

Cultural differences in scientific writing

How to write an article: a step by step guide

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11. How to write the Discussion section
12. Acknowledgements and References



Writing traditions in European science

Anglo-Saxon tradition (Anglo-American)

- Science as investigation
- Problem-based
- Empirical findings
- One research question
- Often analytical
- Typical for papers in medicine, biology, public health, social sciences...

German-Romanic tradition (Continental)

- Science as thinking
- Theory-based
- Little problem-based
- Several or no research question(s)
- Often descriptive
- Typical for papers in philosophy, art, culture, social sciences



Writing traditions in European science

Anglo-Saxon tradition (Anglo-American)

- Scientific writing as learnt craftsmanship
- Can be learnt by many
- Emphasis on methods

German-Romanic tradition (Continental)

- Scientific writing as art
- Can't be learnt by anyone
- Emphasis on theories



Current writing practices in health sciences in Western Europe and the CIS

Western Europe

- Regulated by the ICMJE-guidelines
- Relatively thorough peer-review process
- Data driven writing
- All papers ~3000 words
- Universal structure (IMRaD)
- Systematic reviews and meta-analyses are common
- Publication bias?

CIS

- No universal recommendations
- The quality of peer review is generally low
- Writing is often driven by politics or economics
- Various length of articles
- Different structures (often IMRaC)
- Reviews are often non-systematic; meta-analyses are very rare
- Publication bias?



Current writing practices in Western Europe and the CIS

Western Europe

- Most titles are informative
- Between 4 and 6 authors per paper on average
- Authorship criteria?
- Structured abstracts
- Emphasis on methods and discussion
- Authors are careful with conclusions
- References are mostly from English language journals

CIS

- Many titles are imprecise
- Either too few or too many authors per paper
- Authorship criteria?
- Unstructured abstracts
- Emphasis on results
- Lengthy conclusions often with recommendations
- Overstepping the data
- References are mostly from Russian journals. Fewer references in general



Authorship criteria (ICMJE)

1. Substantial contribution to conception and design OR acquisition of data OR analysis and interpretation of data
2. Drafting the article OR revising is critically for important intellectual content
3. Final approval of the version to be published

Select your team of authors before doing a study, revise before writing, revise before submitting!

- Who is the first author?
- Who is the second author?
- Who is the last author?



How to write an original article?

- Manuscript structure
 - Title page
 - **Abstract**
 - Introduction
 - Methods
 - Results
 - Discussion
 - Acknowledgements
 - References
 - **Tables and figures**



Most common reasons for rejection of manuscripts-1

1. Poor experimental design and/or inadequate investigation
2. Failure to conform to the targeted journal
3. Poor English grammar, style, and syntax
4. Insufficient problem statement
5. Methods not described in detail
6. Overinterpretation of results
7. Inappropriate or incomplete statistics
8. Unsatisfactory or confusing presentation of data in tables or figures
9. Conclusions not supported by data
10. Incomplete, inaccurate, or outdated review of the literature
11. Author unwilling to revise the manuscript to address reviewer's suggestions



Most common reasons for rejection of manuscripts-2

1. Inappropriate or incomplete statistics
2. Overinterpretation of results
3. Inappropriate or suboptimal instrumentation
4. Sample too small or biased
5. Text difficult to follow
6. Insufficient problem statement
7. Inaccurate or inconsistent data reported
8. Incomplete, inaccurate, or outdated review of the literature
9. Insufficient data presented
10. Defective tables or figures

Bordage G. Reasons reviewers reject and accept manuscripts: the strengths and weaknesses in medical education reports. *Acad Med* 2001 76(9):889–896.



