

October 2011

# GENDER PAY DIFFERENCES

## Progress Made, but Women Remain Overrepresented among Low-Wage Workers



U.S. Government Accountability Office



YEARS

1921-2011

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### Why GAO Did This Study

Women represent an increasingly larger share of the total workforce in the United States—constituting nearly half of the total workforce. In addition, an increasing proportion of women in the workforce are more educated. However, research by GAO and others has shown that women’s average pay has been and remains lower than that of men. Questions have been raised about the extent to which less-advantaged women—that is, those who are low wage or less educated—experience lower wages than less-advantaged men.

GAO was asked to examine the differences in representation, key characteristics, and pay among women and men (1) with less education and (2) with low wages. GAO defined less-educated workers as those having a high school degree or less and low-wage workers as those earning an hourly wage rate in the bottom quintile—or 20 percent—of wages across the workforce. GAO analyzed data from the Department of Labor’s Current Population Survey (CPS); reviewed other work on similar topics; and interviewed agency officials, representatives of women’s groups, and other researchers.

### What GAO Recommends

GAO is not making recommendations in this report. The Department of Labor provided technical comments, which were incorporated where appropriate. The Department of Commerce had no comments on this report.

View [GAO-12-10](#) or key components. For more information, contact Andrew Sherrill at (202) 512-7215 or [sherrilla@gao.gov](mailto:sherrilla@gao.gov).

## GENDER PAY DIFFERENCES

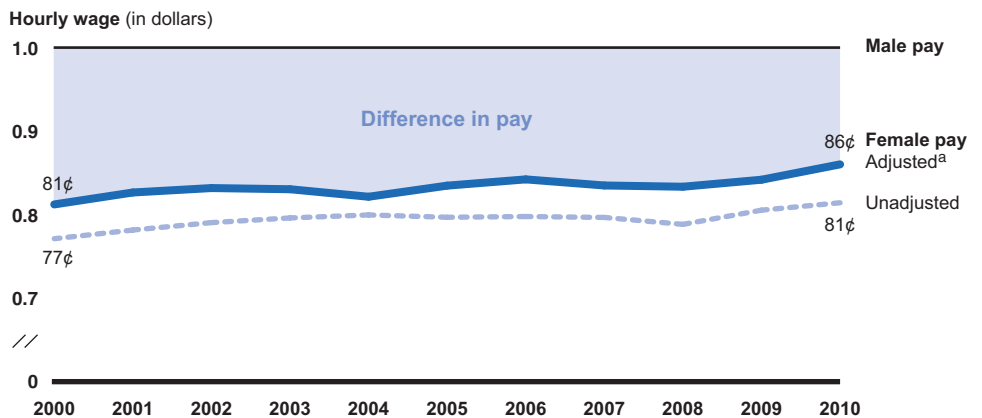
### Progress Made, but Women Remain Overrepresented among Low-Wage Workers

### What GAO Found

Women in general have surpassed men in obtaining education over the last three decades, but on average, women with a high school degree or less earned lower hourly wages than men with the same level of education. Among these less-educated workers, women tended to work in industries and occupations, such as health care and social assistance, that had lower wages than those in which men worked. Even when less-educated women and men were in the same broad industry or occupation category, these women’s average hourly wage was lower than men’s. GAO estimated that in 2010, less-educated women earned 86 cents—compared with 81 cents in 2000—for every dollar men earned, after adjusting for available factors that may affect pay. The annual household income of less-educated workers varied based on marital status and the presence of children, but in all cases, women, on average, had lower personal earnings than men. Less-educated single women households with children had among the lowest total annual income of all households, averaging about \$37,000.

Women have made progress in earning higher wages over the last three decades, but they remain overrepresented among workers who earn low wages. Women made up an estimated 49 percent of the overall workforce in 2010, but constituted 59 percent of the low-wage workforce. Low-wage women and men earned a similar hourly wage, but women as a group earned less in a typical week—in part, because they were more likely to work part-time. While hourly wages for low-wage men and women did not vary much, annual household income did vary, largely based on marital status and the presence of children in the household. Single women with children in the household had the lowest annual household income, averaging about \$27,000.

**Estimated Pay Differences between Less-Educated Women and Men, 2000-2010**



Source: GAO analysis of CPS data.

<sup>a</sup>The adjusted pay difference controls for the following factors—age, race/ethnicity, education, marital status, children in the household, full-time/ part-time job status, union membership, citizenship status, veteran status, state of residence, industry, and occupation (see app. III for more details).

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### **Abbreviations**

ASEC	Annual Social and Economic Supplement
BLS	Bureau of Labor Statistics
CPS	Current Population Survey
DOL	Department of Labor
NAIC	North American Industry Classification System
SIC	Standard Industry Classification

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G A O

Accountability \* Integrity \* Reliability

United States Government Accountability Office  
Washington, DC 20548

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October 12, 2011

The Honorable Robert P. Casey, Jr.  
Chair  
Joint Economic Committee  
United States Congress

The Honorable Carolyn B. Maloney  
House of Representatives

Over the past 30 years, the size of the United States workforce has grown from about 75 million to over 115 million workers, with women representing an increasingly larger share. By the end of 2010, women made up nearly half (47 percent) of the workforce, up from 41 percent in 1980. During the same period, the percentage of women who worked rose 10 percentage points to just over 66 percent, while the percentage of men who worked fell 8 percentage points to about 77 percent.<sup>1</sup>

Women have also attained higher education levels since 1980. Both men and women workers are better educated than they were 30 years ago; however, women have surpassed men with respect to obtaining high school diplomas and college degrees. Younger women—those from age 25 to 34—now complete high school and college at somewhat higher rates than men. For example, in 2010, 90 percent of women within that age group held at least a high school diploma or equivalent compared with 87 percent for men of that age. Moreover, 37 percent of these younger women held a bachelor's degree or higher, compared with 29 percent of younger men.<sup>2</sup>

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<sup>1</sup>Data presented in this report are estimates based on GAO analysis of the Current Population Survey. Data on workforce participation are based on workers age 25 to 64, including those who are self-employed. Subsequent analyses in this report exclude self-employed workers, because of the difficulty in accurately estimating hourly wages for this population. For more information about our analysis, see appendix II.

<sup>2</sup>U.S. Census Bureau, *Table 226: Educational Attainment by Race, Hispanic Origin, and Sex*, <http://www.census.gov/compendia/statab/2011/tables/11s0226.xls>, and *Table 1: Educational Attainment of the Population 18 Years and Over, by Age, Sex, Race, and Hispanic Origin: 2010*, <http://www.census.gov/hhes/socdemo/education/data/cps/2010/Table1-01.xls> (Washington, D.C.: Aug. 11, 2011).

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While gains have been made in some areas, research by GAO and others has shown that women’s average pay has been and remains lower than that of men.<sup>3</sup> For example, in 2003, we reported that across the general workforce, gender pay differences had narrowed over time, but women in 2000 received 80 cents for every dollar earned by men after adjusting for available factors that may affect pay.<sup>4</sup> Most recently, in 2010, in response to a request from the Joint Economic Committee, we examined women’s progress in the workplace and reported on differences in the representation, characteristics, and pay of women and men in management positions.<sup>5</sup> As with our findings for the overall worker population, we found a pay difference between male and female managers, although it had narrowed somewhat over time. We estimated that women managers earned 81 cents for every dollar earned by male managers in 2007, compared with 79 cents in 2000, after adjusting for selected factors.

As a follow-up to our earlier work, you asked us to examine gender differences among less-advantaged workers—specifically, those with less education and those with low wages. We defined less-educated workers as those having a high school degree or less. We defined low-wage workers as those earning an hourly wage rate in the bottom quintile—or 20 percent—of wages across the workforce.<sup>6</sup> In 2010, those in the bottom quintile earned an average hourly wage of \$11.00 or less. These two populations are somewhat distinct, but they also overlap. We estimated that nearly 60 percent of low-wage workers have a high school degree or

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<sup>3</sup>GAO, *Women’s Earnings: Work Patterns Partially Explain Difference between Men’s and Women’s Earnings*, [GAO-04-35](#) (Washington, D.C.: Oct. 31, 2003). White House Council on Women and Girls, *Women in America: Indicators of Social and Economic Well-Being* (March 2011).

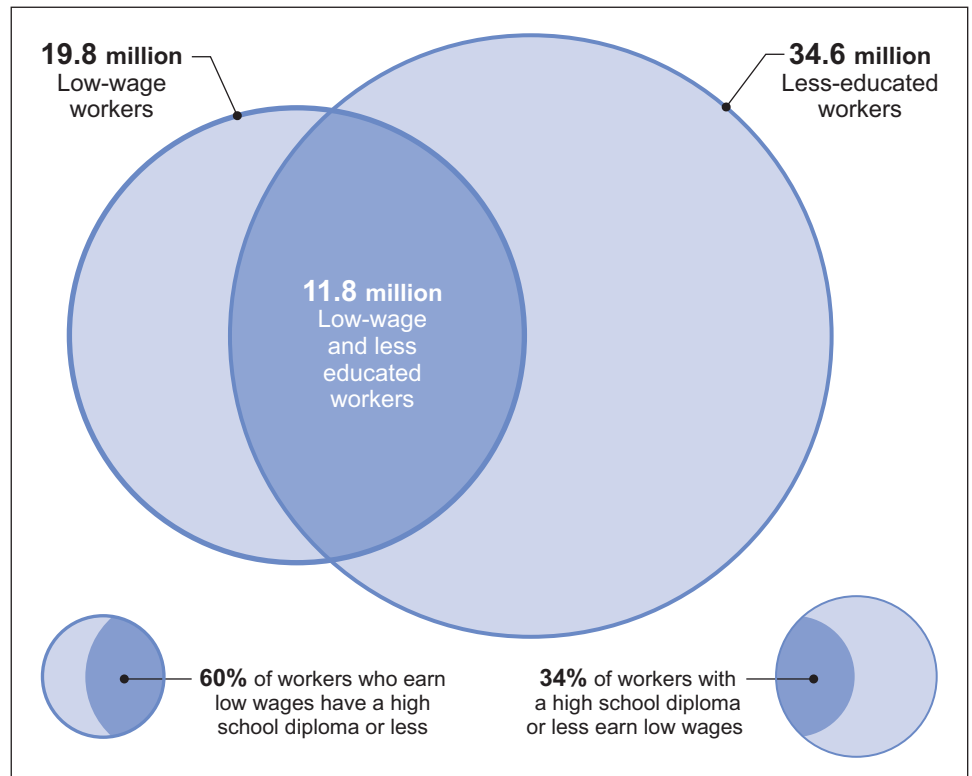
<sup>4</sup>For other examples of past GAO work on gender pay differences see GAO, *Women’s Pay: Gender Pay Gap in the Federal Workforce Narrows as Differences in Occupation, Education, and Experience Diminish*, [GAO-09-279](#) (Washington, D.C.: Mar. 17, 2009), and *Retirement Security: Women Face Challenges in Ensuring Financial Security in Retirement*, [GAO-08-105](#) (Washington, D.C.: Oct. 11, 2007).

<sup>5</sup>GAO, *Women in Management: Analysis of Female Managers’ Representation, Characteristics, and Pay*, [GAO-10-892R](#) (Washington, D.C.: Sept. 20, 2010).

<sup>6</sup>In the rest of this report, when we refer to “hourly wage” we mean hourly wage rate. Our analysis includes workers who are paid in hourly wages as well as those workers who are paid on other schedules.

less, while just over a third of less-educated workers are also low-wage (see fig.1).

**Figure 1: Amount of Overlap between Less-Educated and Low-Wage Worker Populations in 2010**



Source: GAO analysis of CPS data.

To respond to your request, we are answering the following question: What are the differences in representation, key characteristics, and pay among women and men (1) with less education and (2) with low wages?

To perform this work, we analyzed data from the Department of Labor Bureau of Labor Statistics' (BLS) Current Population Survey (CPS) to obtain information on gender differences in representation, characteristics, and pay among workers who have low wages or less education. We selected the CPS because it provides a good measure of hourly wages, large sample sizes, and data over time. We assessed CPS data reliability—by reviewing documentation on CPS design, methods, and data elements; interviewing agency officials; and performing



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electronic data testing—and determined that the data were sufficiently reliable for our purposes. We restricted our analysis to individuals ages 25 to 64 who were not self-employed. As is the case with research that uses statistical modeling to study pay differences, our models cannot explain any earnings difference between women and men in our population that persists after controlling for available factors that may affect pay. For example, our work could not measure level of work experience. In addition, our analysis cannot determine whether differences in pay were due to worker choice or discrimination. Beyond our analysis of CPS data, we also reviewed other work on similar topics and interviewed representatives of women’s groups and other researchers to provide the appropriate context for this report.<sup>7</sup>

We conducted our work from January to October 2011 in accordance with all sections of GAO’s Quality Assurance Framework that are relevant to our objectives. The framework requires that we plan and perform the engagement to obtain sufficient and appropriate evidence to meet our stated objectives and to discuss any limitations in our work. We believe that the information and data obtained, and the analysis conducted, provide a reasonable basis for any findings and conclusions in this product. Appendix I includes separate fact sheets that provide more details on representation, characteristics, and pay for each population—less-educated and low-wage workers. Appendixes II and III provide detailed descriptions of our methodology.

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## Women with a High School Degree or Less Earn Lower Wages than Men

Women in general have surpassed men in obtaining education over the last three decades, but on average, less-educated women earn lower wages than less-educated men. Within this less-educated group, 81 percent of women compared with 75 percent of men had a high school diploma in 2010, according to BLS data. Less-educated women also tended to be older than less-educated men, averaging about age 45 compared with about age 42 for men.<sup>8</sup> Although women were older and had greater high school graduation rates than men among the less educated, women’s wages lagged behind men’s. The particular industry and occupation in which they worked had a considerable effect on the

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<sup>7</sup>Estimated differences presented in this report are significant at the 95 percent confidence level.

<sup>8</sup>See appendix I for more information on characteristics of less-educated workers.

