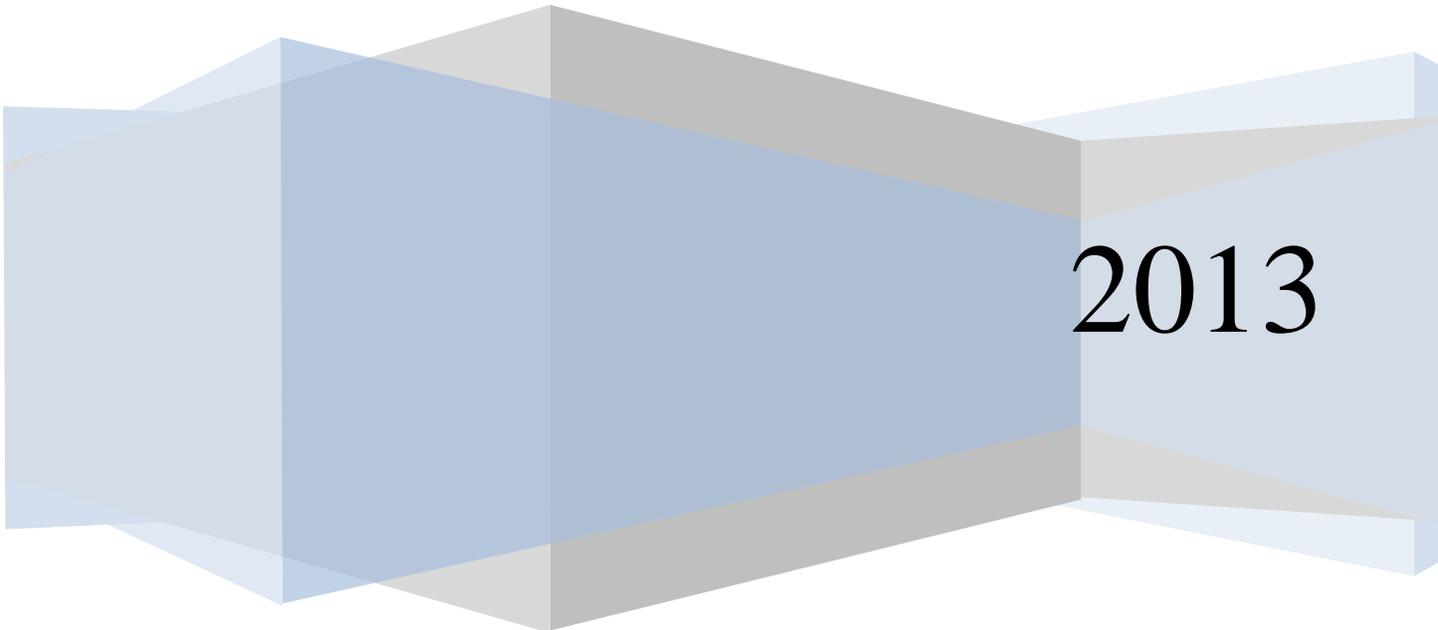


Emerging Infectious Diseases journal

# Editorial Style Guide

Version 3.6

Updated June 11, 2013



2013

## Emerging Infectious Diseases Editorial Style Guide

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## **Types of Articles**

### **Perspectives**

Articles should not exceed 3,500 words in the main body of the text or include more than 40 references. Use of subheadings in the main body of the text is recommended. Photographs and illustrations are encouraged. Provide a short abstract (not to exceed 150 words), a 1-sentence summary of the conclusions, and a brief biographical sketch of first author or of both authors if only 2 authors. Articles in this section should provide insightful analysis and commentary about new and reemerging infectious diseases and related issues. Perspectives may also address factors known to influence the emergence of diseases, including microbial adaptation and change, human demographics and behavior, technology and industry, economic development and land use, international travel and commerce, and the breakdown of public health measures. If detailed methods are included, a separate section on experimental procedures should immediately follow the body of the text.

### **Synopses**

Articles should not exceed 3,500 words in the main body of the text or include more than 40 references. Use of subheadings in the main body of the text is recommended. Photographs and illustrations are encouraged. Provide a short abstract (not to exceed 150 words), a 1-line summary of the conclusions, and a brief biographical sketch of first author or of both authors if only 2 authors. This section comprises concise reviews of infectious diseases or closely related topics. Preference is given to reviews of new and emerging diseases; however, timely updates of other diseases or topics are also welcome. If detailed methods are included, a separate section on experimental procedures should immediately follow the body of the text.

### **Research**

Articles should not exceed 3,500 words in the main body of the text or include more than 40 references. Use of subheadings in the main body of the text is recommended. Illustrations are encouraged. Provide a short abstract (not to exceed 150 words), a 1-sentence summary of the conclusions, and a brief biographical sketch of first author or of both authors if only 2 authors. Report laboratory and epidemiologic results within a public health perspective. Explain the value of the research in public health terms and place the findings in a larger perspective (i.e., “Here is what we found, and here is what the findings mean”).

Articles describing mathematical, economic, or statistical studies have some additional restrictions because readers of Emerging Infectious Diseases may not necessarily have extensive training in these areas. With the increase in submissions of these types of articles, we have developed the following editorial criteria to screen submitted papers.

Table. Editorial criteria for mathematical, economic, and statistical papers

<p>Overall content:</p> <ul style="list-style-type: none"><li>• Must provide information that our audience (public health officials) is likely to find of “immediate and practical” value.</li><li>• Must reflect the realities of public health.*</li></ul> <p>Writing style</p> <ul style="list-style-type: none"><li>• Should be written in a style most likely to appeal to most of our intended audience.</li><li>• In the main text, equations should be kept to a minimum, and those that are presented should preferably be written out in words rather than mathematical notation.</li><li>• Mathematical, economic, and statistical jargon should be eliminated or used sparingly.</li><li>• In the main text, and in diagrams and tables associated with the main text, mathematical notations should be kept to a minimum.</li></ul> <p>Technical aspects</p> <ul style="list-style-type: none"><li>• Where possible, mathematical, economic, and statistical articles should include a simple schematic diagram outlining the elements in the model(s) and how they are connected.</li><li>• Models should contain detailed sensitivity analyses. Univariate (1 variable at a time) sensitivity analyses are generally considered inadequate. One goal of sensitivity analyses should be to define which inputs are, within the model, relatively most important.</li><li>• All articles should contain sufficient description of the methods to allow independent replication of results by another researcher with suitable skills and interest.</li><li>• Papers should contain a Table 1 which lists all the inputs, the values and ranges, and identifies data sources.</li><li>• Figures should be as simple as possible. The use of color should be kept to a minimum.</li><li>• It is insufficient to only report p values as evidence of statistical significance. Authors must also report some measure of dispersion (e.g., standard deviations, confidence intervals).</li><li>• For statistical models, a table of results should provide the results of all the variables used in the model, the statistical significance of each variable, and a measure of goodness-of-fit of the entire model.</li></ul> <p>*Public health officials have to be practical. Purely conceptual modeling papers, for example, are unlikely to be of immediate and practical value to our intended audience.</p>
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## Policy and Historical Reviews

Articles should not exceed 3,500 words in the main body of the text or include more than 40 references. Use of subheadings in the main body of the text is recommended. Photographs and illustrations are encouraged. Provide a short abstract (not to exceed 150 words), a 1-line summary of the conclusions, and a brief biographical sketch of first author— or of both authors if only 2 authors. Articles in this section include public health policy discussions or historical reports based on research and analysis of emerging disease issues.

## Dispatches

Articles should not exceed 1,200 words in the main body of the text and need not be divided into sections. If subheadings are used, they should be general (e.g., “The Study” and “Conclusions”) may help orient the reader and are encouraged. Provide a brief abstract (not to exceed 50 words), references (not to exceed 15), figures or illustrations (no more than 2), tables (not to exceed 2), and a brief biographical sketch of first author or of both authors if only 2 authors. Dispatches are updates on infectious disease trends and research. The articles include descriptions of new

methods for detecting, characterizing, or subtyping new or reemerging pathogens. Developments in antimicrobial drugs, vaccines, or infectious disease prevention or elimination programs are appropriate. Case reports are also welcome.

### **Photo Quiz**

The photo quiz (1,200 words) highlights a person who made notable contributions to public health and medicine. Provide a photo of the subject, a brief clue to the person's identity, and 5 possible answers, followed by an essay describing the person's life and his or her significance to public health, science, and infectious disease.

### **Commentaries**

Thoughtful discussions (500–1,000 words) of current topics. Commentaries may contain references but no abstract, figures, or tables. Include a brief biographical sketch of the first author or of both authors if only 2 authors. Commentaries are typically invited by the editorial board and address current journal content.

### **Another Dimension**

Thoughtful essays, short stories, or poems on philosophical issues related to science, medical practice, and human health. They should not exceed 3,500 words in the main body of the text and should include references, if necessary. Topics may include science and the human condition, the unanticipated side of epidemic investigations, or how people perceive and cope with infection and illness. This section is intended to invoke compassion for human suffering and to expand the science reader's literary scope. Manuscripts are selected for publication as much for their content (the experiences they describe) as for their literary merit. Include biographical sketch or the first author or of both authors if only 2 authors.

### **Letters**

Letters commenting on recent articles as well as letters reporting cases, outbreaks, or original research are welcome. All letters should contain material not previously published. No biographical sketch is needed.

### **Letters Commenting on Articles**

These letters should contain no more than 300 words and 5 references; they are more likely to be published if submitted within 4 weeks of the original article's publication.

### **Letters Reporting Cases, Outbreaks, or Original Research**

These letters should contain no more than 800 words and 10 references. They may have either 1 figure or 1 table if it is necessary to understand the content; letters should not be divided into sections. No biographical sketch is needed.

## Books, Other Media Reviews

Reviews (250–500 words) of recently published books or other media on emerging disease issues are welcome. Title, author(s), publisher, number of pages, and other pertinent details should be included, as well as price and ISBN number (when applicable).

## Conference Summaries

Summaries of emerging infectious disease conference activities (500–1,000 words) are published online only. They should be submitted no later than 6 months after the conference and focus on content rather than process. Provide illustrations, references, and links to full reports of conference activities.

## Online Reports

Reports may be published online only on consensus group meetings, workshops, and other activities in which suggestions for diagnostic, treatment, or reporting methods related to infectious disease topics are formulated. These should not exceed 3,500 words and should be authored by the group. EID journal does not publish official guidelines or policy recommendations. Submit an abstract (100 words), which will be published in print as well as online.

## Etymologia

We welcome thoroughly researched derivations of emerging disease terms. Historical and other context could be included. Submissions are limited to 100 words and 5 references.

## Announcements

Submit announcements to [eideditor@cdc.gov](mailto:eideditor@cdc.gov). In 50–150 words, describe timely events of interest to our readers. Include the date of the event, the location, the sponsoring organization(s), and a website that readers may visit or a telephone number or email address that readers may contact for more information. Announcements may be posted on the journal website only, depending on the event date.

Table. Summary of EID article types and requirements\*

Article type	Word limit (main body of text)	Word limit (abstract)	References limit	Figures and tables
Perspective	3,500	150	40	As appropriate
Synopsis	3,500	150	40	As appropriate
Research	3,500	150	40	As appropriate
Policy and historical	3,500	150	40	As appropriate

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reviews					
Dispatch	1,200	50	15	2 figures and 2 tables	
Photo quiz	1,200	NA	15	1	
Commentary	1,000	NA	15	0	
Another Dimension	3,500	NA	40	As appropriate	
Letter (comment on article)	300	NA	5	0	
Letters reporting cases, outbreaks, or original research	800	NA	10	1 figure or 1 table	
Book or other media review	500	NA	0	0	
Etymologia	100	NA	5	0	
Announcements	150	NA	0	0	
Conference summaries	1,000	NA	As appropriate	As appropriate	
Online reports on consensus group meetings and workshops	3,500	100	As appropriate	As appropriate	

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\*NA, not applicable.

## Manuscript Submission

To submit a manuscript, assess Manuscript Central from the Emerging Infectious Diseases website [Author Resource Center](http://wwwnc.cdc.gov/eid/pages/author-resource-center.htm) (<http://wwwnc.cdc.gov/eid/pages/author-resource-center.htm>). Include a cover letter indicating the proposed category of the article (e.g., Research, Dispatch), verifying the word and reference counts and confirming that the final manuscript has been seen and approved by all authors. Complete provided Authors Checklist. Manuscripts (initial submissions as well as revisions) submitted by email will be returned.

## Manuscript Preparation

### Editorial Policy

For information about editorial policy, visit [http://www.cdc.gov/ncidod/eid/about/ed\\_policy.htm](http://www.cdc.gov/ncidod/eid/about/ed_policy.htm)

### Word Processing

For word processing, use Microsoft Word. The font should be 12 pt. Times New Roman; the document should be double-spaced and left justified. Use 1 space rather than 2 spaces after a period. See the Typeface section for additional information.

## **Parts of a Manuscript**

Each manuscript should contain each of the following elements, in the following order.

### **Title Page**

Give complete information about each author (i.e., full name, graduate degree(s), affiliation, and the name of the institution in which the work was done. Clearly identify the corresponding author and provide that author's mailing address (include phone number, fax number, and email address). Include separate word counts for abstract and text.

### **Article Summary Line**

For perspectives, synopses, policy reviews, and research studies, include a clear, brief 1-sentence summary of the article's conclusions; the summary will appear on the print table of contents. This sentence should highlight the bottom-line public health implications of the article and should be pithy, readable, and designed to entice someone to read the full article.

### **Running Title**

A running title that will appear on the top of each right-hand print page and along top of the online browser window. The running title should be no more than 50 characters long, including spaces. Some common abbreviations (*E. coli*) and acronyms (MRSA, MDR TB, XDR TB) are allowed in running titles, but less familiar terms should be written out within the character limit.

