

1. True or False: Price discrimination always increase economic efficiency, relative to what would be achieved by a single, uniform monopoly price.

False. If the aggregate quantity does not increase, then third degree price discrimination lowers welfare.

2. Suppose that monthly demand for a patented AIDS drug treatment in North America is $P_N = 100 - Q_N$ and in sub-Saharan Africa is $P_S = 40 - Q_S$. Assume that the marginal cost of producing each month's treatment is constant at 20 per unit (i.e. $MC = 20$) and that transportation costs to the African market are negligible.

a. (optional problem.) Assume that the patent holder either does not or cannot price discriminate the two markets. Show the aggregate demand curve.

$$Q = 0, \quad P \geq 100;$$

$$Q = 100 - P, \quad 40 \leq P < 100$$

$$Q = 140 - 2P, \quad 0 \leq P < 40$$

b. Show that the patent holder's profit-maximizing price is $P = \$60$ if both groups are to be charged the same price.

At this price, how much is sold to North America? **{40}**

What is the consumer surplus to North America? **{800}**

What is the producer surplus to North America? **{1600}**

At this price, how much is sold to sub-Saharan Africa? **{0}**

What is the consumer surplus to sub-Saharan Africa? **{0}**

What is the producer surplus to sub-Saharan Africa? **{0}**

c. Suppose the patent holder can separate the two markets and charge separate, profit-maximizing prices to each.

In North America:

$$P_N = \mathbf{\{60\}}$$

$$Q_N = \mathbf{\{40\}}$$

Consumer surplus = **{800}**

Producer surplus = **{1600}**

In sub-Saharan:

$$P_S = \mathbf{\{30\}}$$

$$Q_S = \mathbf{\{10\}}$$

Consumer surplus = **{50}**

Producer surplus = **{100}**

d. If total surplus is defined as consumer surplus plus producer surplus, how has price discrimination affected total surplus? **{increase because of the new market}**