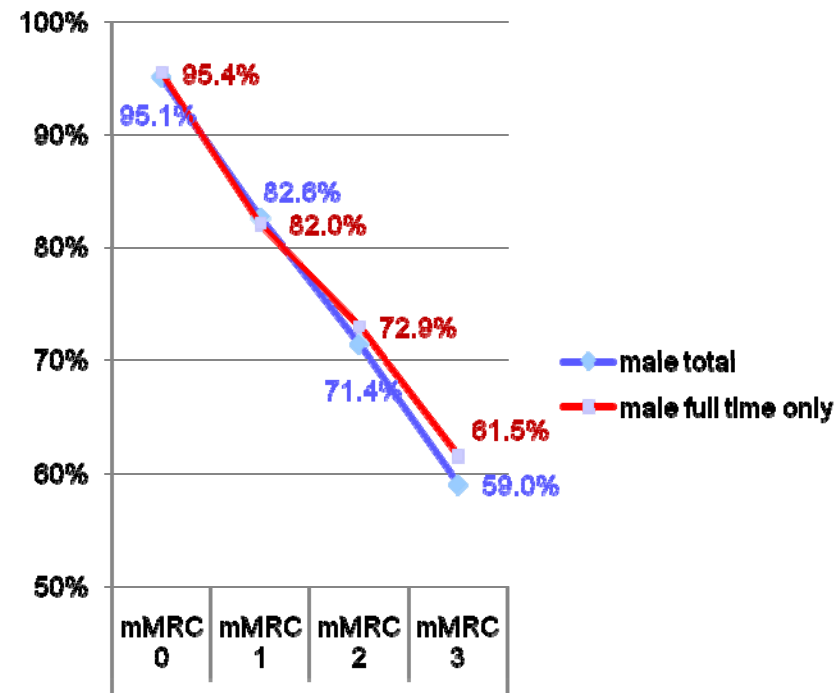
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- understand and consider some key terms:
  - odds ratio (case-control studies and cross-sectional surveys)
  - relative risk (cohort studies and experiments)
  
  - confounding
  - modification
  
  - multiple regression (continuous outcome)
  - logistic regression (binary outcome)

## Back to your findings

- use Figures as well as Tables
- even, if you must, pie charts

Males in current employment	Full Time	%	Part Time	%	Total	%
Total	2039		187		2226	
Breathlessness score						
mMRC 0	1733	95.4%	149	94.3%	1893	95.1%
mMRC 1	223	82.0%	22	83.1%	242	82.6%
mMRC 2	51	72.9%	9	73.5%	55	71.4%
mMRC 3	32	61.5%	7	57.4%	36	59.0%



- Figures and Tables should 'stand alone'; the reader should be able to understand them without referring to the text

## Your findings

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- a good way to start this section is by thinking about your Tables and Figures ....
- ... and then filling in the text
  
- you might want to use subheadings to divide the section into logical parts.
- your text should:
  - for the most part accompany your tables/figures ...
  - ... and not repeat what is in them ...
  - ... but act more as a commentary
  - interpret what you see (you do the thinking – don't leave this to the reader)
  
  - OK to write text referring to information that is not displayed
  
- if you have many similar figures, select representative examples and put the rest in an Appendix
  
- make comments on the results as they are presented, but save broader generalizations and conclusions for later

## Your discussion

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- a good way to start this section is by splitting it up:
  - summarise your main findings
  - interpret and explain them, one by one
  - put them into context – how do they compare with what others have found?
  - what are the weaknesses of your work – and how might these have affected its validity?
- what are the implications for OH?
- are there remaining questions – how might these be studied?
- rounding off paragraph

## Some random thoughts on style

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- paragraphs need to have:
  - a purpose
  - starting and finishing sentences
  - a link to the next one
- numbers
  - >10 are numerals (“14”)
  - ≤10 get spelled out (“six”) ...
  - ... unless they’re attached (“6mm”)
  - don’t start sentences (“Two hundred and forty eight employees responded ...”)
- people are ‘male and female’, adults are ‘men and women’
- “data” *are* plural
- infinitives don’t like to be split (much)
- “the frogs were put in a test tube”
- “we put the frogs in a test tube”
- embrace the Anglo-Saxon in you: ‘start’ for ‘commence’

## further reading

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### Design and related issues:

Schultz K and Grimes D. Lancet series 'Epidemiology'. Lancet 2005;365:1348 onwards

### Statistics:

Essentials of Medical Statistics by Betty R. Kirkwood

### Format. Style and tips for writing:

<http://unilearning.uow.edu.au/main.html>