Most common reasons for rejection of manuscripts-3

10. Picking the wrong journal
9. Submitting a manuscript in a format that does not match what the Journal publishes
8. Not following the manuscript preparation instructions
7. Poor writing
6. Getting carried away in the discussion
5. Suboptimal reporting of the results
4. Inadequate description of the methods
3. Poor study design
2. Failure to revise and resubmit following peer review
1. Failure to write and submit a full manuscript after presenting the abstract

Pierson D. The Top 10 Reasons Why Manuscripts Are Not Accepted for Publication. *Respir Care* 2004;49:1246 –1252.



Structure of the manuscript

- Title page
- **Abstract**
- Introduction (Background)
- Methods (Materials and Methods)
- Results
- Discussion
- Acknowledgements
- References (Bibliography)
- **Tables and figures**



Outline of the manuscript

- Make a skeleton of the paper before you start writing
- Number all pages (title page=page 1)
- Start each section on a separate sheet
- Headings of each section are in CAPITAL
- Times New Roman font, 12 pts.
- Double-spaced
- Uneven margin
- Two lines between paragraphs
- Each table on a separate sheet
- Each graph on a separate sheet
- Length of the manuscript ~3000 words



Title page

- Title
 - The title alerts the reader to the topic
 - Creates curiosity
 - Draws the readers to investigate the substance
 - Describes the whole article in one sentence
 - Respect the reader: briefly but clearly explain the content
 - Informative (what, where, when, design)
- Authors and affiliations
- Key words (Medical Subject Headings /MeSH terms)
- Corresponding author
- Financial support
- Conflict of interest



Anemia in pregnancy and its associations with pregnancy outcomes in the Arctic Russian town of Monchegorsk between 1973-2002: a registry-based study

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Running title: Anemia and pregnancy outcomes in Monchegorsk, Russia



Prevalence of stunting, underweight, overweight and obesity in adolescents in Velsk district, north-west Russia:

A cross-sectional study using both international and Russian growth references

Syphilis epidemiology in Norway, 1992-2008:
resurgence among men who have sex with men

Congestion Road Tax and
Physical Activity

Self-reported sexually transmitted infections and their correlates among men who have sex with men in Norway: an Internet-based cross-sectional survey

Deaths of infants subject to forensic autopsy in Estonia from 2001 to 2005: what can we learn from additional information?



Introduction (Background)

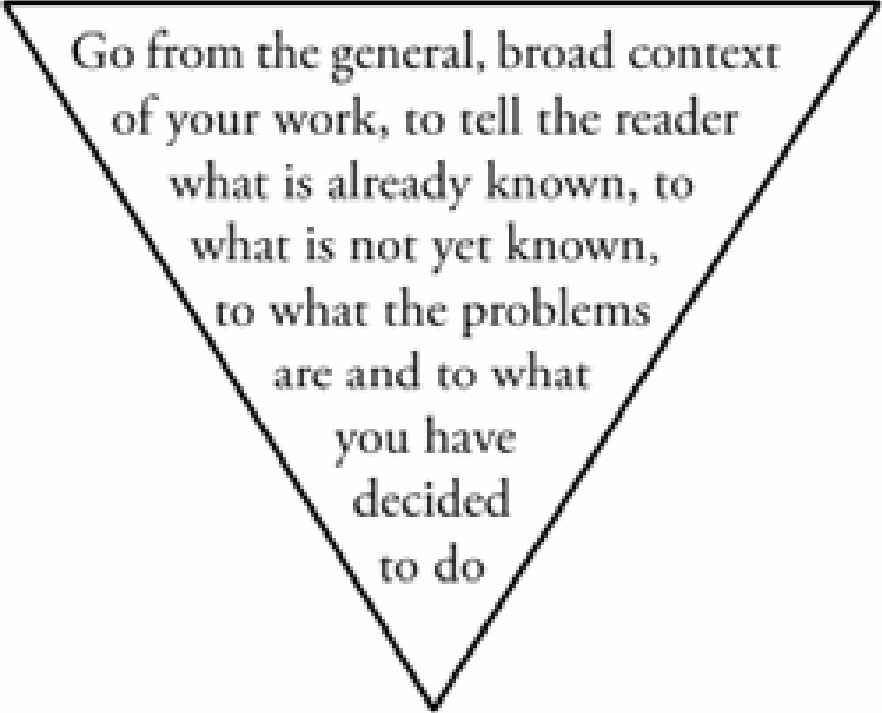
- Lays foundation for the paper
- Should not be a detailed literature review
- Should not be long
- Classic introduction – 4 paragraphs
 - Background information and what is known
 - The importance of the problem and unresolved issues
 - Rationale for the study
 - Finish the introduction by stating the aim of the study (research hypothesis)

