



Worksheet – Supply and demand, Shortage, Labor market

Related news articles: [The labor shortage in Helsinki will deepen in the coming years](#) (Helsinki Times, April 14, 2023), and [New research delivers grim warning about ongoing nursing shortage](#) (ABC 11, April 14, 2023)

Summary: This worksheet could be used for in-class or homework practice. Students will be asked to read two short articles or the excerpts below about the labor shortage in the healthcare and education sectors in Finland and the U.S. Then, students will be asked to analyze the effect of different phenomena on the markets for healthcare professionals and teachers, explain when a labor shortage occurs, and how the wage adjusts to a new equilibrium. **Answers are provided at the end of this document.**

Learning objectives:

At the end of this worksheet, students will be able to:

- o Apply the supply and demand model to analyze the effect of given phenomena on the market for nurses in Finland (simultaneous shifts of the labor supply and the labor demand curves);
- o Identify the wage ranges at which there would be a shortage of nurses;
- o Analyze how wages adjust to eliminate the shortage of nurses and to reach a new equilibrium;
- o Identify the effect of given events on the market for teachers in Finland;
- o Recognize factors that affect the supply and demand for nurses in the U.S.

Economics concepts: Supply, Demand, Equilibrium, Shortage, Wage, Labor

Suggested excerpts:

[The labor shortage in Helsinki will deepen in the coming years](#) (Helsinki Times, April 14, 2023)

“In Helsinki, as elsewhere in Finland, there is currently a serious labor shortage in the social and healthcare sector, as well as in the field of education...”

“The situation is the result of several parallel phenomena in society and the labor market, such as population aging, retirement, population growth, and weakened attractiveness of the welfare

sectors. To solve the labor shortage in critical fields, the number of start-up places in vocational education should be increased..."

"The number of working-age population has decreased, while the population has aged, increasing the need for social and healthcare services. The need for early childhood education staff has been fueled by longer-term societal changes, such as an increase in the number of children and subsequently, a rapid and nationally targeted increase in early childhood education participation. In the future, various factors will affect labor demand, such as changes in population structure and service needs, professional qualifications and staffing changes, workforce turnover, and retirement."

"In 2020, 19 percent of all nurses and 23 percent of all practical nurses working in Helsinki were over 55 years old."

[New research delivers grim warning about ongoing nursing shortage](#) (ABC 11, April 14, 2023)

"Nurses are leaving the workforce at an alarming rate, according to a new study that projects one-fifth of registered nurses will have left the workforce because of stress, burnout and retirement by 2027."

"The National Council of State Boards of Nursing revealed the data on Thursday that finds 100,000 nurses left the workforce during the COVID-19 pandemic in the past two years."

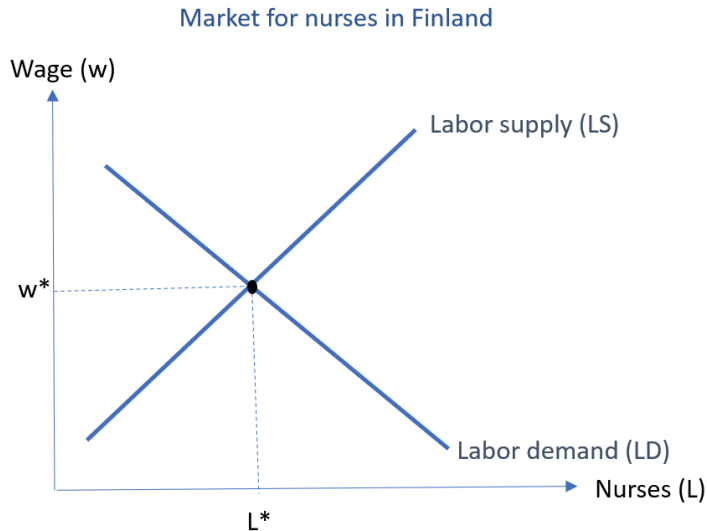
"Burnout and fatigue are pervasive in nursing, according to the study, which warns that these factors threaten the future of the U.S. nursing workforce, particularly for younger, less experienced registered nurses."

"A quarter to half of nurses reported feeling emotionally drained, used up, fatigued, burned out, or at the end of the rope "a few times a week," or "every day," namely among nurses with 10 or fewer years of experience, the study said."

"The findings come as overall, there's a 3.3% decline in the U.S. nursing workforce in the past two years."

Questions

1. According to the article about Finland, which phenomena have affected the labor markets in the healthcare and education sectors in the country?
2. Given that there is a labor shortage in the healthcare sector in Finland, the wage of healthcare professionals must be _____.
 - a. Above the equilibrium wage of healthcare professionals.
 - b. Below the equilibrium wage of healthcare professionals.
 - c. Equal to the equilibrium wage of healthcare professionals.
 - d. Indeterminate.
3. Fill in the blank. If there is a shortage of nurses, their wages have to _____ (increase/decrease/remain unchanged) for the market to reach an equilibrium.
4. According to the article about Finland, “the number of working-age population has decreased, while the population has aged, increasing the need for social and healthcare services.” What was the effect of these changes on the market for nurses in the country?
 - a. Both labor demand and labor supply shifted to the right.
 - b. Both labor demand and labor supply shifted to the left.
 - c. Labor demand shifted to the left, and labor supply shifted to the right.
 - d. Labor demand shifted to the right, and labor supply shifted to the left.
5. The following graph shows the labor supply and the labor demand for nurses in Finland. Use the graph to show the changes identified in Question 4. What was the effect of these shifts on the equilibrium wage and quantity of nurses in the country?



