



# HEALTH RESEARCH AND STUDIES COURSES



**IAPH**

International Academy  
of Public Health

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## INTRODUCTION

It is an established fact that research is deemed highly valuable. It is a tool that serves to inform public health professionals of the issues that are of importance to the advancement of the public health field. Such issues may include updates on disease trends and risk factors, patterns of healthcare service delivery, outcomes of public health interventions, functional abilities of the health system or selected health service delivery points. Research may also shed light on issues pertaining to health care costs and use, supply and demand as well as side issues in the provision of health services, amongst other matters. More specifically, research findings may serve to influence public health policy at various levels from the local, to the subnational, national and international levels. Hence, it is important for public health practitioners to have knowledge of the basic principles of research as this will make them well-versed in the skills they need to apply research principles to public health practice.

The execution of medical and health research in the region may be seen as deficient when compared to research projects implemented in other regions. This finding may be attributed to the fact that some health professionals do not have the knowledge they need to conduct research. Students may need more practical and applied teaching methods integrated in the curriculum for them to grasp the concepts of research. To address this gap, this program adopts a practical skills-based chronological approach to deal with the challenges facing new and inexperienced authors seeking to publish their research findings.

The program takes participants through the process of conducting research, writing research articles and getting their research published in highly regarded journals. It is designed to take a publishing-insider's perspective to enable trainees to improve their research writing and increase their chances of having their articles pass peer review. It also enhances possibilities of articles being read and cited widely once published.

Training Courses:

There are 10 courses divided into two programs and an applied research project as follows:

### **Foundations in Public Health Research**

Course 1: Introduction to Research Methods  
Course 2: Study Designs  
Course 3: Basic Concepts in Research Methodology  
Course 4: Applied Research in Public Health  
Course 5: Statistical Tools 1 (Epi Info)  
Course 6: Statistical Tools 2 (Excel)

### **Advanced Health Research Methods**

Course 7: Advanced research methods  
Course 8: Advanced Statistical Methods  
Course 9: The statistical Package for Social Sciences (IBM SPSS)  
Course 10: Scientific Writing

### **Applied Research Project**

Each training course is delivered in (30) Learning Hours. These courses can be taken as part of the three-month programs for a Post Graduate Diploma Certificate, or as stand-alone course. Upon meeting the course requirements, the participant will be awarded a Certificate of Successful Completion by the International Academy of Public Health (IAPH) and accredited by the Agency for Public Health Education Accreditation (APHEA).

**Duration:** 30 Learning Hours

### **Description**

This course is a general overview and an introduction to research. Its overall aim is to demonstrate the importance of research and highlight the fact that research in public health can be conducted even in limited-resource settings. This course allows participants to discuss the role of research in public health and development. It also allows them to describe types of research and list various steps involved in a research project. It also allows participants to decide on types of research they will choose for their projects and on their plans to conduct research. This 5-day course is intended to leave participants with confidence in their ability to independently, conduct public health research.

### **Learning Outcomes**

By the end of this course, participants will be able to:

1. Explain the role of research in development
2. Compare the types of research (qualitative, quantitative, and mixed methods)
3. Identify and prioritize problems for research
4. Analyze a problem statement and differentiate it from a research hypothesis
5. Apply the steps involved in the research process
6. Formulate research hypotheses and null hypothesis
7. Identify Type I and Type II errors in research and their implication
8. Understand ethical issues in research conduct

## **Course Outline**

1. Research and its importance and overall role in development
2. Research types and their uses and applications
3. Literature review and exploratory research
4. Problem analysis, identification, and prioritization
5. Formulating research hypothesis and/or research objectives
6. Null and Alternate hypotheses
7. Type I and Type II errors
8. Research process
9. Ethical considerations in human subject research

## **Training Delivery Methods**

- In-class method
- Online method

**Duration:** 30 Learning Hours

### **Description**

This course provides an orientation for different research designs. It aims to enable participants to choose their respective study or research project approach.

