

# How to get started with a systematic review: an introductory guide for early career researchers

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# Aims

- Outline stages of carrying out a systematic review - particularly of observational studies
  - Design, searching, reporting your findings
- Highlight useful resources and lessons from our own experience
- *Hopefully* convince you that even though systematic review is a lengthy process, the potential rewards are great

# Format

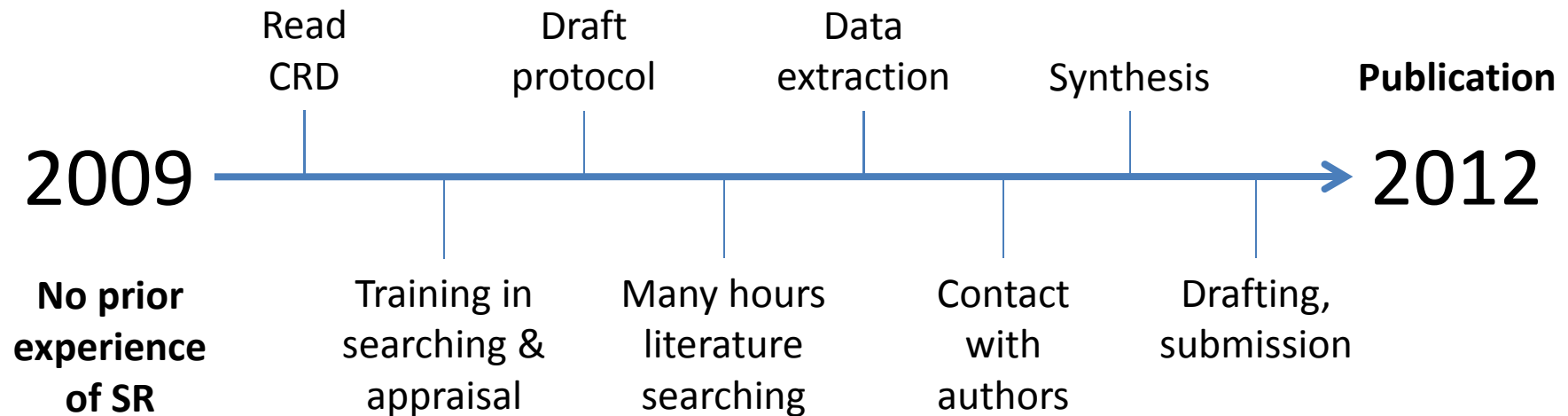
- Talk – 30 minutes
- Discussion – 10 minutes
- Conclusions and close
- Please see sheet for details of all resources
- Slides will also be available at  
<http://www.socsocmed.org.uk/ECR/>

# Systematic review definition

- “The application of strategies that limit bias in the assembly, critical appraisal, and synthesis of all relevant studies on a specific topic...”

Porta M (ed.) (2008) A Dictionary of Epidemiology. 5<sup>th</sup> ed.

# Birth weight and muscle strength



- Advice of experienced systematic reviewers
- Accurate note-keeping and consistency
- Two reviewers at each stage very helpful

# A question

- Clearly define the review question
- Can be one broad question or broken down into several smaller objectives
- Think about the purpose of the review
- Is the review required?

