



Pan American
Health
Organization



World Health
Organization

Regional Office for the Americas

*PAHO/WHO
Methodologies for
Information Sharing
and Knowledge
Management in
Health*

6. HOW TO IMPROVE SCIENTIFIC WRITING IN PUBLIC HEALTH

The main purpose of a scientific text is to transmit technical and scientific information in a clear, accurate, concise and simple way, using the proper level for the intended audience.

Title	How to improve scientific writing in public health
Version	1, May 22 th , 2015
Definition	It means to put scientific or technical information in writing in order to disseminate the results of a research, a trial, a survey or any other source related to the public health field.
Objective	To transmit scientific or technical information in an effective way and as clearly, precisely and concisely as possible.
Expected results	Production of scientifically and linguistically correct texts with the intended communicative effect.
Premises	<ul style="list-style-type: none">• Technical standards: the text should comply with international scientific or technical standards of scientific language production, regardless of the language of the writing.• Linguistic norms: the text should comply with the standards of the language in which it is written.• Standard use in a particular specialty field: the text should be written according to the accepted educated “use” of a language for a specific scientific field.• Suitable for the reader: the text should be adapted to the comprehension level of the main intended audience.

Procedure

Phase I

Design

This phase should define the scope of the text, sections, main audience, length, main topics and sources of information to be used.

Define the name or title: the title should be clear, short and indicative of the content. It should present the key information of the text in a direct way to encourage reading.

→ *The title should be short (no more than 12 words), and all the words should be meaningful.*

Define whether the text will include an abstract: the abstract should be clear, precise, informative and representative of the text. It should be autonomous and should not include bibliographic quotes or references to charts or figures.

→ *The title and the abstract are key sections of a document. Many times, they are the only sections most readers will read. It is advisable to write them at the end, once the main text has been finished.*

→ *Showing the title and the summary to peers, or even to people outside the field of knowledge, may help to detect lack of clarity.*

Determine the length of the text: this should be proportional to the information to be provided and the space available according to the publication format (press release, technical report, scientific article, data sheet, etc.). As a general rule, the scientific text should be informative, but as short as possible.

→ *"Brevity is the soul of wit".*

Determine the technical scope of the text (degree of depth or complexity): before starting to write, the degree of detail and the terminology to be used should be determined according to the main audience of the text.

→ *Depending on the audience, a too simple text is as bad as a too complex one.*

Determine the main medium of the text: the medium may determine the length of the text and the place of key paragraphs or elements within the text, since reading from paper follow a different pattern than reading from versus screens. Typically, texts to be read on screen, particularly in the case of mobile devices, should be shorter.

→ *Place key elements or concepts of the text to be published on the internet at the beginning of the document, where they will be more visible.*

Determine the key concepts you will include and a convenient order of presentation.

Identify bibliographic references: this is a significant section since a scientific text should be endorsed by relevant scientific evidence readily accessible for the reader.

Determine which and how many references you will include; there is an advisable number for each type of text. Preferably, cite primary references instead of secondary sources (articles or documents which, in turn, cite primary references).

→ *References should be updated, relevant and significant for the text.*

Phase II

Writing

During this phase the text is written and arranged.

Determine whether the text has technical vocabulary that should be used according to a scientific standard: living organisms, such as viruses and animals, should be designated according to the Classification of living things (e.g., *Canisfamiliaris*) or by their common name (e.g., dog), as appropriate. The taxonomic name should be written with an initial capital letter in the proper word and, in general, in italics. Common names should not be capitalized.

→ *Scientific language is based on international standards, regardless of the language in which it is written.*

If the text mentions a disease, the correct name should be used, preferably that included in the *International Classification of Diseases*.

→ *Common names of diseases are not capitalized.*

Pharmaceutical substances should be written with an initial lowercase letter and their names should be in agreement with the International Nonproprietary Name (generic name). Occasionally, trade names may be used and it should be written with an initial capital letter. The use of the registered trademark symbol (®, TM) is optional.

Write figures and units in compliance with the International System of Units. Avoid using units not included in it (inches, yards, feet, gallons, miles, etc.). Decimals are

separated by a dot (or comma). Most Spanish-speaking countries frequently use the decimal comma.

→ *Write 12 543 instead of 12543, 12.543 or 12,543.*

Write units with an initial lowercase letter (with some exceptions), without using a dot or an “s” even in the case of plurals.

→ *Write 1 kg and 25 kg, instead of Kg, kg., or kgs.*

→ *Write 25 °C, instead of 25°C or 25º C.*

Produce a linguistically correct text: apart from the technical correctness, the text should comply with some basic style rules so that it reads smoothly and easily.

Be consistent in the use of terms. In general, it is advisable to avoid using synonyms. When a synonym is necessary, use it at the beginning of the text and then employ always the same term.

Avoid using jargon typical of a reduced number of people, or localisms understood only in a particular area.

Limit the use of acronyms to the minimum (in general, to replace very long and repeated expressions), and remember to use the terms in full when they are introduced, except for those universal and well-known acronyms.

Use the official acronyms of the language in which the text is written, if available. Otherwise, use the acronym in its original language.

→ *Remember: In Spanish you should use interrogation and exclamation marks at the beginning and at the end of the sentence/phrase!*

Final closing marks include a full stop; therefore, it is not necessary to use an additional one.

Use politically correct and inclusive language, avoiding excess words that burden the reading (e.g., continuous repetition of “boys and girls”, or, in the case of Spanish: “niñ@s” o “niños/as”). A long document may also include a footnote explaining the meaning of a particular term at the beginning.