SELL YOUR STUDY IN THIS SECTION



Introduction (Background)

- Define the problem
 - Start globally
(observational studies)
 - Summarize what is known
 - Find gaps
 - Suggest how your study
can contribute
 - Finish locally
(observational studies)
 - State aims
-
- How long? No more than
300-600 words



Go from the general, broad context
of your work, to tell the reader
what is already known, to
what is not yet known,
to what the problems
are and to what
you have
decided
to do



Methods

- Describes what was done
- Passive voice, past tense
- Often skipped by most readers, but scrutinized by most reviewers
- Provides enough details for a reader to replicate the study in another setting
- Allows the reader to evaluate the appropriateness of the study design to answer the research question (aims)
- Should not be brief
- Do not write any results here



Methods

- Should be written in a chronological order
- Can be structured as follows:
 - Study design
 - Setting
 - Sample (sample size, sampling procedure, tables and figures allowed)
 - Data collection (sources of data, measurements, instruments, manufacturers)
 - Data presentation
 - Statistical analysis (descriptive statistics, tests, significance level, software)



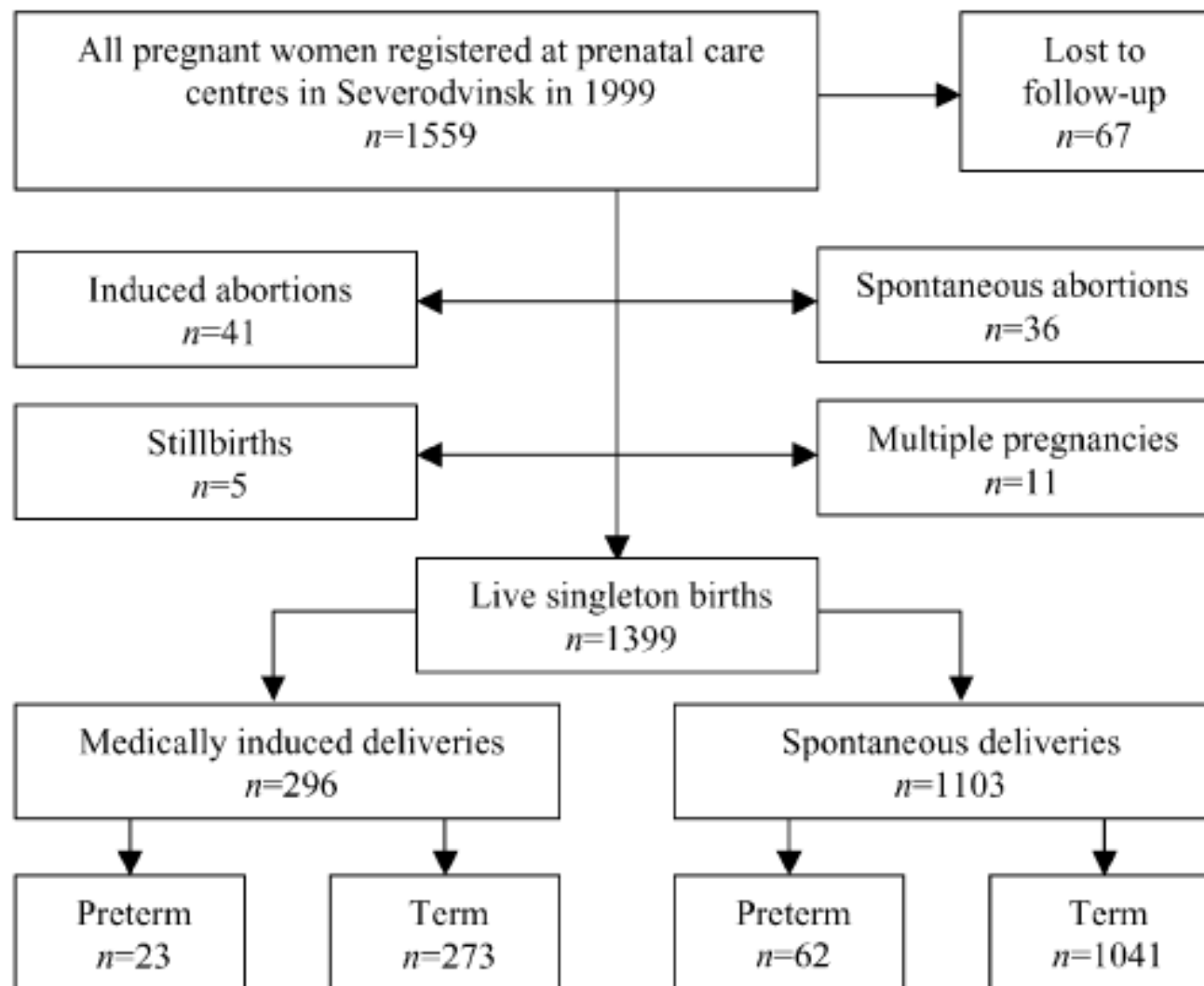


Figure 1 Sampling procedure. Severodvinsk cohort, 1999.



Methods

- Ethical considerations
 - Informed consent
 - Approval from the ethical committee
 - Clinical trial(s) must be registered



Results

- The shortest section (clear and concise)
- Past tense, mostly in passive voice
- Present the findings in the same order as written in the methods section
- Present only those results that are relevant to your research question (even negative ones)
- Do not include irrelevant (although interesting) results
- Negative results should be reported if relevant to the research question
- No duplication of information (tables, figures, text)
- Results of all comparisons should be complemented with p-values