### **Learning Outcomes**

By the end of this course, the participant will be able to:

1. Explain and differentiate between research types
2. Write case reports and case series
3. Identify and apply the most appropriate study design for research projects



## **Course Outline**

1. Research types (non-interventional/observational and interventional research)
2. Exploratory studies
3. Descriptive studies
4. Analytical studies
5. Case reports and case series
6. Ecological studies
7. Cross-sectional studies
8. Cohort studies
9. Case-control design
10. Experimental and Quasi-experimental designs
11. Clinical trials

## **Training Delivery Methods**

- In-class method
- Online method

**Duration:** 30 Learning Hours

### **Description**

This course allows participants to learn various concepts in research methods. The course also contains in-class exercises that allow participants to match learnt concepts to their prospective research projects. It builds the capacity to correctly frame their samples, calculate the sample size and use suitable tools and techniques to collect the data.

### **Learning Outcomes**

By the end of this course, participants will be able to:

1. Define research variables
2. Identify study population
3. Utilize appropriate sampling techniques
4. Identify and differentiate between random sampling error and bias
5. Calculate sample size for different study designs
6. Use various data collection technique and tools

## Course Outline

1. Research variables
2. Study population
3. Introduction to sampling
4. Sampling methods in quantitative and qualitative research
5. Non-probability sampling methods
6. Probability Sampling and sampling theory in quantitative research
7. Sampling or random error
8. Non-sampling errors (bias)
9. Introduction to sample size in qualitative and quantitative research
10. Sample size determination
  - Calculating sample for estimation of prevalence/descriptive studies
  - Calculating sample for testing hypotheses/cohort, case-control, clinical trials studies
11. Introduction to data collection techniques in qualitative and quantitative research

## Training Delivery Methods

- In-class method
- Online method

**Duration:** 30 Learning Hours

### **Description**

In this section participants write their concept notes for their selected topics. It provides an opportunity to recap all research concepts learnt through the previous courses and ends with a written concept note as its main output.

### **Learning Outcomes**

By the end of this course, participants will be able to:

1. Finalize a research topic for a project
2. Identify resources for a literature review
3. Refine research objectives and hypotheses
4. Finalize research methodology
5. Develop a research concept note
6. Design a data collection tool or questionnaire
7. Develop a research proposal from a concept note
8. Devise a Gantt Chart for a research project
9. Devise a budget for a research project

## Course Outline

1. Recap of problem identification and prioritization
2. How to conduct a literature review
3. Building research hypothesis(es) and research objectives
4. Applying and embedding research concepts in study methodology
5. How to develop a concept note and expand it to a research proposal
6. Major components of a research proposal
7. Questionnaire design for qualitative and quantitative data and pilot testing
8. Research project management and making use of Gantt Charts
9. Developing budget for a research project

## Training Delivery Methods

- In-class method
- Online method



**Duration:** 30 Learning Hours

### **Description**

Epi Info is a statistical software for data management that runs under Microsoft Windows for public health practitioners. The program allows for electronic survey creation, data entry and analysis. It enables participants to develop questionnaires, customize the data entry process, enter and analyze data, and develop maps and graphs. The course will provide hands on experience and provide exercises and materials.

### **Learning Outcomes**

By the end of this course, participants will be able to:

1. Design simple data entry forms using the Form Designer.
2. Implement intelligence to data entry forms using Check Code
3. Enter records into Epi Info form
4. Read multiple data sources and utilize the Visual Dashboard and Classic Analysis sessions for manipulating, managing, and analysing data
5. Generate statistics from frequencies, 2X2 tables and means commands
6. Output results into HTML, Excel, or Word formats,
7. Explain the Epi Info companion for android
8. Create maps

## Course Outline

1. Introduction to Epi Info and Getting Started
2. Creating a survey in Form Designer
3. Data entry and validation using Check Code
4. Data entry and using Epi Info Data Package
5. Data analysis using the Classical Analysis
6. Data analysis using the Visual Dashboard and Gadget
7. Create maps
8. Epi Info Companion for Android

## Training Delivery Methods

- In-class method
- Online method

**Duration:** 30 Learning Hours

### **Description**

Excel is a spreadsheet application part of Microsoft Office. It is a tool for organizing and performing calculation on data. It allows data analysis and developing tables, chart and graphs. This course has been designed to equip participants with the knowledge and skills that can be applied when conducting public health data surveillance activities in their daily work.