### **Keywords**

Include appropriate keywords (no limit); use terms listed in the National Library of Medicine Medical Subject Headings index ([www.ncbi.nlm.nih.gov/mesh](http://www.ncbi.nlm.nih.gov/mesh)). Do not use formatting (boldface or italics) in keywords (note that they are only used for indexing and are not visible to readers).

### **Title**

The title should be brief, concise, and call attention to the main point of the article. With a few exceptions, abbreviations and acronyms must be written out in full in titles but numbers can be given as digits rather than spelled out. EID does not use subtitles in titles or titles that are sentences.

### **Authors**

Give complete information about each author (i.e., full name, affiliation, and the name of the institution where the work was done). Provide, at minimum, first and last names of each author.

Middle names or initials and academic degrees are optional, although academic degrees will not appear in the published article. (Note: use periods, but no spaces, between initials.)

Use the following format:

Dana C. Crawford, Shanta M. Zimmer, Craig A. Morin, Nancy E. Messonnier, Ruth Lynfield, Qian Yi, Cynthia Shephard, Michelle Wong, Mark J. Rieder, Robert J. Livingston, Deborah A. Nickerson, Cynthia G. Whitney, and Jairam Lingappa

If 2 or more authors contributed equally to an article, this contribution may be acknowledged with a footnote that states “These authors contributed equally to this article.” However, a biographical sketch will be printed for only the first author (unless the article has only 2 authors).

### **Affiliations**

Authors may list multiple affiliations, but provide only the overall institutional affiliation for each, not departments or other subunits. Identify city, state or province (for USA, Canada, Australia only), and country.

Incorrect: National Immunization Program, Coordinating Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, USA

Correct: Centers for Disease Control and Prevention, Atlanta, Georgia, USA

Incorrect: Department of Epidemiology and Biostatistics, School of Public Health, University of North Carolina, Chapel Hill, North Carolina, USA

Correct: University of North Carolina, Chapel Hill, North Carolina, USA

Author’s full initials and last name will appear after their respective institutions.

Centers for Disease Control and Prevention, Atlanta, Georgia, USA (J. Doe, A.-E. Smith); and University of North Carolina, Chapel Hill, North Carolina, USA (J. Doe, B. Jones)

Use heading of “Author affiliations:” (>1 affiliation) or “Author affiliation” (1 only). No possessive (i.e., not Authors’).

Drop redundant material after first mention, unless something changes after city.

Author affiliation: Centers for Disease Control and Prevention, Atlanta, Georgia, USA; Emory University, Atlanta

Author affiliations: University of Massachusetts, Amherst, Massachusetts, USA; EviMed Research Group, LLC, Goshen, Massachusetts, USA

Author affiliations: Columbia University, New York, New York, USA; The Consortium for Conservation Medicine, New York; University of California, Santa Cruz, California, USA; New York State Department of Health, Slingerlands, New York, USA

## Emerging Infectious Diseases Editorial Style Guide

Author affiliations: Queensland Health, Brisbane, Queensland, Australia; University of Queensland, Brisbane; Auckland University of Technology, Auckland, New Zealand; OzFoodNet, Canberra, Australian Capital Territory, Australia; OzFoodNet, Wallsend, New South Wales, Australia; and Australian National University, Canberra

When all authors have 2 affiliations, and those affiliations are the same it is acceptable to format as:

Author affiliations: Grady Memorial Hospital, Atlanta, Georgia, USA; and Emory University, Atlanta.

Universities with multiple campuses:

Write campus (city) location as city, so it appears only once.

Incorrect: University of California, Los Angeles, Los Angeles, California, USA

Correct: University of California, Los Angeles, California, USA

Names of institutions (including geographic designations that are part of the name) need not be translated into English. However, the city, state or province, and country listed in the affiliation should be given as the common English preferred designation in the Getty Thesaurus of Geographic Names.

Incorrect: Università degli Studi di Firenze, Firenze, Italia

Correct: Università degli Studi di Firenze, Florence, Italy

Institut Pasteur (Pasteur Institute in English) should list the city separately, not as part of the name.

Incorrect: Institut Pasteur de Morocco, Casablanca, Morocco

Correct: Institut Pasteur, Casablanca, Morocco

Countries: Abbreviate USA and UK within affiliations in all cases. Include the state, territory, or province only for the USA, Canada, and Australia. Do not list the country for cities in England (only UK); do specify Wales, Scotland, or Northern Ireland for cities in these countries.

List China as China. For Taiwan, it is up to the author's discretion whether or not to use "Republic of China."

On second mention within affiliations, abbreviate DRC (Democratic Republic of the Congo)

List Hong Kong as Hong Kong, China, at first mention, then just Hong Kong at subsequent mention. Special Administrative Region is not the preferred usage, according to Getty.

Mention Singapore (city/country) only once.

According to Australia's postal conventions, the suburb, not the city, is used in an address.

Organizations in author list: If the author list on an article includes an organization and a membership list is given, follow this process:

1. Insert a superscript footnote number after the organization name.
2. Insert a footnote after the affiliations in this format: “Additional members of [group name] who contributed data are listed at the end of this article.” If no members are listed separately as authors, delete “additional”; “who contributed data” can also be deleted if appropriate, such as when all group members are listed.
3. Place the member list directly after the text of the article, formatted using the Acknowledgments style. If there is an Acknowledgments header, then this paragraph should go before the header (not under it).
4. Use the same wording as the footnote as an introduction before the list: “Additional members of [group name] who contributed data:”
5. If locations are given, list name first, then location in parentheses. That is, “S.N. O’Connor (United States),” not “United States: S.N. O’Connor.”

## **Abstract**

An abstract is a brief, comprehensive summary of the contents of the article; it allows readers to survey the contents of an article quickly, and like a title, it enables abstracting and information services to index and retrieve articles. An abstract should briefly summarize the research question and any relevant background information, methods, results, and conclusions. Avoid vague or promising phrases such as “...implications of these findings are discussed;” instead, state public health implications of the results.

Do not use structured abstracts (i.e., subheadings). Do not cite references in the abstract. Abstracts for perspectives, synopses, policy reviews, and research studies should not exceed 150 words. Abstracts for dispatches should not exceed 50 words. Letters, book reviews, and conference summaries do not have abstracts.

## **Text**

Keep formatting simple. Use 12-point Times New Roman font with ragged right margins (left justified). Double space everything, including the title page, abstract, references, tables, and figure legends. Indent paragraphs; leave no extra space between paragraphs. After a period, leave only 1 space before beginning the next sentence. Italicize (rather than underline) scientific names when needed.

## **Acknowledgments**

Full names only, not titles (e.g., Doctor, Professor) and affiliations, are listed for persons acknowledged. Acknowledgments for materials supplied belong as a parenthetical citation in the text where materials are mentioned.

## Disclaimers

A disclaimer is placed on the inside front cover of the published journal and used periodically throughout the publication. It states, “The opinions expressed by authors contributing to this journal do not necessarily reflect the opinions of the Centers for Disease Control and Prevention or the institutions with which the authors are affiliated.” Additional disclaimers are discouraged.

## Biographical Sketch

For all article types, excluding letters, media reviews, and conference summaries, include a short (2–3 sentences) biographical sketch of only the first author or of both authors if only 2 authors. Include current position and affiliations (city but not state and country if same as in author affiliation list) and primary research interests.

## References

Follow [Uniform Requirements](http://www.icmje.org/index.html) style ([www.icmje.org/index.html](http://www.icmje.org/index.html)). Do not use endnotes for references. Place reference numbers in parentheses (do not use superscript style), and italicize numbers. Number citations in order of appearance, including references in figures and tables. If a reference is used in a figure key or label or in a figure legend, it should be numbered in order with any reference numbers that have preceded the first figure citation in text. For example, if references 1–10 have been cited in text, and the figure contains a previously uncited reference, that reference should be numbered as 11 (and text reference citations renumbered accordingly).

Consult [List of Journals Indexed in Index Medicus](#) for accepted journal abbreviations; if a journal is not listed, spell out the journal title in full. List the first 6 authors followed by “et al.” For juniors and subsequent sequels, include the designation (with no punctuation) after the first initial: “von Hoffman J Jr” or “Snowden CM III.” When there are >6 individual authors and a working group, list the first 6 authors, followed by et al., then the group.

Doe, Smith, Jones, Lane, Carter, James, et al.; The XYZ Working Group.

For organizations as author, spell out the full name of the organization (World Health Organization, not WHO) if it is the author, or just give the title with no author. Never use “Anonymous” or “No author given.”

For publisher location, place US states or country names in parentheses.

Adelaide (Australia): Adelaide University

Ames (IA): Iowa University Press

Cite personal communications and unpublished data (including manuscripts in preparation or submitted for publication but not yet accepted) in parentheses in text:

(D.E. Berg, pers. comm.)

(D. Stantio, unpub. data)

Articles in press (accepted for publication but not yet published) should include publication name and current year (no comma).

Authors. Article name. Publication name. In press 2008.

The following cities should be used without the state or country name when listed in references, meeting, or publisher locations (e.g., New York: John Wiley & Sons). Provide state or country name in text for manufacturer locations (e.g., Fisher Scientific, Pittsburgh, PA, USA)

Atlanta	Cincinnati	Madrid	Pittsburgh
Amsterdam	Cleveland	Mexico City	Prague
Baltimore	Copenhagen	Miami	Rome
Basel	Dallas	Milan	San Francisco
Beijing	Denver	Minneapolis	Seattle
Belgrade	Detroit	Montreal	St. Louis
Berlin	Dublin	Moscow	Stockholm
Bonn	Edinburgh	Munich	Tokyo
Boston	Frankfurt	Naples	Toronto
Brussels	Geneva	New Orleans	Turin
Budapest	Houston	New York	Uppsala
Buenos Aires	Kiev	Oslo	Vienna
Cairo	Leningrad	Oxford	Warsaw
Cambridge*	London	Paris	Washington
Chicago	Los Angeles	Philadelphia	Zurich

\*Cambridge, Massachusetts, should be listed with the state.

## Abstracts

Abstracts can be cited in the references. If the abstract has only a number, cite the name of the booklet (e.g., Program and Abstracts).

Galil K, Singleton R, Levine O, Fitzgerald M, Ajello G, Bulkow L, et al. High prevalence of *Haemophilus influenzae* type b (Hib) carriage among Alaska Natives despite widespread use of Hib-conjugate vaccine. In: Abstracts of the 35th Infectious Diseases Society of America; San Francisco; 1997 Sep 13–16; Abstract 421. Alexandria (VA): Infectious Diseases Society of America; 1997.

## Dissertations, Theses

Dissertations can be used as references; theses cannot. Cite theses in the text, giving all information that would normally be included in a reference. International variations in terminology occur; the primary distinction is whether or not the work is published.

## **Electronic Citations**

If a URL is provided, it is not necessary to say “Available from.” The URL alone is sufficient. Do not give a URL for articles that have a Medline link. Include the date cited for each URL listed in references. Use the URL for the specific page where information can be found, not to the main page of the website.

Wikipedia information should be cited in text (see [www.wikipedia.org/wiki/...](http://www.wikipedia.org/wiki/...)), not as a numbered reference.

Below are some examples of references that may not be listed in Uniform Requirements.

## **Electronic Journal Citations**

Ben Amor Y, Nemser B, Sing A, Sankin A, Schluger N. Underreported threat of multidrug-resistant tuberculosis in Africa. *Emerg Infect Dis* [Internet]. 2008 Sep [date cited]. <http://www.cdc.gov/EID/content/14/9/1345.htm>

Note: If the citation references an e-published ahead of print article, do not update the reference. The reference needs to reflect the source used at the time the reference was cited.

## **Other Electronic Citations**

World Health Organization. Outbreak encephalitis 2005: cases of Japanese encephalitis in Gorakhpur, Uttar Pradesh, India. 2005 Oct 21 [cited 2006 Jul 11]. <http://w3.who.org/en/Section1226/Section2073.asp>

## **ProMed Citations**

Lipkin I. West Nile-like virus: PCR primers and protocols. *ProMed*. 1999 Oct 13. <http://www.promedmail.org>, archive no. 19991013.1826.

## **Foreign Language Citations**

References published in a foreign language but translated into English should indicate the original language in brackets, after the article title.

Pablos-Mendez A, Lessnau K. Clinical mismanagement and other factors producing antituberculosis drug resistance [in Dutch]. *Journal name*;2000:159–76.

References that appear in a foreign language should be translated into English, if possible.

## **Address for Correspondence**

Clearly identify the corresponding author and provide that author’s mailing address, including phone number, fax number, and email address.

(The phone and fax number will not be published.) Only 1 author may be designated as corresponding, and only 1 address may be published for that author (i.e., corresponding author may not list 2 email addresses). Use American form of country names.

Mexico, not México

Peru, not Péru

Brazil, not Brasil

For CDC addresses, list CDC only (spelled out); provide mailstop; include NE after Clifton Road.

John Doe, Centers for Disease Control and Prevention, 1600 Clifton Rd NE, Mailstop X55, Atlanta, GA 30333, USA

## **Tables**

Provide tables within the manuscript file, not as separate files. Use the MS Word table tool. Do not use any other program or tabs or spaces to align columns. If not formatted correctly, the tables will be returned to the author for proper formatting. Footnote any use of boldface. Tables should be no wider than 17 cm. Condense or divide larger tables. See section Formatting Tables and Figures for additional instructions. Place tables within manuscript after References.

## **Figures**

Submit figures as separate files, in the native format when possible (e.g., Microsoft Excel, PowerPoint). Photographs should be submitted as high-resolution (600 dpi) .jpeg or .tif files. Other files may be acceptable; contact fue7@cdc.gov for guidance. Figures should not be embedded in the manuscript file. Use color only as needed. Use Arial font for figure lettering. Figures, symbols, lettering, and numbering should be clear and large enough to remain legible when reduced to print size. Large figures may be made available online only. Place figure keys within the figure. Figure legends should be provided at the end of the manuscript file. See Formatting Tables and Figures for additional instructions. Submit multiple panels as individual files. Do not submit multipanel panels. Place figure captions in manuscript after tables.