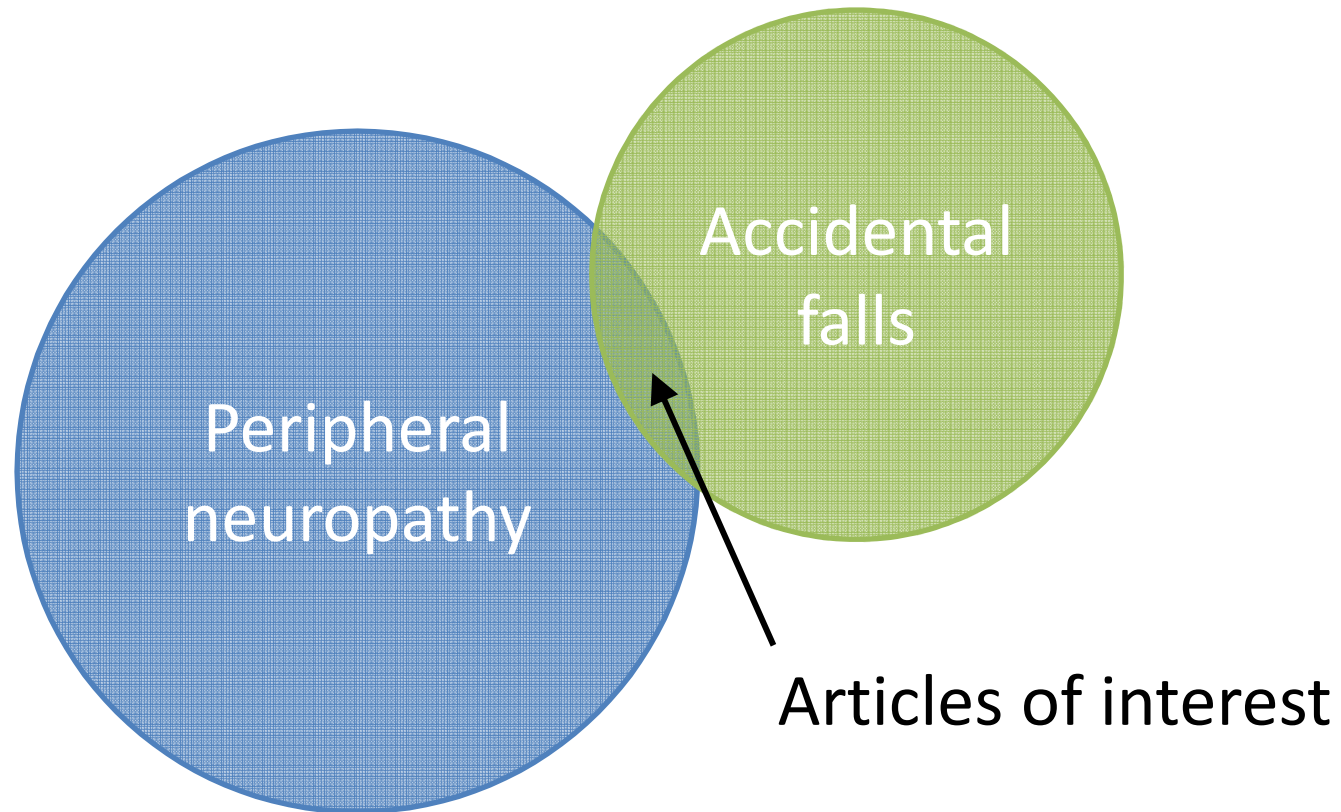


# Developing a protocol

- Sets out methods to be used in the review
- A protocol:
  - focuses the purpose of the review
  - ensures methodological consistency
  - is a useful reference
- You may edit/update protocol as the review progresses
- Refer to established guidelines, e.g. PRISMA, MOOSE