6. If the equilibrium number of nurses in Finland has declined as a result of the changes identified in Question 4, which of the following must be true?
- The labor supply shift must have been relatively larger than the labor demand shift.
 - The labor supply shift must have been relatively smaller than the labor demand shift.
 - The labor supply and the labor demand curves must have shifted by the same amount.
 - The equilibrium number of nurses would decrease regardless of the relative magnitudes of the labor supply and the labor demand shifts.
7. Consider the changes identified in Question 4. Suppose that the wage of nurses in Finland remains at the initial equilibrium level. At that wage, one would expect:
- A shortage of nurses.
 - A surplus of nurses.
 - The market for nurses to be in equilibrium.
 - Nurses experiencing burnout.
8. Consider the changes specified in Question 4. As nurses' wages adjust to the new equilibrium wage level:
- The shortage of workers would be becoming larger.
 - The shortage of workers would be becoming smaller.
 - The surplus of workers would be becoming larger.
 - The surplus of workers would be becoming smaller.

9. Consider the market for early childhood education teachers in Finland. According to the article about Finland, it is expected that one in five early childhood education teachers would retire in the next ten years. At the same time, “Helsinki's population is growing,” and more qualified teachers would be needed. How are these events expected to affect the market for early childhood education teachers in Finland in the next ten years?

- a. Both labor demand and labor supply would shift to the right.
- b. Both labor demand and labor supply would shift to the left.
- c. Labor demand would shift to the left, and labor supply would shift to the right.
- d. Labor demand would shift to the right, and labor supply would shift to the left.

10. True or false? According to the two articles, the supply of nurses in both Finland and the U.S. has recently been decreasing.

11. Which of the following factors is likely to affect the demand, but *not* the supply of nurses in the U.S.?

- a. Burnout of nurses.
- b. Increase in the population that needs healthcare services.
- c. Stress and fatigue of nurses.
- d. Nurses feeling emotionally drained.

Answer Key

1. According to the article about Finland, which phenomena have affected the labor markets in the healthcare and education sectors in the country?

Answer: The article mentions “population aging, retirement, population growth, and weakened attractiveness of the welfare sectors” as factors that have affected the labor markets in the healthcare, social and education sectors.

2. Given that there is a labor shortage in the healthcare sector in Finland, the wage of healthcare professionals must be _____.

- a. Above the equilibrium wage of healthcare professionals.
- b. Below the equilibrium wage of healthcare professionals.
- c. Equal to the equilibrium wage of healthcare professionals.
- d. Indeterminate.

Answer: B. When the wage is below the equilibrium wage, the quantity of labor demanded exceeds the quantity of labor supplied, which implies that there is a shortage of workers.

3. Fill in the blank. If there is a shortage of nurses, their wages have to _____ (increase/decrease/remains unchanged) for the market to reach an equilibrium.

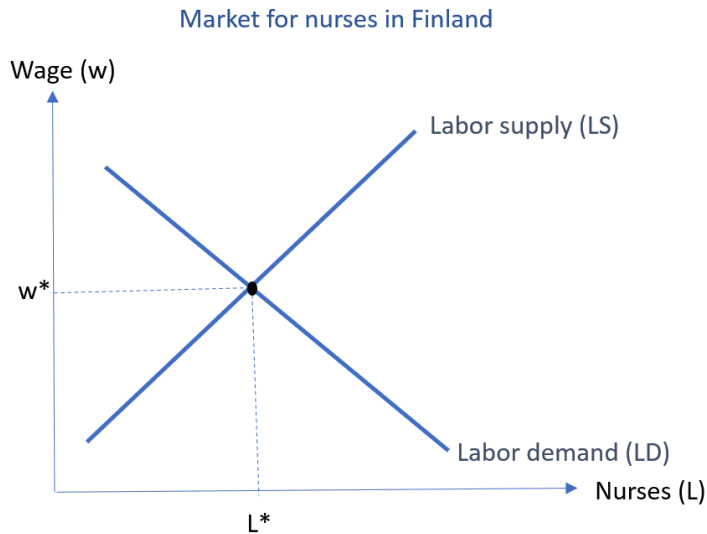
Answer: If there is a shortage of nurses, their wages have to increase for the market to reach an equilibrium.

4. According to the article about Finland, “the number of working-age population has decreased, while the population has aged, increasing the need for social and healthcare services.” What was the effect of these changes on the market for nurses in the country?

