Employment and Wages by Major Occupational Group

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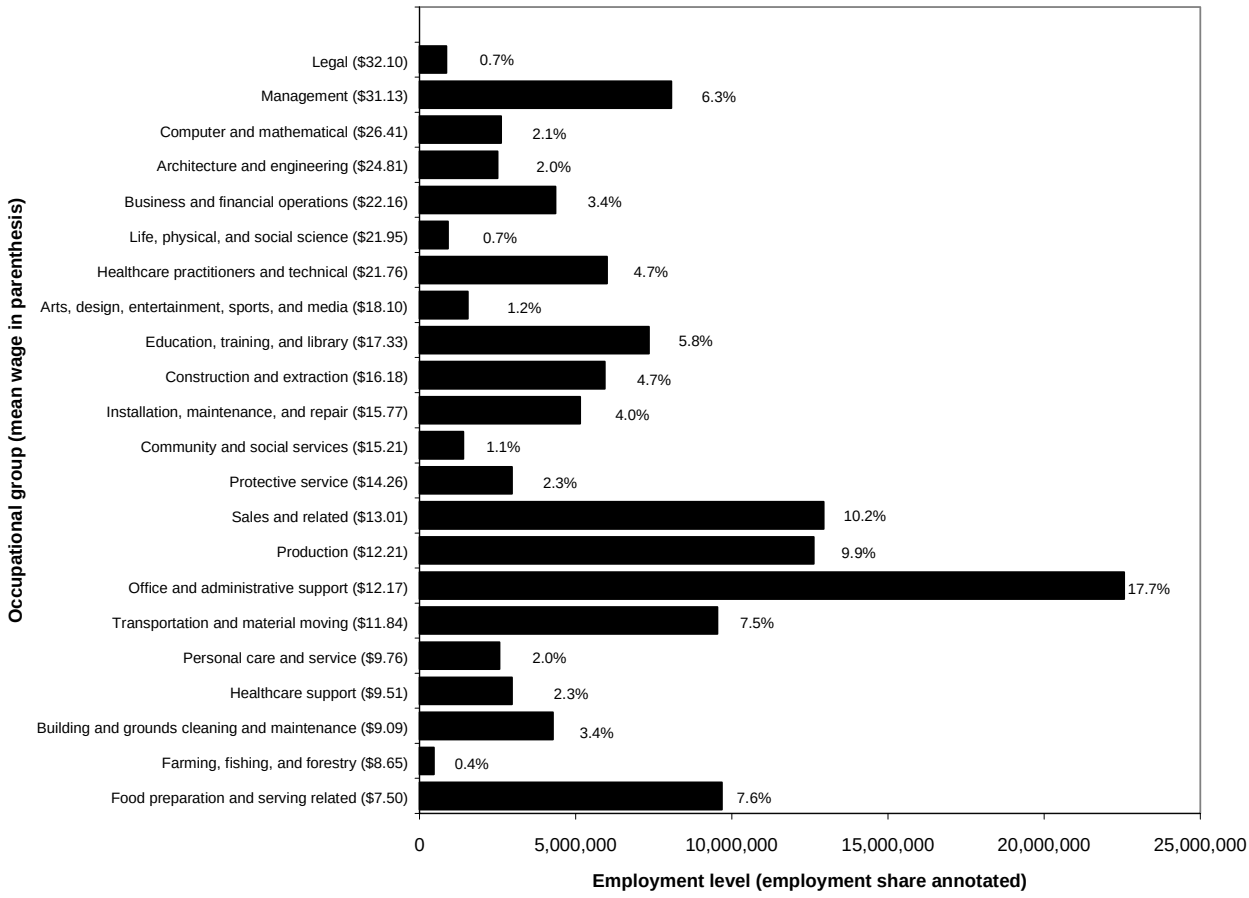
In 1999, the Occupational Employment Statistics (OES) program began using the new, government-wide Standard Occupational Classification (SOC) system, authorized by the U.S. Office of Management and Budget, to develop estimates of employment and wages by major occupational group. The version of the SOC used in the OES program consists of 22 major occupational groups. Chart 1 displays employment, the percentage of total employment, and the mean wage for each of these groups. The chart is arrayed by mean wage, with the highest paying occupational group on the top and the lowest paying group on the bottom. Total employment for all occupational groups in 1999 was approximately 127 million workers.

