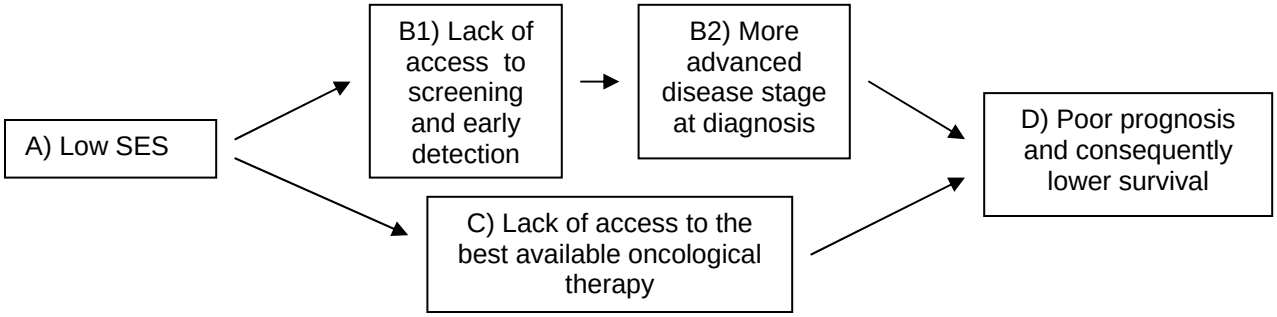
Points to illustrate with Gorey et al., AJPH 87: 1156, 1997

1) An example of how data from population-based cancer registries may be used to demonstrate disparities in healthcare utilization in cancer diagnosis and treatment.

2) Understand the design of this study as an ecological analysis that attempts to correlate socioeconomic status (SES) with cancer survival.

3) Observe that this study's underlying hypothesis is based on a prognostic pathway implied as follows:



4) Note the analogy between the above model and the expectation of epidemiologic associations discussed in class regarding common etiologic or prognostic relations in cancer. A is upstream (distal) in the prognostic pathway in relation to B1/B2 and C. The latter, in turn, are intermediate variables upstream in relation to D, the final outcome. Proper assessment of the nature of the remote relation between A and D, which is the object of this study, assumes that the above pathway is correct but the authors do not have data on B and C. Therefore, they cannot adjust (control for) the remote relation A-D for the intermediate variables B and C. If they could do so, the crude A-D relation might have disappeared or be considerable attenuated (provided that the model is true). They obtain insights into this relation by using a counterfactual (Toronto).

5) Note that the study design assumes two steps to demonstrate the underlying hypothesis of inequity: (i) proof that SES is correlated with cancer survival in Detroit (USA), where SES is a determinant of healthcare access and utilization, and (ii) the lack of correlation between SES and cancer survival in Toronto (Canada), where all individuals have equitable and free access to the best available healthcare, independently of SES. The latter proof (ii) serves as counterfactual that supports the validity that SES is causally related to cancer survival in the US (in Detroit, at least).

6) Note how the authors acted conservatively in testing the hypothesis by: (i) conducting the analysis for several sites of cancer individually, and not for only one or for all sites combined, which provides consistency for the observations; (ii) using census-based correlates of SES, which more faithfully portray the availability and access to local oncological diagnosis and treatment than the person's own family income; and (iii) conducting an additional analysis that makes an even more conservative comparison of the outcomes for the lowest income quintile for Toronto with the fourth quintile of the income distribution for Detroit, which shows that, despite differences in definition of poverty levels, the correlation persists.

7) Consider the study's limitations regarding lack of data on stage and treatment. The authors conclude that in the US the low survival for low SES is due to lack of access to screening (and thus to more advanced stage at diagnosis) and to suboptimal oncological treatment (which worsens the prognosis). On the other hand, these conclusions can only be confirmed if the authors had data on stage and treatment (see above model). Final validation of their hypothesis would have been possible if they had achieved the following additional proofs: (i) demonstration that SES is correlated with cancer stage and/or appropriateness of oncological care in Detroit and NOT in Toronto; and (ii) demonstration that the correlation between SES and survival in Detroit disappears or becomes attenuated when the analysis is controlled (adjusted) for these two variables (stage and treatment).

8) What else can be identified as pros and cons in this study? Consider practical aspects of study cost for this study versus other designs.