## **Videos**

Submit as AVI, MOV, MPG, MPEG, and WMV. Videos should not exceed 5 minutes and should include an audio description and complete captioning. If audio is not available, provide a description of the action in the video as a separate Word file. Published or copyrighted material (e.g., music) is discouraged and must be accompanied by written release. If video is part of a manuscript, files must be uploaded with manuscript submission. When uploading, choose the file "Video" file. Include a brief video legend in the manuscript file. Your video upload will not convert to PDF, but will be available during the peer-review process.

## **Online-only Materials**

### **Tables, Figures**

Tables and figures to appear online only should be numbered sequentially with tables and figures that will appear in print and are included in the manuscript maximum counts (e.g., no more than 2 tables and 2 figures total for a dispatch). Tables and figures that appear online only will be cited in text with a link to the online file. References within appendix tables or appendix figure legends are included in the manuscript maximum count (e.g., 15 for a dispatch) and should be numbered sequentially based on where the citations appear in text.

### **Technical Appendixes and Other Materials**

For materials outside the scope of the article, authors may submit a Technical Appendix that will be presented online only. Technical Appendixes will be formatted but not edited; these materials are not included in the manuscript maximum word and reference counts. A link to the Technical Appendix will be provided in the text of the article where the materials are cited. Technical Appendixes that are surveys written in a language other than English may be printed in their original language.

Alternatively, readers may be referred to the corresponding author for supplemental materials, or authors may post supplemental materials on a separate website and provide a link to that site in the article.

## **Formatting Tables and Figures**

### **Tables**

Tables must be created by using the Microsoft Word table tool, not by using tabs and spaces or in Microsoft Excel. Do not use any other program or tabs or spaces to align columns. Number tables consecutively in the text; if an article has only 1 table, do not number it. Tables may not be separated into subdivisions (Table 1A and Table 1B); instead, split into 2 tables. References in tables are ordered according to the first citation of the table in text.

### **Table Formatting**

Tables are set in 8-point Arial font and may be no wider than 17 cm. Tables that exceed maximum width should be truncated or included for online publication only.

Tables should be arranged with like data (e.g., organism name, antibody titer) in columns. If a table cell contains text, only the first word should begin with a capital letter. Horizontal rules are used to set off column heads. If necessary for readability, horizontal rules may also be used to group categories of information within the body of the table. Vertical rules are never used, and tables are never displayed in landscape (sideways) orientation.

## Table Titles

Table titles should be brief but self-explanatory. Place the title above, not below, the table. Capitalize the first letter of the title and do not include a period at the end. Titles should contain enough information to stand alone (e.g., populations, dates, locations) but should not repeat information in column or row heads. Avoid using abbreviations in titles, but when necessary to do so, explain abbreviation in a footnote, not in the title.

## Table Headers

Use abbreviations as needed for space (see below). Capitalize only the first word of each column header. Capitalize the first word after a symbol.

## Abbreviations in Tables

Tables should be self-explanatory; therefore, spell out terms even if they have been introduced in the text. Terms may be abbreviated within the table and defined in a footnote; all abbreviated terms may be defined in the same footnote. Also explain any use of boldface in a footnote.

M and F do not need to be defined when used to mean male and female.

Use no. (%).

Use no. patients

Do not use virgules; e.g., NA, ND, not N/A, N/D.

## Footnotes

Use the following symbols in the order shown to indicate footnotes:

\*, †, ‡, §, ¶, #. If the table requires >6 footnotes, use double (e.g., \*\*, ††) symbols. No space is used between a footnote symbol and the footnote. Place a period at the end of each footnote.

## Units of Measure in Tables

Units should not be repeated in every cell but should be noted once in the column head. Use SI units or other common units of measure.

Weight during treatment, kg

## Figures

Figures should be submitted for review as high-resolution (600 dots per inch [dpi]) TIFF or JPEG files. Be prepared to submit final figures in the native, editable format (e.g., Excel files for figures created in Microsoft Excel) during production editing (after the article has been accepted

for publication). Figure revisions may be required during review or production editing. Number figures consecutively in the text; if an article has only 1 figure, do not number it. References in figures are ordered according to the first citation of the figure in text. Submit multiple panels as individual files. Place figure captions in manuscript after tables.

## **Figures**

Figures should be submitted as separate files and not embedded in the Word document. If the figure is made up of multiple images or panels, submit each panel separately. A panel may contain only 1 image. Panels should be directly related to each other and generally of the same type. Avoid grouping panels that contain macro and micro images or that are not directly related such as an image from pulsed-field gel electrophoresis paired with a phylogenetic tree panel.

Eliminate unnecessary white space around the image. The final image files must be a minimum 8.4 cm wide to appear in print. To check the resolution and size on a PC, locate the image on your computer, right click on it to bring up a sub-menu. Select Properties and then the Summary tab. The vertical and horizontal resolution and image dimensions will be displayed. Large figures (i.e., those that exceed a 17.02 cm by 17.02 cm width) will appear online only.

### ***File Types Accepted***

Send editable files (see file types below) in native format. Do not embed images in programs such as Word, PowerPoint, or Excel; send in the actual image file instead. If the software that was used to create the figure file does not have an option to export an editable file type, send the image as a 600 dpi resolution .jpg or .tif file.

Editable file types: .xls, .xlst, .xslm, .xlsx, .ppt, .pptx, .doc, .docx, .ai, .eps, .psd, .png

Noneditable file types: .jpg, .tif, .pdf

### ***Naming Figure Files***

When submitting a new manuscript, number figures consecutively as they appear in the text. If an article has only 1 figure, do not number it.

When naming figure files, indicate the figure number and panel letter. Examples: Figure 1, Figure 1A, Figure 2C.

When submitting a revised manuscript, include the manuscript number when naming the figure file. Examples: 12-0355 Figure 1, 09-0875 Figure 2C

If you are submitting a revised figure, add “rev” to the figure file name to distinguish it from previously submitted figure files. Example: Figure 1A rev.

## ***Text in Figures***

Place figure keys within the figure (see Figure Keys section below) or within figure legends at the end of the manuscript file. Use Arial (or an equivalent sans serif font, such as Calibri) 10 point or 12 point font. Symbols, lettering, and numbering should remain legible when reduced to minimum print size. Use boldface font only to indicate statistical significance. Italicize genus and species names. Capitalize only the first letter of the first word of an axis title, label, or key entry, and omit unnecessary words (e.g., use %, not “Percent of total,” “No. patients”, not “Number of patients”). Horizontally align all text except labels on vertical axes. Include descriptive axes labels that clearly convey what is being shown so that the figure can be understood if it were presented without the manuscript text. Text should not have drop shadow or shadow effects applied to it.

## ***Color Figures***

Colors may be used in the following order: red, blue, green, gold, purple, orange, brown, dark pink. Avoid light or pastel colors.

Graphs and line art should be set in black and white to produce a better contrast and to more clearly present the data. For figures with vertical columns, use black, white, and gray columns. Use shades of gray if needed and try to avoid the use of patterns. If you have too many columns consider using a different type of chart or graph.

## ***Figure Keys***

Figure keys provide additional information to interpret the data in a figure. Keys can define the color codes that indicate number ranges, for example. If you can interpret the figure without the key, then the key information should be moved to the figure legend to keep the figure as simple as possible. Complex figures do not portray information as easily as simple figures.

## ***Figure Legends***

Figure legends should be self-explanatory. If the legend begins with a sentence, include a period at the end of the sentence. Place a minimum of text in the figure and use the legend for more lengthy explanations. Place the legend in the article’s text file, after references and tables. Spell out terms even if they have been introduced in the text. Terms may be abbreviated in the figure if they are defined in the legend. Provide magnification levels or indicate scale bar information within the legend. If you are submitting black and white figures in addition to color figures, provide a legend for both versions of the image.

If a reference is used in a figure key or label or in a figure legend, it should be numbered in order with any reference numbers that have preceded the first figure citation in text. For example, if references 1–10 have been cited in text, and the figure contains a previously uncited reference, that reference should be numbered as 11 (and text reference citations renumbered accordingly).

## **Types of Figures**

### ***Photographs***

Photographic images include those captured with a camera (e.g., radiographs, micrographs, x-rays, magnetic resonance and computer tomographic scan images, and gel images). Such images generally do not contain labels. They should be submitted as high resolution (600 dpi) .jpg, or .tif files. If appropriate, the image should contain a scale bar in the lower right corner that is part of the image and not a separate layer. The unit of measurement for the scale bar should be included in the figure legend. If the image is magnified to show detail, please include the magnification level within the figure legend. Use credits as needed. If the figure needs to include text labels, the labels should be in Arial (or equivalent sans serif font), 10- or 12-point Arial (or an equivalent sans serif font). Refrain from adding labels (e.g., A, B, C) to individual panels; instead make the panel label part of the figure file name.

### ***Computer-generated Figures***

Computer-generated figures include graphs, charts, and flow diagrams and are typically generated in computer programs such as Microsoft Excel, PowerPoint, and Word. Whenever possible, submit computer-generated figures in the editable native format that was used to create the figure. Do not embed an Excel file into Word or PowerPoint; instead, send the Excel file. Do not submit charts or graphs in a 3-dimensional form.

### **Excel Charts and Graphs**

When submitting figures generated in Excel, include the linked data within the workbook. If you send the generated chart without the data, edits cannot be made. We do not publish the actual Excel file, just the final edited chart or graph generated with Excel. If you have several graphs or charts created in Excel, submit them in the same workbook with each figure's data and chart on a separately named worksheet.

Omit unnecessary boxes, borders, and horizontal lines in plot areas for graphs. Text along the x- and y- axes should be oriented horizontally. The y-axis label should be rotated parallel to the y-axis and read left to right from the bottom to the top of the axis. Additional y-axis labels should be rotated to continue in a clockwise rotation; that is, for a chart with a right y-axis, the text label should read left to right from top to bottom. Labels should be as concise as possible; abbreviate days to "d", week(s) to "wk," month(s) to "mo," years to "y."

A chart cannot overflow one page when printed. You may need to shrink the font, use landscape orientation on wide charts, or simplify the data display (e.g., 3 letter month, year only) for a long listing of dates. Do not use vertical text in a figure.

For pie charts, start at the 12 o'clock position and set the largest segment in a clockwise direction. Smaller segments should continue to be set in a clockwise direction around the pie chart.

Three-dimensional bar charts should not be submitted. Bar charts should be 2-dimensional stacked or clustered bars.

## **Maps**

Map images should be submitted as text-editable files; otherwise submit as .jpg or .tif files at 600 dpi resolution if you cannot provide a text-editable file. If you have a large map and an inset, split the figure into two panels and submit each panel as a separate file. Maps should have country or region labels, country boundaries, and a symbol indicating north. Topographic maps should not be submitted unless relevant to the study.

## **Phylogenetic Trees (Dendrograms)**

Phylogenetic trees or dendrograms should be in regular text. Use bold-face font only to indicate a special meaning. Genus and species names should be in italics. Include a scale bar if necessary and define the scale bar in the figure legend.

## **Spanning Trees**

Spanning trees should be submitted in black, white and shades of gray if necessary. To have color figures online, submit color versions of figures.

## **Videos**

Submit as AVI, MOV, MPG, MPEG, or WMV. Videos should not exceed 5 minutes in length and should include an audio description and complete captioning. If audio is not available, provide a description of the action in the video as a separate Word file published or copyrighted material (e.g., music) is discouraged and must be accompanied by written release. If video is part of a manuscript, files must be uploaded with manuscript submission. When uploading, choose “Video” file. Include a brief video legend in the manuscript file. Place the legend after references, tables, and figure legends. Spell out terms used in the video even if they have been introduced in the text.

## **General Style Guidelines**

### **Typeface**

#### **Accents**

Do use the accent aigu on French words beginning with a capital E

École Polytechnique, Émile Zola

## **Boldface**

Avoid using boldface for emphasis in running text. Boldface may be used judiciously in tables, if necessary, to highlight significant values or isolates described in a given study, for example. Similar uses are permitted in figures. Usage should be defined in table footnote or figure legend (i.e., “Boldface indicates a significant result.”).

## **Italics**

Do not use italics for emphasis.

For use of italics with organisms, see Scientific Nomenclature.

Do not italicize coined terms. If necessary, set off in quotation marks at first occurrence only.

Single-letter variables are italicized. However,  $R_0$  (basic reproductive number) is not italicized to avoid confusion with  $R$  (correlation coefficient in multivariate analysis).

Do not use italics to format article headings, subheadings, table titles, or figure legends.

Do not use italics in keywords.

Do not italicize titles of books or journals, either in text or in references.

Italicize reference numbers in text but not in reference list.

Commas, colons, and semicolons that immediately follow italicized text should not be italicized.

Use the format  $p = 0.05$  or  $p < 0.05$  (lowercase  $p$ , no italics; put zero before decimal, note spaces around  $=$ , no spaces around  $>$  and  $<$ ).

Some foreign words and phrases have become part of standard English usage and do not need to be italicized, unless not using italics would be confusing. These terms include

*in vivo*

*in vitro*

*in situ*

*falciparum* (in *falciparum* malaria)

*et al.*

## **Underlining**

Do not underline for emphasis or to indicate book or journal titles. Do not underline URLs or email addresses. Underlining may be used to indicate nucleotide or amino acid substitutions.

Capitalization: Avoid unnecessary capitalization. Follow Chicago Manual of Style, 16th edition (<http://www.chicagomanualofstyle.org/cmofstyle.html>).

## Accession Numbers

Do not capitalize accession number, and use the abbreviation no. instead of number when a specific number is provided.

GenBank accession numbers were recorded.

The isolate was deposited into GenBank under accession no. AA00000.

## Other Capitalization Preferences

African American

AM, PM, BCE, CE: format in small caps

Arctic (when referring to region), arctic when referring to cold temperature. American

Heritage says “arctic or Arctic fox”; “arctic or Arctic tern,” in that order.

