# Five Things to Know About Vaccine Economics

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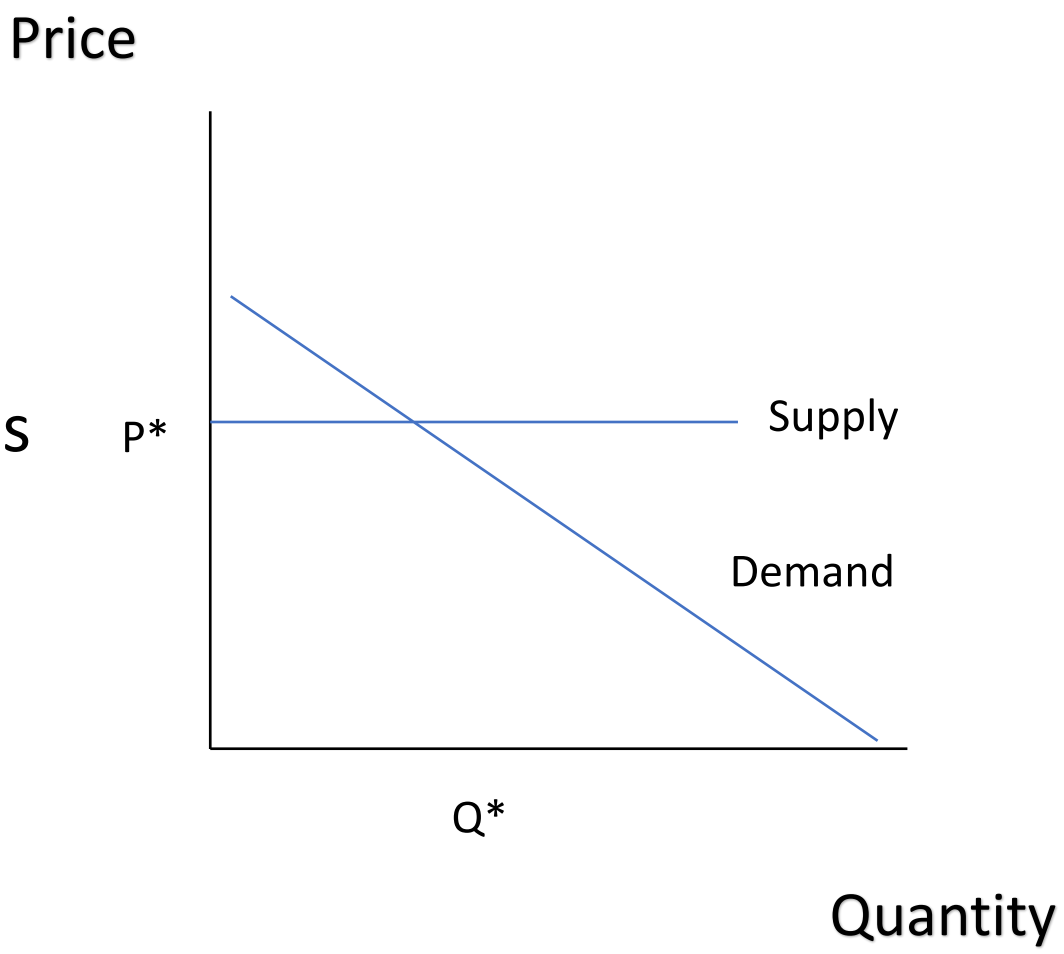
# Outline

1. Private markets can’t finance vaccines sufficiently
2. Private demand won’t allocate vaccines fairly
3. Reaching the last 20% will cost more
4. Returns to scale in production so big plants make lower cost vaccines
5. Better forecasts of demand can lower costs

