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COURSE BROCHURE

# Epidemiology and Medical Statistics Essentials Training Course

7 – 11 June 2027
Vienna

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Registered in the United Kingdom and Saudi Arabia

# Epidemiology and Medical Statistics Essentials Training Course

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Epidemiology and Medical Statistics Essentials is a 1-week training course for health professionals, public health staff and researchers who read, judge and use evidence about disease, and it ends with a critical appraisal of a published health study. Clinical guidelines, screening decisions and outbreak responses now rest on studies that busy staff must interpret quickly and correctly. Jupiter Prime Training runs this epidemiology and medical statistics course.

## Why Epidemiology and Medical Statistics Matter Now

Three pressures make epidemiology and medical statistics a daily skill rather than a specialist one. Health services must justify new treatments and screening with evidence that boards and patients can follow. Public health teams face fast-moving infections where incidence figures change weekly and early reports are often biased. Journals publish more studies than ever, many with small samples. A hospital or public health unit that reads evidence well avoids adopting weak interventions; one that reads it badly spends money and staff time on findings that later collapse. The course rests on established principles of study design, measurement and statistical inference.

## Who Gains Most from Epidemiology and Medical Statistics

- Clinicians and nurses who interpret trial and cohort results when updating local care protocols
- Public health officers who track disease incidence and investigate clusters of cases
- Clinical audit and quality staff who compare outcomes between wards, sites or time periods
- Early-career researchers who design studies and prepare results for publication
- Pharmacy and formulary staff who weigh evidence before new medicines are listed

A public health department or hospital research unit gains most when clinicians and analysts attend together.

## Epidemiology and Medical Statistics Capabilities

Participants learn to turn patient counts into rates, match questions to designs and judge reported associations.

- Calculate incidence, prevalence and mortality rates from surveillance counts — public health reporting
- Assess which study design answers a given clinical question — research ethics committees
- Calculate relative risk, odds ratios and risk differences — guideline development groups
- Communicate confidence intervals and p-values in plain terms — clinicians and patients
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Test a published study for bias, confounding and chance — formulary and protocol decisions
- Build a structured critical appraisal of one health study — departmental journal clubs

## Key Epidemiology and Medical Statistics Terms

- Incidence — the number of new cases of a condition in a defined population over a stated period.
- Prevalence — the proportion of a population living with a condition at one point or across a period.
- Relative risk — the ratio of disease risk in an exposed group to the risk in an unexposed group.
- Confounding — distortion of an association because a third factor is linked to both exposure and outcome.
- Confidence interval — a range of values, calculated from sample results, within which the true population value plausibly lies.
- Selection bias — systematic error that arises when the people studied differ from the population the findings are meant to describe.

## Epidemiology and Medical Statistics Day by Day

## Day 1: Measuring Disease in Populations

- Counts, Rates and Ratios — Choosing the Right Disease Measure
- Incidence and Prevalence Calculation — Describing Burden for Service Planning
- Crude and Standardised Rates — Fair Comparison Between Populations
- Surveillance Case Definitions — Consistent Counting During Outbreaks
- Descriptive Epidemiology by Person, Place and Time — Spotting Clusters

## Day 2: Study Designs for Health Questions

- Cross-Sectional Surveys — Estimating Prevalence and Generating Hypotheses
- Case-Control Studies — Investigating Rare Outcomes and Exposures
- Cohort Studies — Following Exposure Groups to Measure Risk
- Randomised Controlled Trials — Testing Treatments Against a Comparison Arm
- Design Selection Matrix — Matching Question, Time and Ethics

## Day 3: Measures of Association and Error

- Relative Risk and Odds Ratio — Expressing Strength of Association
- Risk Difference and Number Needed to Treat — Clinical Impact
- Selection and Information Bias — Threats to Study Validity
- Confounding and Stratified Analysis — Separating Exposure From Third Factors
- Causation Criteria — Judging Whether an Association Is Causal

## Day 4: Statistical Inference for Medical Data

- Sampling Distributions and Standard Error — Precision of Estimates
- Confidence Intervals for Proportions and Ratios — Reporting Uncertainty
- Hypothesis Tests for Two Groups — Comparing Treatment Outcomes
- Chi-Square Test for Tables — Association Between Categorical Variables
- Sample Size and Power — Avoiding Underpowered Health Studies

## Day 5: Practising Critical Appraisal of a Health Study

- Appraisal Checklist Walk-Through — Structured Questions for Any Paper
- Design and Bias Review — Applying Day Two and Day Three Methods
- Results Interpretation — Applying Ratios, Intervals and Tests to Tables
- Relevance to Local Practice — Transferring Findings to Patients
- Critical Appraisal Report — Presenting One Health Study to Peers

## Applying Epidemiology and Medical Statistics After the Course

- Recalculate one quarter of local infection or admission data as standardised rates and share the comparison with the quality committee
- Lead a journal club session using the appraisal checklist on a recent trial relevant to a ward protocol

## Epidemiology and Medical Statistics Questions FAQ

### What are epidemiology and medical statistics and why do they matter now?

Epidemiology and medical statistics are the methods for measuring disease in populations and judging evidence from health studies. They matter now because care decisions increasingly depend on published findings that staff must interpret correctly.

### Which roles gain most from epidemiology and medical statistics training?

Clinicians, nurses, public health officers, clinical audit staff, pharmacists and early-career researchers gain most. Each reads or produces evidence that shapes protocols, surveillance or research.

### How does epidemiology and medical statistics training differ from a general research statistics course?

A general research statistics course covers tests across many fields. Epidemiology and medical statistics training focuses on disease measures, health study designs and bias in medical evidence, at a Core level.

### What do you bring back from epidemiology and medical statistics training?

You bring back a written appraisal of one health study and a checklist you can reuse on any paper, together with worked calculations for rates, ratios and intervals.

## Epidemiology and Medical Statistics: The Way Forward

The critical appraisal of a health study gives a department its first decision: whether a published finding is strong enough to change a local protocol. Clinicians, pharmacists and quality leads use it to discuss evidence on equal terms. After its first use, revisit how local patients differ from the study population before acting on similar papers.