Writing Abstracts

Barbara Gastel, MD, MPH
Professor, Texas A&M University
INASP Associate—AuthorAID
bgastel@cvm.tamu.edu

Overview

- Definition
- Importance of abstracts
- Content and structure
- Analysis of examples
- Pitfalls to avoid
- Some other points
- Questions and answers

Some Aspects of My Background

- Recipient of MD and MPH from Hopkins
- Teacher of science communication (at MIT, Peking University Health Science Center, UCSF, and now Texas A&M University)
- Coordinator, science journalism MS program, A&M
- Author, with Robert A. Day, of 6th and 7th editions of *How to Write and Publish a Scientific Paper*
- Major participant in AuthorAID (www.authoraid.info)
- It's good to be back!

Definition and Examples

Definition

- Abstract: a summary of information in a document or presentation
- Some items that abstracts may summarize:
  - Journal articles
  - Grant proposals
  - Presentations

Note

Abstracts often appear without the full document (for example, in PubMed).

Also, abstracts often are read before other parts of the document.

Therefore abstracts should be understandable on their own.

Two Examples

- Conventional abstract of journal article
- Structured abstract of journal article

High Rates of *Mycobacterium tuberculosis* among Socially Marginalized Immigrants in Low-Incidence Area,1991–2010, Italy

Migration from low- and middle-income countries to high-income countries increasingly determines the severity of tuberculosis (TB) cases in the adopted country. Socially marginalized groups, about whom little is known, may account for a reservoir of TB among the immigrant populations. We investigated the rates of and risk factors for *Mycobacterium tuberculosis* transmission, infection, and disease in a cohort of 27,358 socially marginalized immigrants who were systematically screened (1991–2010) in an area of Italy with low TB incidence. Overall TB and latent TB infection prevalence and annual tuberculin skin testing conversion rates (i.e., incidence of new infection) were 2.7%, 34.6%, and 1.7%, respectively. Prevalence of both TB and latent TB infection and incidence of infection increased as a function of the estimated TB incidence in the immigrants' countries of origin. Annual infection incidence decreased with time elapsed since immigration. These findings have implications for control policy and immigrant screening in countries with a low prevalence of TB.

Baussano et al, *Emerging Infectious Diseases,* Sep 2013

GeoSentinel Surveillance of Illness in Returned Travelers, 2007–2011

Background: International travel continues to increase, particularly to Asia and Africa. Clinicians are increasingly likely to be consulted for advice before travel or by ill returned travelers.

Objective: To describe typical diseases in returned travelers according to region, travel reason, and patient demographic characteristics; describe the pattern of low-frequency travel-associated diseases; and refine key messages for care before and after travel.

Design: Descriptive, using GeoSentinel records.

Setting: 53 tropical or travel disease units in 24 countries.

Patients: 42 173 ill returned travelers seen between 2007 and 2011.

Measurements: Frequencies of demographic characteristics, regions visited, and illnesses reported.

(more)

(continued)

Results: Asia (32.6%) and sub-Saharan Africa (26.7%) were the most common regions where illnesses were acquired. Three quarters of travel-related illness was due to gastrointestinal (34.0%), febrile (23.3%), and dermatologic (19.5%) diseases. Only 40.5% of all ill travelers reported pretravel medical visits. The relative frequency of many diseases varied with both travel destination and reason for travel, with travelers visiting friends and relatives in their country of origin having both a disproportionately high burden of serious febrile illness and very low rates of advice before travel (18.3%). Life-threatening diseases, such as *Plasmodium falciparum* malaria, melioidosis, and African trypanosomiasis, were reported.

Limitations: Sentinel surveillance data collected by specialist clinics do not reflect healthy returning travelers or those with mild or self-limited illness. Data cannot be used to infer quantitative risk for illness.

(more)

(continued)

Conclusion: Many illnesses may have been preventable with appropriate advice, chemoprophylaxis, or vaccination. Clinicians can use these 5-year GeoSentinel data to help tailor more efficient pretravel preparation strategies and evaluate possible differential diagnoses of ill returned travelers according to destination and reason for travel.

Primary Funding Source: Centers for Disease Control and Prevention.

Leder et al, *Annals of Internal Medicine,* 19 Mar 2013

Importance of Abstracts

Abstracts of Journal Articles

- The most-read section
- Before publication
  - May be used in initial screening by journal
  - May be used in assigning peer reviewers
- After publication
  - Used to decide whether to read further
  - Sometimes used to decide whether to obtain the article
  - Help orient readers
  - Remind readers of key content

Abstracts of Presentations

- During conference planning
  - Used to decide which presentations to accept
  - Sometimes used to decide whether a presentation will be oral or poster
- At or shortly before the conference
  - Used to decide which presentations to attend (or which posters to view)

Abstracts of Grant Proposals

- Sometimes used in assigning peer reviewers
- Remind review-committee members of the content

All Abstracts

Contribute to first impressions of the work

Thus, abstracts are important.

Yet preparation of abstracts is often almost an afterthought.

Give abstracts the attention they deserve!