→ *If the document include charts, figures or graphs, remember to number and cite them in the right place of the text.*

In English, every noun and adjective of the title should be written in capital letters. In Spanish, only the first word of the title should be capitalized.

Phase III

Revision

In this phase the text is revised in order to guarantee most clarity and precision.

Revise the document before publishing or forwarding the final version, but remember that it is also advisable to ask someone outside that field of knowledge to review it. A “fresh and uncontaminated” look may contribute valuable corrections or suggestions.

When making the revision, be clear about what “you want to correct” and what “you do not want to correct”. Sometimes, trying to produce a “perfect” text may be counterproductive. Corrections lead to the possibility of introducing new mistakes, particularly when time is limited.

→ *“Perfect is the enemy of good”.*

Before making a correction, particularly if it is not absolutely necessary, bear in mind the effort and time it will require and remember that corrections in the main text may require corrections in charts, figures, annexes and other material.

Word’s “Find and Replace” function is extremely useful but should be used with caution, particularly when using the command “Replace all”. You may carry out a trial replace to obtain more information. Doubt when the number of replacements exceeds the reasonable number; you may be making undesirable replacements. Explore the “More”, “Format” and “Special” buttons; you will find very useful functions to make safer replacements.

→ *Check “Find whole words only” and “Match case” to avoid unwanted changes in the middle of correct words.*

Useful resources

Practical and simple resources for correct writing.

→ *"Doubt is the mother of discovery".* Ambrose Bierce

Scientific writing

Mednet. International Nonproprietary Names for pharmaceutical substances →

This site, maintained by the World Health Organization, provides official names for drugs (generic names, INN, international nonproprietary name) in English, Spanish, French, Chinese and Russian, as well as biochemical information.

International Classification of Diseases and health-related problems, 10th revision.

Washington DC: Pan American Health Organization; 2008.

The ICD-10 (CIE-10 in Spanish) is the international standard diagnostic classification for epidemiology, health management and clinical purposes.

International System of Units →

Names and acronyms of the units of the metric system, required for scientific writing in any language.

Antonio Esteve Foundation →

Foundation devoted to promote good scientific writing. The website offers several resources, including free download to monographs such as: Glosario de investigación clínica y epidemiología; Medicina y medios de comunicación; Traducción y lenguaje en medicina; Scientific journalism; El periodismo biomédico en la era 2.0; Competing interests in biomedical publications; La información científica en los telediarios españoles; La redacción médica como profesión; Redacción científica en biomedicina: lo que hay que saber; Cómo elaborar folletos de salud destinados a los pacientes; La ciencia en los medios de comunicación; One-day meeting on biomedical journalism; Debates on scientific journalism.

Real Academia Nacional de Medicina. Dictionary of Medical Terms. Madrid: Editorial

Médica Panamericana; 2012 →

Paper and electronic dictionary, the latter includes a versatile search engine. Letter A can be consulted for free as a trial.

Dicciomed →

Bio-medical, history and etymology dictionary of the Universidad de Salamanca in Spain; useful to solve specific doubts on scientific terms.

Cosnautas →

Web site including professional resources for medical translation and writing, including the electronic version of the “Diccionario de dudas y dificultades de traducción del inglés médico” by F. Navarro. The acronyms’ dictionary is free, but requires registration.

Elaboration of scientific articles

Day R y Gastel B. How to write and publish a scientific paper. Washington DC: Pan American Health Organization; 2008.

An enjoyable book, full of practical advice on how to write scientific articles. A classic work whose third edition is freely available for download at [➔](#).

International Committee of Medical Journals Editors [➔](#)

Practical examples on how to cite scientific articles, books and other sources.

International Committee of Medical Journal Editors [➔](#)

This site contains useful information on authorship, bibliographic references, conflict of interest in publications, peer review processes, copyright, manuscript preparation, etc.

Health Science Descriptors (DeCS) [➔](#)

Virtual Health Library’s keyword thesaurus in Spanish, English and Portuguese.

Medical Subject Headings (MeSH) [➔](#)

U.S. National Library of Medicine’s keyword thesaurus in English.

Council of Science Editors [➔](#)

The Reference links section contains links to many useful resources for scientific writing.

Equator Network [➔](#)

International initiative promoting the use of guidelines for reporting scientific research results.

Public Health

Pan American Journal of Public Health [➔](#)

A free-access, peer-reviewed multilingual (English, Portuguese and Spanish) scientific journal published by the Pan American Health Organization, indexed in the most important bibliographical databases.

Bulletin of the World Health Organization [➔](#)

Multilingual scientific journal published by the World Health Organization which maintains an open-access policy and is peer-reviewed and indexed in the most important bibliographic scientific databases.

Scientific Library on Line (SciELO) →

Collection of public health journals from SciELO.

Pan American Health Organization →

Pan American Health Organization website.

World Health Organization →

World Health Organization website.

Professional Associations in the field of scientific writing

Tremédica. International Association of Translators and Editors in Medicine and Applied Sciences →

European Medical Writers Association →

American Medical Writers Association →

Professional associations in the field of scientific communication.

Spanish Language

Real Academia Española. Diccionario de la Real Academia Española →

Real Academia Española. Diccionario panhispánico de dudas →

Real Academia Española. Diccionario esencial del español →

Official main reference resources in Spanish language.

Diccionario inverso de la Real Academia Española (DIRAE) →

It is a tool to search inside definitions of the academic dictionary; it is useful for learning about the use in context of general terms.

Fundéu BBVA →

Recommendations, consultations, news and frequent doubts in Spanish language.