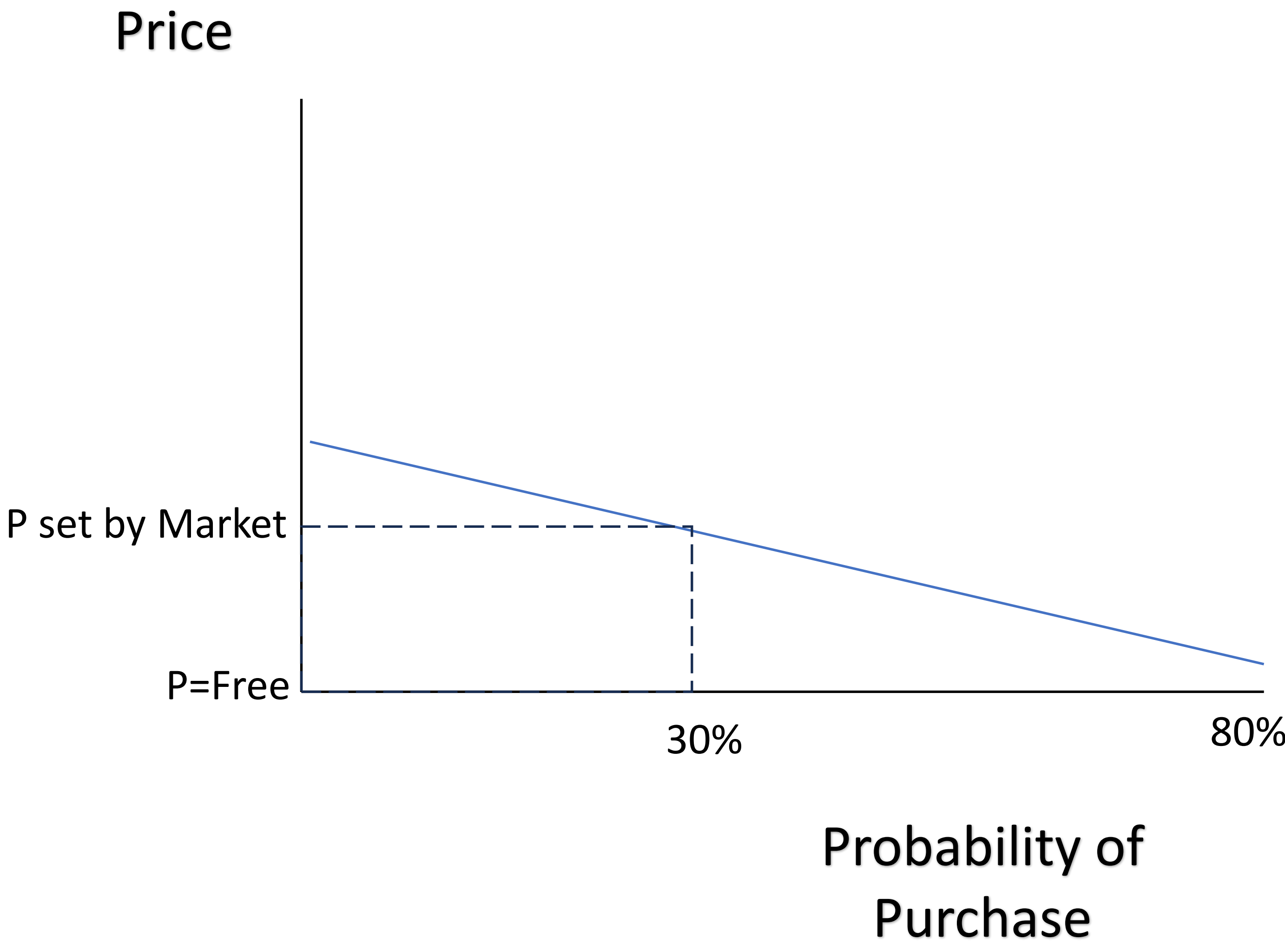
# Private Demand

- Private demand is a choice
- Individual perception that benefit>cost
- Demand is for lower Q  when prices are higher
- Buy vaccine if maximal willingness to pay>P



# Demand Curve

- Based on perceived Value of ↓Risk in Vaccinee
- Vaccinee does not consider benefit to others
  - Private demand too low to reach herd immunity
- Society subsidizes to offer P=free