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wages of less-educated workers, which averaged from \$11.10 to \$23.02 per hour.<sup>9</sup> Women tended to work in industries and occupations that had lower wages than the industries and occupations in which men worked. For example, in 2010, health care and social assistance drew the largest number of less-educated women, where they earned, on average, about \$14 per hour. At the same time, a sizable number of less-educated men worked in construction or in transportation/utilities, where they earned, on average, more than \$19 per hour. Further, even when less-educated women and men worked in the same broad industry or occupation category, women's average hourly wage was lower than men's.

As we found in our earlier studies of the general population, among less-educated workers, differences in pay between women and men have narrowed somewhat over time.<sup>10</sup> We estimated that, in 2000, less-educated women earned 81 cents for every dollar men earned, while in 2010, the pay difference decreased by 5 cents—to 86 cents per dollar, after adjusting for available factors that may affect pay.<sup>11</sup> The factors available for adjusting with the models are limited, however, and could account for about 25 percent of the pay differences.

Beyond the hourly wages of less-educated workers, when considering the annual household income of this group, we found that the household income of these workers varied depending on marital status and the

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<sup>9</sup>The broad industry and occupational categories used in this report combine many narrowly defined industries and occupations. There may be considerable variation in average wages and gender representation between the narrow industries and occupations within these broad categories.

<sup>10</sup>However, models used to estimate gender pay differences are limited because some factors that affect pay are not measured and available in datasets. As a result, our estimated differences should not be interpreted to represent actual pay differences between women and men that may exist if we could measure all factors that affect pay.

<sup>11</sup>The unadjusted pay differences between less-educated women and men from 2000 to 2010 averaged about 4 cents higher than the adjusted amounts. However, the unadjusted pay differences do not take into account any factors that may affect pay, including different attributes of women and men, or that women and men may work in different industries or occupations.

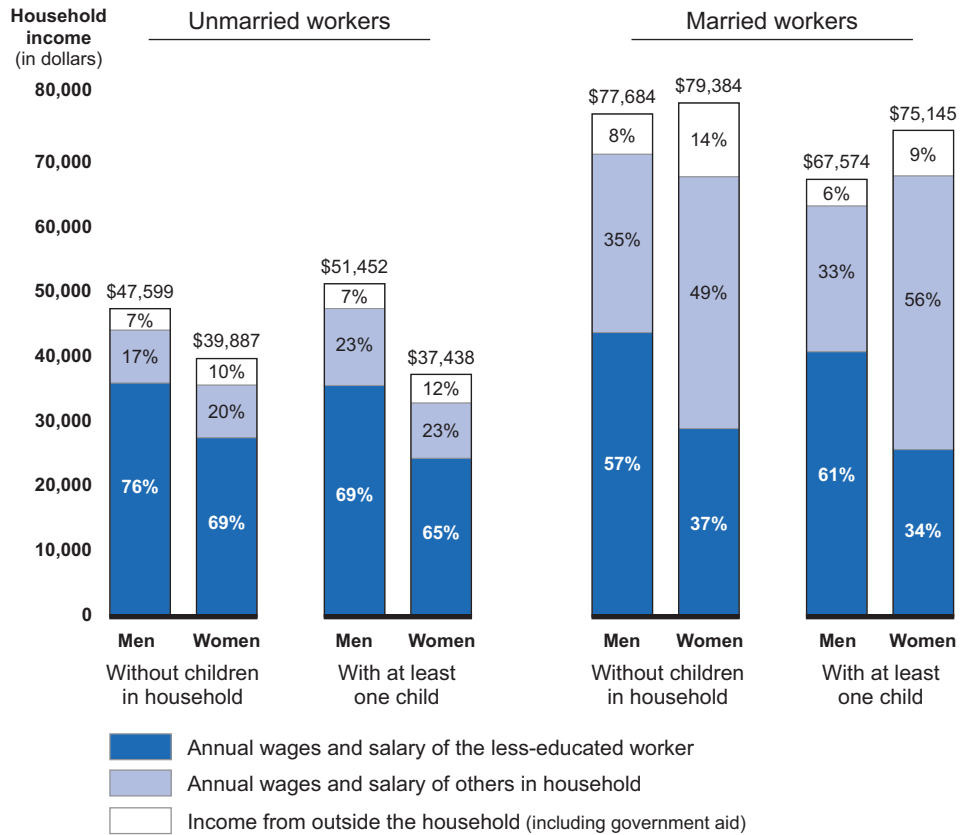
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presence of children.<sup>12</sup> However, in all of these household categories, women had lower average personal wage and salary earnings than men. We estimated that 43 percent of less-educated women were unmarried, including those with and without children in the household (compared with about 36 percent of men). Less-educated unmarried women were almost three times more likely than less-educated unmarried men to have a child in the household. These single woman households had among the lowest total annual income of all households—averaging about \$37,000 in households with children and \$40,000 in those without children. About one-third of these households' income came from sources other than the wage and salary earnings of the less-educated worker. While married less-educated women had lower wage and salary earnings than married less-educated men, they had a slightly higher total household income, and in these households, women's earnings were a smaller proportion of total household income (see fig. 2). Less-educated women were more likely than less-educated men to work part-time—on average, 29 percent of women and 15 percent of men worked part-time in 2010.

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<sup>12</sup>Total household income includes (1) annual wage and salary earnings of the worker; (2) annual wage and salary earnings of others in the household; and (3) income from outside the household, including government benefits (such as Social Security, public assistance, veterans' payments); retirement, investment, and rental income; and other sources of non-wage/salary income. We restricted our analysis to women and men who were defined as either the "householder" (for example, the owner or renter) or spouse of householder.

**Figure 2: Annual Household Income of Less-Educated Workers, as of 2009**



Source: GAO analysis of CPS data.

Note: These are 2009 data collected in 2010. The largest 95 percent margin of error for total household income of any group in this figure was plus or minus \$3,148, for unmarried men with children in household. Some percentages may not add to 100 percent because of rounding.

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## Even with Progress, Women Remain Overrepresented in the Low-Wage Workforce

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### Low-Wage Workers Earn Similar Hourly Wages, but Women Earn Less Annually

Women have made progress in earning higher wages over the last three decades, but they remain overrepresented among workers who earn low wages. We estimated that women made up 49 percent of the overall workforce in 2010, but constituted 59 percent of the low-wage workforce. Women and men in the bottom quintile of wages earned a similar hourly wage, averaging from \$8.21 to \$9.09 depending on industry and occupation.<sup>13</sup> However, relatively more women than men were in this low-wage group. Moreover, women as a group earned less in a typical week because women were more likely than men to work part-time. In 2010, 41 percent of low-wage women worked part-time compared with 26 percent of low-wage men, according to our estimates.

While low-wage workers earned similar hourly wages, women were more likely to work part-time (and therefore fewer hours per year) and as a result, earn less annually. The annual household income of low-wage workers varied depending on marital status and the presence of children in the household. We estimated that just under one-fifth of low-wage women were unmarried with at least one child in the household—making them almost three times more likely than unmarried low-wage men to have a child in the household. These single woman households had the lowest total annual income of all households, averaging about \$27,000. Fifty-seven percent of the household income (or about \$15,000) came from their personal wage and salary earnings. The remaining \$12,000 came from other sources, such as government benefits and other household members' earnings. Without income from these other sources, the low-wage single mother households would be well below the poverty level of \$22,314 (or \$10.73 per hour, full-time) for a family of four.<sup>14</sup>

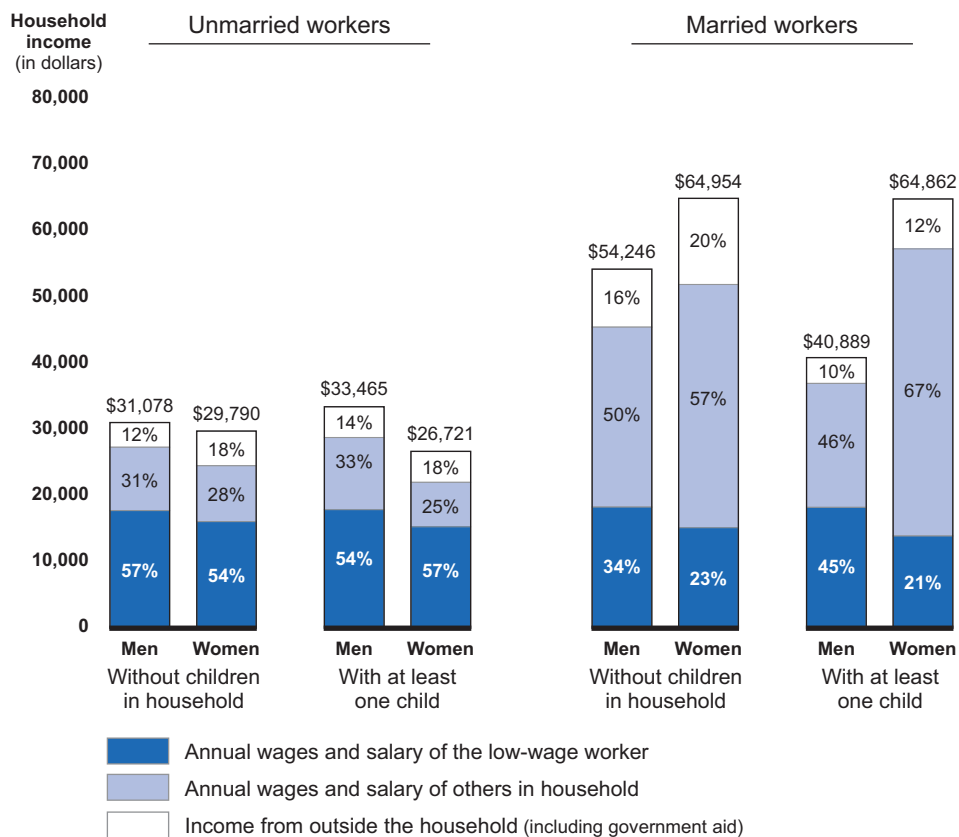
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<sup>13</sup>We found that the difference between the hourly wage rates for women and men in the low-wage group was less than 1 percent, in part because of the limiting effect of the minimum wage.

<sup>14</sup>GAO analysis of U.S. Census Bureau data.

Among low-wage workers who were married—both with and without children in the household—the earnings of the women were lower than those of men. However, the households with low-wage working married women had higher total household income—mainly because of the higher earnings of others in the household (for example, a spouse)—and relied less on the woman’s earnings than the households of low-wage working married men (see fig. 3).

**Figure 3: Annual Household Income of Low-Wage Workers, as of 2009**



Source: GAO analysis of CPS data.

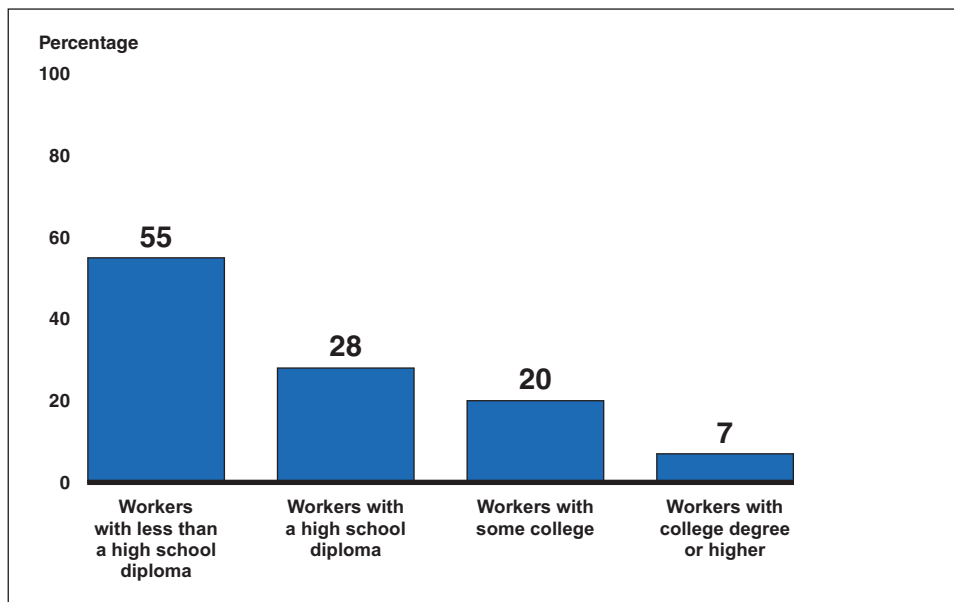
Notes: These are 2009 data collected in 2010. The largest 95 percent margin of error for total household income of any group in this figure was plus or minus \$3,397 for unmarried men with children in the household. Some percentages may not add to 100 percent because of rounding.

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## Additional Education Reduces Likelihood of Being Low Wage

Across the general workforce, workers who are better educated are less likely to earn low wages. Workers who have a high school education or more are far less likely than those who do not to be in the bottom quintile of wages. This trend can be seen in the percentage of low-wage workers in each educational category (see fig. 4). For example, 55 percent of workers with less than a high school degree in 2010 were low wage; however, only 28 percent of those with a high school degree (and without further education) were low wage. A separate analysis—which examined the effect of education on the likelihood of being a low-wage worker—confirmed these findings. We found that for both women and men, workers who had a high school degree or more were substantially less likely to earn low wages than those without a high school degree, after adjusting for available factors that may affect pay. See appendix III for a detailed description of our methodology for this analysis.

**Figure 4: Percentage of Workers Who Are Low Wage, by Education Level, as of 2010**



Source: GAO analysis of CPS data.

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## Concluding Observations

Unlike our previous work on pay differences that has focused on federal workers or managers, this work examines gender pay issues for low-wage and less-educated worker populations. Our findings confirm that working women have continued to make progress over time both in their wages and in their education levels. Even with gains, however, women

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who had a high school degree or less in 2010 still earned less than men with the same education levels. As is true with research examining gender pay differences, our analysis was not able to capture all potentially salient factors. For example, we could not assess the role that work experience might have played in gender pay differences. In addition, our study leaves other questions unanswered. In particular, why are women employed in industries and occupations where the average earnings are lower? Moreover, even when men and women work in the same industries or occupations, why do women generally earn lower wages than men? It remains unclear what effect the weak economy and continued high unemployment will have on the work patterns or pay differences we found. Understanding these and other issues that may affect gender pay differences would better position policymakers in focusing scarce resources to respond to the needs of less-advantaged workers.