Biosafety Level. Abbreviate with hyphen (e.g., BSL-2).

Black (when referring to persons)

California encephalitis virus

chikungunya virus

ClustalW, ClustalX

Eastern equine encephalomyelitis

Ebola (named after the Ebola River in Zaire)

federal

formalin

Guinea worm disease

Gulf Coast

Internet

Legionnaires’ disease

Mercurochrome

o'nyong-nyong virus

Pacific Coast

QIAGEN

Sin Nombre virus

Southeast Asia

Saint Louis encephalitis virus

Suramin

Teflon

the Gambia

the Netherlands

The Hague

Gram stain, gram-negative, gram-positive

Venezuelan equine encephalomyelitis virus

website

West Africa

Western equine encephalomyelitis virus

Western Hemisphere

Western blot

White (when referring to persons)

x-ray

### **Specific Designations**

Do not capitalize words used as specific designations (case, group, series, patient), unless they begin a sentence or are part of a title or heading.

Trade names should generally be capitalized. Do not use <sup>TM</sup> or ® with trade names.

Most words derived from proper nouns are not capitalized. Follow the Chicago Manual of Style (<http://www.chicagomanualofstyle.org/cmosfaq.html>), except that black and white should be capitalized when referring to persons (e.g., Black case-patients, White persons).

Do not capitalize titles, such as chairman, president, professor, or director unless the term directly precedes a name (e.g., Professor Smith).

### **Titles and Headings**

Capitalize the first letter of all words except articles, coordinating conjunctions, and prepositions (regardless of length).

Never capitalize “to” in a title or a heading, either as a preposition or infinitive.

Lowercase “that” as a subordinating conjunction but capitalize as a relative pronoun.

Evidence that Penicillin-Resistant Strains Are Common

Strains That Are Resistant to Penicillin

Capitalize resistant, susceptible, sensitive, and words with equal weight. Do not capitalize related, associated, or acquired.

Penicillin-Resistant Gonorrhea

Methicillin-Susceptible *Staphylococcus aureus*

Bite-associated Infection

Community-acquired Infection

Capitalize hyphenated or dashed words of equal weight.

Case–Control Study

Human–Animal Interactions

Cat-Scratch Disease, Rat-Bite Fever

If a word in a title (or other word that would ordinarily be capitalized, as at the beginning of a sentence or the first word in a table cell) begins with a lowercase Greek letter, capitalize the first non-Greek letter after it.

β-Lactamase–Inhibitor Combinations

Titles of books and journals are neither italicized nor placed within quotation marks.

Lowercase specific epithets in the scientific names of organisms in titles as you would in running text: *Escherichia coli*.

If a symbol begins a heading (e.g., column heading in table), capitalize the next word.

% Infected

% Patients

Lowercase all letters in email addresses. Lowercase all letters in URLs unless necessary for the URL to work properly (e.g., PDF file names).

## Spelling

### British versus American Spelling

Change British spelling to American.

ameba, amebae, not amoeba, amoebae

analog, not analogue

analyze, not analyse

anesthesia, not anaesthesia

color, not colour

estradiol, not oestradiol

homolog, not homologue

orthopedics, not orthopaedics

titer, not titre

Exceptions: aerobic, anaerobic, proper names (The XYZ Programme, *S. faecalis*, *N. gonorrhoeae*)

Use the US adopted name rather than the international nonproprietary name for drugs.

rifampin, not rifampicin

acetaminophen, not paracetamol

### Other Spelling Preferences

## Emerging Infectious Diseases Editorial Style Guide

See also Hyphens and Other Capitalization Preferences.

acknowledgment

Beijing/W genotype

Cameroon not Cameroun

Côte d'Ivoire not Ivory Coast

Dhaka not Dacca

*Escherichia coli* O157 (use the letter O)

extensively drug-resistant tuberculosis (XDR TB)

*Haemophilus influenzae* type b (Hib)

*helminthic* not *helmintic*

hemorrhage

inoculation

judgment not judgement

leukocyte not leucocyte

mucus (n), mucous (adj)

multidrug-resistant tuberculosis (MDR TB)

occurred, occurrence

omit, omitted

precede

proceed

protozoon (n, s), protozoa (n, pl) protozoan (adj)

repellent

Réunion Island, but Reunion (state)

Robert Koch Institute (not Koch-Institute)

supernatant not supernate

typeable not typable

villus (n), villous (adj)

## Grammar

### Restrictive and Nonrestrictive Clauses

Set nonrestrictive clauses (extra information) off with commas and introduce them with “which.”

The samples, which James analyzed, had been stored for 2 weeks.

(Only 1 set of samples is being discussed; therefore, the clause “which James analyzed” is not necessary for defining the samples.)

Do not place commas around restrictive clauses (necessary information) and introduce them with “that.”

The samples that James analyzed had been stored for 2 weeks.

(More than 1 set of samples is being discussed. The clause “that James analyzed” defines the noun “samples,” telling which samples were analyzed.)

### Subject–Verb Agreement

Use a singular verb with a singular subject and a plural verb with a plural subject, even if a plural phrase follows the subject.

Our analysis of all patients with *E. coli* infections shows...

Collective nouns (e.g., number, total, staff, faculty) take a singular verb when the noun is regarded as a group and a plural verb when individual members of the group are emphasized. A good rule of thumb is to use a singular verb when the article is “the” and a plural verb with “a.”

The number of patients was unclear.

A number of patients were quarantined. [patients were quarantined individually]

The number (total, group) reported is 25.

A number (total, group) of persons are...

Seventy-eight percent is the largest percentage reported.

The Centers for Disease Control and Prevention is...

In a noncount noun in a prepositional phrase with "none," the verb plurality is determined by the object of the preposition.

None of the blood was...

None of the patients are participating.

## Verbs

dialyze blood, not animals or humans

transfuse blood, not animals or humans

A quantity indicated by a unit of measure is singular, even when the units are spelled out (ASM).

Twelve milliliters was injected.

...10 mg was added

...5 mL was injected

...220 cpm of radioactivity was detected

Exceptions:

Nonabsolute or informal units

...10 drops were added

Do not allow a mathematical symbol to stand for the main verb in a clause (ASM).

Incorrect: When  $p < 0.005$ ...

Correct: When  $p$  was  $< 0.005$ ...

Avoid using nouns as verbs.

Incorrect: was electrophoresed

Correct: underwent electrophoresis

Incorrect: The patient was biopsied.

Correct: A biopsy was performed.

## Possessives

See also Apostrophes.

Year indications are not possessive.

1960s, not 1960's

Organization names vary:

American Medical Writers Association

Department of Veterans Affairs

## Preferred Usage

### affect, effect

affect (v), to influence

affect (n), subjective aspect of an emotion (psychological studies)

effect (v), to bring about or initiate

effect (n), result or outcome

### age designations

Term	Age
neonate or newborn	birth to 1 month
infant	1 month to 1 year
child	2–12 years
school-age	5–18 years
teenage	13–19 years
adolescent	13–17 years
adult	>18 years
childbearing age	15–44 years
elderly	(determined by the author)

### Alaska native, Alaska Native

Alaska native: anyone who was born and raised in Alaska, regardless of cultural background.

Alaska Native: a person who has origins in any of the original peoples of the area that is now Alaska and who maintains cultural identification through tribal affiliation or community recognition

## **American Indians, Native Americans**

An American Indian is a person whose origins are in any of the original people of North (except Alaska), Central, or South America and who maintains cultural identification through tribal affiliation or community attachment. Whenever possible, specify the nation or people (e.g., Navajo, Anishinabe, Inuit) rather than using the more general term. Either American Indians or Native Americans is acceptable, although Native Americans is preferred. Usage of either term is at the author's discretion.

## **among, between**

Among always applies to >2 objects.

Between literally applies to only 2 objects but may be used with >2 when each is treated individually, as in “a treaty between 3 powers.”

## **and/or**

Avoid. In most cases, either *and* or *or* is correct. When a choice cannot be made, use “X, Y, or both.”

## **antibodies to, antibodies against**

Although somewhat redundant, use antibodies against.

## **antigen, T- and t-**

See t-antigen.

## **based on, on the basis of**

Based on is often erroneously used to mean on the basis of. Correctly used, it follows forms of the verb to be.

The calculations were based on the following results.

## **BCE**

Use BCE (“before the Common Era”) instead of BC (“before Christ”).

If inclusive dates are used with BCE, the higher numbered year comes first, and the second number should be given in full to avoid confusion (e.g., “375–330 BCE”). If inclusive dates carry over into CE (“of the Common Era”), use an en dash between the dates (e.g., 11 BCE–20 CE).

The abbreviation should be set in small caps.

### **biopsy**

The procedure of removing and examining tissue, cells, or fluids from the living body. Observations are made on the biopsy specimen, not on the biopsy itself. Biopsy is a noun; do not use as a verb.

### **Black, African American**

Use of either term is acceptable at the author's discretion. Black should be capitalized.

### **brevity**

Avoid unnecessary wordiness. If it can be said in one word, use one word.

<i>Instead of...</i>	<i>use...</i>
the majority of	most or many
prior to	before
at the present time	now
at the time that	when
in terms of	in, of, for
the truth is	is
the facts are	are
in order to	to
large in size	large
period of time	period
very unique	unique

### **case, patient**

A case is a particular instance of disease, illness, injury, or asymptomatic disease. Distinguish between a case (a situation or set of circumstances) and a patient (a human being). Cases do not show symptoms, experience side effects, recover, or die; patients do. Do not dehumanize persons into cases. ("Case-patient," however, is an acceptable term.)

*C. perfringens* was isolated in a case of diarrhea. or ...from a patient with diarrhea.

Erythromycin is recommended for treating patients with legionellosis.

Avoid use of case except for cases of disease. Phrases like in this case or in any case may be changed to in this instance or in any event, unless referring to a case of disease.

### **CE**

Use CE (“of the Common Era”) instead of AD (anno Domini, “in the year of the Lord”).

The abbreviation should be set in small caps.

### **comorbid, comorbidities**

Use concurrent condition(s) instead.

### **compare to, compare with**

Use compare to for items that are very different. Use compare with for items that are similar. In scientific writing, compare with is most often used.

The sodium levels of the patients in the control group were compared with those of the patients in the study group.

Shall I compare thee to a summer’s day?

### **complain**

Use reported or described rather than complain (e.g., the patient reported that she had a fever).

### **compose, comprise**

Compose: to total, form, to go together, to make up (an object); always takes the passive voice.

The district is composed of 3 counties.

Comprise: to include, to contain, to be made up of (always takes the active voice; do not say is comprised of). The whole comprises the parts; the parts do not comprise the whole.

The district comprises 3 counties.

### **continual, continuous**

Continual means to recur at regular and frequent intervals. Continuous means to go on without pause or interruption.

The patient with emphysema coughed continually.

His labored breathing was eased by a continuous flow of oxygen through a nasal cannula.

### **control**

Reduction of disease incidence, prevalence, morbidity, or mortality to a locally acceptable level as a result of deliberate efforts; continued intervention measures are required to maintain the

reduction. Also see entries for elimination of disease, elimination of infection, eradication, and extinction.

### **dehumanizing terms**

Describe a person as having a condition, not being the condition.

person with diabetes, not a diabetic

person with arthritis, not an arthritic

person with asthma, not an asthmatic

Note that patient refers to someone receiving treatment for a particular condition. In, for example, a seroprevalence study of persons with HIV infection, person with HIV is preferable to AIDS patient, unless the sample is being evaluated or receiving treatment for the clinical condition of AIDS.

Do not refer to a person as a subject. Use patient or participant.

### **develop**

Diseases develop in patients. Patients do not develop diseases.

### **developed country, industrialized country**

Use industrialized, not developed.

### **developing country**

Use developing or resource-limited, not undeveloped or Third World.

### **diagnose**

To evaluate, identify. Conditions, syndromes, diseases, and pathogens are diagnosed. Patients are not diagnosed.

### **die of, die from**

Patients die of, not from, specific diseases or disorders.

### **different from, different than**

Use different from, not different than.

### **dosage, dose**

Dosage implies a regimen; dose implies a quantity. Dosage is the amount of medicine to be taken by a patient in a given period; dose is the amount taken at one time.

### **due to, owing to**

These terms are not synonymous and can be vague. Whenever appropriate, replace with caused by or because of.

### **ecologic, ecological**

Follow author preference.

### **e.g.**

This abbreviation means “for example” or “such as.”

Only use the abbreviation within parentheses. Place a comma after the abbreviation.

Examples may be introduced by e.g. but should not be followed by e.g.

Correct: In evaluating an IQ score, several factors (e.g., socioeconomic level) must be considered.

Incorrect: Socioeconomic level, e.g., is a factor to be considered.

### **eliminate, eradicate**

Disease is eradicated from the entire world, eliminated from a country or region. See separate entries for elimination of disease, elimination of infection, eradication, extinction, and control.

### **elimination of disease**

Reduction to zero of the incidence of a specified disease in a defined geographic area as a result of deliberate efforts; continued intervention measures are required. Also see entries for elimination of infection, control, eradication, and extinction.

### **elimination of infection**

Reduction to zero of the incidence of infection caused by a specific agent in a defined geographic area as a result of deliberate efforts; continued measures to prevent reestablishment of transmission are required. Also see entries for elimination of disease, control, eradication, and extinction.

### **-emia**

This suffix indicates in the blood and should not be used in the plural.

Parasitemia or levels of parasitemia, not parasitemias

**epidemic, endemic**

A disease is endemic to an area; the area is not endemic.

endemic malaria, disease-endemic areas

Epidemic, a disease that occurs suddenly and in numbers in excess of what would be expected (because it was introduced from outside).

Endemic, belonging or native to a particular people or country, indigenous. Use “to” with a place and “in” with a population.

Diseases endemic to the tropics

Infections endemic in European wild rodents

**era designations**

See BCE and CE.