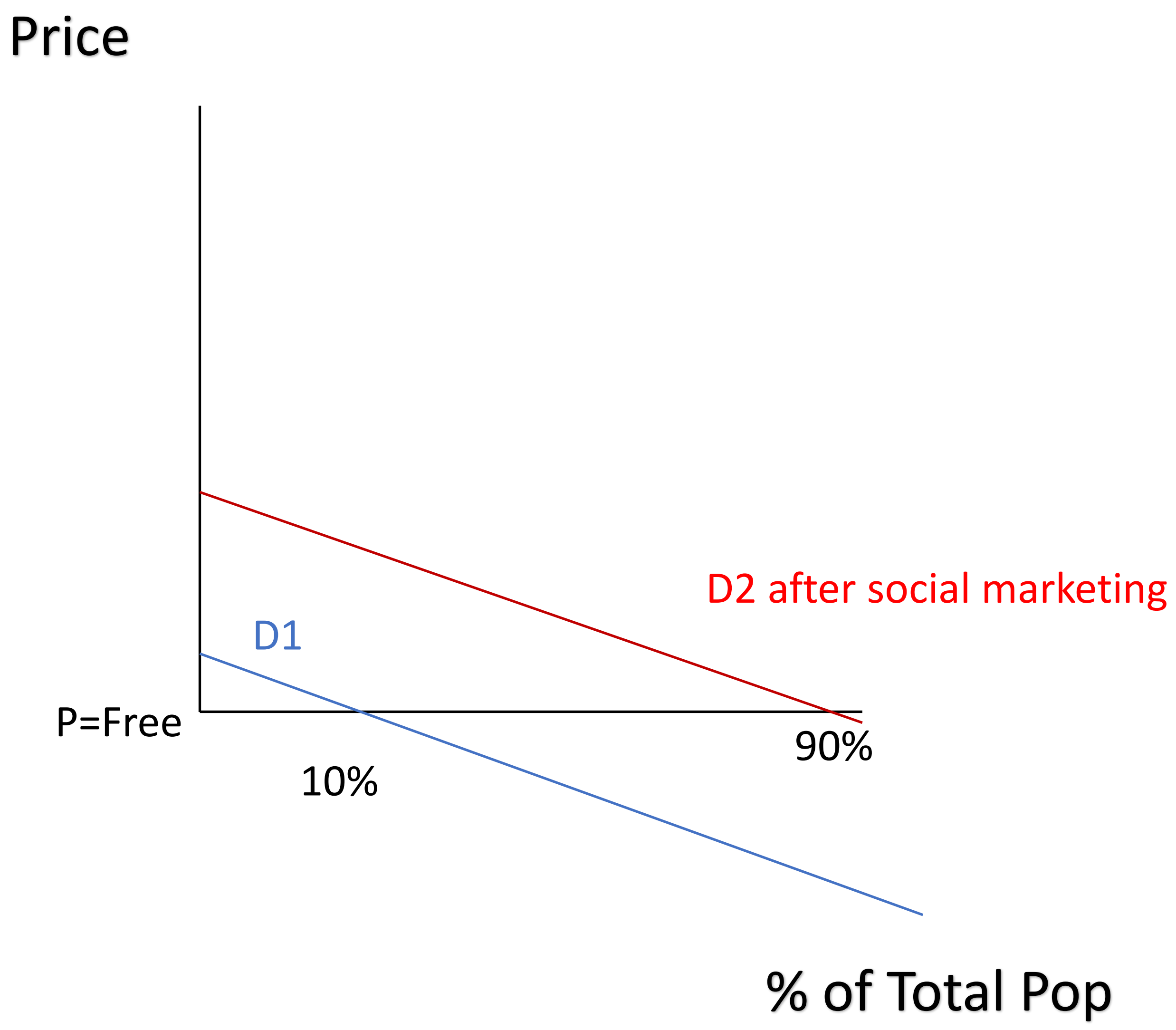


# Shifting a Demand Curve

Sometimes even free vaccines do not produce enough demand

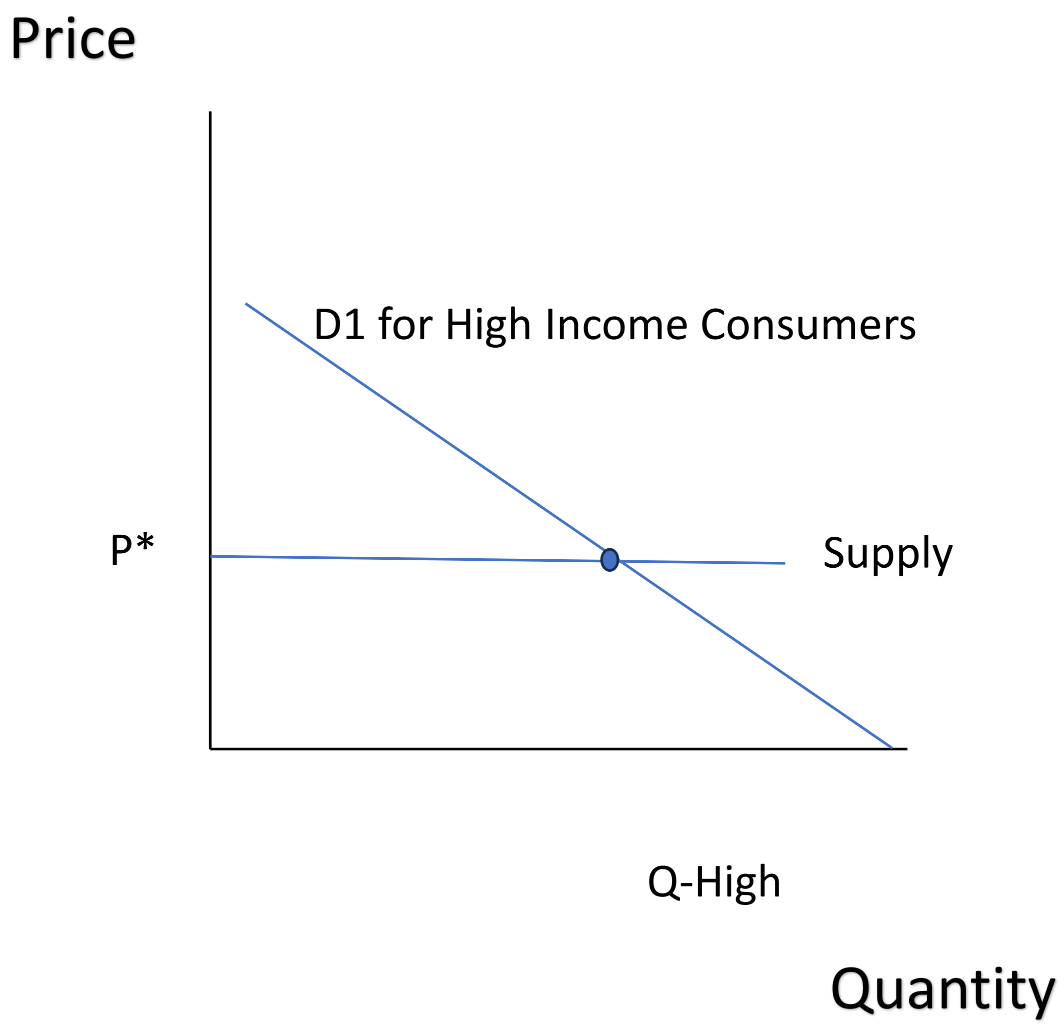
Shift right

- Marketing