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## Agency Comments and Our Evaluation

We provided a draft of this report to the Secretaries of Commerce and Labor for review and comment. The Department of Labor provided technical comments, which we incorporated where appropriate. The Department of Commerce had no comments.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees and to the Secretaries of Commerce and Labor. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions concerning this report, please contact me at (202) 512-7215 or [sherrilla@gao.gov](mailto:sherrilla@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix IX.



Andrew Sherrill,  
Director, Education, Workforce,  
and Income Security Issues



# Less-Educated Workers

## Overview

### About This Report

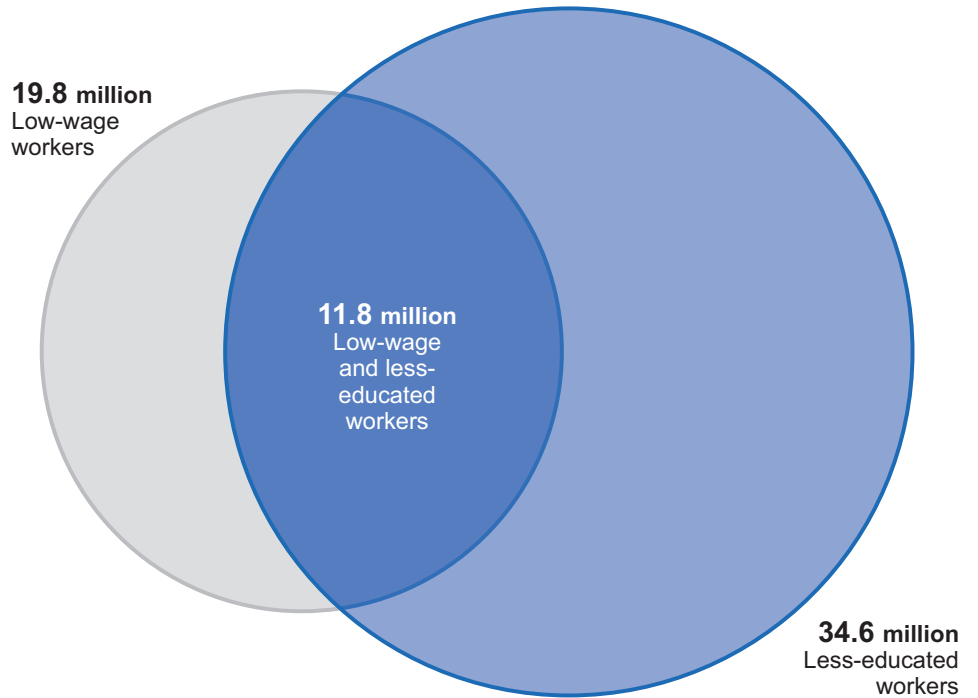
This report examines gender differences among two populations of less-advantaged workers—(1) those with less education and (2) those with low wages.

While these two populations are somewhat distinct, they also overlap—11.8 million (or 34 percent) less-educated workers also earn low wages (see fig.).

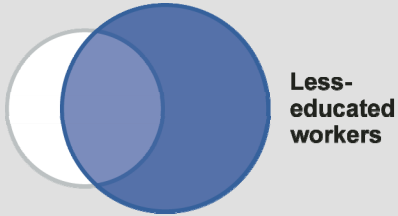
### Defining the Less-Educated Population

This section of the report is about the United States' 34.6 million less-educated workers—defined as those with a high school degree or less. This analysis includes only wage and salary earners age 25-64, who had positive usual weekly hours and earnings.

**Less-Educated Workers Compared with Low-Wage Workers, Calendar Year 2010**



Source: GAO analysis of CPS data.



**The Workforce**

**In 2010**

**Size of U.S. workforce** (in millions)<sup>1</sup>

**Total U.S. workers:** 96.7  
 Male workers: 49.5  
 Female workers: 47.2

**Total less-educated workers:** 34.6  
 Less-educated men: 19.4  
 Less-educated women: 15.2

**In 1980**

**Size of U.S. workforce** (in millions):

**Total U.S. workers:** 64.4  
 Male workers: 36.5  
 Female workers: 28.0

**Total less-educated workers:** 36.9  
 Less-educated men: 20.0  
 Less-educated women: 16.9

Note: Some numbers may not add to total amount because of rounding.

**More on Unemployment**

**In 2010**

**Unemployment rate of total U.S. labor force**

Total unemployed: 8.3 percent  
 Men: 9.0 percent  
 Women: 7.5 percent

**Unemployment rate of less-educated workers**

Total unemployed: 11.6 percent  
 Men: 12.5 percent  
 Women: 10.3 percent

Source: GAO analysis of CPS data.

**Less-Educated Workers**

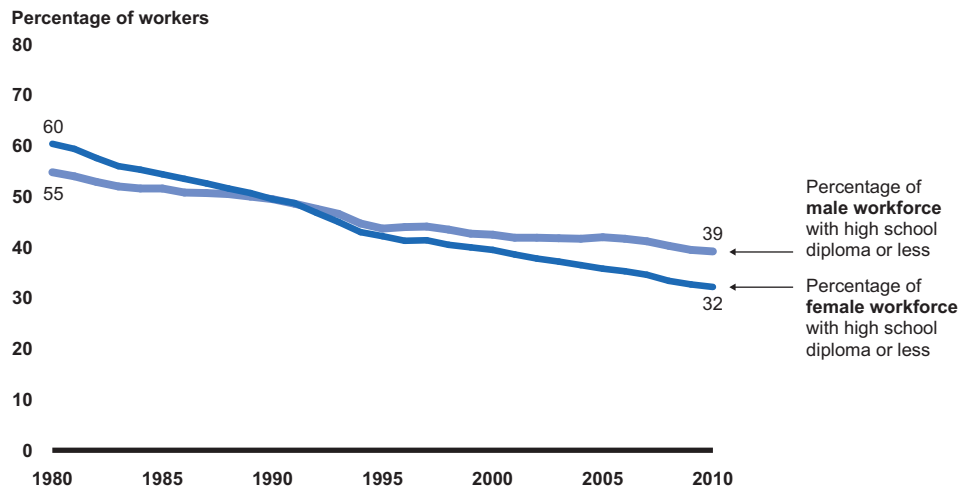
**Representation over Time**

**Women Tend to Be More Educated than Men**

Over the last three decades, while the U.S. workforce in general has become more educated, women have attained higher education levels at a faster rate than men.

- From 1980 to 2010, the proportion of working women with only a high school degree or less decreased from about 60 percent to about 32 percent.
- Over the same period, the proportion of working men with only a high school degree or less decreased from about 55 percent to about 39 percent.

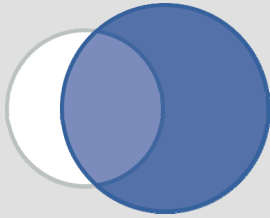
**Representation of Less-Educated Workers by Gender**



Source: GAO analysis of CPS data.

Note: In 1992, the CPS changed its measure of education level—before 1992, CPS used the number of years of school completed, and beginning in 1992, CPS has used the highest diploma or degree received.

<sup>1</sup>We define the workforce as wage and salary earners in the civilian labor force age 25-64 with positive usual weekly hours and earnings.



Less-educated workers

**For More on Industries**

See appendix IV for a description of examples of areas contained within each industry.

**For More on Wages**

We estimated that when less-educated women and men worked in the same industry, women’s hourly wage rate was lower than men’s for 12 of the 14 industries.

See appendix V for the hourly wage rate for less-educated workers by gender in each industry.

The average hourly wage rate for all 34.6 million less-educated workers was \$15.98.

**Statistical Note**

Except where otherwise indicated, all differences between women and men were statistically significant at the 95 percent confidence level.

Source: GAO analysis of CPS data.

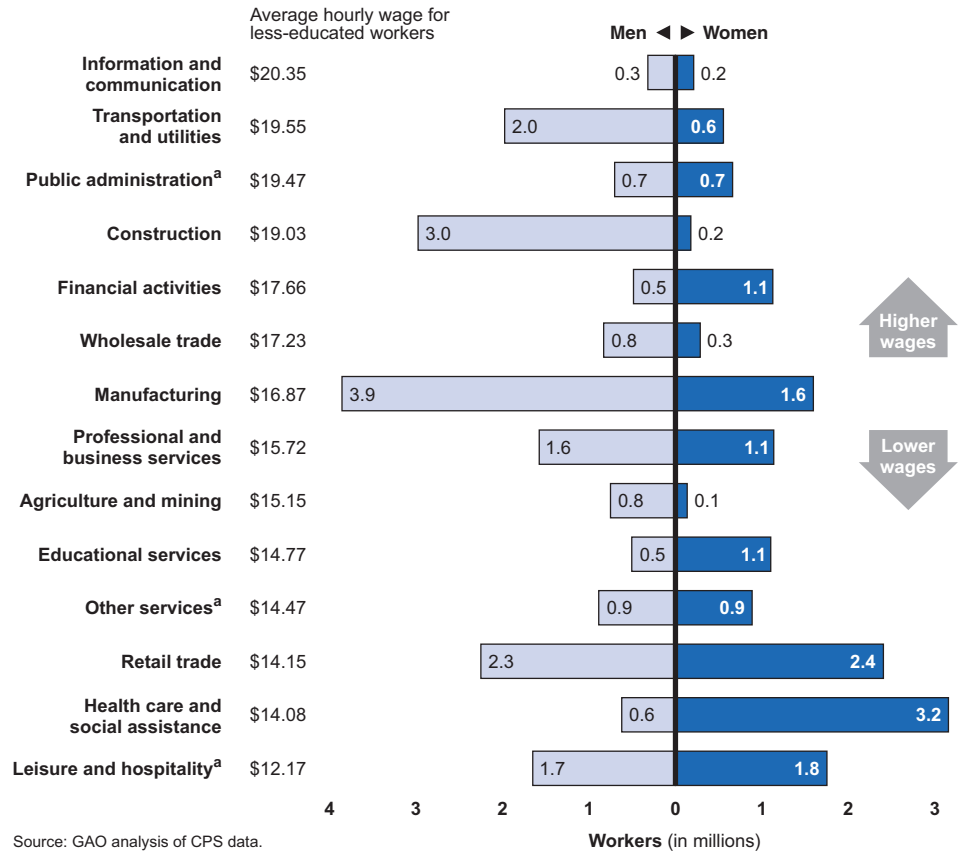
**Less-Educated Workers**

**Representation by Industry**

**A Look by Gender**

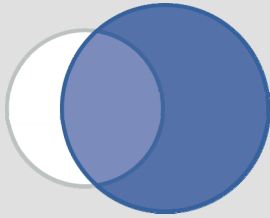
Less-educated women tended to work in industries that had a lower average hourly wage than that of men in 2010.

**Representation of Less-Educated Women and Men by Industry (in millions)**



Source: GAO analysis of CPS data.

<sup>a</sup>The difference between the number of women and men was not statistically significant at the 95 percent confidence level.



Less-educated workers

**For More on Occupations**

See appendix IV for a description of examples of areas contained within each occupation.

**For More on Wages**

We estimated that when less-educated women and men worked in the same occupation, women’s hourly wage rate was lower than men’s for all 15 occupations.

See appendix V for the hourly wage rate for less-educated workers by gender in each occupation.

**Statistical Note**

This list of occupations shown in the figure at right represents about 95 percent of the total less-educated workforce; occupations held by a small number of workers were omitted.

All differences between the number of women and men were statistically significant at the 95 percent confidence level.

Source: GAO analysis of CPS data.

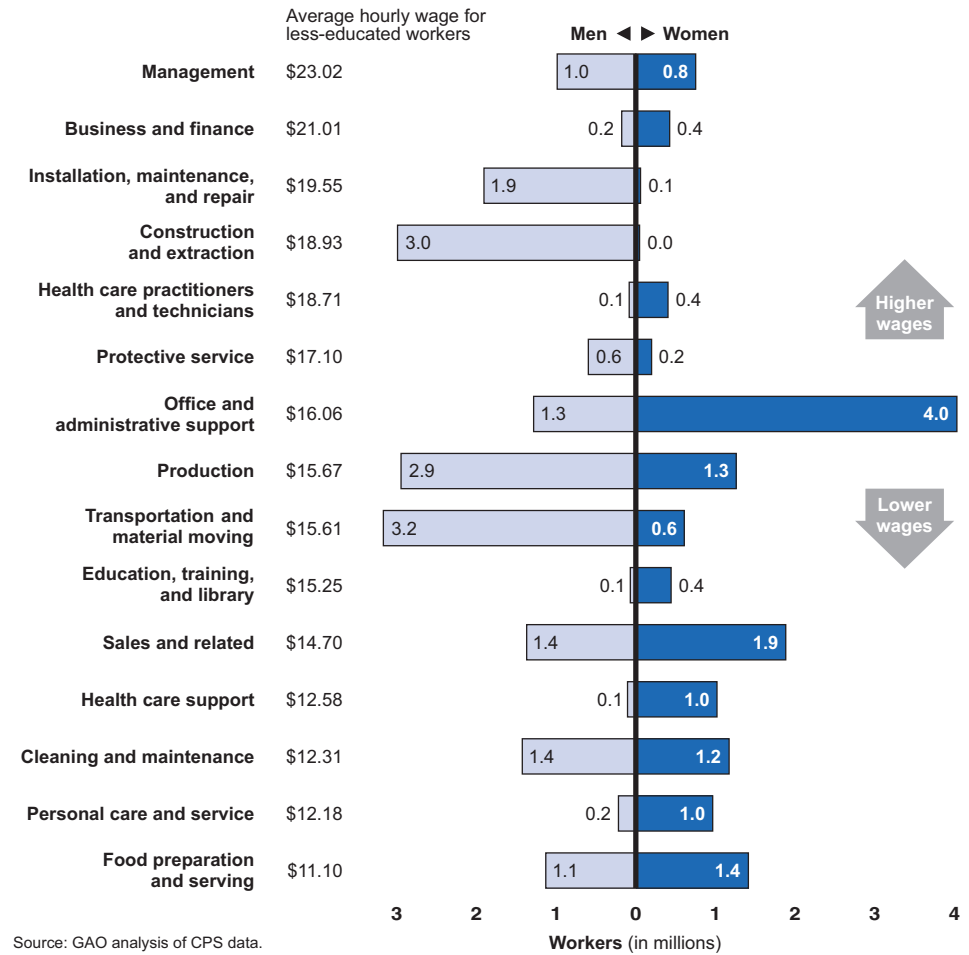
**Less-Educated Workers**

**Representation by Occupation**

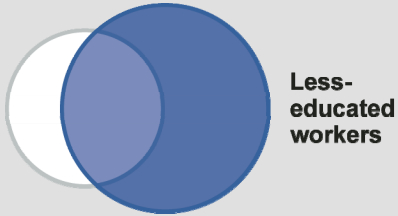
**A Look by Gender**

Some occupations employed both less-educated women and men, while others employed primarily one gender in 2010.

