Mendelian Randomization

Try to answer the questions below, using the paper you have read in class and supplement with additional information you can find elsewhere.

This will be integrated into one of the subsequent homeworks and hence the final project work.

Questions

1) What is the historical background of Mendelian Randomization procedures?
2) How is it defined?
3) What is its relation to causality or reverse causation? Is an association study able to "prove" causality? Are there methods to "prove" causality?
4) Can you find examples where Mendelian Randomization worked? (other than those explicitly mentioned in the paper)
5) Is population stratification an issue in the context of Mendelian Randomization? Why/why not?
6) Is linkage disequilibrium a concern in the context of Mendelian Randomization strategies?
7) Make a table listing the pros and cons (advantages and disadvantages) of the method. Give a little bit of extra information, highlighting some of the concerns that are relevant.

In-class reference

George Davey Smith, Shah Ebrahim, Sarah Lewis, Anna L Hansell, Lyle J Palmer, Paul R Burton (2005) Genetic epidemiology and public health: hope, hype and future prospects. Lancet 366: 1484–98.