Ethics of Algorithms for Resource Allocation – Activity 1

Recall the vaccine distribution problem from the pre-module assignment. You were an intern at an NGO, in charge of distributing vaccines from suppliers to countries.

You were given the maximum number of doses each supplier can provide and each country is willing to purchase, and which suppliers can feasibly deliver to which countries. You designed a network flow solution to maximize the number of vaccines delivered subject to these constraints.

**Question 1 [8 minutes]:** What is an example of an "undesirable/unfair" outcome that your maximum flow solution may result in? For this question, assume that the constraints given in the problem accurately capture the real-world vaccine distribution context.

**Question 2 [12 minutes]:** What questions would you ask your supervisor at the NGO to identify potential gaps between the present formulation and the real-world problem, and why?

*Sample Answers:*

Why are delivery constraints binary? What if we estimate the numerical efficacy of vaccines transported from each warehouse to each country?

Do we know if the countries will use the delivered vaccines as first doses, second doses, or booster doses? Should this affect our distribution?