In terms of employment, the 22 occupational groups fall into three broad categories. The first consist of five groups with the largest employment. They are sales and related; production; office and administrative support; transportation and material moving; and food preparation and serving related. These groups account for more than one-half of total employment, or more than 67 million workers. Of the five, the office and administrative support group, with more than 22.5 million workers, is the largest, and the transportation and material moving group, with more than 9.5 million workers, is the smallest. The mean wage in each of these five major groups is less than the mean wage for all workers across occupational groups ($15.18). The food preparation and serv-

Text table 1. **Percentile wages by major occupational group**

Major occupational group	Hourly earnings						
	Employment	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	Mean wage
Total	127,274,000	$6.33	$8.13	$12.10	$18.85	$27.44	$15.18
Legal	858,320	12.09	16.38	26.50	46.65	68.23	32.10
Management	8,063,410	13.38	18.91	27.68	40.47	59.20	31.13
Computer and mathematical	2,620,080	14.11	18.61	24.99	32.81	41.53	26.41
Architecture and engineering	2,506,380	13.12	17.53	23.66	31.18	39.34	24.81
Business and financial operations	4,361,980	11.62	15.08	20.08	26.71	35.03	22.16
Life, physical, and social science	909,530	10.86	14.51	20.00	27.02	36.12	21.95
Healthcare practitioner and technical	6,001,950	9.93	13.71	18.73	25.33	35.72	21.76
Arts, design, entertainment, sports, and media	1,551,600	6.69	9.87	15.21	23.07	33.67	18.10
Education, training, and library	7,344,830	7.01	10.69	16.14	22.05	29.06	17.33
Construction and extraction	5,938,860	8.36	10.68	14.82	20.55	26.33	16.18
Installation, maintenance, and repair	5,140,210	8.32	10.88	14.84	19.79	24.95	15.77
Community and social services	1,404,540	8.17	10.56	14.01	18.89	24.36	15.21
Protective service	2,958,730	6.68	8.30	12.41	18.81	25.13	14.26
Sales and related	12,938,130	5.83	6.68	9.02	15.32	25.45	13.01
Production	12,620,920	6.76	8.21	10.75	14.94	20.27	12.21
Office and administrative support	22,562,480	7.00	8.69	11.14	14.73	19.02	12.17
Transportation and material moving	9,538,820	6.12	7.50	10.20	14.42	19.52	11.84
Personal care and service	2,556,920	5.69	6.37	7.82	10.57	16.34	9.76
Healthcare support	2,970,780	6.27	7.36	8.92	11.03	13.52	9.51
Building and grounds cleaning and maintenance	4,274,200	5.79	6.58	8.08	10.56	14.11	9.09
Farming, fishing, and forestry	463,360	5.83	6.20	6.96	9.74	14.27	8.65
Food preparation and serving related	9,687,970	5.50	5.96	6.64	8.32	10.65	7.50

Chart 1. **Employment level, mean wage, and percent share of employment by major occupational group, 1999**



ing related group has a mean wage of $7.50 per hour, the lowest among all occupational groups.

A second category consists of five occupational groups with midsize employment. Accounting for more than one-quarter of total employment, or 32.5 million workers, these groups are management; healthcare practitioner and technical; education, training, and library; construction and extraction; and installation, maintenance, and repair. The mean wage in each of these groups is greater than the mean wage for all workers across occupational groups. The management group, with about 8.1 million workers, has the largest employment among the midsize occupational groups and the second-highest mean wage among all occupational groups. The installation, maintenance, and repair group, with 5.1 million workers, has the smallest employment and lowest mean wage among the midsize occupational groups. Still, the mean wage of $15.77 per hour for the installation, maintenance, and repair group is higher than the mean wage for all workers across occupational groups.

The remaining 12 occupational groups account for less than 22 percent of total employment, or 27.4 million workers. Among these occupational groups, the business and financial operations group, with fewer than 4.4 million workers, has the largest employment, and the farming, fishing, and forestry occupations, with fewer than 0.5 million, the smallest. Four of the twelve occupational groups—legal; computer and mathematical; architecture and engineering; and business and financial operations—have the first-, third-, fourth-, and fifth-highest mean wage, respectively, among all occupational groups. Another four—farming, fishing, and forestry; building and grounds cleaning and maintenance; healthcare support; and personal care and service—have the second-, third-, fourth-, and fifth-lowest mean wage, respectively, among all occupational groups.

Percentile wages by occupational group

In addition to total employment and mean wage by major occupational group, text table 1 also displays the 10th-, 25th-, 50th-, 75th-, and 90th-percentile wages for each of the 22 major occupational groups. A percentile wage shows the percentage of workers in an occupation who earn less than a given wage and the percentage who earn more. For example, the 50th-percentile wage, or median wage, is the pay level at which 50 percent of workers earn more and 50 percent earn

less. Likewise, 10 percent of workers earn less than the 10th-percentile wage and 90 percent of workers earn less than the 90th-percentile wage. The middle 80 percent of workers in an occupational group earn wages between these two endpoints.

The lowest paid occupational group is the food preparation and serving related occupations. This is clearly indicated by the fact that, for each percentile wage shown, the food preparation and serving related group wage is lower than that for any of the other groups. In addition to being the lowest paid occupational group, the food preparation and serving related occupations have the narrowest distribution of wages among all occupational groups. Ten percent of workers in this group, approximately 1 million persons, earn less than $5.50 per hour, while ninety percent of the workers earn less than $10.65 per hour, a difference of $5.15 per hour. By contrast, the range of wages for the middle 80 percent of workers in the farming, fishing, and forestry occupations, the occupational group with the second-lowest mean wage, is from $5.83 to $14.27, or $8.44. This is $3.29 more than the comparable range for the food preparation and serving related group.