**Representation of Less-Educated Women and Men by Occupation (in millions)**



Source: GAO analysis of CPS data.



**For More on Characteristics**

See appendix VI for more detailed information on characteristics of less-educated workers by gender.

**For More on Two Industries**

See appendix VII for a comparison of the characteristics and pay of less-educated women and men in two industries that employ a large number of both women and men— (1) retail trade and (2) manufacturing.

**Full-Time versus Part-Time**

In this analysis, a full-time worker is defined as one who works 35 hours or more per week.

A part-time worker is one who works less than 35 hours per week.

**Statistical Note**

Differences in the distribution of women and men within each reported characteristic were statistically significant at the 95 percent confidence level.

Source: GAO analysis of CPS data.

**Less-Educated Workers**

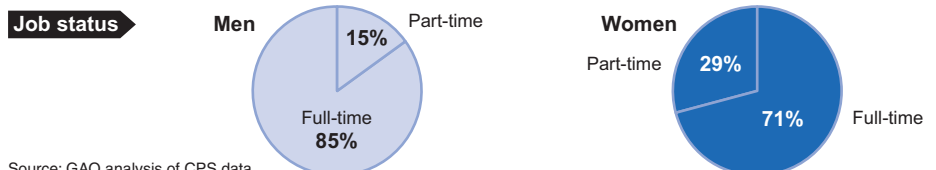
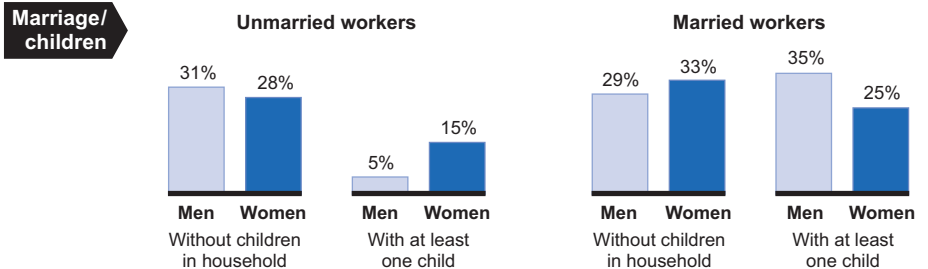
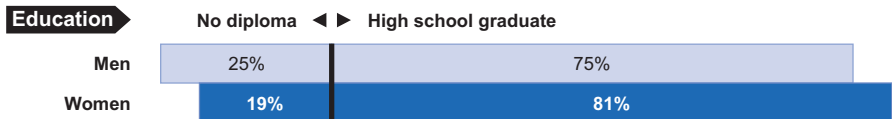
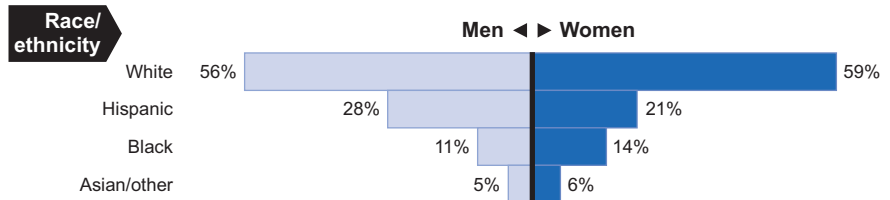
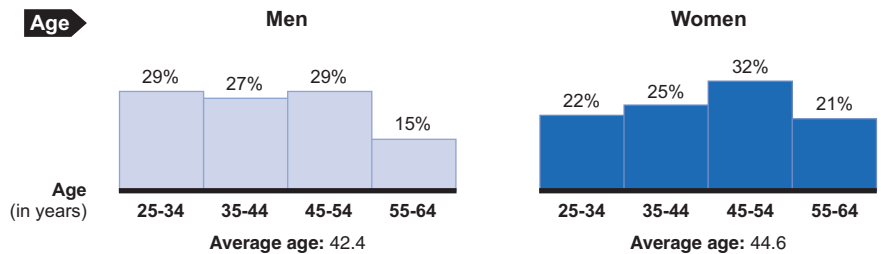
**Characteristics**

**A Look by Gender**

In 2010, compared with less-educated men, less-educated women tended to be older, more often black and less often Hispanic, slightly more likely to have a high school degree, less often married, and more often part-time workers.

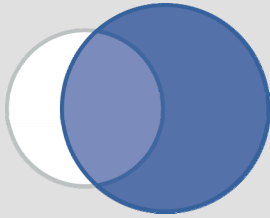
Less-educated unmarried women were almost three times more likely to have a child in the household compared with less-educated unmarried men.

**Characteristics of Less-Educated Workers**



Source: GAO analysis of CPS data.

Note: Some percentages may not add to 100 percent because of rounding.



Less-educated workers

**About Our Analysis**

We restricted this analysis to workers that were householders (or spouses of a householder)—generally, those who owned, bought, or rented the home (this excludes children, other relatives, and nonrelatives in household). This resulted in a population of 27.9 million less-educated workers out of 34.6 million total less-educated workers in the entire workforce.

See appendixes II and VIII for more details.

**Included in Total Household Income**

**Annual wages and salary of worker** are defined as those earned solely by the less-educated worker.

**Annual wages and salary of others in household** can include wages/salary of others in household who may not be less-educated workers.

**Income from outside the household** includes government benefits (such as Social Security, public assistance, veterans' payments); retirement, investment, and rental income; and other sources of non-wage/salary income.

**Wages and Job Status**

For this subpopulation of 27.9 million less-educated householders (or spouses of a householder)

**Full-time less-educated workers**

Men: 81 percent (12.1 million)  
 Women: 70 percent (9.0 million)

**Part-time less-educated workers**

Men: 19 percent (2.9 million)  
 Women: 30 percent (3.9 million)

Source: GAO analysis of CPS data.

**Less-Educated Workers**

**Annual Household Income**

**Among Less-Educated Workers in 2009<sup>2</sup>**

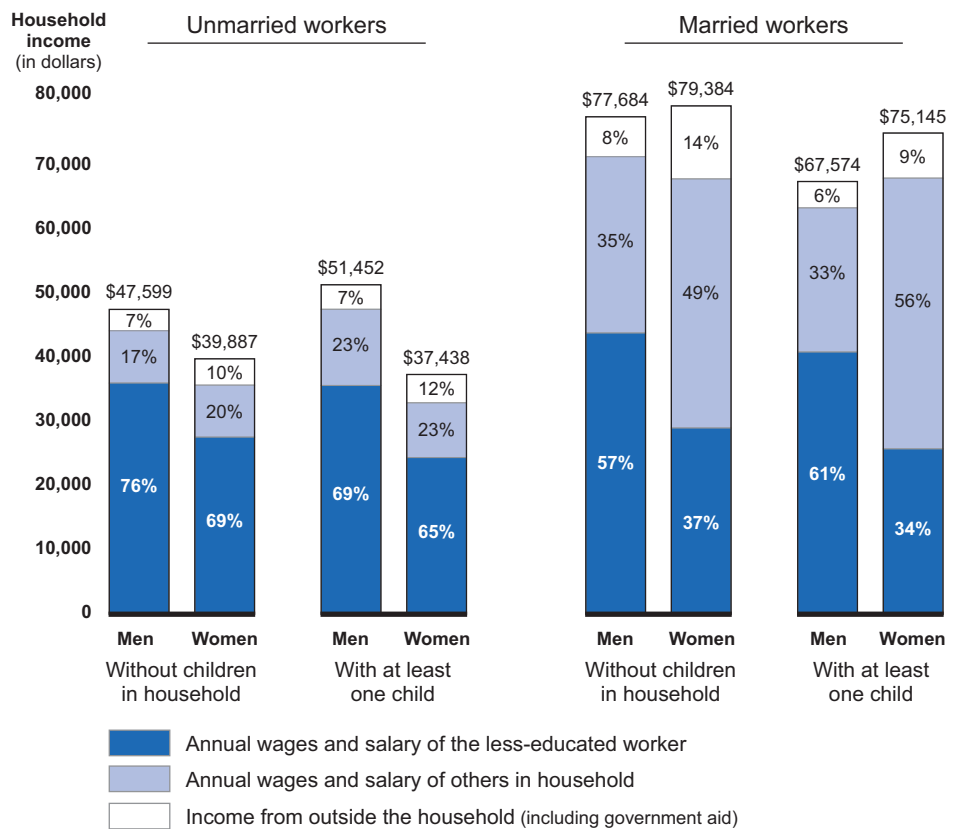
Households of unmarried women had lower incomes than those of men, while married women's households had higher incomes.

Unmarried women had the lowest total household income. Differences based on children were not statistically significant.

Unmarried women's average wage and salary earnings were about two-thirds of total household income compared with one-third for married women's earnings.

Women were more likely to work part-time (and therefore fewer hours per year) and earned less per hour compared with men.<sup>3</sup>

**Annual Household Income of Less-Educated Workers**

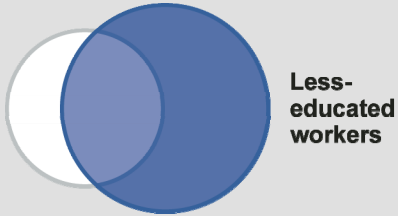


Source: GAO analysis of CPS data.

Note: Some percentages may not add to 100 because of rounding.

<sup>2</sup>This page shows 2009 data collected in 2010. See appendix VIII for standard errors on estimates.

<sup>3</sup>A "full-time" worker was defined as one who worked 50 or more weeks per year, and 35 or more hours per week; all other workers were defined as "part-time".



**About Our Analysis**

Our analysis adjusted for the following factors—age, race/ethnicity, education, marital status, number of children in the household, full-time versus part-time job status, union membership, citizenship status, veteran status, state of residence, industry, and occupation.

We did not attempt to provide an explanation for any difference in earnings between women and men that persists after controlling for available factors that may affect pay. Specifically, our analysis cannot determine whether differences in pay were due to worker choice or discrimination.

See appendix III for details about how we conducted this analysis.

**For More on Pay**

We estimated that the smallest pay difference between less-educated women and men was for those who were unmarried without children in the household.

See appendix III for data on the estimated pay differences between less-educated women and men by marital status and presence of children in the household.

Source: GAO analysis of CPS data.

**Less-Educated Workers**

**Pay Differences by Gender**

**Estimated Pay Differences**

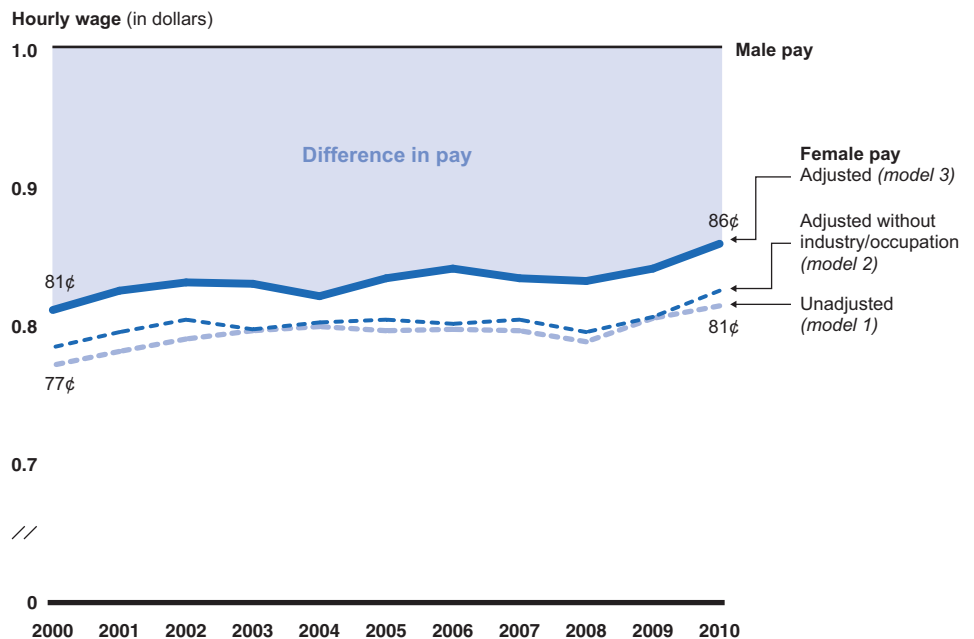
**Model 1:** Over time (from 2000 to 2010), the difference in hourly wages between less-educated women and men has gradually narrowed, even without adjusting for factors that may affect pay.

- Unadjusted pay differences do not take into account any factors that may affect pay, including different attributes of women and men, or that women and men may work in different industries or occupations. To show the importance of these factors, we conducted analysis in two steps described below.

**Model 2:** After adjusting for available factors that may affect pay—except for industry and occupation—the difference in hourly wages between less-educated women and men has gradually narrowed from 2000 to 2010, but was similar to the unadjusted difference.

**Model 3:** After adjusting for available factors that may affect pay—including industry and occupation—we found a similar narrowing of pay differences over time (see all factors at left). However, including industry and occupation in the model caused the pay difference to shrink. Unlike in Model 2, the adjusted difference was less than the unadjusted difference in each year, demonstrating the ability of industry and occupation to explain pay differences among less-educated workers.