- Confidence intervals are more informative than p-values
- In most journals: No more than 5 tables+figures



Guidelines for reporting studies

<i>Study type</i>	<i>Guideline</i>	<i>Acronym</i>
Randomized trials	Consolidated standards of reporting trials	CONSORT
Meta-analyzes of randomized trials	The quality of reporting of meta-analyzes	QUORUM
Diagnostic studies	The standards for reporting of diagnostic accuracy	STARD
Observational studies in epidemiology	Strengthening the reporting of observational studies in epidemiology	STROBE
Meta-analyzes of observational studies	Meta-analysis of observational studies in epidemiology	MOOSE



Discussion

- The most difficult and often the longest section
- Generally does not contain additional data / results
- Answers the question "so what?"
- What should I write in the Discussion part?
 - State the major findings of the study
 - Explain the meaning of the findings and why they are important
 - Consider alternative explanations of the findings
 - Relate the findings to those of similar studies
 - State clinical relevance of the results
 - Discuss advantages and disadvantages of the study
 - Make suggestions for further research
 - Present conclusions



Discussion: summary of the main findings

- One paragraph
- Summarize only those findings that are relevant to the research questions
- This paragraph should be in line with the aims
- Do not repeat the results (no data)
- Do not claim priority, but emphasize your contribution



Discussion: relate the findings to those of similar studies

- Admit that your study is not novel
- Do additional literature search and evaluation
- Evaluate studies, not authors
- If your results contradict those obtained from other studies – think why
- About half of the references come from this part of the paper
- Discuss reasons for expected and especially unexpected results
- Is often written in both active (about other studies) and passive (about your study) voice