Content and Structure of Abstracts

Main Format for Biomedical Journal Articles: IMRAD

- **I**ntroduction: What was the question?
- **M**ethods: How did you try to answer it?
- **R**esults: What did you find?
- **A**nd
- **D**iscussion: What does it mean?

Abstracts should have this structure too.

Verb Tense in Abstracts of Articles

- Methods and results: past tense
- Introduction and discussion: may include present tense

Conventional vs Structured Abstracts

- Conventional abstract: a single paragraph
- Structured abstracts: multiple short paragraphs, each with a specified heading
  - The journal typically specifies the headings.
  - Some parts may have phrases, not sentences.
  - Different types of articles may have different standardized headings.
  - As well as aiding readers, the headings can facilitate writing abstracts.

A Suggestion

If a conventional abstract is requested, draft it first as a structured abstract (for example, with the headings Background, Method, Results, and Conclusion). Then remove the headings and paragraph breaks.

Voila! An informative, well-organized abstract!

Analysis of Some Examples

Conventional Abstract of a Journal Article

High Rates of *Mycobacterium tuberculosis* among Socially Marginalized Immigrants in Low-Incidence Area,1991–2010, Italy

Migration from low- and middle-income countries to high-income countries increasingly determines the severity of tuberculosis (TB) cases in the adopted country. Socially marginalized groups, about whom little is known, may account for a reservoir of TB among the immigrant populations. We investigated the rates of and risk factors for *Mycobacterium tuberculosis* transmission, infection, and disease in a cohort of 27,358 socially marginalized immigrants who were systematically screened (1991–2010) in an area of Italy with low TB incidence. Overall TB and latent TB infection prevalence and annual tuberculin skin testing conversion rates (i.e., incidence of new infection) were 2.7%, 34.6%, and 1.7%, respectively. Prevalence of both TB and latent TB infection and incidence of infection increased as a function of the estimated TB incidence in the immigrants' countries of origin. Annual infection incidence decreased with time elapsed since immigration. These findings have implications for control policy and immigrant screening in countries with a low prevalence of TB.

Baussano et al, *Emerging Infectious Diseases*, Sep 2013

Structured Abstract of a Journal Article

GeoSentinel Surveillance of Illness in Returned Travelers, 2007–2011

Background: International travel continues to increase, particularly to Asia and Africa. Clinicians are increasingly likely to be consulted for advice before travel or by ill returned travelers.

Objective: To describe typical diseases in returned travelers according to region, travel reason, and patient demographic characteristics; describe the pattern of low-frequency travel-associated diseases; and refine key messages for care before and after travel.

Design: Descriptive, using GeoSentinel records.

Setting: 53 tropical or travel disease units in 24 countries.

Patients: 42 173 ill returned travelers seen between 2007 and 2011.

Measurements: Frequencies of demographic characteristics, regions visited, and illnesses reported.

(more)

(continued)

Results: Asia (32.6%) and sub-Saharan Africa (26.7%) were the most common regions where illnesses were acquired. Three quarters of travel-related illness was due to gastrointestinal (34.0%), febrile (23.3%), and dermatologic (19.5%) diseases. Only 40.5% of all ill travelers reported pretravel medical visits. The relative frequency of many diseases varied with both travel destination and reason for travel, with travelers visiting friends and relatives in their country of origin having both a disproportionately high burden of serious febrile illness and very low rates of advice before travel (18.3%). Life-threatening diseases, such as *Plasmodium falciparum* malaria, melioidosis, and African trypanosomiasis, were reported.

Limitations: Sentinel surveillance data collected by specialist clinics do not reflect healthy returning travelers or those with mild or self-limited illness. Data cannot be used to infer quantitative risk for illness.

(more)

(continued)

Conclusion: Many illnesses may have been preventable with appropriate advice, chemoprophylaxis, or vaccination. Clinicians can use these 5-year GeoSentinel data to help tailor more efficient pretravel preparation strategies and evaluate possible differential diagnoses of ill returned travelers according to destination and reason for travel.

Primary Funding Source: Centers for Disease Control and Prevention.

Leder et al, *Annals of Internal Medicine,* 19 Mar 2013

Abstract of a Grant Application (Grant Proposal)

Gardnerella vaginalis: toxin production and pathogenesis

Bacterial vaginosis (BV) is an exceedingly common disorder of the vaginal microflora affecting >30% of all women, with higher rates in pregnancy and among African-American populations. Women with BV are at substantially increased risk of preterm birth, which is a major cause of neonatal morbidity and mortality, as well as acquisition of sexually transmitted diseases including human immunodeficiency virus. Despite its public health importance, the pathogenesis of BV is not well understood. We have recently characterized vaginolysin (VLY), a cholesterol-dependent cytolysin from *Gardnerella vaginalis* (a bacterial species present on the vaginal mucosa in the setting of BV and thought to contribute to the pathogenesis of disease) that exhibits exquisite human specificity. We hypothesize that this species-specific toxin may be an important virulence factor of *G. vaginalis* with relevance to the pathogenesis of BV. In our preliminary data, we have characterized the receptor for VLY (human CD59) on genital tract epithelial cells. Introduction of