# Searching

- Helpful to use an exposure / outcome model



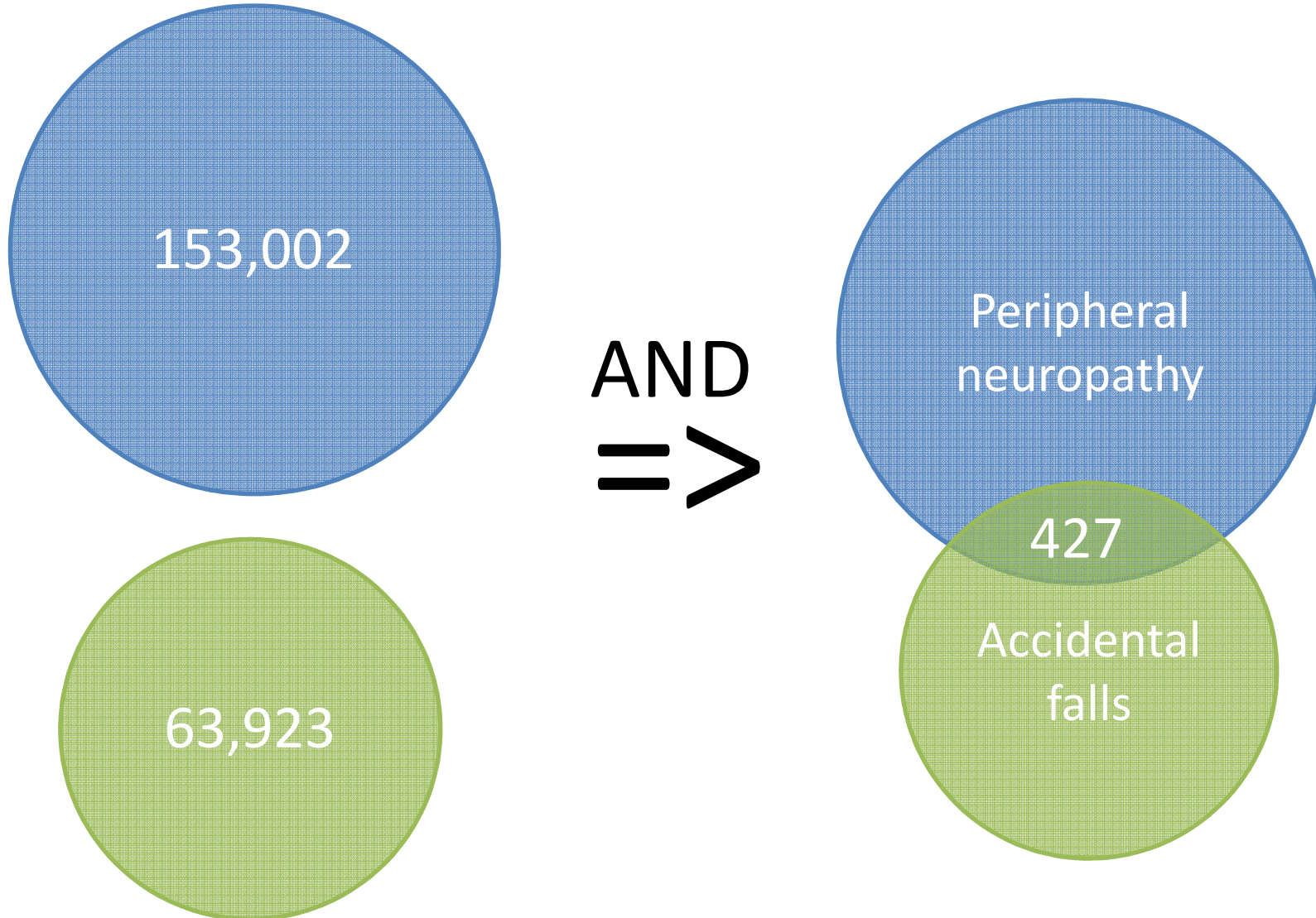


# Search strategy

“peripheral neuropathy”  
OR  
“peripheral nerve disease”  
OR  
“PNS”  
OR...

“accidental falls”  
OR  
“falls”  
OR  
“stumble”  
OR...

# Search strategy



# Screening

- Refer back to protocol and the inclusion criteria
- Two phases:
  1. Screen list of title/abstracts to identify potentially relevant papers
  2. Obtain these in full and decide if meet inclusion criteria
- Record decisions made
- Additional search methods following screening:
  - Reference list screening
  - Contacting authors
  - Grey literature

# Data Extraction

- Allows you to extract the relevant information from the included papers
- Use a standard data extraction form, tailored to the review
- Pilot the form to assess appropriateness
- To include on form:
  - citation
  - source
  - study description
  - participant description
  - description of exposure (or intervention) and outcome measures
  - statistical data/results
- Risk of bias / “quality” assessment

