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| HEI LOGO | OPTION 2 TEMPLATE  RESEARCH REPORT |
| HEALTH  EFFECTS  INSTITUTE  Number [X]  [Month Year] | [Research Project Title]  Principal Investigator:  *[Name, Affiliation, and Address]*  Research Team:  *[Names and Affiliations]*  **NOTE: This research report is intended to be a complete description of the research conducted. The report should describe all components of the research (scientific background, specific aims, methods, and all results) and discuss all the findings.** |

Trusted Science, Clean Environment, Better Health

# Contents

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***[INSERT TABLE OF CONTENTS TO THIRD-LEVEL HEADERS]***

# Option 2 Template and Guidance for Preparing Report

This template provides general and section-by-section guidance for preparing your report. Use this template (chapter format) for research in which multiple studies or experiments were conducted to address varied aims. Some chapters can consist of articles that were published over the course of the funded investigation **if** the articles were published in open access journals offering Creative Commons licenses, such as CC BY, which allow authors to use content without needing to obtain permission.

**SUBMITTAL & REPORT REVIEW**

**Draft Final Report**

* Investigators’ Report: Submit one PDF file with text, tables, and figures.
* Appendices and Additional Materials: Submit separate PDF files.
* Complete and submit the Investigators’ Report **[Submission Form](https://www.healtheffects.org/system/files/report-submission-form2021.pdf)**.
* Submit the [**COI disclosure and disclaimer statement**](https://www.healtheffects.org/system/files/coi-form-for-multiple-authors-2021.pdf)**.**

Submit all items ***no later than*** contractual deadline to lmcburney@healtheffects.org.

**Revised Final Report**

* Investigators’ Report: Submit one clean Word file and two PDF files (one clean and one showing tracked changes).
* Appendices: Submit one clean Word file and two PDF files (one clean and one showing tracked changes). Appendices will be lightly edited.
* Additional Materials: Submit two PDF files (one clean and one showing tracked changes). Additional Materials will not be edited.
* Individual Figure Files: Submit files in JPEG, PNG, high-resolution PDF (300 dpi), TIFF, EPS, or Excel. For images drawn in Microsoft Word or PowerPoint, please submit original files.
* Permissions: Submit a list of any published figures or tables that HEI must seek permission to use. Include the original numbers and provide copies of the original publication pages.
* Complete and submit the Investigators’ Report [**Submission Form**](https://www.healtheffects.org/system/files/report-submission-form2021.pdf).

**Report Review Overview**

Your draft report will be sent to external peer reviewers and then discussed by the Review Committee. You will receive an initial review letter with requests for revisions and essential (need-to-address) comments clearly identified. The Committee will discuss your revised report. If it is accepted for publication, it will enter HEI’s editing and production process, and the Committee will prepare a Commentary to highlight strengths and limitations of the research.

## General Guidance: Length, Content, and Considerations

* Be succinct; no more than 20,000 words.
* Be judicious with figures and tables; suggested number is no more than 10–15. Number tables and figures sequentially in the order mentioned in the text.
* Use Appendices and Additional Materials (described below) for additional tables, figures, computer codes, and raw data.
* Present information in a logical sequence and ensure that the results follow from the design, methods, and data analysis described.
* Make sure that the interpretations and conclusions are supported by the results.
* Write approach and methods so that a reader can then understand the results and discussion sections. Readers include people with a scientific background who might not be familiar with your field of research.
* Provide well designed illustrations with informative captions.
* Present data efficiently and clearly in tables.
* Ensure that data in tables and figures are consistent with the text.
* Use abbreviations and other terms judiciously, consistently, and according to worldwide scientific nomenclature; spell out a term at its first mention.
* Spell out chemical compounds at their first text reference.
* Use exponential notations (e.g., 7.3 × 105), not engineering notations (e.g., 7.3E+03).
* Use lowercase superscript letters beginning with “a” for table footnotes.

## Abstract

* Limit to about 500 words and use the headers below to summarize the study, key findings, and implications of the work.

***Introduction***

***Methods***

***Results***

***Conclusions***

## Chapter 1: Introduction

Briefly summarize the state of the science that led to the research questions addressed in your study. Specifically, provide enough context for someone unfamiliar with this research area to grasp the research described in the report. Clearly state the hypotheses or questions that this research was intended to address.