**eradication**

Permanent reduction to zero of the worldwide incidence of infection caused by a specific agent as a result of deliberate efforts; intervention measures are no longer needed. Also see entries for elimination of disease, elimination of infection, control, and extinction.

**erythrocytes, red blood cells**

Use erythrocytes, when possible.

**etc.**

Avoid in scientific writing; it is vague.

**expire, die**

Patients do not expire or have fatal outcomes; they die. Medications expire.

**extinction**

The specific infectious agent no longer exists in nature or the laboratory. Also see entries for elimination of disease, elimination of infection, control, and eradication.

**feel, believe**

Use feel to express physical sensations; use believe to express personal conviction, accepting something as true.

The patient felt cold.

The author believed that the theory was sound.

### **fever, temperature**

Fever is a rise of body temperature above normal. If a patient has a temperature of 37.8°C, he has a fever of 0.8°C. Also correct: The patient was febrile (37.8°C).

Please use the Times New Roman degree symbol; do not use a superscript lowercase o.

### **few, less (fewer, less; fewest, least)**

Few refers to units or people that can be counted.

Less refers to quantities of mass, bulk, or volume.

### **genomic segments**

Define as large (L), medium (M), or small (S).

### **gram**

Gram should be capitalized and never hyphenated when used as Gram stain; gram negative and gram positive should be lowercase and only hyphenated when used as a unit modifier.

Gram staining

gram negative

gram-positive bacteria

### **Greek letters**

Greek letters are preferred to words in most circumstances. In some chemical names, however, the approved nonproprietary name uses the word.

tumor necrosis factor  $\alpha$ ,  $\beta$ -blocker, interferon- $\gamma$ , betamethasone, beta carotene

Chi square should always be written as  $\chi^2$ . If the symbol begins a sentence, rewriting the sentence may be desirable.

### **hand, foot and mouth disease**

Do not add a comma after “foot.”

### **homosexual, bisexual, gay**

Using these terms as adjectives is acceptable, as in “gay men,” and dependent on the author’s discretion. However, avoid using these terms as nouns as they may too vague or perceived as perjorative. Sometimes the phrase “men who have sex with men” or MSM is used because some of these men do not label themselves as gay, homosexual, or bisexual.

Vague: homosexuals (the term does not specify the sex)

Clear: gay men, lesbians, bisexual persons, heterosexual persons

### **hospital**

Use “admitted to the hospital” rather than “admitted to hospital.”

### **-ic, -ical**

Dispense with most -al endings. For example, use epidemiologic, geographic, serologic, logistic, immunologic, toxicologic, anatomic. However, check dictionary and consider author’s preference (e.g., biological warfare, ecological, psychological).

### **i.e.**

This abbreviation means “that is” or “in other words.”

Only use the abbreviation within parentheses. Place a comma after the abbreviation.

### **immunize, vaccinate**

Immunize means to confer immunity; vaccinate means to administer vaccine.

### **impact**

This trendy word is a red flag for editors. Editors tend to avoid it because it is overused and imprecise and to reserve its use for physical collision or global effect. Whenever possible, a more specific word should be used; otherwise, effect (noun) and affect (verb) are good alternatives.

Avoid: Combination therapy with metronidazole impacted colonization rates.

Better: Combination therapy with metronidazole affected colonization rates.

Preferred: Combination therapy with metronidazole decreased colonization rates.

## **important**

This word is vague and should be avoided. In most cases, it can be deleted without affecting meaning or changed to a more specific adjective.

Avoid: These data suggest important abnormalities...

Preferred: These data suggest abnormalities...

## **in, among**

Conditions usually occur in, not among, persons.

The 25 cases of measles were in school-aged children.

infection in patients, not infection among patients

## **incidence, prevalence**

Incidence (a rate) refers to the number of new cases per unit of population per unit of time. Prevalence refers to the number of existing cases per unit of population at a given time (point prevalence) or in a given time (period prevalence). Refer to cases per unit, not incidence or prevalence per unit.

Correct: cases per 100,000 population

Incorrect: incidence (or prevalence) per 100,000 population

## **includes**

This word indicates that a partial list follows. Do not use it if your list is complete.

Correct: The alphabet includes the letters a, b, and c.

Correct: The first 3 letters of the alphabet are a, b, and c.

Incorrect: The first 3 letters of the alphabet include a, b, and c.

## **individual, person**

Person is a noun; individual is an adjective (e.g., an individual student). Avoid using individual as a noun to refer to persons (animals okay).

## **influenza season**

Truncate second year for influenza season, when the range is no more than 1 year, and when first 2 digits are the same.

2000–01

but

2000–2002 and 1999–2000

Truncation may be used for other periods that do not follow a calendar year (e.g., school years, fiscal years).

### **inject, inoculate**

Inject a fluid; inoculate an animal or person. Liquid cannot be inoculated into an animal or a petri dish; it is injected into or spread on.

We used a 0.5-mL aliquot to inoculate each mouse.

We injected a 0.5-mL aliquot into each mouse.

### **injection drug user(s)**

See “persons who inject drugs.”

### **intravenous drug user(s)**

Be aware of the difference between persons who inject drugs (PWID) and intravenous drug users (IVDUs). The former includes persons who inject other forms of drugs (e.g., intramuscularly injected drugs).

### **insure, ensure, assure**

Insure means to guarantee life or property against risk (e.g., to underwrite; to give, take, or procure insurance). Ensure means to make certain or guarantee. Assure means to make safe, to give confidence to.

### **in vitro**

Do not hyphenate foreign phrases that are printed without a hyphen in other circumstances (e.g., in vitro translation, in situ protein synthesis, in vitro–stimulated growth, in situ–synthesized proteins).

### **large T-antigen**

See “t-antigen.”

### **last, past**

Although last is not wrong, most recent or past is often more precise. Last can mean final.

Patients were included if they were symptomatic for the last 10 days. (These are only their last 10 days if they died; past is better.)

Patients reported condom use at their last sexual encounter. (May not be their last; most recent is better.)

### **leukocytes, white blood cells**

Use leukocytes, when possible.

### **male, female**

As nouns, these terms can be considered dehumanizing and are best reserved for laboratory animals. They can be used as adjectives (male adolescents, female participants), but as nouns referring to humans, they should be replaced by men and women or boys and girls.

### **molecular weight**

The relative mass of a substance. It is a pure number and has no units.

Incorrect: The molecular weight of the protein is 30,000 Da.

Correct: The molecular weight of the protein is 30,000.

Correct: The molecular mass of the protein is 30,000 Da.

### **morbidity, morbidity rate**

Morbidity refers to the condition of being diseased, the rate of illness or disease. Do not use morbidity if illness or disease would work; use morbidity only to refer to the rate of illness in a specified population during a specified time (morbidity rate).

### **mortality, mortality rate**

Mortality refers to the number of deaths from a particular condition. Death is preferred over mortality. Mortality rate is the number of deaths in a particular population divided by the size of that population at the same time.

### **negative, normal**

Examinations and most laboratory tests are neither negative nor normal in and of themselves; interpretations of the test results, however, may be negative or within normal limits.

Observations, results, or findings from examinations and tests are within normal limits or abnormal.

Incorrect: Urinalysis was normal.

Correct: Urinalysis results were within normal limits.

Cultures, tests for microorganisms, tests for specific reactions, and reactions to tests may be negative or positive (reactive, for some).

Electroencephalograms, electrocardiograms, isotope scans, and radiographs are pictures and are, therefore, not negative or positive.

### **offspring**

Use children, not offspring, for humans.

### **-ology**

This suffix means a branch of knowledge, science, or study of something. Terms ending in -ology (e.g., etiology, pathology, serology) should not be used to describe particular items. All “ology” words refer to the study of something. For example, the methodology of a research study would be a study of the methods used within the study, while the methods would include the study design and other information about how the study was conducted by researchers.

Incorrect: The pathology was located in the upper part of the gastrointestinal tract.

Correct: The pathologic lesion was located in the upper part of the gastrointestinal tract.

Incorrect: The histology was small-cell carcinoma of the lung.

Correct: The histologic diagnosis was small-cell carcinoma of the lung.

Incorrect: The patient’s serology showed...

Correct: The patient’s serologic test results showed...

Incorrect: We used the following methodology.

Correct: We used the following methods.

### **parameter**

Parameter has a specific statistical meaning and should not be used to mean measurement, value, or number. Ordinarily, except when a descriptive quantity for a statistical population is meant, parameter should be changed to measurement, value, quantity, variable, number, or a comparable term.

## **patient**

An ill person who is receiving or has received medical care. Do not use the term normal patient.

## **PCR, real-time reverse transcription**

Always abbreviate PCR, even on first usage, and always write out real-time on every usage. Reverse transcription is preferred rather than reverse transcriptase, and is abbreviated RT after first usage if used 3 or more times. Real-time can be abbreviated as r when used with RT-PCR (rRT-PCR) if used 3 or more times.

## **person, persons, people**

Person is preferred over individual as a noun. The plural of person is persons, not people. The latter term refers to a group of persons who share particular characteristics (e.g., the American people).

## **persons who inject drugs**

Use “persons who inject drugs” (PWID) instead of “injection drug users.” This usage is in accordance with usage by the World Health Organization ([http://search.who.int/search?q=pwid&ie=utf8&site=default\\_collection&client=en&proxystylesheet=en&output=xml\\_no\\_dtd&oe=utf8](http://search.who.int/search?q=pwid&ie=utf8&site=default_collection&client=en&proxystylesheet=en&output=xml_no_dtd&oe=utf8)).

Be aware of the difference between PWID and IVDUs (intravenous drug users). The former includes persons who inject other forms of drugs (e.g., intramuscularly injected drugs).

## **platelet**

preferred over thrombocyte

## **population, sample**

Population refers to the set of entities from which statistical inferences are to be drawn. Sample is that portion of the population that is under study.

## **present, present with**

As a synonym for seeking treatment, present is jargon and should be avoided.

Incorrect: The patient presented with...

Correct: The patient sought treatment for...

Correct: The patient had...

**preventative, preventive**

Preventative is becoming obsolete; preventive is preferred.

**radiograph**

A picture produced on a sensitive surface by a form of radiation other than visible light; an x-ray or gamma ray photograph (includes CT but not MRI images).

**Radiogram**

A radiograph.

**Radiography**

The process of making a radiograph or sonogram.

**rate, ratio**

Rate is the incidence of a disease (or number of deaths) in a specified population in a specific time period. If no time period is specified, ratio is preferred.

The overall case-fatality ratio for SARS is  $\approx 12\%$

The rate of West Nile virus infection in Canada is  $\approx 300$  per 100,000 population per year.

**react, test**

A substance is tested for a reaction with another substance; it is not reacted with another substance.

**resolve**

Symptoms are resolved; patients do not resolve their symptoms.

**risk of, for, from**

What is my risk of getting AIDS?

Men who have sex with other men are at highest risk for AIDS.

The most serious risk from AIDS is death.

To avoid categorization by group, do not use high-risk as an adjective. Similarly, replace high-risk groups with groups at high risk.

Incorrect: high-risk youth

Correct: youth at high risk

### **sacrifice**

A euphemism for killing laboratory animals after an experiment. Preferred terms are humanely kill or euthanize.

### **SARS**

Spell out severe acute respiratory syndrome at first use.

It is permissible to use SARS in the title of a dispatch or letter provided it is defined in the abstract of the dispatch or the first paragraph of the letter.

### **serum, sera**

Serum and the names of other body fluids should not be singular if they mean samples collected from different patients. Change serum of patients to serum samples or serum specimens. Be sure to use the word samples or specimens if a specific number is given: 14 serum samples, not 14 sera.

### **severe acute respiratory syndrome**

Spell out at first use.

It is permissible to use SARS in the title of a dispatch or letter provided it is defined in the abstract of the dispatch or the first paragraph of the letter.

### **sex partner**

Use the term sex partner, not sexual partner; however, the term sexual behavior is correct.

### **since, because**

Using since when you mean because can create ambiguity (causal vs. temporal).

Vague: Since they began treatment, the patients were more active.

More clear (meaning #1): Because they began treatment, the patients were more active.

More clear (meaning #2): After they began treatment, the patients were more active.

## **significant**

Significant has a specific statistical meaning. If that is not the meaning intended, substitute a synonym, e.g., marked, noteworthy, substantial. When using in the statistical sense, the modifier statistically is redundant.

Incorrect: We included all statistically significant variables in the multivariate model.

Correct: We included all significant variables in the multivariate model.

## **small t-antigen**

See “t-antigen.”

## **subject**

Do not refer to human participants as subjects. Substitute participant, patient, or person.

## **survival**

Be sure to clarify whether survival refers to times or rates, i.e, distinguish between patients living longer or more patients not dying.

## **t-antigen**

For the term “large T-antigen,” use a capital letter “T”; for the term “small t-antigen,” use a lowercase letter “t.”

## **target**

This term is dehumanizing and often misused. Targeting people is like painting a bulls-eye on them. If you must target something, be sure you do not confuse it with aim.

Dehumanizing: Our program targets low-income women.

Better: Our program serves low-income women.

Better: Our program addresses the needs of low-income women.

Incorrect: We targeted the program to low-income women.

Better: We focused the program on low-income women.

Incorrect: We targeted the intervention to rural areas.

Better: The intervention targeted rural areas.

### **test positive**

Samples, but not patients, can test positive.

### **thrombocytes**

Use platelets.

### **time designations**

From March to August (excludes August)

From March through August (includes March and August)

Between March and August (excludes March and August)

1960s, not 1960's

once a day, not daily or qd

twice a day, not twice daily or bid

1986 to 1987 (1-year period). Between 1986 and 1988 is also a 1-year period [1987]).

1986 through 1987 (2-year period)

1986–1987 (2-year period)

AM, PM (small caps)

BC, AD (small caps)

3:00 PM, not 15:00

### **times**

Use the word “times” (not the mathematical symbol  $\times$ ) in the following context: the score for the control group was 64 times higher than that for the case-patient group.