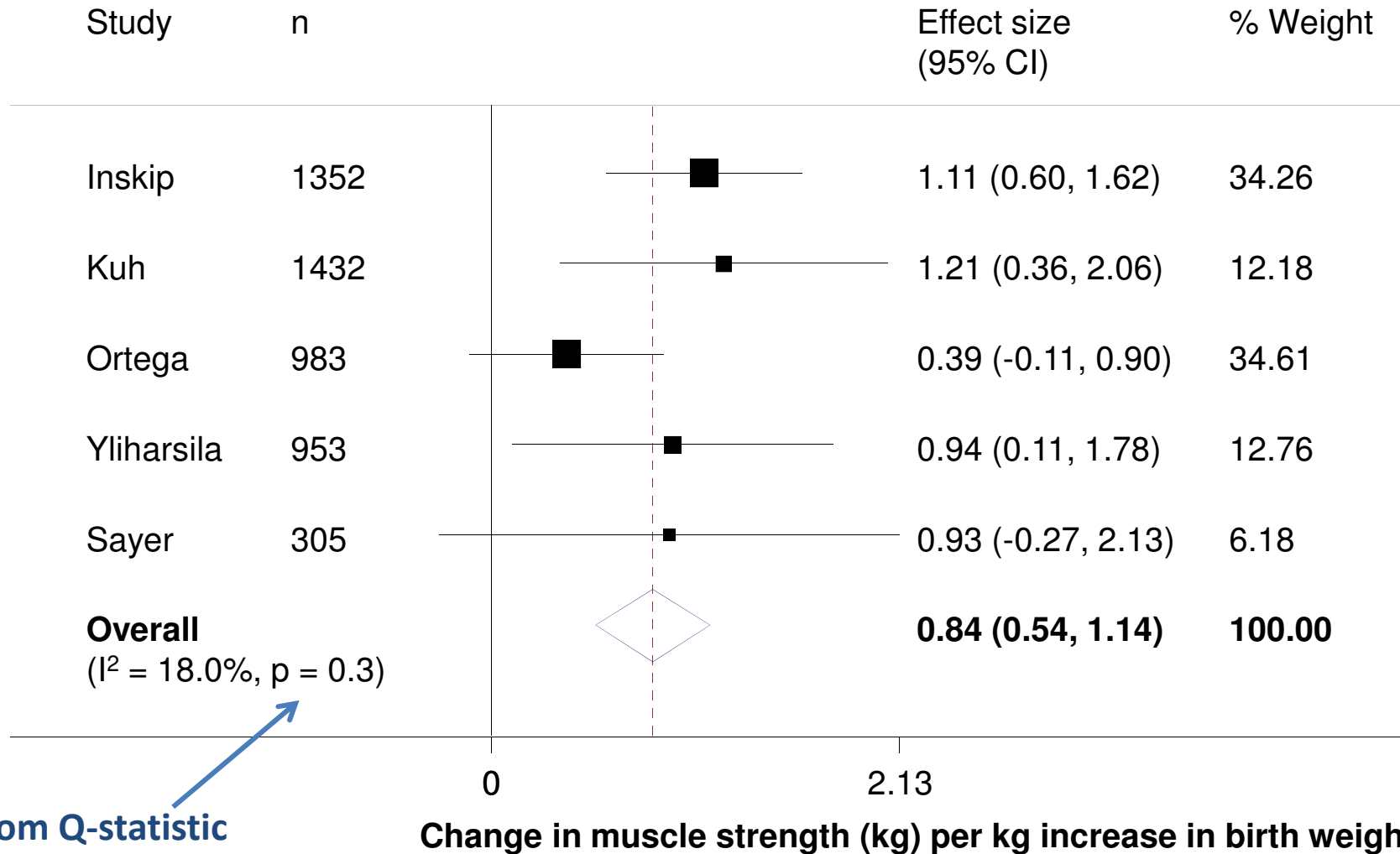
# Synthesis of results

- Tabulate study characteristics, results and bias issues with relation to review question
- Should link to data extracted so ideally little need to return to papers
- Summarise where possible, e.g.  
“Grip strength was used to measure muscle strength in 15 studies”
- Consider overall direction of results and potential reasons for studies which differ

# Meta-analysis

- Many advantages:
  - Single measure of effect (where appropriate)
  - Allows tests for publication bias
- Need a consistent measure of effect
  - e.g. change in outcome per unit change in exposure
  - consider contact with authors (blank results table)
- Fixed and random effects models
- Study heterogeneity ( $I^2$  and Q statistic)

# Sample Forest plot



# Writing up and submission

- Helpful to follow protocol
- May need to focus to one part of the whole review if too broad for a single paper
- Keep guidelines (MOOSE, PRISMA) in mind
- Very helpful to brainstorm sections and then divide between two reviewers
- Consider if repeat literature search needed prior to submission



# Conclusions

- Systematic review is a powerful tool that can generate important research findings
- As an ECR, systematic reviews are an excellent opportunity to
  - Improve critical appraisal skills
  - Carry out research without waiting for ethical approval, data collection and so on
  - Develop a solid knowledge of a topic

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