## Chapter 2: Specific Aims and Overaching Approach

State specifically the project aims and how each aim was investigated. If substantive changes were made to the original aims over the course of the study, briefly note the changes and the justifications for the changes. Include a table (see below) that indicates the aims, the studies and experiments conducted, and the location of a description of the methods to provide a roadmap for the reader. If there is a common method or approach that is used throughout the chapters, describe it here.

Research Roadmap

|  |  |
| --- | --- |
| Aims and Research Conducted | Methods Description |
| Aim 1 |  |
| * Study or Experiment | [Indicate where the description of methods appears (e.g., chapters, appendices, or supplemental materials)] |
| * Study or Experiment | [Indicate where the description of methods appears (e.g., chapters, appendices, or supplemental materials)] |
| Aim 2 |  |
| * *Continue as above for all the aims.* |  |
|  |  |

## Chapter 3: *[Specific Research Question or Aim]*

This chapter should follow the headers outlined below. A published article can be used as a basis for this chapter; this approach assumes that the investigators have published in an open access journal offering Creative Commons licenses, such as CC BY, which allow the authors to use content without needing to obtain permissions. The investigator can cut and paste text from the journal article into the format below, or the investigator can provide a cover page that provides a brief introduction to the article and then provide the published article. If published articles are used, please discuss with HEI staff to see how best to incorporate them.

**Reminders for “Study Design and Methods”**

Over time, HEI has noted several elements that are often missing from this section. In case they apply to your study, they are listed here as a reminder to include them.

* Define the study sample (e.g., cell type, animal strain, or human population), size, and rationale for choosing it (with power calculation, if available).
* For each pollutant or pollutant mixture in toxicological or human clinical studies, explain the choices of exposure concentrations and route of administration. In epidemiological studies, describe the approach used to estimate exposure for human populations.
* If the study involved human data, include a statement that the study was approved by the Institutional Review Board or that the study was exempted.
* For a study involving humans, describe how the participants were selected, the inclusion and exclusion criteria, and the informed-consent procedure. If the study involved human tissue, describe when and how it was acquired. Indicate whether participants were paid or otherwise remunerated for their participation.
* In an Appendix, describe the QA/QC procedures implemented in compliance with the procedures for “Studies Using Human Participants” as detailed in the investigators’ QA/QC plan.
* If the study involved animals, include a statement that animal care procedures met government guidelines.

## Introduction

Provide a brief introduction specific to the question or aim addressed in this chapter.

## Study Design and Methods

This section should consist of general descriptions with enough detail so that readers can understand the study design and approach. More detailed information about methods and procedures (e.g., sample collection, biological assays, and exposure modeling) should go in an Appendix. Information on equipment and specialty chemicals (e.g., name, model number, and manufacturer or source) should also be included in the Appendix. A few reminders on information to include in this section are provided in the textbox.

## Data Analysis

This section should include a description of statistical design and analytical methods in sufficient detail to enable readers to understand the general approach of the analyses. Additional detail that allows a knowledgeable reader with access to the original data to verify the reported results should be described in an Appendix.

* Clearly state the hypotheses that were tested and the specific comparison groups.
* Describe the randomization procedures (or other methods of treatment allocation); methods used for any blinding of assessments; treatment complications; number of observations; and any losses to observation (e.g., missing animals or participants who did not complete the study).
* Identify computer programs used, and document that you have evaluated the program’s performance.
* Include sensitivity analyses to evaluate whether important findings are stable over a reasonable range of modeling strategies.
* Throughout the report, reserve statistical terms — such as *random*, *significant*, *normal*, and *correlation* — for use in their technical sense.

## Results

Present all results (published and unpublished) pertaining to the specific research described in this chapter whether they are consistent with your hypothesis or not. HEI encourages presenting and discussing approaches that were not successful so that other researchers can avoid trying those approaches.