### **titer**

Use only as a noun, not a verb, and use American spelling.

Incorrect: were titered

Correct: titers of... were determined

Titer reflects dilution, not optical density. For optical density, state the optical level that determines positivity.

Use a colon to express a ratio or dilution. Titers are expressed as the reciprocal of the dilution. (length:width, 2:1)

The end IgG titer was 256 after a serial 1:2 dilution.

### **tracking**

The use of the word tracking is considered jargon when used in place of proper English.

Incorrect: tracking people

Correct: analyzing trends among persons

### **treat**

Treat the disease, not the patient.

### **treatment**

Avoid anti-[disease] treatment.

Preferred: TB treatment

Avoid: anti-TB treatment

### **using**

The word using probably causes more dangling participles than any other word.

Incorrect: Using inhalation anesthesia, the dogs were splenectomized.

Correct: Using inhalation anesthesia, we splenectomized the dogs.

Using requires the word by when the actor is not specified.

By needed: Age was determined by using body mass and/or reproductive characters.

By not needed: We calculated age-specific hospitalization incidence rates and fitted linear models, using the  $\chi^2$  test.

### **US citizens**

Preferred rather than the term Americans.

### **vaccinate for/vaccinate against**

Use of either term is acceptable depending on context.

### **varying, various**

Varying means that which is changing (adjective) or causing to change (verb).

Various means of different kinds or aspects.

### **versus**

Use versus in running text and titles, vs. in parenthetical expressions and tables, and v. in legal citations. Do not use vs. without periods.

Kirby-Bauer disk diffusion versus serial dilution

(3.9 for case-patients vs. 7.2 for controls)

Roe v. Wade

### **while, although**

Although is more precise when you mean in spite of the fact that. While also has a temporal meaning of during the time that.

Vague: While a vaccine is not yet available, many candidate vaccines are being tested. (Either meaning could apply.)

More precise: Although a vaccine is not yet available, many candidate vaccines are being tested. (Has only 1 meaning.)

### **White, Caucasian**

White refers to a person whose origins are in any of the original peoples of Europe, the Middle East, or North Africa. Due to the international audience of the journal, the use of the term White is preferred unless referring to persons from the Caucasus region. White should be capitalized.

## **Punctuation**

### **Accents**

Do not use accents for words that can be correct without them (e.g., naive, debride).

## Apostrophes

Use an apostrophe to indicate possession. If the possessor is plural, the apostrophe comes after the plural –s.

the patient's symptoms

6 months' gestation

woolsorters' disease

Pronominal possessives (his, hers, yours, theirs, ours, its) do not take an apostrophe. (It's is a contraction of it is.)

Year indications are not possessive.

1960s not 1960's

Diseases, syndromes, tests, or compounds that are named after a person or place are not possessive. Official animal names, however, may retain apostrophes (see <http://www.itis.gov/> for animal names).

Bright disease

Chagas disease

Down syndrome

Hodgkin disease

Kaposi sarcoma

Kawasaki syndrome

Lyme disease

Marfan syndrome

Minimata disease

Reye syndrome

Student *t* test

Bonferroni adjustment

Eagle minimal essential medium

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Exceptions: Legionnaires' disease, woollsorters' disease

Avoid the following eponyms:

Reiter syndrome (use reactive arthritis)

Wegener's granulomatosis (use vasculitis or ANCA-associated granulomatous vasculitis)

Note: ANCA = antineutrophil cytoplasmic antibodies

### Colons

A colon may be used, sparingly, to introduce a list or series. Do not capitalize the first word after a colon (unless it would be capitalized for other reasons, such as beginning a sentence or a subtitle). Do not use a colon to introduce a series of complete sentences; change the colon to a period or edit the list so that it is no longer made up of complete sentences.

Incorrect: Cells were prepared as follows: Strain 12B was grown in G broth. Cells were harvested by centrifugation. The pellet was dissolved in solution Y.

Correct: Cells were prepared as follows. Strain 12 B was grown in G broth. Cells were harvested by centrifugation. The pellet was dissolved in solution Y.

Correct: Cells were prepared as follows: strain 12B was grown in G broth, cells were harvested by centrifugation, and the pellet was dissolved in solution Y.

If any item in a list includes a complete sentence that gives information about that item only, either edit out the colon or put the additional information in parentheses.

Incorrect: This conclusion is based on the following results: 1) The mapping of the mutations between 0.13 and 0.23 map unit. This finding indicates that they lie within a 1.2-kbp region. 2) The presence of the Nif phenotype in all the mutants.

Correct: This conclusion is based on the following results: 1) the mapping of the mutations between 0.13 and 0.23 map unit (this indicates that they lie within a 1.2-kbp region) and 2) the presence of the Nif phenotype.

Do not use a colon if the items in the list complete the sentence grammatically.

Incorrect: XYZ medium contained: A, B, and C.

Correct: XYZ medium contained A, B, and C.

### Commas

Commas are required in the following situations:

*before* the conjunction in a compound sentence if both clauses are independent.

Incorrect: All culture results were negative for *S. pneumoniae*, and were omitted from multivariate analysis.

Correct: All culture results were negative for *S. pneumoniae* and were omitted from multivariate analysis.

Correct: All culture results were negative for *S. pneumoniae*, and they were omitted from multivariate analysis.

*after* all items linked by *and* or *or* in a series, including the item before the conjunction.

*after* state when city is mentioned in text.

in Dallas, Texas, in 1995

*after* date that gives month, day, and year in text.

Comma needed: The test given January 1, 1997, showed that...

Comma not needed: The test given in January 1997 showed that

*after* an introductory phrase of >5 words; a comma can be used after fewer words if necessary to clarify the meaning.

*after* i.e. and e.g.

in numerals >999 (e.g., 100,000)

## Dashes

Avoid em-dashes (—) in scientific writing. Their use is for sudden breaks in thought that change the sentence structure or amplify and expand a phrase in the main clause. Try parentheses instead.

Use an en-dash (–) to connect numbers in a range. Use a hyphen, not an en dash, between numbers that are not inclusive (e.g., phone numbers and grant numbers).

Use an en-dash to indicate negative values (–70°C).

Use between compound adjectives when 1 element is an open compound, when >2 elements are hyphenated compounds, or in complex modifying phrases that include suffixes and prefixes and hyphens.

New York–Boston connector

*Trypanosoma cruzi*–infected

*Triatoma infestans*

## Reverse transcription PCR

In complex modifying phrases that include suffixes or prefixes, hyphens and en-dashes are sometimes used to avoid ambiguity.

non-group-specific blood

manic-depressive-like symptoms

## Hyphens

Terms formed by combining >2 words or elements of words may be open (with a space between them), hyphenated, or solid (as 1 word). If in doubt about how to treat a compound, consult Merriam-Webster's or Dorland's dictionaries. Below is a list of common terms.

acute-phase serum samples	foot-and-mouth disease
age group (2 words)	fresh water (n), freshwater (adj)
airborne	groundwater
antibody-capture ELISA	handwashing
antibody-positive children	health care
antimicrobial drug-resistant	ICD-9, ICD-10
antimicrobial drug resistance	influenza-like illness
basepair	insect-borne
bed net (n), bed-net (adj)	life cycle
bedbug	live-born
birthweight	longstanding
blood-borne	long term (n), long-term (adj)
breast-feed, breast-fed	managed care
case-patient, control-patient/participant	maximum-likelihood (as adj only)
cat-scratch disease	maximum-parsimony (as adj only)
chickenpox	meta-analysis
childbearing	needlestick
child care (n), childcare (adj)	neighbor-joining (ad adj only)
ClustalW	plaque-reduction neutralization test
co-infection	postmortem
co-trimoxazole	postpartum
co-worker	pulsed-field gel electrophoresis
cut off (v), cutoff (adj)	real-time reverse transcription PCR
database, dataset	reemerge
day care (n), daycare (adj)	restriction fragment length polymorphism
email	Robert Koch Institute
Epi Info	sandfly
Etest	short term (n), short-term (adj)
extended-spectrum	ST5
fingerstick	stand by (v), standby (adj)
follow-up (n), follow up (v)	t cell (n), t-cell (adj)
foodborne	tick-borne

under way  
USA300  
variable number tandem repeat  
vector-borne  
waterborne  
website, web page

well-being  
well-known person, but he is well known  
work-up (n), work up (v)  
worldwide

Common and unambiguous compound adjectives need not be hyphenated. Ethnic designations are never hyphenated, even when used adjectivally.

food safety issues, foodborne illness study, public health nurse

African American patients, French Canadian ancestry, Asian American participants

## Prefixes

Below is a list of common prefixes. They should always be closed up with the root word, except as noted.

ante	infra	multi	pseudo	trans
anti	inter	non	re	ultra
co	intra	over	semi	un
counter	macro	post	sub	
de	micro	pre	super	
extra	mid	pro	supra	

Exceptions:

*before* a capital letter (un-American, sub-Saharan)

*before* an abbreviation or acronym (non-mRNA)

*before* a numeral (pre-1970)

*to avoid confusion* with a similar unhyphenated word (re-cover, re-creation)

*to avoid a confusing meaning*, as in immunologic terms such as anti-rabbit, anti-goat, anti-mouse, anti-human. Goat anti-rabbit IgG means goat antiserum against rabbit IgG, not goat IgG that is antirabbit.

Even if letters are doubled, common prefixes are usually not joined by hyphens.

antiinflammatory

intraabdominal

nonnegotiable

posttraumatic

Always hyphenate the prefixes self- and cross-.

self-aware, self-sticking, cross-react

## Suffixes

Similarly, most common suffixes are joined without a hyphen, such as -fold, -hood, -less, -like, -wide, and -wise, unless doing so creates an unclear or excessively long word, triples a consonant (bell-like), follows a proper noun (Whitman-like), or follows a number (10-fold, 2.5-fold).

Exception: Hyphenate -like for words with >1 syllable, unless the word ends with L.

Doglike

Canine-like

Bell-like

Hyphenate all words with the -borne suffix. Exceptions are those listed in Merriam-Webster dictionary as 1 word (airborne, foodborne, waterborne).

For words with a prefix that modifies a hyphenated term, use hyphen for primary construction and en-dash for secondary construction. In the following example, non- modifies mosquito-borne, not just mosquito so the en-dash is used.

Non-mosquito-borne, not nonmosquito-borne

Do not hyphenate after an adverb ending in -ly, even when used in a compound modifier preceding the word modified.

The rapidly rising temperature caused...

Do not hyphenate foreign phrases that are printed open in other circumstances (e.g., in vitro translation, in situ protein synthesis, in vitro-stimulated growth, in situ-synthesized proteins).

Do not hyphenate CDC mailstops.

Mailstop C12

## Parentheses and Brackets

Nested parentheses sometimes appear in chemical names, usage is dependent on the author's discretion as to how to best use them.

(x(yy)x)

If a designation that already contains parentheses must be enclosed within parentheses, do not change the designation. Instead, use brackets in place of the outer set of parentheses.

Incorrect: another strain (strain 123[pXYZ])

Incorrect: another strain (strain 123(pXYZ))

Correct: another strain [strain 123(pXYZ)]

If a reference falls inside a parenthetical statement, separate it from other material with a semicolon. Do not enclose the reference number in brackets.

The procedure we used (the Lowry method; 12)...

(21; Table 1)

When multiple tables or figures are enclosed within the same parentheses, use semicolons, not the word and.

(Tables 1; 2) ↯

(Table 3; Figure 2)

Exception: use a semicolon between print and online tables and figures (with or without URL) or between figure panels and another graphic (figure or table).

(Table 3; online Appendix Figure 2)

(Figure 3, panel B; Table 4)

Avoid numbered lists if possible. If a numbered list is necessary for clarity, use a single parenthesis to avoid confusion with references. Separate elements with commas, unless commas are used within elements, in which case semicolons should be used.

Three procedures were instituted hospitalwide: 1) handwashing, which is associated with fewer nosocomial infections; 2) isolation precautions, according to established guidelines; and 3) mandatory screening of staff.

## Periods

Periods are omitted from some abbreviations

US citizens

Washington, DC

Dr Tannenbaum

PhD

but not others.

et al.

e.g., i.e. (use only within parentheses)

Joseph E. Filmore

*S. aureus*

St. Louis

Email addresses or URLs in references are not followed by a period.

For an ellipsis, use the Microsoft Word character (...) rather than 3 periods separated by spaces.

Use a period for a decimal (23.7), not a comma (European style).

### **Semicolons**

Semicolons are used to separate 2 independent clauses when no conjunction is used.

Guadalupe is a young community; 81% of houses were built in the past 20 years.

but

Guadalupe is a young community, and 81% of houses were built in the past 20 years.

Semicolons are also used to separate items in a series if internal punctuation is present.

Exclusion criteria included tobacco use; history of asthma, COPD, or lung cancer; pregnancy or intent to become pregnant; and inability to give informed consent.

### **Virgules**

Use of a virgule implies duality.

The physician/patient experience implies that the physician and patient are one and the same.

The physician–patient relationship implies 2 different persons.

Correct: HIV/TB co-infection (because they equally describe the co-infection)

Avoid: HIV/AIDS (because they are not the same)

He or she, not he/she

Father and son bowling league, not father/son bowling league

Avoid and/or; most of the time simply and or or is appropriate.

Do use a virgule for drug combinations.

## Medical Journal Style Preferences

### Abbreviations, Acronyms, and Initialisms

An abbreviation is a truncated word; an acronym is made up of parts of the phrase it stands for and is pronounced as a word (ELISA, AIDS, GABA); an initialism is an acronym that is pronounced as individual letters (DNA, RT-PCR). For the purposes of this section, “abbreviation” will refer to all of these.

Do not introduce an abbreviation in a heading. Abbreviations can, however, be used in a heading if previously established.

Abbreviations should be written out in Affiliations and Acknowledgments (unless abbreviated in text). Affiliations may be abbreviated at the author’s discretion in the Address for Correspondence.