- Information
- Tribal affiliations



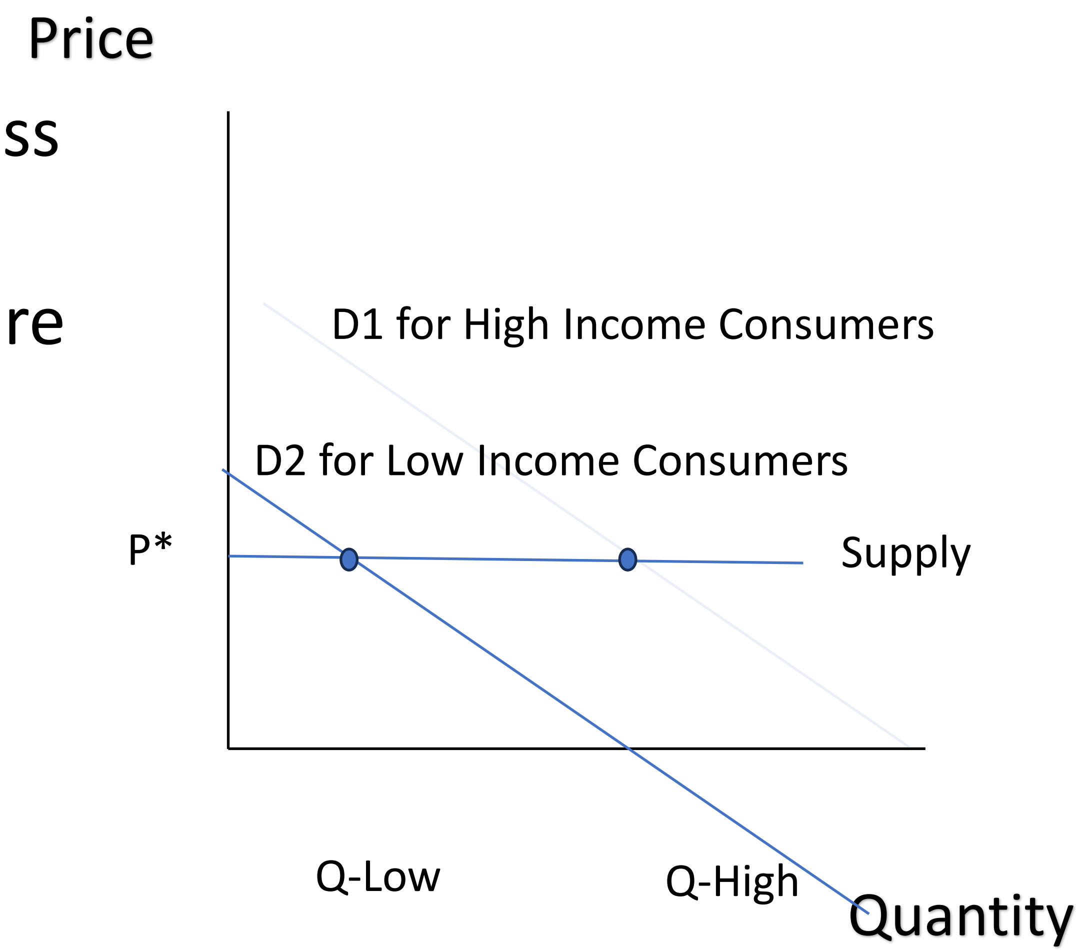
# Private Market is Not Fair

- Demand
  - Purchase Q-High price P*
  - High incomes mean disease costs more to them
    - More expensive medical bills
    - Higher lost wages



# Private Market is Not Fair

- Low Income Country Purchases Less
- Implications when a high income country and low income country are neighbors?