Discussion: critical evaluation of your study

- Present advantages (novelty) of the study
- Present limitations of the study
- What are the main points to discuss?
 - Design (appropriate or not)
 - Sampling procedure (sample size and its representativeness of the general population)
 - Measurements (validity)
 - Analytical techniques (statistics)
 - Generalizability of your results



Conclusions

- A take-home message
- Should not be extended beyond the results of THIS study
- Should not include new ideas, not presented earlier
- Should not contain data
- Can be presented as a separate section in some journals
- Overstepping the data is the most common problem with this section
- Some authors prefer very cautious conclusions
- Some authors suggest further studies in this part
- Conclusions should be an answer to your research question



Acknowledgements

- Who should we thank here?
- Technicians, sponsors, language specialists etc...i.e. all those who contributed to the study, but do not qualify for authorship
- Specify what is each of the mentioned people is thanked for (constructive criticisms, comments, language, assistance in data collection...)
- Grants, financial support, equipment, fellowships...



References

- How many?
- What format (Vancouver / Harvard / ГОСТ-2003(8))?
- Where to find the references?
- Be careful! Do not cite a paper after having read only the abstract



http://www.icmje.org/urm_main.html

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Abstract

- Condensed version of a full academic paper
- Describes rationale for the study, methods, results and conclusions
- 200-300 words
- A "bare bones" information
- Enough "meat" to communicate the message
- Structured vs. Unstructured abstracts
- Why did you start?
- What did you do?
- What did you find?
- What does it mean?



Abstract (Introduction)

- Introduction (background)
- why did you start?
- 1 or 2 sentences (no more than 3)
- Background sentence defining the problem
- Aims of the study (if not a separate part)



Abstract (Introduction)

Abstract

Background: The incidences of reportable sexually transmitted infections (STI) among men who have sex with men (MSM) have increased since the late 1990s in Norway. The objectives of our study were to assess factors, associated with recent selected STI among MSM, living in Norway in order to guide prevention measures.

S U M M A R Y

Objectives: To study the prevalence of stunting, underweight, overweight and obesity among adolescents in a predominantly rural district in north-west Russia, and to assess the agreement between the findings obtained using international and Russian criteria.

Abstract

Background. Hyperemesis gravidarum (HG) is a condition that occurs in the first half of pregnancy, and is manifested by severe vomiting, electrolyte disturbances and weight loss. Previous studies have suggested the potential role of genetic factors in the aetiology of HG. We hypothesise that consanguineous relations between parents increase the risk of HG due to the increased risk of homozygosity in HG-associated alleles in a fetus. Moreover, we examine whether ethnic variations in the occurrence of HG can be attributed to consanguinity. **Methods.** All Norwegian, Pakistani and Turkish primiparous



Abstract (Methods)

- Could well be written before
- What did you do?
- 3-4 sentences
- Concise, omit details
- Design
- Sample
- Setting
- Data collection
- Data analysis



Abstract (Methods)

Methods: We conducted a cross-sectional Internet-based survey during 1-19 October 2007 among members of a MSM-oriented Norwegian website using an anonymous questionnaire on demographics, sexual behaviour, drug and alcohol use, and STI. The studied outcomes were gonorrhoea, syphilis, HIV or Chlamydia infection in the previous 12 months. Associations between self-reported selected STI and their correlates were analysed by multivariable Poisson regression. P value for trend (p-trend), adjusted prevalence ratios (PR) with 95% confidence intervals [] were calculated.