**Estimated Pay Differences between Less-Educated Women and Men**



Source: GAO analysis of CPS data.

# Low-Wage Workers

## Overview

### About This Report

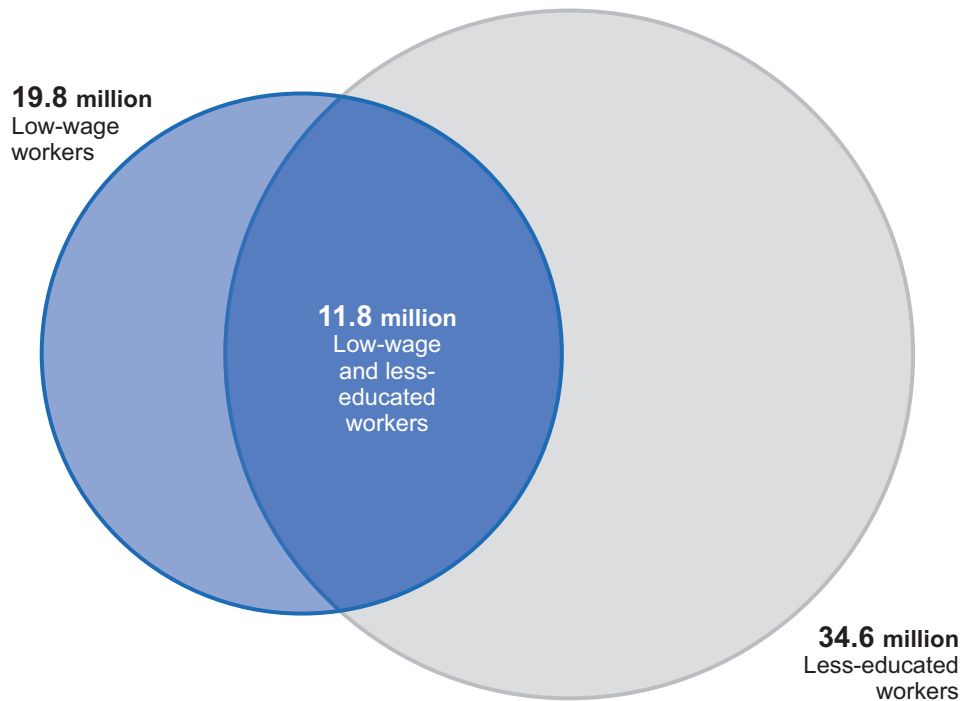
This report examines gender differences among two populations of less-advantaged workers— (1) those with less education and (2) those with low wages.

While these two populations are somewhat distinct, they also overlap—11.8 million (or 60 percent of) low-wage workers are also less educated (see fig.).

### Defining the Low-Wage Population

This section of the report is about the United States' 19.8 million low-wage workers—defined as those who earn an hourly wage rate that is in the bottom quintile (bottom 20 percent) of wages across the entire workforce. This analysis includes wage and salary earners age 25-64 who had positive usual weekly hours and earnings.

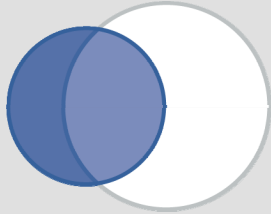
**Low-Wage Workers Compared with Less-Educated Workers, Calendar Year 2010**



Source: GAO analysis of CPS data.



Low-wage workers



**The Workforce**

**In 2010**

Size of U.S. workforce (in millions)  
**Total U.S. workers:** 96.7  
 Male workers: 49.5  
 Female workers: 47.2

**Total low-wage workers:** 19.8  
 Low-wage men: 8.2  
 Low-wage women: 11.6

**In 1980**

Size of U.S. workforce (in millions):  
**Total U.S. workers:** 64.4  
 Male workers: 36.5  
 Female workers: 28.0

**Total low-wage workers:** 13.0  
 Low-wage men: 3.5  
 Low-wage women: 9.5

Note: Some numbers may not add to total amount because of rounding.

Source: GAO analysis of CPS data.

**Low-Wage Workers**

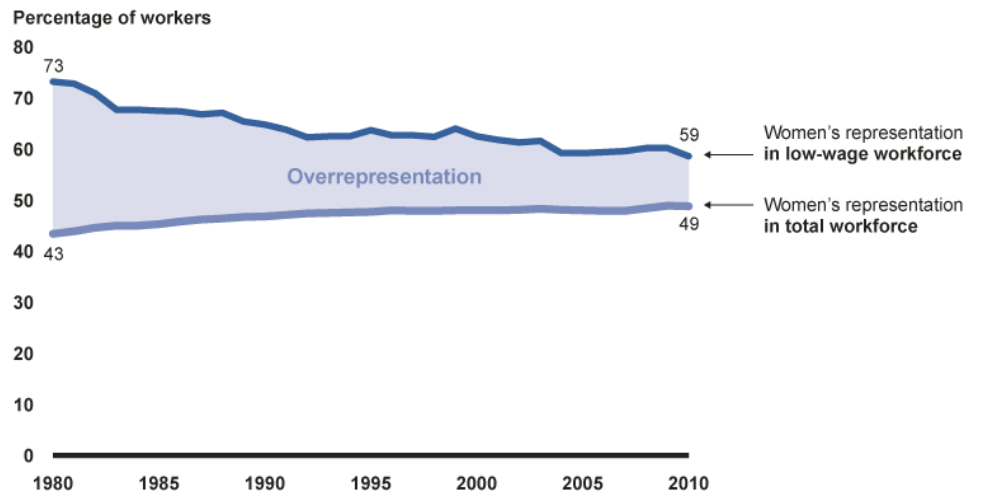
**Representation over Time**

**More Women Earn Low Wages than Men**

While there has been some progress over time, women are still overrepresented in the low-wage workforce.

- **In 1980**, 43 percent of the entire workforce were women, but 73 percent of the bottom quintile of wage earners were women.
- **In 2010**, women's percentage of the entire workforce had increased to 49 percent and women's representation in the bottom quintile of wage earners had decreased to 59 percent.

**Representation of Women in Low-Wage Workforce, 1980-2010**



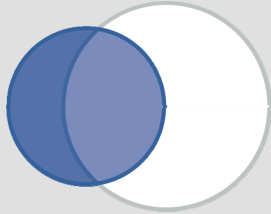
Source: GAO analysis of CPS data.

**Women Are More Likely to Be Low-Wage Workers**

In a separate analysis, we examined the likelihood of women being in the low-wage workforce as compared with men. In our analysis, we found that women were more likely than men to be in the bottom quintile of wage earners, and even after using a multivariate analysis to adjust for differences between women's and men's levels of education, occupation, industry, as well as other available factors that may affect pay, we found that this difference in likelihood was not reduced.

See appendix III for more details about this analysis.

Low-wage workers



**For More on Industries**

See appendix IV for a description of examples of areas contained within each industry.

**For More on Wages**

See appendix V for the hourly wage rate for low-wage workers by gender in each industry.

The average hourly wage rate for all 19.8 million low-wage workers was \$8.65.

**Statistical Note**

Except where otherwise indicated, all differences between women and men were statistically significant at the 95 percent confidence level.

Source: GAO analysis of CPS data.

**Low-Wage Workers**

**Representation by Industry**

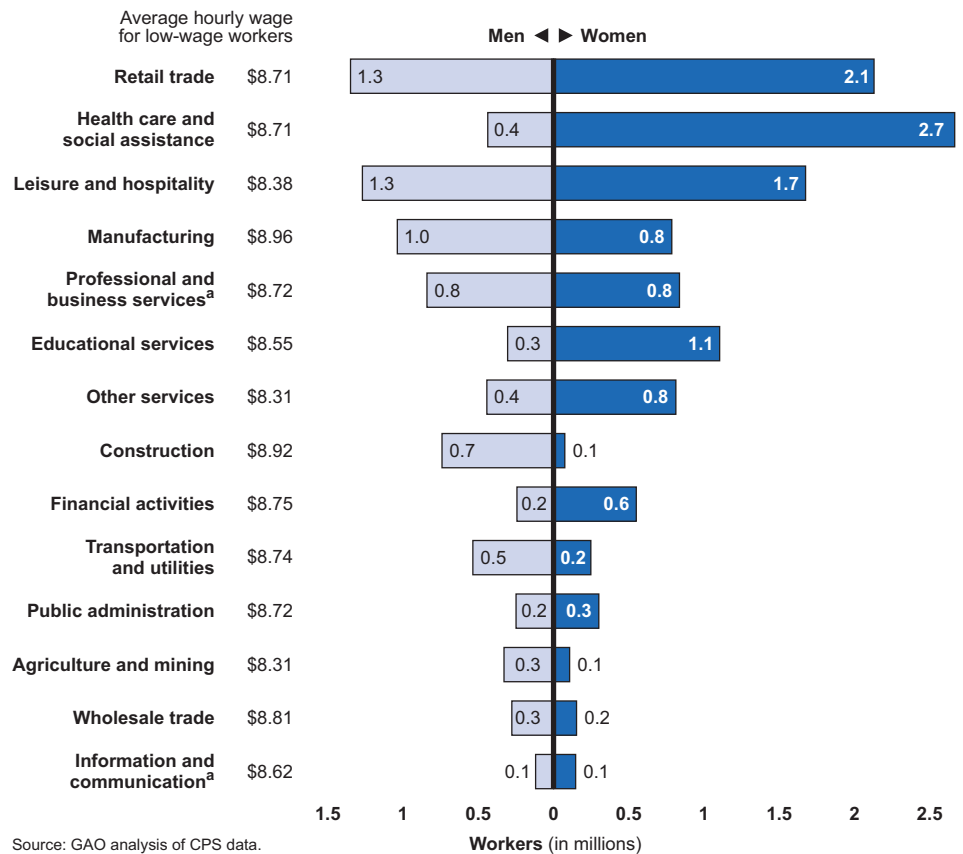
**Low-Wage Women and Men Earn Similar Wages**

Some industries employed low-wage women and men in similar numbers in 2010, while others employed primarily one gender.

Among the three industries that employ the largest numbers of low-wage workers, two industries—retail trade and leisure and hospitality—employed large numbers of both women and men. The third industry—health care and social assistance—employed mostly women.

The average hourly wage rate for both women and men in the low-wage workforce did not vary markedly across industries—it ranged from \$8.31 to \$8.96.

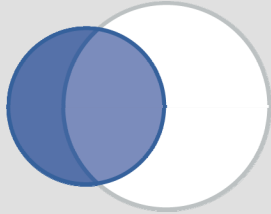
**Representation of Low-Wage Women and Men by Industry (in millions)**



Source: GAO analysis of CPS data.

<sup>a</sup>The difference between the number of women and men was not statistically significant at the 95 percent confidence level.

Low-wage workers



**For More on Occupations**

See appendix IV for a description of examples of areas contained within each occupation.

**For More on Wages**

See appendix V for the hourly wage rate for low-wage workers by gender in each occupation.

**Statistical Note**

The list of occupations shown in the figure at right represents about 95 percent of the total low-wage workforce; occupations held by a small number of workers were omitted.

All differences between the number of women and men were statistically significant at the 95 percent confidence level.

Source: GAO analysis of CPS data.

**Low-Wage Workers**

**Representation by Occupation**

**Low-Wage Women Cluster in Certain Occupations**

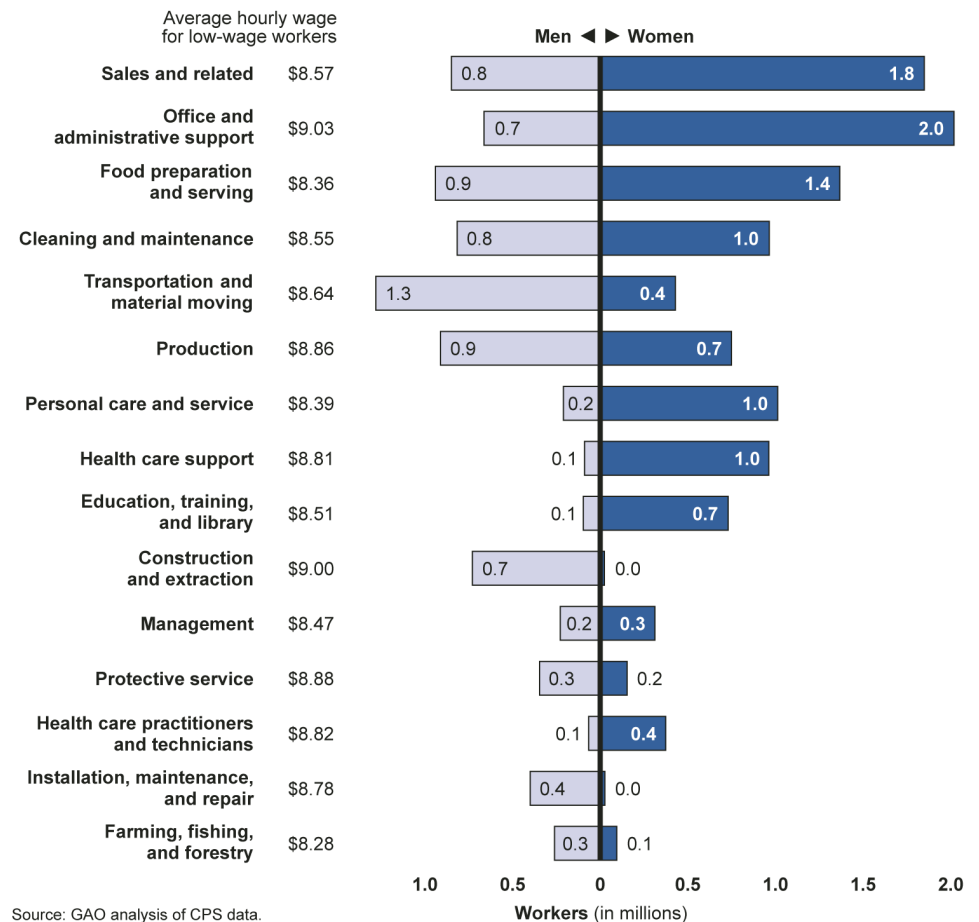
More than half of low-wage women were in four occupations that employed the largest number of low-wage workers in 2010:

- office and administrative support,
- sales and related,
- food preparation and serving, and
- cleaning and maintenance.

