1:

Identify a research question in an area of interest, for which you could imagine accessing or collecting the necessary data from ***a survey or following-up a cohort***.

a) What is the main outcome and main exposure?
b) Specify the target population (to whom you wish to generalise your findings) and study population (the population from which the data is obtained)
c) Is it a prevalence or incidence study (see pages 393 & 395 of Pearce IJE 2012)
d) If a cohort study, is it:
    i. prospective or retrospective
    ii. conducted in an open or closed cohort?
e) If a cross-sectional study (i.e. a survey), explain how the study subjects will be identified

2:

(a) Suggest a case-control approach to address the same research as the cohort or cross-sectional study in Exercise 1 above

(b) Will the controls be chosen by exclusive, inclusive or concurrent/density sampling?

(c) Which design do you think is best for this research question? Justify your choice (this can be of convenience, cost, efficiency, practical reasons or other considerations: see attached summary of advantages and disadvantages of cohort and case-control designs)

Some points to consider regarding the choice of study design.

A cohort/incidence study often considered the gold standard, but there are many considerations

Advantages of cohort studies:

1. Suitable for studying rare exposure
2. Can assess multiple outcomes (effects) of a single exposure
3. Can demonstrate temporal relationship between exposure and disease
4. Allows direct measurement of incidence of disease in exposed and unexposed populations

Difficulties with cohort studies:

1. Loss-to-follow up: Subjects may lose interest, die, move to another area…
    a. Reduced study size weakens analysis
    b. More importantly may cause ***bias***
2. Follow-up may be expensive (time and money)
3. Changes in habits (time trends) and hence exposure.
4. Not suitable for studying rare diseases, except very large samples used.
5. 1. and 2. of less concern if outcome is available electronically (e.g. electronic registers)

Advantages of case-control studies

1. Suited to study of ***rare diseases***
2. Requires comparatively ***few subjects***
3. **Existing records** can be used
4. **2.** and **3.** ***Speed:*** no waiting for outcome and ***Economy*** especially for rare diseases
5. Allows study of **multiple potential causes** of disease
6. Can offer flexibility to accommodate exclusions (like in RCT)

Difficulties with case-control studies

1. Cannot calculate **incidence** (at least not directly!)
2. Choosing controls
3. Availability of appropropiate previously recorded data
4. ***Bias*** especially recall bias (e.g. cases may "remember" more adverse exposures)
5. Maybe difficult to establish **sequence of events**
6. Unsuitable for study of **rare exposure**