Methods: Body weight and height were measured in 1066 schoolchildren aged 14–17 years, and body mass index values were calculated. The prevalences of stunting, underweight, overweight/obesity and obesity were estimated according to the World Health Organization 2007 (WHO-2007), Centers for Disease Control and Prevention 2000 (CDC-2000), Russian and International Obesity Task Force (IOTF) criteria. Pearson's Chi-squared test and McNemar's test were used to compare categorical data. The agreement between estimates obtained using Russian and international criteria was assessed by Cohen's kappa.

the occurrence of HG can be attributed to consanguinity. **Methods.** All Norwegian, Pakistani and Turkish primiparous women with singleton pregnancies registered in the Norwegian Medical Birth Registry (MBRN) from 1967 to 2005 comprised the sample. Data on HG and potential confounders were obtained from MBRN. Multiple logistic regression was used to study associations between the degrees of relationship between women and their partners and the prevalence of HG. Crude and adjusted odds ratios (OR) with 95% confidence intervals (CI) were calculated. **Results.** The prevalence of



Abstract (Results)

- Main results
- Probably the longest part of the abstract
- Show the numbers
- The structure should correspond to that in the Methods
- Avoid phrases like "the results will be provided"
- Provide the data from which conclusions will be drawn, not all the data
- Provide p-values and confidence intervals
- No tables or figures



Abstract (Results)

Results: Among 2430 eligible 16-74 years old respondents, 184 (8%) reported having had one of the following: syphilis (n = 17), gonorrhoea (n = 35), HIV (n = 42) or Chlamydia (n = 126) diagnosed in the past 12 months. Reporting Chlamydia was associated with non-western background (PR 2.8 [1.4-5.7]), number of lifetime male partners (p-trend < 0.001), unsafe sex under the influence of alcohol (PR 1.8 [1.1-2.9]) and with younger age (p-trend = 0.002). Reporting gonorrhoea was associated with unrevealed background (PR 5.9 [1.3-26.3]), having more than 50 lifetime male partners (PR 4.5 [1.3-15.6]) and more than 5 partners in the past 6 months (PR 3.1 [1.1-8.8]), while mid-range income was protective (PR 0.1 [0.0-0.6]). Reporting HIV was associated with residing in Oslo or Akershus county (PR 2.3 [1.2-4.6]), non-western background (PR 5.4 [1.9-15.3]), unrevealed income (PR 10.4 [1.5-71.4]), number of lifetime male partners (p-trend < 0.001) and being under the influence of selected drugs during sex in the past 12 months (PR 5.2 [2.7-11.4]). In addition, the frequency of feeling drunk was reversibly associated with HIV.

Results: The prevalence of stunting was 3.3%, 5.2% and 4.5% using the WHO-2007, CDC-2000 and Russian criteria, respectively. The prevalence of overweight/obesity was 10.3%, 8.6%, 8.6% and 9.0% as estimated using the WHO-2007, CDC-2000, Russian and IOTF criteria. The corresponding proportions for obesity were 4.7%, 2.6%, 2.3% and 2.0%, and for underweight were 3.6%, 3.1%, 2.3% and 1.8%. The Russian criteria led to lower estimates for the prevalence of overweight/obesity in boys but not in girls. The agreement between the estimates obtained using international and Russian criteria varied between 0.3 and 0.9 in boys and between 0.2 and 1.0 in girls.

Abstract (Conclusions)

- Brief statement of why the study's findings are important
- 1-2 sentences
- Should be based on the results, not on what you think
- Should be supported by the data you presented in the previous section
- Should correspond with the aim of the study (research question / main hypothesis)
- Avoid overstepping the data



Abstract (Conclusion)

Conclusions: Our study demonstrates different associations of demographic and behavioural factors with different STI outcomes in the study population. Number of lifetime male partners was the most important potential predictor for Chlamydia and HIV. The STI prevention efforts among MSM should focus on Oslo and Akershus, promote safe sex practices and tackle sex-related drug and alcohol use.

Conclusions: The prevalence of stunting was higher in the study population than in most European countries, whereas the prevalences of underweight, overweight/obesity and obesity were lower. The choice of reference population considerably influences the prevalence estimates. Moreover, the agreement between the estimates varies by gender.

Conclusions. Consanguinity was not associated with HG in this study. The differences in the occurrence of HG between Norwegian, Pakistani and Turkish women are not attributed to consanguinity.

