Ultimately, we aim to make causal inferences (bottom right of diagram) and Chapter 1 discusses some important concepts of causation as they relate to epidemiologic research.

Any study starts with an overall study design and the main observational study types are discussed in Chapters 1.5

In any study, it is important to identify the target population and obtain a study group from it in a manner that does not lead to selection bias. Sampling and selection bias is discussed in Chapter 1.2

Once we have identified our study subjects, it is necessary to obtain data on exposure variables, extraneous variables and the outcome in a manner that does not lead to information bias (Chapter 12). Two important tools that are used in that process are questionnaires (Chapter 3) and diagnostic and screening tests (Chapter 5).

In order to start the process of establishing an association between exposure and outcome, we need to settle on a measure of disease frequency (Chapter 4) and select a measure of association (Chapter 6) that fits the context. In many cases, the study design will determine the measures that are appropriate.

Confounding bias is a major concern in observational studies, and the

identification of factors that should be controlled as confounders is featured in Chapter 13.

With our data in hand, we are now able to begin to model relationships with the intent of estimating causal effects of exposure (Chapter 13). Individual chapters are dedicated to the analyses appropriate for outcomes that are continuous (Chapter 14), dichotomous (Chapter 16), nominal/ordinal (Chapter 17), count (Chapter 18) and time-to-event data (Chapter 19). Chapter 15 presents some general guide lines on model-building techniques that are applicable to ali types of model.

In veterinary epidemiologic research, we often encounter clustered or correlated data and these present major challenges in their analyses. Chapter 20 introduces these while Chapters 21 and 22 focus on mixed (random effects) models for continuous and discrete outcomes. Chapter 23 presents some alternative methods of analysis for dealing with clustered data.

Structured reviews and assessments of the literature in the form of meta-analyses are becoming increasingly important and are introduced in Chapter 24.

Not all studies allow us to collect data on exposures and outcomes at the individual level and yet there is much that we can learn by studying disease in groups (eg herds). Thus, ecologic studies are introduced in Chapter 25.

Finally, we complete the text with Chapter 26 which provides a ’road map for investigators starting into the analysis of a complex epidemiologic dataset.