1) A charitable organization has chosen to hand out mosquito-proof nets in rural Africa. In order to measure the effect of this scheme, they gather data on the number of people who catch malaria.

a) One member of the organization believes that they should care about the effect this scheme has on the entire population. Another member believes that they should only focus on the effect for people who received a net. Using the notation introduced in class, describe the two effects and suggest a wider research context in which each is the more appropriate.

b) The team decide to focus on the effect for people who received a net, they set up temporary centers and hand out nets to all visitors. They then record the change in the sickness rate for these patients and declare it to be the effect of the intervention, using the notation you saw in class, describe their mistake and offer a solution.

c) Another team decide to focus on the overall effect for the entire population. They hand out nets, then record the change in overall malaria rates. Discuss what may have gone wrong in this scenario.

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2) For each following scenario, draw the DAG, list all paths and suggest controls that would lead to unbiased estimation. Defend all your choices.

a) In order to study the effect of Uber on traffic congestion we gather data about the presence of Uber in cities, average traffic congestion and average taxi fare per kilometre in each city.

b) A sports scientist wants to estimate the effect of number of games played on the probability of injury. He also possesses data on player income per game.

c) Daron Acemoglu wants to study the effects of winning the Nobel prize on professors' salary. He asks around and gathers data on professor salaries and Nobel wins in various universities.