# The Intransigent Last 20%

Demand Curves Actually Not Linear

First 80% or so respond to incentives

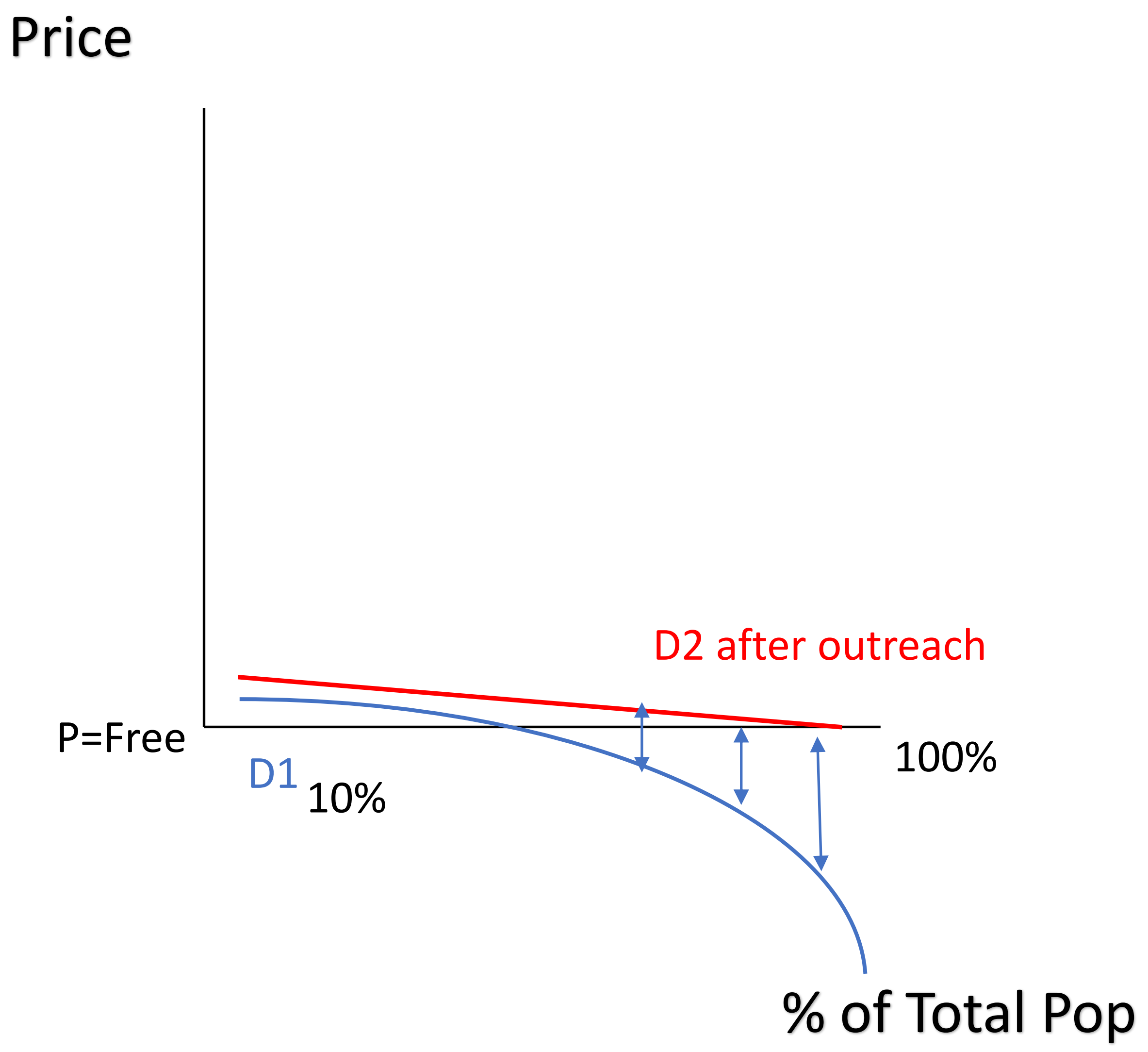
The holdouts are increasingly expensive/impossible to convert

- Religious beliefs
- Existential core antivax identity
- Live in deepest forest
- Live on highest mountain