* State the main findings of the study and support them with data summaries.
* Ensure that the results reported match the methods described.
* When possible, quantify findings and present them with appropriate indicators of measurement error or uncertainty (e.g., confidence intervals).
* In figures and tables, call attention to statistically significant findings by using bold font or asterisks. However, avoid sole reliance on statistical results that fail to convey important quantitative information, such as P values.
* In figure captions and table footnotes, state the statistical tests or methods used and define any symbols. Make sure all abbreviations and terms are included in the list of Abbreviations and Other Terms described at the end of the report.
* Present detailed data (e.g., individual or subgroup studies and sensitivity analyses) in additional figures and tables in the Appendices.
* When preparing figures with comparable content, it is helpful to match the scales and units on the axes so that readers can more easily compare curves or data patterns among figures.
* Refer to the HEI [data access policy](https://www.healtheffects.org/accountability/data-access-transparency) for additional requirements regarding access to full data and statistical code.

## Discussion and Conclusions

Interpret the results and state the conclusions specific for this chapter. Discuss uncertainties that remain and any discrepancies with research results (e.g., published vs. unpublished) presented in this chapter. Ideally the discussion and conclusions provided in this chapter would lead to the next chapter.

## Chapter 4 and More

Include as many chapters as needed to cover ***all*** the research, studies, and experiments outlined in the overall approach described in Chapter 2. Each of these chapters should follow the same general format as described for Chapter 3. As noted in Chapter 3, a published article can be used as the basis for the chapter; this approach assumes that the investigators have published in an open access journal offering Creative Commons license, such as CC BY, which allow the authors to use content without needing to obtain permissions. The investigator can cut and paste text from the journal article into the format described, or the investigator can provide a cover page that provides a brief introduction to the article and then provide the published article. If published articles are used, please discuss with HEI staff to see how best to incorporate them.

***Note that if you are using published articles for these chapters, and you have unpublished results that are not covered in the above chapters, you will need to add a chapter to present and discusss your unpublished results in a similar format. HEI encourages presenting and discussing approaches that were not successful so that other researchers can avoid trying that approach.***

## Chapter X: Synthesis, Interpretation, and Implications of Findings

This chapter should discuss the overarching findings and their implications. Note that at this stage all data whether consistent with the hypotheses should be presented somewhere within the report or in appendices or supplemental materials and any contradictions discussed. Ideally, this chapter should put the findings into a broader context related to public health and environmental issues and should provide some directions for future research. Any limitations of the overall research should also be discussed here.

## Data Availability Statement

Briefly describe the main project assets (research data, code, and results files) and how to access them. If certain data are not being made available, describe those data, the methods used to access them, and the reason that they are not being made available.

## Acknowledgments

Optional section; use if funds other than the HEI Research Contract need to be acknowledged or if contributors other than the authors need to be mentioned.

## References

Follow the numbered citation style used by the journal *Environmental Health Perspectives* (<https://ehp.niehs.nih.gov/authors/references-and-citations>). Number references numerically according to the order in which they first appear in the main text of the report. Place in-text citations immediately after the information cited by using superscript numbers. Place citation numbers outside periods and commas but inside colons and semicolons.

## Appendices

We strongly encourage using supplementary Appendices to present details that are not essential for the main report, including details of experimental methods, statistical methods, and further results with figures or tables.

* Appendices will be reviewed for spelling, basic grammar, and cross-reference accuracy but will not be fully edited or formatted by HEI.
* Appendics should be lettered (e.g., Appendix A, Appendix B, and so forth).
* If an Appendix is deemed essential for understanding the main report (as decided by HEI and the investigator), it will undergo the same editorial process applied to the main text and will be incorporated into the main body of the report.

## Additional Materials

Additional background information (e.g., questionnaires for human studies, raw data, consent forms, and computer code for statistical analyses) will be published separately as Additional Materials.

* Additional Materials will not undergo any editing or formatting and will be posted “as is.”
* Additional Materials should be numbered (e.g., Additional Materials 1, Additional Materials 2, and so forth).

## About the Authors

Provide a brief biography (one paragraph) about each author. Include education and background, current title, role on this project, and research interests. If an investigator has moved since working on the project, please provide both titles and both institutions. (However, on the title page, list the affiliation in effect at the time the study was completed.)

## Other Publications Resulting from This Research

List full citations of all publications based on research from this contract. Be sure to send HEI all published articles and copies of abstracts and manuscripts submitted.

## Abbreviations and Other Terms

Provide a list of all abbreviations, acronyms, chemical formulas, and shortened terms used, along with brief definitions.