In addition to having the highest mean wage, the legal occupations have the widest distribution of wages. Ten percent of workers in this group earn less than $12.09 per hour, while ninety percent earn less than $68.23 per hour, a difference of $56.14 per hour. However, the legal group does not have the highest wages in all percentile wage categories. The group ranks fourth in the 10th- and 25th-percentile categories and second in the 50th-percentile category.

There is general concordance between the ranking of occupational groups by mean wage and their rankings by the 10th-, 25th-, 50th-, 75th-, and 90th-percentile wages. The Spearman rank correlation coefficients[1] between the mean wages of the groups and their 10th-, 25th-, 50th-, 75th-, 90th-percentile wages are, respectively, 0.93, 0.96, 0.98, 0.99, and 0.98. A rank correlation coefficient of 1 indicates identical rankings between the mean wages and percentile wages of the groups. The rank correlation coefficient between the mean wage and the 75th-percentile wage is the highest, and that between the mean wage and the 10th-percentile wage is the lowest. This indicates that the rankings of occupational groups by mean wage and 75th-percentile wage are more similar than their rankings by mean wage and 10th-percentile wage.

As shown in text table 1, the mean wage in every occupational group is higher than the 50th–percentile, or median, wage for that group, suggesting that the top half of workers have a wider wage distribution than do the lower half. In other words, the distribution of wages in each occupational group is skewed towards the higher end of the wage range.

Chart 2 uses the percentile wages from text table 1 to graphically display the wage distribution for each major occupational group. Combined, the portions of the bars represent the middle 80 percent of the distribution for each occupational group. The left endpoint of the bar indicates the 10th-percentile wage—10 percent of workers in the occupational group earn less than that wage. The right endpoint of the bar indicates the 90th-percentile wage—10 percent of workers in the occupational group earn more than that wage. Similarly, the inner bar segment between the 25th and 75th percentiles shows the middle 50 percent of the distribution for each of the occupational groups.

The legal occupations group has the highest mean wage and the widest wage distribution for both the middle 80 percent and middle 50 percent of workers. Over $56 separates the 10th-percentile wage of $12.09 per hour and the 90th-percentile wage of $68.23 per hour. The middle 50 percent of workers in the legal group have a wage range of over $30.

The food preparation and serving related occupations group has the lowest mean wage and the narrowest wage distribution for both the middle 80 percent and the middle 50 percent of workers. The middle 80 percent have a wage range of $5.15, and the middle 50 percent have a range of only $2.36.

As shown in chart 2, the width of the wage distributions for both the middle 80 percent and middle 50 percent of workers in an occupational group generally declines with the mean wage of that group. Wages for the middle 50 percent of workers are skewed, to varying degrees, toward the lower end of the pay distribution for all occupational groups. Most noticeable in this regard are the farming, fishing, and forestry; personal care and service; and sales and related groups, with only 37 cents, 68 cents, and 85 cents, respectively, separating the 10th-percentile wage from the 25th-percentile wage. The difference between the 75th-percentile wage and the 90th-percentile wage in those three occupational groups is, respectively, $4.53, $5.77, and $10.13, which —amounts to at least 9 times the corresponding difference between the 10th-percentile wage and the 25th-percentile wage. By contrast, wages for the middle 50 percent of workers in computer and mathematical; architecture and engineering; education, training, and library; and installation, maintenance, and repair groups are comparatively less skewed toward the lower end of the pay distribution. In these occupational groups, the amounts separating the 75th-percentile wage from the 90th-percentile wage are at most twice those separating the 10th-percentile wage from the 25th-percentile wage.

In addition to cross-industry estimates for the 22 OES major occupational groups, the OES program produces detailed occupational wages across all industries. These estimates show that wages for detailed occupations can vary substantially within a major occupational group. Because of these variations, comparative wages for detailed occupa-

[1] Mutual dependence or concordance between the rankings of two variables, x and y, can be assessed through the Spearman rank correlation coefficient, $rs = 1 - (6 \sum D^2)/ n (n^2 -1)$, where D is the rank difference, and n is the number of observations on x and y. If the two rank orders are identical, the rank differences all are zero, and $r_s = 1$. If one rank order is the reverse of the other, so that there is total discrepancy, we get $r_s = -1$.

tions in different major occupational groups might not follow the overall pattern of wage difference noted between their respective major groups. To see how wages vary for these occupational groups, see Patrick Kilcoyne, "Occupational Employment Estimates by Industry," elsewhere in this publication.

Chart 2. **Wage distribution by occupational group, 1999**