When writing out affiliations, use the official spelling, which may or may not be American spelling. Words to look for are Programme vs. Program, Centre vs. Center, Organisation vs. Organization.

WHO, World Health Organization

OIE, World Organisation for Animal Health  
Avoid excessive abbreviations. Use standard abbreviations only; do not make up abbreviations. Spell out on first mention and use only if it occurs a substantial number ( $\geq 3$  times) of times (subject to editorial discretion). Some specific examples follow:

#### **amino acid**

Spell out amino acid when followed by words; abbreviate aa without definition when paired with (before or after) numbers (absolute or percentage).

#### **cycle threshold**

Define  $C_t$  at first use. Use subscript “t.”

#### **nucleotide**

Spell nucleotide when followed by words; abbreviate nt without definition when followed by numbers (absolute or percentage).

#### **SOB**

Avoid SOB (shortness of breath, sulfur-oxidizing bacteria), if possible.

#### **STI**

Use STI for sexually transmitted infection but not for soft tissue infection (SSTI okay for skin and soft tissue infection).

#### **No. (vs. number)**

In text, use “number” when followed by a word, “no.” when followed by a numeral.

We assigned GenBank accession numbers.

We submitted it under GenBank accession no. ABC123.

### **Viruses**

See the section on Acronym Use with Virus Names

## **Abbreviations/Initialisms That Should Not To Be Spelled Out in Text and Titles In the Text**

The following are used without spelling out on first mention (list not comprehensive).

aa (when followed by numbers [absolute or percentage])

AM, PM (time; caps, no periods)

AMP, ADP, ATP

AIDS

BCG (but at first mention specify *Mycobacterium bovis* BCG)

BLAST

bp, kb, kbp (when used with a numeral, but spell out when not used with a numeral)

BSE (can be used in the title if “bovine spongiform encephalopathy” is used in the abstract or, for letters, in the first paragraph of the text; can be used in the running head)

CFU

CI

CSIRO (The Commonwealth Scientific and Industrial Research Organisation, the national government body for scientific research in Australia)

DDBJ (DNA Data Bank of Japan)

DDT

DNA, RNA, cDNA, mRNA, tRNA, or rDNA (Note: c, complementary; m, messenger; t, transfer; r, ribosomal)

dNTPs (deoxynucleotide triphosphates)

ELISA

EDTA

EMBL (European Molecular Biology Nucleotide Sequence Database)

F, M (male, female; use abbreviations in tables and figures only; write out in text)

HEPA filter

HEPES buffer

HIV

Ig and IgA, IgD, IgE, IgG, and IgM

IU, U

kb, kbp, and bp (when used with a numeral, but spell out when not used with a numeral)

kbp, kb, and bp (when used with a numeral, but spell out when not used with a numeral)

M, F (male, female; use abbreviations in tables and figures only; write out in text)

MDCK

MIC, MIC<sub>50</sub>

N (concentration)

PCR

Pers. comm.

PFU

ppb, ppm, ppt

RNA, DNA, cDNA, mRNA, tRNA, or rDNA (Note: c, complementary; m, messenger; t, transfer; r, ribosomal)

rpm

SD, SE, SEM

SI units used with a numeral are never spelled out.

sp., spp., sp. nov (with organism name), subsp. (preferred over ssp.)

Tris

unpub. data,

UK (when used as an adjective; write out when used as a noun)

US (when used as an adjective; write out when used as a noun)

UV

vol/vol, wt/vol, wt/wt

vs. (can be abbreviated when used inside parentheses; otherwise, spell out)

### **In the Title**

In long titles, the following abbreviations can be used without being spelled out, provided the terms are spelled out in the Abstract or, for letters, in the first paragraph. These terms may also be used in running heads.

BSE

MDR TB

MRSA

SARS

TSE

XDR TB

In instances when an abbreviation has become the de facto name, spelling out may cause confusion, particularly if the term appears only once. In these instances, write the abbreviation, then spell out in parentheses, even if it appears only once in the article. On subsequent occurrences, use the abbreviation.

VDRL (Venereal Disease Research Laboratory) test

The article “a” or “an” should match the sound of the abbreviation or acronym, not the word for which it stands.

an HMO report, a MRSA infection (usually pronounced Mersa), a NICU (usually pronounced nick-you]

However, articles are often omitted in front of abbreviations.

CDC, not the CDC

Abbreviate the following in tables, figures, and in the Methods section of research articles. Exception: Write out in research articles if not preceded by number or if used alone; i.e., not part of a “recipe.”

days	d
weeks	wk
months	mo
seconds	s
minutes	min
hours	h
years	y

Abbreviate Street when part of address, with no period.

265 Peachtree St, Atlanta, GA

Abbreviate Saint, with period.

St. Louis encephalitis

Abbreviate UK and USA when used as part of an address, e.g., affiliations and address for correspondence.

Define ICD code revisions as follows:

International Classification of Diseases, 10th revision (ICD-10)

## Geographic Designations

Use the preferred English spelling indicated in Getty Thesaurus of Geographic Names ([http://www.getty.edu/research/conducting\\_research/vocabularies/tgn/index.html](http://www.getty.edu/research/conducting_research/vocabularies/tgn/index.html)).

Spell out names of states and US territories and possessions when they stand alone or follow a county name. Use postal abbreviations in references, addresses, or product identification.

SAS for Windows version 9.2 (SAS Institute Inc., Cary, NC, USA)

For Australian states, use abbreviations

NSW (for New South Wales)

QLD (for Queensland)

WA (for Western Australia)

Abbreviate US and UK as adjectives; write out as nouns. When using in a location or address (e.g., affiliations), use USA and UK.

US citizens, citizens of the United States

Use accent for Réunion Island, no accent for Reunion state ([Getty Thesaurus of Geographic Names](#)).

United Kingdom: For England, list only “City, UK.” For other countries, list “City, Country, UK”

London, UK

Cardiff, Wales, UK

Glasgow, Scotland, UK

For manufacturer locations, abbreviate state/province for all countries.

SAS for Windows version 9.2 (SAS Institute Inc., Cary, NC, USA)

See References for a list of cities that can be used without the state or country name in reference lists.

## Scientific Nomenclature

Italics are used for bacterial and viral taxa at the level of family and below. All bacterial and many viral genes are italicized. Serovars of *Salmonella enterica* are not italicized.

For organisms other than bacteria, fungi, and viruses, scientific names of taxa above the genus level (families, orders, etc.) should be in roman type.

Because abbreviations for restriction endonucleases are derived from the name of the organism (usually bacteria) from which they are isolated, they should be italicized.

*SmaI* was isolated from *Serratia marcescens*.

*Taq* polymerase, which is used in PCRs, was isolated from *Thermus aquaticus*.

Use italics for genus and species in virus names.

*A/Cygnus cygnus/Germany/R65/2006*

Italicize species, variety or subspecies, and genus when used in the singular. Do not italicize or capitalize genus name when used in the plural.

*Listeria monocytogenes* is

...*listeria* are; *salmonellae*; *mycobacteria*

The genus *Salmonella* consists of only 2 species: *S. enterica* (divided into 6 subspecies) and *S. bongori*. Most salmonellae encountered in EID will be serotypes (serovars) belonging to *S. enterica*. Put the genus and species in italics, followed by initially capped serotype in Roman (e.g., *Salmonella enterica* serotype Paratyphi). The genus shorthand “S.” should never be used without a species name

Correct: *S. enterica*

Correct: *S. enterica* serovar Typhimurium

Correct: *S. enterica* ser. Typhimurium

Incorrect: *S. Typhimurium*

Serotypes belonging to other subspecies are designated by their antigenic formulae following the subspecies name (e.g., *S. enterica* subspecies *diarizonae* 60:k:z or *S. IIIb* 60:k:z).

For an article about 1 genus, the author can use abbreviation to introduce new species.

We studied *Pseudomonas aeruginosa*, *P. putida*, *P. fluorescens*, and *P. denitrificans*.

For an article about multiple genera that each have a different abbreviation, the author can use abbreviation to introduce new species.

We studied *Pseudomonas aeruginosa*, *Streptococcus pyogenes*, *P. putida*, and *S. felis*.

For an article about multiple genera, some of which have the same abbreviation, write out first mention of new species. Abbreviate later.

We studied the relationship between *Trypanosoma cruzi* and *Triatoma infestans*.

We found the relationship between *T. infestans* and *T. cruzi* to be...

For an article about several species of the same genus, the genus must be spelled out only in the title and at first use in the abstract, text, tables, and figures. It may subsequently be abbreviated for other species.

We studied *Pseudomonas aeruginosa*, *P. putida*, and *P. fluorescens*.

However, if >1 genus begins with the same letter in an article, the full genus name must be spelled out the first time it is used with a new species. On subsequent mentions of a species, the genus may be abbreviated.

Ticks were discovered on *Canis lupus*, *Canis latrans*, *Cerdocyon thous*, and *Chrysocyon brachyurus*, but *C. lupus* hosted the greatest number of ticks.

## Bacteria

Italicize family, genus, species, and variety or subspecies. Begin family and genus with a capital letter. Kingdom, phylum, class, order, and suborder begin with a capital letter but are not italicized. If a generic plural for an organism exists (see Dorland's), it is neither capitalized nor italicized.

*Mycobacterium tuberculosis*

family *Mycobacteriaceae*, order Actinomycetales

mycobacteria

Binary genus-species combinations are always used in the singular. Genus used alone (capitalized and italicized) is usually used in the singular, but it may be used in the plural (not italicized) if it refers to all species within that genus.

*Salmonella enterica* is...

Salmonellae are ubiquitous...

Do not use spaces for MRSA isolates.

Preferred: USA300

Avoid: USA 300

## Genes

Gene designations are generally italicized, which helps clarify whether the writer is referring to a gene or to another entity that might be confused with a gene. Style for genes varies according to organism.

There is no real consensus on style of depicting acronyms for *Plasmodium* genes, except that when referred to as genes, they are italicized; when referred to as proteins, they are not. The style is more dependent on the particular journal. In molecular microbiology the gene and species abbreviation, i.e., *pf*, is italicized and all of the term is in lowercase; *pfmdr1*, *pfatp6*, *pvdhfr*. This

particular gene was presented in The Lancet as *PfATPase6*. The main idea is to be consistent throughout the manuscript.

Acronyms for *Plasmodium* genes are italicized when referring to a gene. When referring to a protein they are not italicized.

Many virus gene names are written in italics and are traditionally 3 letters, lowercase, although some will be written in all caps, roman. No definitive rules exist for naming such genes, and you will see them described in a variety of different ways.

src gene, myc gene, HA, NA

Bacteria gene names are always written in italics.

*lacZ* gene

Fungus gene names are generally treated the same as virus gene names (i.e., 3 italicized letters, lowercase). With a multigene family, a numeric notation is included. When different alleles of the same gene are noted, the terminology allows for a superscript.

Mitochondrial genes add an “mt” prefix to the 3- or 4-letter gene, which may or may not be in lowercase. Drug target genes are all capped, no italics.

*msg1, msg2, msg3* (multigene)

xyz1 (different alleles of same gene)

mt*LSU* (mitochondrial genes)

DHPS and DHFR (drug target genes)

Insertion sequences are written as “IS” plus an italicized number (*IS6110*).

Human gene names are all caps and italicized. May be all uppercase Latin letters or a combination of uppercase letters and Arabic numbers, ideally no longer than 6 characters. Initial character is always a letter. No subscript, superscript, roman numerals, or Greek letters are used.

Similar gene names may exist for humans and mice. For example, AMA Manual of Style lists the following genes:

$\beta_2$ -microglobulin: B<sub>2</sub>m (mice) and B<sub>2</sub>M (humans)

CD5 antigen: Cd5 (mice) and CD5 (humans)

A list of human gene names is available at <http://www.genenames.org/guidelines.html>

## Proteins

Proteins, the combinations of amino acids that make up plants and animals, including humans, often have the same name as a gene but are not italicized and always begin with a capital letter. For example, 1 of the outer surface proteins of *Borrelia burgdorferi* is named outer surface protein A. It is encoded by *ospA* (the gene), and the protein is OspA.

Proteins often have common names (e.g.,  $\beta$ -galactosidase is the gene product of *lacZ*).

How to tell difference between proteins and genes? If a term is combined with 1 of the following words, it is probably describing a gene:

Promoter (e.g., P2 core promoter [of myc gene]); promoters are parts of genes, not proteins

Terminator, operator, attenuator sites

If term is combined with one of following words, it is probably describing a protein.

Repress—a protein represses, a gene doesn't.

React—a protein reacts, a gene doesn't

Heterodimerization

Elevated levels of \_\_\_\_ [A common usage error is for authors to write “elevated myc” when they mean: “elevated levels of myc.”]

Italicizing MMR is another common usage error. This term, which means “mismatch repair,” is never a gene, just an abbreviation for a process. But you may see “Mice with specific alterations in a number of MMR genes have been developed...”

## Restriction Enzymes

Restriction enzymes are identified with a 3-letter designation of the bacterium from which they are isolated, plus a single-letter strain designation (as needed) and a roman numeral showing the order in which it was identified. The 3-letter bacterium designation should begin with a capital letter and is italicized; the rest of the enzyme name is set roman.

*SmaI*, *EcoRI*, *BamHI*

## Viruses

### Italic Use with Virus Names

A virus is not a species; a virus belongs to a species. Italicize species, genus, and family of a virus when used in a taxonomic sense. Note however, that it is fine to not mention taxonomy of a virus, especially one like dengue or polio that is well known.

Do not italicize a virus name when used generically. If you capitalize a virus name (other than one that has a proper name in it so that you must capitalize it), then you need to italicize it.

bovine kobuviruses, a kobuvirus, kobuviruses, but *Kobuvirus* spp.

The presence of West Nile virus was confirmed in mosquitoes and dead crows. (AMA Style Guide, p. 758).

Epidemic transmission of West Nile virus (WNV)...prompted aerial application.