### **Learning Outcomes**

By the end of this course, participants will be able to:

1. Navigate within Excel's User Interface (UI)
2. Enter and format data to create a database
3. Use formulas and functions to analyse data
4. Organize data by sorting and filtering
5. Create a histogram, epidemic curve and line graph from a dataset
6. Prepare and print a worksheet

## **Course Outline**

1. Introduction to Microsoft Excel
2. User Interface
3. Data Entry and Edit
4. Data Quality
5. Data Analysis (functions and formulas)
6. Pivot Table
7. Data Visualization
8. Page Setup and Print

## **Training Delivery Methods**

- In-class method
- Online method

**Duration:** 30 Learning Hours

### **Description**

This course addresses the methodological issues crucial to the wide range of epidemiologic applications in public health and medicine. It covers a broad range of concepts and methods, including modern study designs, epidemiologic measures of association and impact, causal inference, methods of handling confounding, methods of identifying effect modification, measurement error and information bias, and validity and reliability. The main objective of the course is to enhance a student's ability to design and conduct unbiased and efficient health research studies.

### **Learning Outcomes**

By the end of this course, participants will be able to:

1. Understand the strengths, limitations, and principles of different modern study designs
2. Identify and interpret effect modification
3. Identify potential sources of selection and information bias and understand how to control bias by appropriate study design
4. Identify potential sources of confounding and understand how to address confounding in the design and analysis of epidemiological studies
5. Explain commonly used considerations for causal inference and models of causality
6. Understand the concepts 'validity' and 'precision', 'random' and 'systematic measurement error', 'differential' and 'non-differential misclassification', and the use of validation and reproducibility studies for epidemiological research



## Course Outline

1. Review of epidemiologic study designs
2. Modern analytical study designs
3. Measures of association and measures of impact
4. Causation and Causal Inference
5. Threats to validity and issues of interpretation
  - Lack of validity: Bias
  - Noncausal associations: Confounding
  - Defining and assessing heterogeneity of effects: Interaction
6. Dealing with threats to validity
  - Stratification and Adjustment
  - Quality Assurance and Control
7. Design strategies to improve study accuracy

## Training Delivery Methods

- In-class method
- Online method

**Duration:** 30 Learning Hours

### **Description**

This course provides students with the necessary skills they need to perform statistical analysis of data from biomedical research, healthcare administration, electronic medical records, vital statistics, disease registries, and research databases. Students will learn the appropriate statistical techniques used for estimation and inference. The course enhances participants understanding of statistical modelling for continuous and binary data and their assumptions, correlated data analysis, and longitudinal data analysis. The use of a statistics package, such as SPSS, to analyze case studies will be important throughout.

### **Learning Outcomes**

By the end of this course, participants will be able to:

1. Demonstrate mastery of essential concepts in hypothesis testing & statistical inference.
2. Apply statistical concepts commonly used in health sciences & health informatics
3. Conduct statistical analysis using the appropriate statistical procedures for biomedical data and archival data
4. Interpret results, draw conclusions, and prepare statistical reports

## Course Outline

1. Review of descriptive statistics
  - Measures of central tendency and measures of variability
  - Graphical method
2. Estimation and hypothesis testing
3. Two-Sample T-test (independent samples)
4. Chi-square test of independence
5. Analysis of variance
6. Repeated measures analysis
7. Correlation coefficient and linear regression
8. Logistic regression
9. Survival analysis
  - Kaplan-Meier Survival Curves
  - Cox Proportional Hazards Models
10. General Linear Models
11. Factor analysis

## Training Delivery Methods

- In-class method
- Online method

**Duration:** 30 Learning Hours

### Description

In this course participants will learn the main features of the software including setting up a new data file in IBM SPSS ready for analysis, as well as some techniques of data management, and more advanced statistical procedures that are available in SPSS. The course is designed to provide an intensive training to the latest version of the Statistical Package for the Social Sciences (SPSS), now known as IBM SPSS Statistics. The training combines lecture and hands-on sessions and involves an analysis of a subset of a large dataset. Participants should have knowledge of basic statistical concepts and should have experience in computer operations using Microsoft Windows. Experience with SPSS is not necessary, although a basic understanding of the purpose and functions of the software is helpful.