In comparison, a large number of low-wage men were employed in the transportation/material moving and production occupations, and to a lesser extent in the same four occupations noted above.

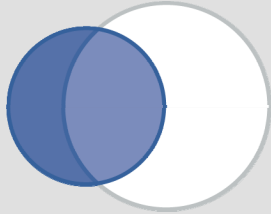
The average hourly wage rate for those in the low-wage workforce did not vary markedly across occupations—it ranged from \$8.28 to \$9.03.

**Representation of Low-Wage Women and Men by Occupation (in millions)**



Source: GAO analysis of CPS data.

Low-wage workers



**For More on Characteristics**

See appendix VI for more detailed information on characteristics of low-wage workers by gender.

**Full-Time versus Part-Time**

In this analysis, a full-time worker is defined as one who works 35 hours or more per week.

A part-time worker is one who works less than 35 hours per week.

**Education and Low Wages**

In a separate analysis, we examined the effect of education on the likelihood of being a low-wage worker. We found that for both women and men, workers who have a high school degree or more are substantially less likely to earn low wages than those without a high school degree.

See appendix III for more details about this analysis.

**Statistical Note**

Differences in the distribution of women and men within each reported characteristic were statistically significant at the 95 percent confidence level.

Source: GAO analysis of CPS data.

**Low-Wage Workers**

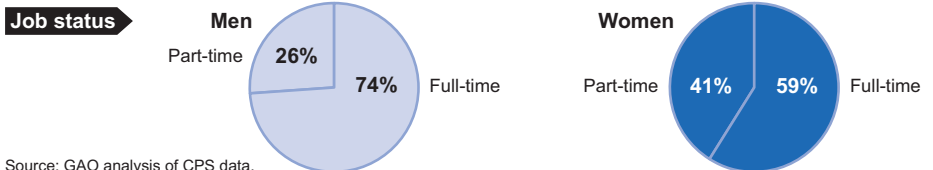
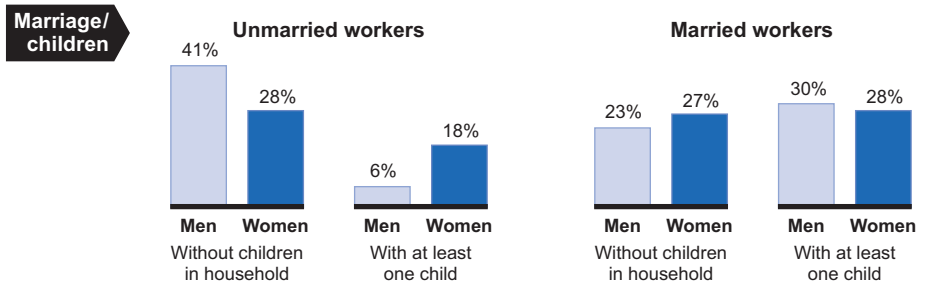
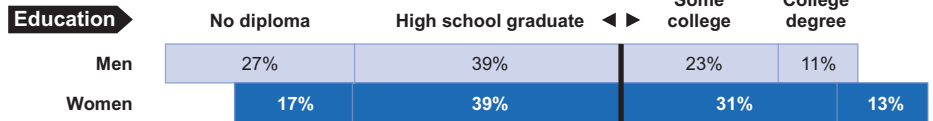
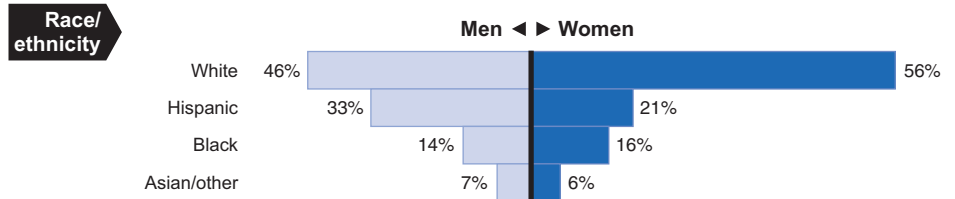
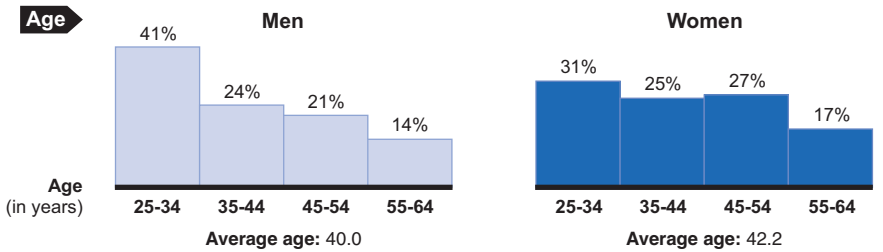
**Characteristics**

**A Look by Gender**

In 2010, compared with low-wage men, low-wage women tended to be: older, more often white and less often Hispanic, better educated, as likely to be married, more often had children in the household, and more often part-time workers.

Low-wage unmarried women were almost three times more likely to have a child in the household compared with low-wage unmarried men.

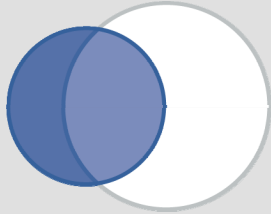
**Characteristics of Low-Wage Workers**



Source: GAO analysis of CPS data.

Note: Some percentages may not add to 100 percent because of rounding.

Low-wage workers



**About Our Analysis**

We restricted this analysis to workers that were householders (or spouses of a householder)—generally, those who owned, bought, or rented the home (this excludes children, other relatives, and nonrelatives in the household). This resulted in a population of 16.7 million low-wage workers out of a total of 19.8 million low-wage workers in the entire workforce.

See appendixes II and VIII for more details.

**Included in Total Household Income**

**Annual wages and salary of worker** are defined as those earned solely by the low-wage worker.

**Annual wages and salary of others in household** can include wages/salary of others in household who may not be low-wage workers.

**Income from outside the household** includes government benefits (such as Social Security, public assistance, veterans' payments); retirement, investment, and rental income; and other sources of non-wage/salary income

**Wages and Job Status**

For this subpopulation of 16.7 million low-wage householders (or spouses of a householder)

**Full-time low-wage workers**

Men: 71 percent (4.2 million)  
 Women: 58 percent (6.3 million)

**Part-time low-wage workers**

Men: 29 percent (1.7 million)  
 Women: 42 percent (4.6 million)

Source: GAO analysis of CPS data.

**Low-Wage Workers**

**Annual Household Income**

**Among Low-Wage Workers in 2009<sup>4</sup>**

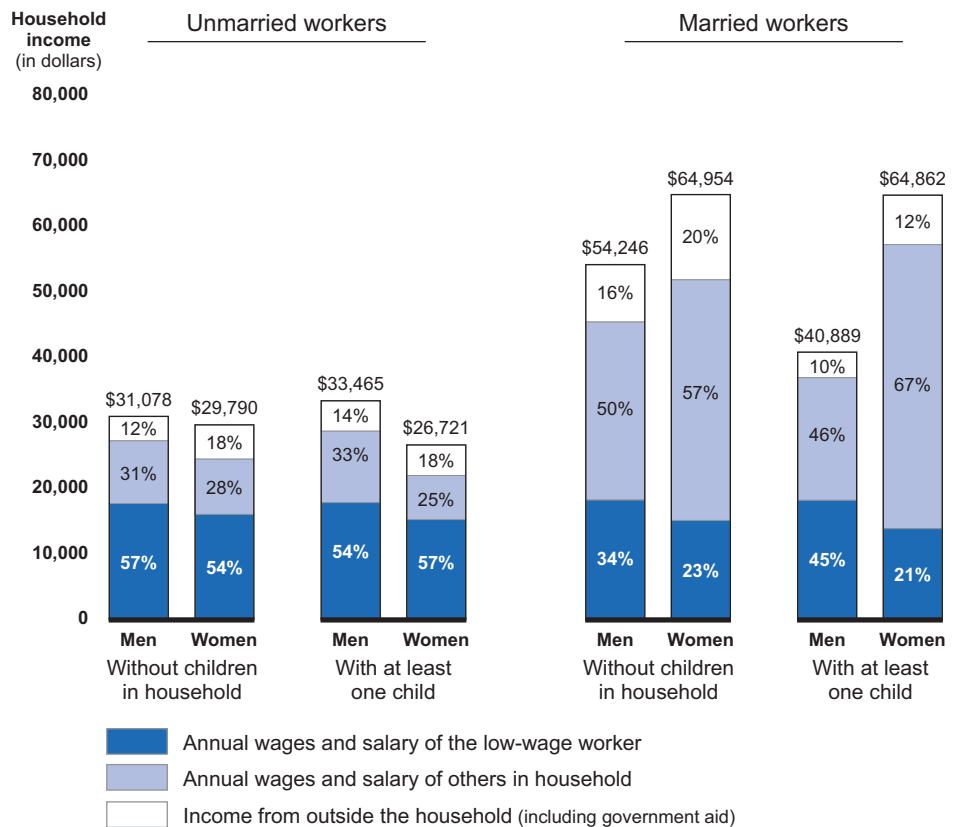
Married women—both with and without children in the household—had higher total household income compared with married men.

Unmarried women with children in the household had the lowest total household income.

On average, married women's annual wage and salary earnings were less than a quarter of average total household income. In contrast, unmarried women's earnings were over half of total household income.

While the hourly wage was similar among all low-wage workers, women's annual personal earnings were lower than men's, regardless of marital status or presence of children in the household—in part because more women worked part-time (i.e., fewer hours per year) compared with men.<sup>5</sup>

**Annual Household Income of Low-Wage Workers**



Source: GAO analysis of CPS data.

Note: Some percentages may not add to 100 percent because of rounding.

<sup>4</sup>This page shows 2009 data collected in 2010. See appendix VIII for the standard errors for estimates.

<sup>5</sup>In this analysis, a "full-time" worker was defined as one who worked 50 or more weeks per year, and 35 or more hours per week; all other workers were defined as "part-time."

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# Appendix II: Objectives, Scope, and Methodology

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This appendix discusses in more detail the methodology for our study examining gender differences among less-advantaged workers—specifically, those with less education and those with low wages. Our study was framed around one question: What are the differences in representation, key characteristics, and pay among women and men (1) with less education and (2) with low wages?

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## Analysis of Federal Datasets

To perform this work, we analyzed data from the Department of Labor's (DOL) Current Population Survey (CPS) to obtain information on the gender differences in representation, characteristics, and pay among workers who have less education or low wages. The CPS is administered by DOL's Bureau of Labor Statistics and the Department of Commerce's Census Bureau.

- For our analyses of the differences in representation, characteristics, and pay, we used data from the outgoing rotation groups of the CPS (the basic monthly CPS). For representation and pay analyses, we used data covering 1980-2010; for characteristics analyses, we used 2010 data.
- For our analyses of annual income of the household or individual, we used the Annual Social and Economic (ASEC) Supplement, or March CPS supplement. We used 2009 ASEC data collected in 2010.

We selected the CPS mainly because of the precision of the hourly wage information. In addition, CPS contains large sample sizes, and allowed us to present information over a long time period.

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## Definitions

- Our definition of working included those who were classified as employed. We excluded those individuals that were self-employed because of the difficulty of obtaining reliable estimates of earnings for those workers.
- For both analyses, we limited our analysis to wage and salary earners in the civilian labor force, from age 25 to 64, with positive usual weekly hours and earnings (in the case of the monthly CPS), or positive annual earnings in the prior calendar year (in the case of the ASEC).
- We defined "less-educated" as those with a high school degree or less.

- We defined “low-wage” as those with an hourly wage rate in the bottom quintile (bottom 20 percent) of wages across the workforce for workers that reported positive earnings. For workers that were not paid an hourly wage, we estimated the hourly wage rate using weekly earnings and usual hours worked per week. For the workers in our sample, we estimated that the bottom quintile of hourly wages was \$11.00 or less in 2010.
- We limited the occupations reported to those that represented 95 percent of the less-educated or low-wage population.
- In the monthly CPS, a person was defined as full-time if he/she worked 35 hours or more per week. For the household income analyses, which used the ASEC, full-time was defined as 35 hours or more per week and 50 or more weeks per year.
- For our analyses of annual household income, we restricted our analyses to workers that were “householders” (or the spouse of a householder)—generally, those who owned, bought, or rented the home (this excludes children, other relatives, and nonrelatives in household). To determine workers that were low wage in this analysis, we estimated the hourly wage using the annual wage and salary earnings, the usual hours worked per week, and the weeks worked during 2009. For the workers in this sample, we estimated that the bottom quintile of hourly wages was \$11.90 or less.
- We defined a person as having a child in the household differently based on the dataset we were using.
  - For analysis of characteristics using the basic monthly CPS from 2010, we defined a person as having a child if the person lived with their “own child” in the household. For analysis of the differences in hourly pay between women and men using the basic monthly CPS over the period 2000 through 2010, we defined the number of children in the household using the number of children under 18 in the household, regardless of whether the children were the “own children” of the wage earner. We could not identify “own children” for all wage earners over the period 2000 through 2010, because prior to 2010 the basic monthly CPS identified “own child” only for the head of the household or spouse in the primary family, and our analysis includes wage earners who were not part of the primary family.

- For the ASEC, we combined information from person, family, and household records. For persons to “have a child,” they had to meet two criteria. First, they had to be either the head or spouse of the head of a family. Second, a family in the household had to have a child in the household under 18 years. In addition, because analyses that used the ASEC involved those individuals’ share of household income, we restricted the sample to householders or spouses of householders. We were able to closely approximate official counts of employed people with or without children by this method.