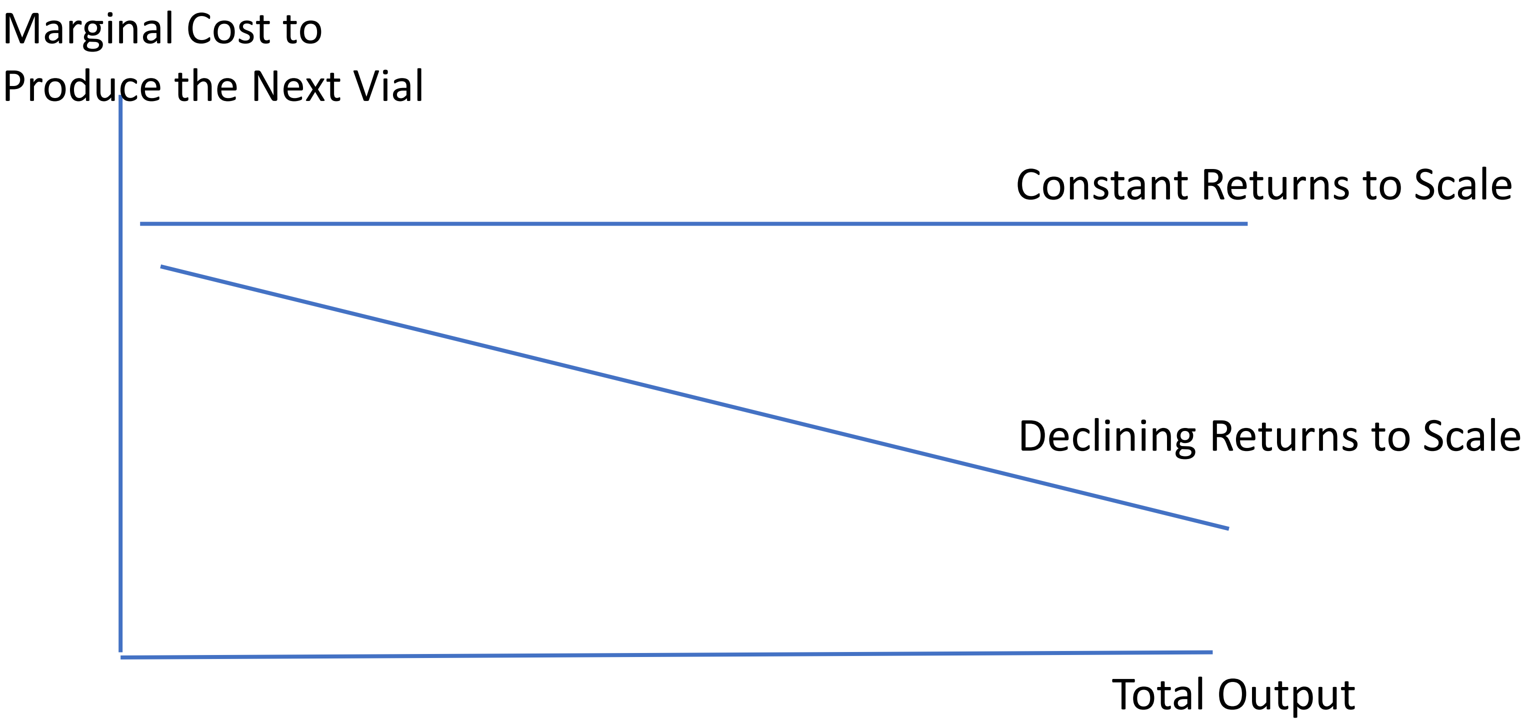
Outreach costs

Small session costs

## Must be prepared to pay these costs



# Returns to Scale in Production



# Why Declining Returns?

- Vaccine production has large fixed costs
  - Big factories
  - Training up the capability of the workforce on each product
  - Distribution networks for each product line
  - Licensed intellectual property
- Once the fixed costs are spent
  - Marginal cost of first vial >>Marginal cost of millionth vial

# Vaccine Forecasts Can Lower Costs

- It costs money to borrow capita to finance the fixed costs
- Borrowing too much money means wasteful interest payments
- Some vaccines take 6-12 months to produce
  - Raw materials are purchased up front
  - Plants could be producing other high value products
  - A canceled order means large losses
  - Can put the risk of a cancelled order into the pricing
- Investors will lend money at lower rates if they see certainty around future market size projections

# Summary

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2. Private demand won’t allocate vaccines fairly
3. Reaching the last 20% will cost more
4. Returns to scale in production
5. Better forecasts of demand can lower costs