(continued)

this receptor into non-susceptible cells renders them sensitive to VLY. We have engineered a transgenic mouse expressing the hCD59 receptor and also constructed a VLY chimera that is hCD59-independent. These represent candidate in vivo models for BV. In addition, we have developed techniques for genetic manipulation of *G. vaginalis,* including transposon mutagenesis. In Aim 1, we will define genetic determinants of *G. vaginalis* virulence using new techniques for mutagenesis and assays of toxin production. In Aim 2, we will determine the role of VLY at the host-pathogen interface both in vitro and in vivo with a focus on unique aspects of the VLY-hCD59 interaction. At the conclusion of these studies, we will have expanded our knowledge of *G. vaginalis* pathogenesis, evaluated new in vivo models of BV, identified candidate strategies to inhibit toxin-host interaction, and developed new tools for continued investigation into the pathogenesis of an important disorder.

From sample grant application posted at http://www.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx.
PI: Adam Ratner, Columbia University; funding agency: National Institute of Allergy and Infectious Diseases

Structured Abstract of an Oral Presentation

Influenza-Associated Pediatric Deaths—United States, 2004–2012

Background: Influenza-associated pediatric deaths are rare. We describe the epidemiology of influenza-associated pediatric deaths across the 2004–2005 to 2011–2012 influenza seasons.

Methods: Deaths in children aged <18 years with laboratory-confirmed influenza virus infection were reported by state health departments to the Centers for Disease Control and Prevention using a standard case report form to collect data on demographics, underlying medical conditions, bacterial co-infections, clinical course, and laboratory results.

Results: From August 1, 2004 to May 5, 2012, 817 influenza-associated deaths in children were reported (range: 22 in 2011–2012 season to 282 in 2009–2010 season). Of 802 children with influenza type distinguished, 641 (80%) were infected with influenza A virus and 160 (20%) were infected with influenza B virus; 1 child had influenza A&B virus co-infection. Median age was 7 years (interquartile range: 2–12). Thirty-five percent of children died in

the emergency department or outside the hospital. Of the 781 with a known medical history, 333 (43%) had no high-risk conditions; of children with high-risk conditions, 57% had neurologic disorders, 45% had asthma or other pulmonary disease, and 22% had genetic or chromosomal disorders. Median duration of illness from symptom onset to death was shorter among children with no underlying high-risk conditions compared with children with at least one high-risk condition (4 versus 7 days; $p<0.01$). Of 390 children with a specimen collected for bacterial culture from a normally sterile site, 150 (38%) had ≥1 bacterial co-infection; the most common bacterial co-infection was *Staphylococcus aureus*, which was identified in 76 (19%) of the children who were tested.

Conclusion: Influenza can be fatal in children with and without underlying high-risk conditions. Children with neurologic conditions and chromosomal disorders were highly represented among those who died. Influenza

vaccination should be a high priority for all children, especially for those with conditions that place them at high risk for complications. Because influenza infection can progress rapidly to death, children with high-risk conditions or severe illness should receive antiviral treatment as early as possible.

Karen K. Wong, MD, MPH, Seema Jain, MD, Alicia Fry, MD, MPH, Lynnette Brammer, MPH, Lenee Blanton, MPH, Rosaline Dhara, MA, MPH and Lyn Finelli, DrPH, MS, Centers for Disease Control and Prevention, Atlanta, GA

From IDWeek 2012

Pitfalls to Avoid

Some Pitfalls to Avoid

- Excessive length (do not exceed word limits and space limits)
- Inconsistencies with the body of the piece
  - Inclusion of material not in the piece
  - Discrepancies (for example, in numbers)
- Use of undefined abbreviations/acronyms
- Citation of references (unless allowed)
- Inclusion of tables or figures (unless allowed)

Suggestion

- When preparing the first draft of an abstract, don't worry about word limits. (Doing so may lead you to omit important content.)
- Then, once the abstract is drafted, condense it if necessary. You may do so by
  - Making the wording more concise (See, for example, http://www.authoraid.info/en/news/details/762/.)
  - Decreasing the amount of detail

Some Other Points

Informative vs Indicative Abstracts

- Informative abstracts: summarize the content (as in the examples shown)
- Indicative abstracts: state the types of content included (as in a table of contents)

Typically, informative abstracts should be used. However, indicative abstracts can be suited for items such as conventional review articles.

When to Write the Abstract

- Prepare the final version of abstract after the piece is written (so you are certain of the content of the piece).
- However, drafting an abstract early in the writing process can be useful.
  - Can help define focus
  - Can serve as an outline

A concern sometimes voiced: Are presentation abstracts prior publications?

- For purposes of journal publication, a typical presentation abstract isn't normally viewed as a prior publication.
- However, if a presentation abstract has been published, the journal editor generally should be told.

Reminder

Reminder

- Abstracts are among the most widely read and influential parts of scientific communications.
  - They give a first impression.
  - They orient readers.
  - They affect peer review.
  - They influence whether readers proceed further.
  - They are important in reviewing content.
- **Give them the attention they deserve!**

Thank You!

Questions and Answers