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## Data Reliability

We assessed the reliability of the CPS generally and of data elements that were critical to our analyses and determined that, despite the limitations outlined below, they were sufficiently reliable for our analyses. Specifically, we

- Reviewed documentation on the general design and methods of the CPS and on the specific elements of the CPS data that were used in our analyses.
- Interviewed Census Bureau and BLS officials knowledgeable about the CPS data and consulted these officials periodically throughout the course of our study.
- Completed our own electronic data testing to assess the accuracy and completeness of the data used in our analyses. To the extent possible, we compared our estimates against published reports using the CPS or other national surveys, like the American Community Survey.

Because CPS and ASEC are survey data collected from a probability sample, estimates produced from these data are subject to sampling error. We followed guidance from the Census Bureau and BLS to construct standard errors associated with the estimates presented in this report and to conduct statistical testing where appropriate.

As a result of these efforts, we identified the following limitations with the data:

- *Hourly wage estimates:* In the CPS data, only workers that are paid an hourly wage are asked directly about the hourly wage. For other workers, an hourly wage can be estimated by using their usual weekly



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pay and the usual hours worked. However, this introduces possible error into the hourly wage estimates.<sup>1</sup> We tested the degree of this error by comparing estimates of hourly wage from two separate CPS sources, and found that the data were sufficiently reliable for our purposes.

- *Definitions of occupation and industry that have changed over time:* During the past decades, there have been changes in the definitions of occupation and industry. In the CPS data, industries were coded using the Standard Industry Classification (SIC) system prior to 2000 and using the North American Industry Classification System (NAICS) after 2000. Although it is possible to cross-walk between the two systems, this would also introduce a source of error. Consequently, our regression estimates of the effect of industry and occupation on wage begin in 2000, when the new industry classification system was in place.

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## Methods

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### Representation of Less-Educated and Low-Wage Workers

To analyze the representation of less-educated and low-wage men and women, we used CPS to estimate the number of men and women that were less educated, as defined above. We also estimated the number of less-educated workers that were men and women within each industry and occupation, and the mean hourly wage. In addition, we estimated the number of men and women in the workforce that were low wage, as defined above. We also estimated the number of low-wage workers that were men and women within each industry and occupation, and the mean hourly wage. To take account of the sample design used in the CPS, we used the person weight present in the CPS data file. In addition, for estimates of counts and proportions, standard errors were adjusted using generalized variance functions provided by BLS. See appendix V.

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<sup>1</sup>See, for example, Long Liu, 2009, "On Hourly Wages and Weekly Earnings in the Current Population Survey," *Economic Letters* 105: 113-116.

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Characteristics of Less-Educated and Low-Wage Workers

To analyze the characteristics of less-educated and low-wage men and women, we used CPS to generate descriptive statistics for women and men by age, race/ethnicity, education level, and job status (full- or part-time). In addition, we reported on the combination of marital status (married or unmarried) and the presence of children in the household. See appendix VI.

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Characteristics of Less-Educated Workers for Two Industries

We also did analysis on the characteristics of less-educated workers in two industries—retail trade and manufacturing—that employ a large number of less-educated women and men. We used CPS to generate descriptive statistics for less-educated women and men by age, race/ethnicity, education level, and job status (full- or part-time). In addition, we reported on the combination of marital status (married or unmarried) and the presence of children in the household. See appendix VII.

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Household Income of Less-Educated and Low-Wage Workers

To analyze the differences in household income between less-educated and low-wage women and men in the workforce, we examined differences in (1) personal wage and salary earnings and (2) total household income. Because this analysis involved annual income, we used data from the March CPS ASEC supplement, which asks respondents about personal wage and salary earnings as well as other forms of household income over the prior year.

Given that differences in total household income are affected by the total number of individuals in the household, we performed separate analyses by marital status and the presence of children in the household. To avoid double counting of people within the same household (such as parent and child), we restricted our analysis to individuals that were householders or the spouses of householders—generally those who owned, bought, or rented the home, excluding children, other relatives, and nonrelatives in the household. This resulted in a reduction in sample size of about 15 percent for both less-educated and low-wage workers. See appendix VIII.

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Pay of Less-Educated and Low-Wage Workers

We used multivariate analysis in two areas: (1) to examine the differences in pay between less-educated male and female workers and (2) to estimate the likelihood of being low wage. See appendix III.

We did not conduct multivariate analysis to examine the pay of low-wage workers, because we found that the difference between the hourly wage rates for women and men in the low-wage group was less than 1 percent,

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in part because of the limiting effect of the minimum wage. By definition, all low-wage workers were below the 20 percent wage threshold and, with rare exceptions, at or above the federal minimum wage.

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## Document Reviews and Interviews

To provide the appropriate context for this report, we (1) reviewed selected GAO and other reports and articles on similar topics and (2) interviewed agency officials (BLS and Census Bureau) and representatives of women's groups and other researchers.

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## Limitations

This report did not attempt to provide an explanation for any difference in earnings between less-educated women and men that persists after controlling for available factors that may affect pay. In addition, we did not compare the relative importance of any of the variables in explaining the differences. Models with different variables can result in differences in the estimates (see app. III). In addition, some factors are difficult to measure, and as a result, our analysis cannot determine whether differences in industry, occupation, or pay are due to factors such as years of experience, worker choice, or discrimination.

We conducted our work from January 2011 to October 2011 in accordance with all sections of GAO's Quality Assurance Framework that are relevant to our objectives. The framework requires that we plan and perform the engagement to obtain sufficient and appropriate evidence to meet our stated objectives and to discuss any limitations in our work. We believe that the information and data obtained, and the analysis conducted, provide a reasonable basis for any findings and conclusions in this product.

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# Appendix III: Multivariate Analysis

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We used multivariate analysis in two areas: (1) to examine the differences in pay between less-educated male and female workers and (2) to estimate the difference between male and female workers in likelihood of being low wage.

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## Differences in Pay

We conducted a regression analysis of the differences in pay between less-educated men and women using the 2010 outgoing rotation groups of the Current Population Survey (the basic monthly CPS). We limited the analysis to those working and not self-employed, because of limitations with calculating hourly wages for self-employed workers. In this analysis, we used an indicator variable for gender to measure the average difference between men's and women's salaries. By including additional variables in the regression, we adjusted for other characteristics of men and women, and determined the extent to which the difference was (or was not) explained by the addition of those variables.

To determine the extent to which gender differences persist when other characteristics of less-educated workers are taken into account, we performed regression analysis to predict the logarithm of hourly wage rate. We estimated three models with varying levels of controls. Model 1 included no explanatory factors. Model 2 included the following vector of characteristics: age, age squared, and dummy variables for race, Hispanic status, state, veteran status, high school degree, citizenship, marital status, part-time status, union membership, and the number of children in the household. Regression model 3 included the following vector of characteristics: all variables in model 2 in addition to dummy variables for industry and occupation. We estimated model 1 for 31 years of CPS data (1980 to 2010). Because of variable coding changes over time, we estimated models 2 and 3 for the most recent 11 years, 2000-2010.<sup>1</sup>

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<sup>1</sup>We performed the multivariate regression over a shorter time period because of the need for consistent occupation and industry designations. We did not examine interaction terms for the control variables.

**(1) Model 1: Without controlling for factors**

$$\text{Ln}(\text{hourly wage rate}) = \alpha + \beta_1^*(\text{female}) + \varepsilon$$

**(2) Model 2:**

$$\text{Ln}(\text{hourly wage rate}) = \alpha + \beta_2^*(\text{female}) + \delta_1^*(\text{vector of characteristics of the individual}) + \varepsilon$$

**(3) Model 3:**

$$\text{Ln}(\text{hourly wage rate}) = \alpha + \beta_3 (\text{female}) + \delta_2^*(\text{vector of characteristics of the individual}) + \gamma^*(\text{vector of industry and occupation dummy variables}) + \varepsilon$$

In these models,  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  are coefficients on the indicator variable for female in the different models,  $\delta_1$  and  $\delta_2$  are vectors of coefficients on individual characteristics,  $\gamma$  is a vector of coefficients on occupation and industry, and  $\varepsilon$  is the error term. Because we used the logarithm of the hourly wage rate, the standard interpretation of the  $\beta$ 's (the coefficients on female), is that they represent the average log point difference between men and women, after adjusting for the other variables in the model. Following practice in the economic literature, that coefficient was modified, to more closely approximate a percentage difference (by  $\exp[\text{coefficient on female}]$ ).<sup>2</sup>

Table 1 shows the estimated coefficient on female by year. Standard errors are in parentheses. As the table shows, over time (1980-2010), the difference in hourly wages between less-educated women and men has gradually narrowed, without adjusting for factors that may affect pay. After adjusting for available factors that may affect pay—except for industry and occupation—the difference in hourly wages between less-educated women and men has gradually narrowed and was similar to the unadjusted difference. After adjusting for industry and occupation, as well as other available factors that may affect pay, the unexplained difference in hourly wages between less-educated women and men narrowed even more from 2000 to 2010.

<sup>2</sup>Francine Blau and Lawrence Kahn, "Gender Differences in Pay," *The Journal of Economic Perspectives*, Vol. 14, No. 4 (2000). This is an issue that is especially important if the pay differences are large. See Robert Halvorsen and Raymond Palmquist, "The Interpretation of Dummy Variables in Semi-logarithmic Equations" *American Economic Review*, Vol. 70, No.3 (1980).

Table 1: Estimated Coefficient for Women by Year

Year	Model 1 (unadjusted difference)		Model 2 (adjusted difference controlling for individual characteristics)		Model 3 (adjusted difference controlling for individual characteristics, industry, and occupation)	
	Coefficient ( $\beta_1$ )	Women's pay as percentage of men's	Coefficient ( $\beta_2$ )	Women's pay as percentage of men's	Coefficient ( $\beta_3$ )	Women's pay as percentage of men's
1980	-0.436 (0.003)	65				
1981	-0.423 (0.003)	65				
1982	-0.403 (0.004)	67				
1983	-0.394 (0.004)	67				
1984	-0.386 (0.004)	68				
1985	-0.378 (0.004)	68				
1986	-0.363 (0.004)	70				
1987	-0.349 (0.004)	71				
1988	-0.346 (0.004)	71				
1989	-0.329 (0.004)	72				
1990	-0.308 (0.004)	74				
1991	-0.281 (0.004)	76				
1992	-0.270 (0.004)	76				
1993	-0.261 (0.004)	77				
1994	-0.275 (0.005)	76				
1995	-0.281 (0.005)	76				
1996	-0.270 (0.005)	76				
1997	-0.268 (0.005)	77				

Appendix III: Multivariate Analysis

Year	Model 1 (unadjusted difference)		Model 2 (adjusted difference controlling for individual characteristics)		Model 3 (adjusted difference controlling for individual characteristics, industry, and occupation)	
	Coefficient ( $\beta_1$ )	Women's pay as percentage of men's	Coefficient ( $\beta_2$ )	Women's pay as percentage of men's	Coefficient ( $\beta_3$ )	Women's pay as percentage of men's
1998	-0.266 (0.005)	77				
1999	-0.278 (0.005)	76				
2000	-0.259 (0.005)	77	-0.242 (0.005)	78	-0.208 (0.006)	81
2001	-0.246 (0.005)	78	-0.228 (0.005)	80	-0.191 (0.006)	83
2002	-0.234 (0.005)	79	-0.217 (0.005)	80	-0.184 (0.006)	83
2003	-0.227 (0.005)	80	-0.226 (0.005)	80	-0.186 (0.006)	83
2004	-0.223 (0.005)	80	-0.219 (0.005)	80	-0.196 (0.006)	82
2005	-0.226 (0.005)	80	-0.216 (0.005)	81	-0.181 (0.006)	83
2006	-0.225 (0.005)	80	-0.220 (0.005)	80	-0.172 (0.006)	84
2007	-0.227 (0.005)	80	-0.217 (0.006)	80	-0.180 (0.007)	84
2008	-0.237 (0.005)	79	-0.228 (0.006)	80	-0.182 (0.006)	83
2009	-0.216 (0.006)	81	-0.214 (0.006)	81	-0.172 (0.007)	84
2010	-0.205 (0.006)	81	-0.192 (0.006)	83	-0.150 (0.007)	86

Source: GAO analysis of CPS data.

Note: Standard errors are shown in parentheses below the point estimates.

In addition to the main analysis, we also performed analyses on subpopulations. Table 2 shows the results of these regression analyses for workers with children, workers without children, married and unmarried workers with and without children, and also for workers in two industries: retail trade and manufacturing. This analysis was done only for 2010.

In general we found that the gender pay difference was larger for workers with children than for workers without children; the pay difference was also generally larger for married workers than for unmarried workers. Among married workers, however, the gender pay difference among workers with children was almost the same as the gender pay difference among workers without children.

**Table 2: Estimated Coefficient for Women by Selected Characteristics and Industries, Calendar Year 2010**

Characteristic	Model 1 (unadjusted difference)		Model 2 (adjusted difference controlling for individual characteristics)		Model 3 (adjusted difference controlling for individual characteristics, industry, and occupation)	
	Coefficient	Women's pay as percentage of men's	Coefficient	Women's pay as percentage of men's	Coefficient	Women's pay as percentage of men's
<b>Marriage/children</b>						
Workers without children	-0.167 (0.007)	85	-0.176 (0.008)	84	-0.141 (0.009)	87
Workers with children	-0.271 (0.011)	76	-0.232 (0.011)	79	-0.179 (0.013)	84
Unmarried, without children	-0.112 (0.011)	89	-0.129 (0.011)	88	-0.086 (0.013)	92
Unmarried, with children	-0.183 (0.025)	83	-0.181 (0.024)	83	-0.149 (0.028)	86
Married, without children	-0.233 (0.010)	79	-0.227 (0.010)	80	-0.206 (0.012)	81
Married, with children	-0.259 (0.013)	77	-0.245 (0.013)	78	-0.189 (0.015)	83
<b>Selected Industries<sup>a</sup></b>						
Manufacturing	-0.212 (0.013)	81	-0.185 (0.012)	83	-0.193 (0.012)	82
Retail trade	-0.197 (0.014)	82	-0.157 (0.015)	86	-0.153 (0.016)	86

Source: GAO analysis of CPS data.

Note: Standard errors are shown in parentheses below the point estimates.