### Learning Outcomes

By the end of this course, participants will be able to:

1. Understand the main features of the software
2. Manage data in SPSS
3. Apply SPSS statistical techniques to summarize and describe data
4. Apply more advanced SPSS statistical procedures to analyze the data
5. Conduct statistical analysis independently based on the type of outcome and study design
6. Interpret results and present findings

### Course Outline

1. Introduction
  - Introduction to SPSS
  - Data analysis with SPSS: general aspects, workflow, critical issues
  - SPSS: general description, functions, menus, commands
  - SPSS file management

2. Input and data cleaning
  - Defining variables
  - Manual input of data
  - Automated input of data and file import
3. Data manipulation
  - Data transformation
  - Syntax files and scripts
  - Output management
4. Descriptive analysis of data
  - Frequency distributions
  - Measures of central tendency
  - Measures of dispersion
  - Explore
  - Crosstabs
5. Statistical tests
  - Means
  - T-test
  - One-way ANOVA
  - Chi-square test
  - Nonparametric tests
  - Normality tests
6. Linear regression analysis
7. Binary logistic regression
8. Multinomial logistic regression
9. Survival Analysis (Kaplan-Meier)
10. Factor Analysis
11. Multivariate Analysis of Variance

### **Training Delivery Methods**

- In-class method
- Online method



**Duration:** 30 Learning Hours

### **Description**

This course is designed to review the steps involved in, peer reviewing, and revising manuscripts for publication. The course participants will refine and demonstrate writing, reading, editing, and reviewing skills through exercises and class discussions. This course aims to teach the fundamentals of effective scientific writing. Instruction will focus primarily on the process of writing and publishing scientific manuscripts only. The course will be presented in two segments: part (1) teaches students how to write effectively, concisely, and clearly and part (2) takes them through the preparation of an actual scientific manuscript.

### **Learning Outcomes**

By the end of this course, participants will be able to:

1. Know how to write a scientific manuscript effectively, concisely, and clearly
2. Identify the publications best suited for their work
3. Have greater insight into the needs of readers and reviewers
4. Understand the purpose of each section in a research paper
5. Have a wider repertoire of practical strategies to improve their own research writing
6. Be able to make strategic choices about how, where, and when to publish their research

## Course Outline

1. What makes good writing?
2. Editorial Ethics: Who is an author and what else is important?
3. What and how to prepare before you write?
4. Conducting a literature review
5. The anatomy of a well written paper
6. Writing the manuscript sections:
  - Cover letter
  - Title Page
  - Summary/Abstract
  - Introduction
  - Methods
  - Results
  - Discussion
  - Acknowledgment
  - References
  - Tables
  - Figures and Figure Legends
7. Submission of scientific manuscripts
8. Responding to a review
9. Communicating effectively with the media and public
10. How to enhance the publication of the manuscript?

## Training Delivery Methods

- In-class method
- Online method

**Description**

Carrying out an applied research project is a requirement to complete the Higher Diploma in Public Health Research. Conducting research allows students to integrate their knowledge in the field of public health into a specific subject area and transfer their ideas and results through a scientifically written product. Applied research project may be descriptive research, survey research, development or evaluation of public health policy, or evaluation of health programs. The project must contain an analytical component, which may be qualitative or quantitative. Students can use existing datasets or develop their own datasets for research.

The student is required to choose a subject for scientific research under the supervision of an experienced supervisor approved by the Academy. Upon approval of the proposal and research plan, the student collects data, analyzes it, and writes the final report of their research. Students are required to present and defend their research and those who pass the exam are awarded the Higher Diploma.

Research topics can cover any area of public health. Priority is given to field research and those that suggest or test practical solutions to existing problems related to the health system, community health and safety, field epidemiology, and other related topics.

## Learning Outcomes

By the end of this course, participants will be able to:

1. Identify and study knowledge gaps in public health topics
2. Conduct a literature review and critically assess the evidence on a particular topic
3. Set research goal and objectives
4. Design an appropriate study to meet the research objectives
5. Conduct the appropriate statistical analysis
6. Write the research results in a scientific paper according to the standards of international scientific journals



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