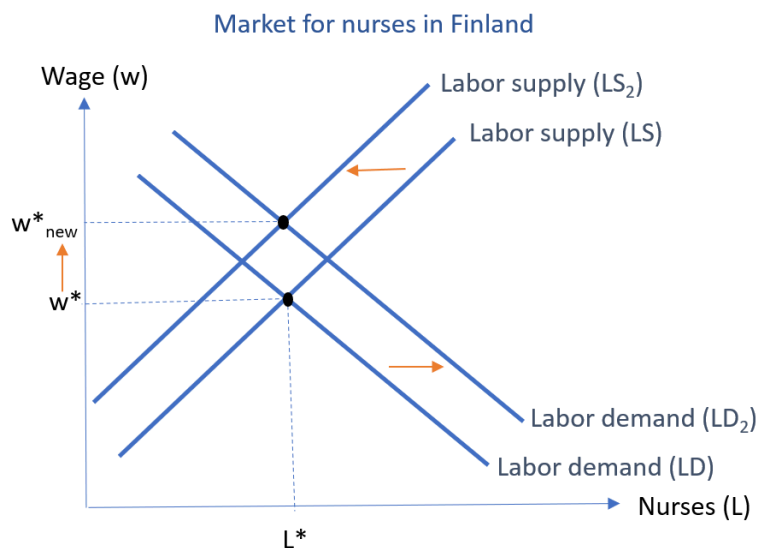
- a. Both labor demand and labor supply shifted to the right.
- b. Both labor demand and labor supply shifted to the left.
- c. Labor demand shifted to the left, and labor supply shifted to the right.
- d. Labor demand shifted to the right, and labor supply shifted to the left.

Answer: D. A decrease in the working-age population is associated with a decline in labor supply. An increase in “the need for social and healthcare services” is associated with an increase in labor demand. Graphically, the labor supply curve shifts to the left while the labor demand curve shifts to the right.

5. The following graph shows the labor supply and the labor demand for nurses in Finland. Use the graph to show the changes identified in Question 4. What was the effect of these shifts on the equilibrium wage and quantity of nurses in the country?



Answer: Simultaneous shifts of the labor demand curve to the right and the labor supply curve to the left lead to a higher equilibrium wage of nurses. The effect on the equilibrium number of workers is ambiguous. The following graph shows the shifts.



6. If the equilibrium number of nurses in Finland has declined as a result of the changes identified in Question 4, which of the following must be true?

- a. The labor supply shift must have been relatively larger than the labor demand shift.
- b. The labor supply shift must have been relatively smaller than the labor demand shift.
- c. The labor supply and the labor demand curves must have shifted by the same amount.
- d. The equilibrium number of nurses would decrease regardless of the relative magnitudes of the labor supply and the labor demand shifts.

Answer: A.

7. Consider the changes identified in Question 4. Suppose that the wage of nurses in Finland remains at the initial equilibrium level. At that wage, one would expect:

- a. A shortage of nurses.
- b. A surplus of nurses.
- c. The market for nurses to be in equilibrium.
- d. Nurses experiencing burnout.

Answer: A. Using the graph in Question 5, at the initial equilibrium w^* , the quantity of labor demanded exceeds the quantity of labor supplied after the shifts. This implies that there would be a shortage of nurses.

8. Consider the changes specified in Question 4. As nurses' wages adjust to the new equilibrium wage level:

- a. The shortage of workers would be becoming larger.
- b. The shortage of workers would be becoming smaller.
- c. The surplus of workers would be becoming larger.
- d. The surplus of workers would be becoming smaller.

Answer: B. As the wage increases from the initial equilibrium w^* to the new w_{new}^* , the distance between the new LS and new LD curves decreases, i.e., the difference between the quantity of labor demanded and the quantity of labor supplied decreases. This means that the shortage would be becoming smaller until the market reaches the new equilibrium.

9. Consider the market for early childhood education teachers in Finland. According to the article about Finland, it is expected that one in five early childhood education teachers would retire in the next ten years. At the same time, "Helsinki's population is growing," and more qualified teachers would be needed. How are these events expected to affect the market for early childhood education teachers in Finland in the next ten years?

- a. Both labor demand and labor supply would shift to the right.

- b. Both labor demand and labor supply would shift to the left.
- c. Labor demand would shift to the left, and labor supply would shift to the right.
- d. Labor demand would shift to the right, and labor supply would shift to the left.

Answer: D. As teachers retire, the supply of teachers would decrease. As the population grows and more teachers are needed, the demand for teachers would increase. Therefore, the labor supply curve would shift to the left, and the labor demand curve would shift to the right.

10. True or false? According to the two articles, the supply of nurses in both Finland and the U.S. has recently been decreasing.

Answer: True.

11. Which of the following factors is likely to affect the demand, but *not* the supply of nurses in the U.S.?

- a. Burnout of nurses.
- b. Increase in the population that needs healthcare services.
- c. Stress and fatigue of nurses.
- d. Nurses feeling emotionally drained.

Answer: B. An increase in the population that needs healthcare services would change the demand for nurses. If nurses feel emotionally drained, experience burnout, stress or fatigue, the supply of nurses would decrease.