

- Many activists claim that there are systemic injustices in the US justice system. Lawyer Brian Stevenson has claimed that our system makes it more likely to be convicted if you are poor and innocent than if you are rich and guilty. For this example, let's assume that Dr. Stevenson bears the burden of proof for this claim.
- A state representative wonders how voters in her home district feel about accepting Syrian refugees into her state. 60% of callers to her office feel that the state should refuse immigrants, but she suspects that this is higher than the proportion of voters who feel this way among all of the voters in her district. She will assume that the callers accurately reflect reality unless the survey proves that less than 60% of voters oppose Syrian immigrants.
- Some educational experts have expressed concerns about the perception that students of color are underrepresented in gifted programs. Before they can investigate causes and potential solutions, they need to convince the wider academy that there is a problem. The experts plan to do a survey of randomly selected students in gifted programs nationwide, and look at the proportion of students who are African American. It is known that 16.7% of the student population is African American. They hope to use their data to show that African American students are underrepresented.
- Flint, Michigan switched water suppliers on 25 April 2014. In May, the state appointed city manager began receiving complaints about the quality of the water coming from the tap in residents' homes. The city manager has to decide whether to take action about the complaints. (Note: his default would be to stay with the current, new, supplier.)
- In her book *The New Jim Crow*, Dr. Michelle Alexander claims that African Americans are overrepresented in the criminal justice system. One example that she cites is non-violent drug offenders. She provides evidence that white and black Americans have been shown to have similar usage rates (with whites slightly more likely to sell drugs and significantly more likely to be hospitalized for drug related issues). She then comments on the racial makeup of those in prison for non-violent drug offenses. If we note that the African American population of the US is approximately 13.3% (according to the US Census Bureau in 2015), set up and reason through the hypotheses for this setting.
- A British woman claims that she can smell Parkinson's disease. Understandably, the scientific community is quite skeptical. A test is proposed wherein she will be given shirts worn by various patients at a local geriatric facility and asked to identify Parkinson's presence or absence for each shirt.
- A banking oversight committee in Virginia has begun to hear complaints from minority populations that they are being discriminated against when applying for home mortgages. They claim that they are being turned down for home loans (mortgages) despite having higher credit ratings than whites who were offered the same type of loan. The committee would like your help in deciding whether to launch a formal investigation into these claims. Assume investigations are not automatically launched.
- A teacher has decided to try a new teaching approach to teaching a topic in her course this semester. She knows that in the past, the average score on the quiz on this material was 38 out of 50. She is going to give a similar quiz to her students this semester, and would like you to help her think through the consequences of her possible decisions about whether the new technique has improved scores (what she hopes to prove) or not (the default position).