The species *West Nile virus* is a member of the genus *Flavivirus*.

We present a potential exposure to an Ebola virus that occurred in a BSL-4 laboratory.

Recent attention has been drawn to Toscana virus (family *Bunyaviridae*, genus *Phlebovirus*, species *Sandfly fever Naples virus*) in countries...

### Acronym Use with Virus Names

It is permissible to use an acronym for a virus (e.g., WNV for West Nile virus), after defining it. However, do not abbreviate a species (including the species West Nile virus). In short, if you do italicize, don't use an acronym.

Correct: West Nile virus (WNV; family *Flaviviridae*, genus *Flavivirus*) is transmitted to humans [here the virus is being transmitted, not the species name; so West Nile virus is roman type and may be abbreviated].

For viruses that begin with a Greek letter, write it out and close up space between the letter and the rest of the word.

Betaherpesvirus

For **human coronavirus**, use the abbreviation hCoV. Be aware that there is a genus/species named *Human coronavirus*, which should be abbreviated as *H. coronavirus*, not hCoV.

For **numbered echoviruses** (e.g., echovirus 13), use the following format: E13 (do not use EV)

For **hepatitis E virus**, use the acronym HEV.

Use a capital H for **human virus abbreviations** (e.g., HMPV, not hMPV), unless otherwise directed by author or precedent (see human coronavirus above).

For **human enterovirus**, use human EV, not HEV. For numbered enteroviruses, use the following format: EV75.

For influenza virus, see separate section below, following West Nile virus.

For **polyomaviruses**, use the following:

KIPyV for KI polyomaviruses (formerly known as Karolinska Institute polyomavirus)  
MCPyV, not MCV, for Merkel cell polyomavirus, and  
WUPyV for WU polyomaviruses (formerly known as Washington University polyomavirus).

For West Nile virus, use WNV.

## **Influenza**

On October 18, 2011, WHO published guidelines for the standardization of terminology of the pandemic A(H1N1)2009 virus (see [http://www.who.int/influenza/gisrs\\_laboratory/terminology\\_ah1n1pdm09/en/index.html](http://www.who.int/influenza/gisrs_laboratory/terminology_ah1n1pdm09/en/index.html)). The guidelines are intended to minimize confusion and differentiate the pandemic virus from the old seasonal A (H1N1) viruses circulating in humans before pandemic A(H1N1)2009 virus. In agreement with WHO guidelines, EID will use the following nomenclature for the pandemic A(H1N1)2009 virus:

influenza A(H1N1)pdm09 virus

After a first mention of the full virus name, including the word “influenza,” it is sufficient to use “A(H1N1)pdm09”; however, the word “virus,” “infection,” or “outbreak” should be added to the name, as appropriate. If the term appears frequently, the abbreviation “pH1N1” may be used.

Examples of other influenza virus nomenclature used by EID:

avian influenza A(H7N9) virus

avian influenza A(H5N1) virus

As stated above for influenza A(H1N1)pdm09 virus, other influenza virus names can be shortened after a first mention that includes the word “influenza,” but, as appropriate, the word “virus,” “infection,” or “outbreak” should be added to the name. Examples: A(H7N9) virus, A(H7N9) infection, A(H7N9) outbreak.

The H and N subtype should always be in parentheses when it follows “influenza”:

influenza virus A(H5N1) (for “influenza virus A subtype H5N1”)

A(H3N2)v (for “variant influenza A(H3N2)”)

When used alone, subtypes do not need parentheses but must be accompanied by the word “subtype.”

The H5N1 subtype is...

Different subtypes, such as H5N1...

Note: H5N1 is neither a virus, nor a disease; it is merely a subtype designation of influenza virus type A. If you want to drop anything later in the article, you may leave out the subtype designation. If only 1 virus is being studied, you can say in the Methods that influenza virus means influenza virus A subtype H5N1, and leave the subtype out from then on.

Influenza virus (H5N1) can have high or low pathogenicity. It is not redundant to include "highly pathogenic" in the title.

For information on this virus nomenclature style, adopted by several international organizations, see International Committee on Taxonomy of Viruses (<http://ictvonline.org/virusTaxonomy.asp?version=2009>).

For influenza virus isolates, include the virus subtype, write out in full the host of origin (omit if human), include the site of isolation and strain number, and use the 4-digit year if the virus was isolated in 2000 or later. For viruses isolated during the 1900s, use the 2-digit year.

Incorrect: dk/Laos/3295/06

Correct: A/duck/Laos/3295/2006

Italicize genus and species of the host in isolate names.

*A/Cygnus cygnus*/Germany/R65/2006

The formal nomenclature for the designation of influenza viruses was revised and published by the World Health Organization (WHO). (WHO. A revision of the system of nomenclature for influenza viruses: a WHO memorandum. Bull. World Health Organ. 1980;58:585–9). The full and correct nomenclature includes the type of virus (A, B, or C), the host of origin (except for human), the geographic site of isolation, the strain number, the year of isolation (4-digit year for viruses isolated in 2000 or later; 2-digit year for viruses isolated during the 1900s), and the subtype (16 possible H and 9 possible N subtypes).

Thus a type A virus isolated in 1995 from a Mallard duck in Memphis Tennessee with a strain number of 123 and an H5N1 subtype is designated:

Influenza A/mallard/Memphis/123/95 (H5N1).

Site can be abbreviated in human viruses, as in the following for which PR (Puerto Rico) and FM (Fort Monmouth) are well known and not written out.

Influenza viruses used were A/PR/8/34 (H1N1), A/FM/1/47 (H1N1), and A/Thailand/SP-83/2004 (H5N1).

## Units of Measure

A quantity indicated by a unit of measure is singular, even when the unit is spelled out, except in the case of nonabsolute or informal units.

10 mg was added

5 mL was injected

220 cpm of radioactivity was detected

Twelve milliliters was injected, but 10 drops were added

Change mM to mmol/L.

Change  $\mu$ M to  $\mu$ mol/L

Change micron (outdated term) to  $\mu$ m.

## Confidence Intervals

Confidence intervals (CIs) are preferred over confidence limits. Use an en-dash in a confidence interval unless the range includes a negative number; for negative confidence intervals, use the word “to.” The abbreviation CI can be used without definition.

(95% CI 0.8–1.6)

(95% CI –1.3 to 4.5)

## Currency

Currency may be converted to US dollars or given in local units. The symbols \$, £, and € may be used without defining (although specify US \$, Can \$, or Aus \$). Other symbols or abbreviations should be defined; inclusion of a conversion factor should be at the author’s discretion.

The approximate cost per case of disease prevented was US \$150.

We analyzed expenses in Japanese yen (¥). The cost of treatment was  $\approx$  ¥10,000.

The unit used in our calculations was the Chinese renminbi (RMB) (RMB 1  $\approx$ US \$0.13).

## Dates

Spell out months in text. In tables, figures, and references, abbreviate months with the first 3 letters.

In running text, write the date as Month DD, YYYY. Set the year off in commas only if it is used with both month and day.

We conducted a study in January 2003 on the prevalence...

We began a study on January 3, 2003, on the prevalence...

In tables and figures, avoid the constructions MM/DD/YYYY and DD/MM/YYYY (because usage is not consistent worldwide and they can be confused with each other). In references and in the body of tables, dates should be written as YYYY Mon DD (e.g., 2006 Sep 1).

### **Digits versus Spelled-out Numbers**

Numerals, including values <10, should be used to express numbers in most circumstances. However, do not use numerals for

numbers that begin a sentence, title, subtitle, or heading

common fractions

idiomatic expressions

numbers used as pronouns

other uses of the number “one” in running text

ordinals first through ninth

numbers spelled out in quotations or published titles

The relative risk of exposed participants was 3 times that of the controls.

In the second phase of the study, 3 of the investigators administered the 5 tests to the 7 remaining participants.

Five species were identified. (In this instance, rewording the sentence may be preferable: We identified 5 species.)

The investigators compared a new laboratory method with the standard one (not 1).

In titles, use numerals unless the number is the first word.

Comparison of 2 Methods to Detect Publication Bias in Meta-analyses

If 2 numbers appear adjacent to each other, try to rewrite the sentence. If this occurrence is unavoidable, write out one of them.

We sterilized five 50-mL test tubes.

When a unit of measure follows a number that begins a sentence, it too must be written out, even if the same unit is abbreviated elsewhere in the same sentence.

Two micrograms was administered on day 1, followed by 1 µg on day 2.

## Equations

In equations, single-letter abbreviations and variables (except for p values) are italicized; surrounding parentheses are not.

Displayed equations should be used only for complex equations that cannot be clearly run into the text. Displayed equations and text are not separated with punctuation.

The value is calculated as follows:

$$n = \ln 1 - \pi (\sum 1y 3x + 1)$$

*y*

Simpler equations should be run into text and set off with a comma.

Distance is calculated as  $D = x(y)$ , where  $D = \text{distance}$ ...

Text equations use initial capital letters for each element and no end punctuation.

(No. new cases/No. persons at risk)

## Fractions

Although decimals are preferred (and required with SI units), for less precise measurements, mixed fractions may be used.

The patient was hospitalized for 5½ days.

Common fractions are expressed with words. Hyphens are used only if the fraction modifies a noun.

approximately one fourth of the population

a two-thirds majority

## Mathematical Symbols

Unless the meaning is obscured, symbols are preferred to text in mathematical expressions. Note: Do not automatically substitute < for “up to” or “as high as” because it could obscure author’s emphasis on the highest value. For example, use

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>12 persons, not more than 12 persons

<4 days, not no more than 4 days

≥80 mm Hg, not at least 80 mm Hg

≈70 geese, not approximately 70 geese

Use words rather than symbols for nonmathematical expressions (disregard this rule for tables and parenthetical expressions), and do not allow symbols to stand for the main verb in a clause.

ribavirin plus interferon, not ribavirin + interferon

where  $p$  was  $<0.05\dots$ , *not* where  $p<0.05\dots$

Symbols (except for  $<$ ,  $>$ ,  $\leq$ , and  $\geq$ ) are written with a space on either side when they indicate mathematical equations. In all other contexts, the symbol should be closed up with associated numbers or variables.

$14x + 27y = z$

$45\% \pm 2\%$

$p<0.01$

$-70^{\circ}\text{C}$

G+C content

densities of  $<10^3$  cells per  $\text{cm}^2$

magnification  $\times 200$ ,  $4 \times 10^6$

the MIC was  $<8.0$  g/mL

$260,000 \times 10^9$  cells/L

If a symbol begins a heading (e.g., column heading in table), capitalize the next word

% Infected

### Numbers

Use commas in all numbers with  $>4$  digits, except in dates and in numbers that represent a position (as with a page number or amino acid)

2,000 people by 2002

We found a Leu→Phe substitution at amino acid 1242.

Use a combination of numerals and words to express rounded large numbers and consecutive numerical expressions.

The disease affects 5 million to 6 million persons.

Study participants were given twenty 5-mL syringes.

For all decimals between  $-1$  and  $1$  ( $\neq 0$ ), use a leading zero to the left of the decimal.

$p < 0.05$  *not*  $p < .05$

## Ordinals

Ordinals generally express order or rank rather than quantity. Ordinals first through ninth are spelled out. Ordinals greater than ninth are expressed as numerals, except at the beginning of sentence, title, or heading.

In a series that includes an ordinal greater than ninth, all ordinals are expressed as numerals.

Samples were taken during the 2nd, 4th, 8th, and 16th weeks after illness onset.

## Percentages

Always use a digit and the % symbol with percentages, unless it is the first word in a sentence.

Forty-three percent of our sample tested positive.

Percentages should immediately follow the number, not the phrase.

The disease was found in 12 (50%) of the 24 children.

## Ranges

Limit to specific statistical meaning. Connect ranges with an en-dash, unless introduced by the preposition “from,” in which case use a joining conjunction is needed (e.g., “from... to” or “from... through”). Be careful with “between... and” constructions because they exclude both endpoints.

Participants were 18–20 years of age.

from 5% to 10%

from 1984 through 1990 (not between 1984 and 1990, unless 1984 and 1990 are not included)

The “from... to” construction may also be used for clarity if one or both of the limits in a range are negative.

from  $-70^{\circ}$  to  $-40^{\circ}$

In ranges of time, particularly years, prepositions and conjunctions are critical in determining the actual amount of time included.

Between 1999 and 2001 = 1 year

From 1999 to 2001 = 2 years

From 1999 through 2001 = 3 years

When the range of years is not necessarily a calendar year and indicates only 1 year (e.g., influenza season, fiscal year, school year), it is ok to truncate the second year.

2005–06 influenza season

2004–05 school year

Repeat units in ranges if the unit is set closed up with the digit, but do not repeat units that are separated with a space.

from  $40^{\circ}\text{C}$  to  $70^{\circ}\text{C}$

25%–50%

50–100  $\mu\text{L}$

from 80 to 89 mm Hg

## **Ratios**

Use a colon to express a ratio or dilution. Titers are expressed as the reciprocal of the dilution.

(length:width, 2:1)

The end IgG titer was 256 after a serial 1:2 dilution.

A ratio may also be expressed as a percentage. Note that a ratio becomes a rate only when an element of time is involved (such as number of deaths per population per year).

Seven of the 12 patients died; death ratio was 58.3%.

During 2000–2004, the average death rate was 12.7% per year.

## SI Units

Use SI units for units of measure, for example:

Unit name	SI symbol
centimeter	cm
cubic millimeter	mm <sup>3</sup>
dalton	Da
deciliter	dL
gram	g
kilodalton	kDa
kilogram	kg
liter	L
meter	m
microgram	μg
microliter	μL
milligram	mg
milliliter	mL
millimeter	mm
mole	mol
molar	mol/L

However, some medical measurements follow other conventions [e.g., blood pressure (mm Hg), oxygen pressure (cm H<sub>2</sub>O), temperature (°C)]. To report both SI and conventional units, repeat the number in parentheses along with the unit of measure.

20 mmol/L (20 mEq/L)