<sup>a</sup>In the regressions for specific industries, Model 3 includes all the factors in Model 2 plus controls for occupation, but does not include controls for industry.



## Likelihood of Being Low Wage

The likelihood of being low wage is associated with gender. Of the approximately 47.2 million women workers, 11.6 million are low wage (about 25 percent). In comparison, of the 49.5 million male workers, about 8.2 million are low wage (about 17 percent). However, other factors affect being low wage as well, such as education. About 55 percent of those with less than a high school degree are low wage, as compared with 28 percent with a high school degree, 20 percent with some college, and only 7 percent of those with a bachelor's degree or higher.

To investigate the extent to which differences in education and other factors explain differences in the likelihoods of men and women being low wage, we used a multivariate technique called logistic regression. Specifically, logistic regression allowed us to address relative representation of men and women in the low-wage workforce, and the extent to which differences in representation were associated with differences in other factors, including education, industry, occupation, and characteristics of the individual. Logistic regression—a widely used statistical technique—enables the researcher to examine how the relative odds of an event occurring (in this case, being a low-wage worker) are related to one or more explanatory factors. For this analysis, we used the basic monthly CPS dataset—the same CPS data we used in the other regression modeling. Unlike in the analysis of pay differences among the less educated, in this analysis, we included all workers and did not limit it to those who were less educated. We estimated the following model:

$$\text{Logit}(\text{probability that a worker is low wage}) = \alpha + \beta^*(\text{female}) + \gamma^*(\text{vector of other explanatory variables}) + \varepsilon$$

After estimation, any coefficient can be transformed into what is known as an odds ratio.<sup>3</sup> For example, in the case of gender, it is the odds of a woman being a low-wage worker over the corresponding odds for a man. If 11.6 of 47.2 million women are low wage, then the odds of a woman being low wage is  $11.6/(47.2-11.6)$ , or 0.33. On the other hand, if 8.2 of 49.5 million men are low wage, the odds of a man being low wage is  $8.2/(49.5-8.2)$ , or 0.20. In this case, an odds ratio of about 1.6 ( $.33/.20$ ) represents the increased likelihood of a woman being low wage—a

<sup>3</sup>An odds ratio of 1.0 would indicate that women and men have equal odds of being a low-wage worker.

woman has about 60 percent greater odds than a man of earning low wages.

The logistic method allows the researcher to estimate how the odds ratio changes when other characteristics are controlled for, similar to how a regression allows a researcher to control for characteristics when examining differences in pay. Table 3 shows the relative odds of being a low-wage worker, unadjusted, and then provides the results of the logistic analysis with the same statistical controls used in the multivariate regression analysis of differences in pay among less-educated workers. All explanatory factors were defined in the same way as in that analysis except for education, which was expanded to include dummy variables for “some college” and “college degree or higher” (categories that did not exist in the less-educated population). As table 3 shows, adding the statistical controls did not reduce the odds of a women being a low-wage worker. In contrast, the odds ratio changed from 1.64 to 1.74, an increase of about 7 percent. In this analysis, we did not attempt to provide an explanation for any difference in likelihood of earning lower pay between women and men that persists after controlling for available factors that may affect pay.

Using the same statistical controls to isolate the effect of gender, we also attempted to isolate the effect of education. As table 3 shows, increased education substantially reduced the odds of being a low-wage worker, whether those odds are adjusted or not. The adjusted odds for a high school graduate being a low-wage worker were about half (49 percent) as much as for a worker who did not graduate from high school. A worker with some college had about a third of the odds (37 percent) as a worker that did not graduate from high school. A college graduate had about a sixth of the odds of being a low-wage worker than a worker who had not graduated from high school.<sup>4</sup>

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<sup>4</sup> Because this analysis, like the others, was restricted to those aged 25-64, it did not include those at the traditional ages for completing high school or college.

**Table 3: Odds Ratios of Being Low Wage from Logistic Regression Analysis**

	Odds ratios— unadjusted	Odds ratios—adjusted for individual characteristics, industry, and occupation
Women (versus men)	1.64	1.74 (1.67–1.81)
High school diploma (versus no high school diploma)	0.33	0.49 (0.47–0.52)
Some college (versus no high school diploma)	0.21	0.37 (0.35–0.40)
College degree or higher (versus no high school diploma)	0.06	0.16 (0.15–0.18)

Source: GAO analysis of CPS data.

Note: Ninety-five percent confidence intervals are shown in parentheses.

In order to check that the results of the logistic regression analysis were not overly dependent on the particular outcome variable we used, we conducted sensitivity analyses in which models were fit using not only the 20th percentile but also the 15th and 25th percentiles of the hourly wage rate distribution as cutoffs for “low wage.” These three models yielded substantively similar results.

# Appendix IV: Description of Industries and Occupations

**Table 4: Examples of Areas Contained within Each Industry**

Industry category	Examples
Agriculture and mining	Animal and crop production, fishing, forestry, hunting, logging, mining, oil and gas extraction, trapping
Construction	Construction of buildings, heavy and civil engineering construction, specialty trade contractors
Educational services	Business schools, colleges and universities, computer and management training, educational support services, elementary and secondary schools, technical and trade schools
Financial activities	Banking, consumer goods rental services, funds and trusts, insurance carriers, real estate, savings institutions, securities and commodities
Health care and social assistance	Child day care services, community food and housing, hospitals, individual and family services, nursing and residential care facilities, offices of health practitioners (physicians, dentists, chiropractors, optometrists, etc), outpatient and home health care centers
Information and communication	Broadcasting, data processing, motion picture and sound recording industries, publishing industries, telecommunications
Leisure and hospitality	Accommodation services, amusement and gambling, historical sites, independent artists, museums, performing arts, restaurants and taverns, spectator sports and recreation
Manufacturing	Computer and electronic product manufacturing, food manufacturing, machinery and metal product manufacturing, petroleum and chemical manufacturing, plastics and rubber products manufacturing, printing, textile product mills, transportation equipment manufacturing, wood and paper product manufacturing
Other services	Automotive repair and maintenance, barber shops and beauty salons, civic and professional organizations, funeral homes, laundry services, personal goods repair and maintenance, private households, religious organizations
Professional and business services	Administrative support, management of companies and enterprises, professional services, scientific and technical services, waste management services
Public administration	Administration of public programs, community development, executive and legislative government bodies, justice and public order, national security and international affairs, public finance, urban planning
Retail trade	Automobile dealers, book and music stores, building material and garden equipment dealers, clothing stores, electronics and appliance stores, food and beverage stores, furniture and home furnishings stores, gasoline stations, general merchandise stores, health and personal care stores, nonstore retailers, sporting goods stores
Transportation and utilities	Air transportation, couriers and messengers, electric power, natural gas distribution, postal service, sightseeing transportation, transit and ground passenger transportation, transportation support activities, truck and rail transportation, warehousing and storage, water transportation, water and sewage
Wholesale trade	Durable and nondurable goods wholesalers, wholesale electronic markets

Source: U.S. Bureau of Labor Statistics, 2007 North American Industry Classification System, last revised February 28, 2011.

Note: This list contains examples for illustrative purposes only and is not a complete list.

**Appendix IV: Description of Industries and Occupations**

**Table 5: Examples of Areas Contained within Each Occupation**

<b>Occupation category</b>	<b>Examples</b>
Business and finance	Claims adjusters, cost estimators, event planners, fundraisers, human resources workers, market researchers
Cleaning and maintenance	Janitors and cleaners, landscaping and groundskeeping workers, maids and housekeeping cleaners, pest control workers, tree trimmers
Construction and extraction	Brick masons, carpenters, carpet installers, cement masons, construction equipment operators, construction laborers, earth drillers, explosives workers, hazardous materials removal workers, highway maintenance workers, mining machine operators, painters, plumbers, pipe fitters, roofers
Education, training, and library	Adult education instructors, graduate teaching assistants, library technicians, teacher assistants
Farming, fishing, and forestry	Agricultural equipment operators, animal breeders, farm workers and laborers, fishers and related fishing workers, forest and conservation workers, hunters and trappers, logging workers
Food preparation and serving	Bartenders, chefs, cooks, dishwashers, fast food and counter workers, food preparation workers, hosts and hostesses, waiters and waitresses
Health care practitioners and technicians	Athletic trainers, clinical laboratory technicians, medical records technicians, paramedics, pharmacy technicians
Health care support	Home health aides, laboratory animal caretakers, massage therapists, medical equipment preparers, nursing assistants, orderlies, therapist assistants, veterinary assistants
Installation, maintenance, and repair	Automotive technicians and repairers, electric motor repairers, electrical power line installers, heating and air conditioning installers, security and fire alarm systems installers, telecommunications equipment installers
Management	General and operations managers, human resources managers, marketing and sales managers
Office and administrative support	Brokerage clerks, computer operators, couriers and messengers, customer service representatives, data entry keyers, dispatchers, file clerks, insurance claims clerks, meter readers, postal service mail carriers, proofreaders, receptionists, transportation ticket agents, secretaries and administrative assistants, stock clerks, switchboard operators, tellers
Personal care and service	Baggage porters, barbers, bellhops, child care workers, funeral service workers, gaming services workers, hairdressers, ticket takers, tour guides, ushers
Production	Assemblers and fabricators, bakers, butchers and meat cutters, computer-controlled machine tool operators, laundry workers, machinists, metal and plastic workers, pourers and casters, printing workers, sewing machine operators, shoe and leather workers, tailors, tool and die makers, upholsterers, welders, woodworkers
Protective service	Animal control workers, bailiffs, correctional officers, crossing guards, detectives and criminal investigators, firefighters, fish and game wardens, jailers, lifeguards, parking enforcement workers, police and sheriff's patrol officers, security guards, ski patrol, transportation security screeners
Sales and related	Cashiers, door-to-door sales workers, models, real estate brokers and sales agents, retail salespersons, sales representatives, street vendors, telemarketers, travel agents
Transportation and material moving	Bus drivers, chauffeurs, crane operators, flight attendants, heavy and light truck drivers, locomotive engineers and operators, parking lot attendants, refuse and recyclable material collectors, ship and boat captains and operators, subway operators, taxi drivers, transportation inspectors

Source: U.S. Bureau of Labor Statistics, 2010 Standard Occupational Classification, January 2009.

Note: This list contains examples for illustrative purposes only and is not a complete list. It also includes occupations that may or may not be associated with low wages or less education.

# Appendix V: Representation by Industry and Occupation for Less-Educated and Low-Wage Workers

**Table 6: Less-Educated Workers by Industry, Calendar Year 2010**

Industry	Number of men	Percentage of total	Average hourly wage for men	Number of women	Percentage of total	Average hourly wage for women	Total number	Percentage of total	Average hourly wage
Agriculture and mining	750,862 (31,044)	4	\$15.68 (0.33)	135,524 (12,807)	1	\$12.21 (0.58)	886,386 (34,333)	3	\$15.15 (0.29)
Construction	2,975,902 (61,048)	15	19.11 (0.22)	178,243 (14,684)	1	17.74 (0.60)	3,154,145 (64,363)	9	19.03 (0.21)
Educational services	504,557 (25,482)	3	16.25 (0.33)	1,101,759 (36,322)	7	14.09 (0.24)	1,606,316 (46,128)	5	14.77 (0.20)
Financial activities	485,134 (24,989)	3	18.27 (0.48)	1,125,781 (36,711)	7	17.40 (0.26)	1,610,915 (46,193)	5	17.66 (0.23)
Health care and social assistance	620,513 (28,241)	3	16.04 (0.39)	3,157,288 (60,784)	21	13.70 (0.13)	3,777,802 (70,317)	11	14.08 (0.13)
Information and communication	318,804 (20,276)	2	21.11 (0.64)	211,416 (15,989)	1	19.22 (0.84)	530,220 (26,580)	2	20.35 (0.51)
Leisure and hospitality	1,650,322 (45,797)	9	13.15 (0.20)	1,751,550 (45,632)	12	11.24 (0.13)	3,401,872 (66,797)	10	12.17 (0.12)
Manufacturing	3,856,178 (69,151)	20	17.92 (0.14)	1,594,513 (43,577)	10	14.35 (0.22)	5,450,691 (84,070)	16	16.87 (0.12)
Other services	886,596 (33,708)	5	16.41 (0.33)	886,825 (32,626)	6	12.52 (0.22)	1,773,421 (48,446)	5	14.46 (0.20)
Professional and business services	1,575,382 (44,764)	8	16.56 (0.27)	1,136,813 (36,888)	7	14.55 (0.26)	2,712,195 (59,757)	8	15.72 (0.19)
Public administration	702,921 (30,044)	4	21.29 (0.41)	660,995 (28,202)	4	17.53 (0.33)	1,363,916 (42,533)	4	19.47 (0.27)
Retail trade	2,250,327 (53,302)	12	15.71 (0.18)	2,404,691 (53,273)	16	12.69 (0.14)	4,655,018 (77,865)	13	14.15 (0.12)
Transportation and utilities	1,975,214 (50,013)	10	20.18 (0.24)	555,490 (25,869)	4	17.29 (0.38)	2,530,704 (57,752)	7	19.55 (0.21)
Wholesale trade	830,095 (32,626)	4	17.86 (0.32)	287,197 (18,628)	2	15.42 (0.56)	1,117,292 (38,522)	3	17.23 (0.28)
<b>Total</b>	<b>19,382,809</b> (140,810)	<b>100</b>	<b>\$17.48</b> (0.07)	<b>15,188,084</b> (123,910)	<b>100</b>	<b>\$14.06</b> (0.07)	<b>34,570,893</b> (193,659)	<b>100</b>	<b>\$15.98</b> (0.05)

Source: GAO analysis of data from the Current Population Survey.

Note: Standard errors are shown in parentheses below the point estimates. The wages are annual averages of monthly data.

**Appendix V: Representation by Industry and Occupation for Less-Educated and Low-Wage Workers**

**Table 7: Less-Educated Workers by Occupation, Calendar Year 2010**

<b>Occupation</b>	<b>Number of men</b>	<b>Percentage of total</b>	<b>Average hourly wage for men</b>	<b>Number of women</b>	<b>Percentage of total</b>	<b>Average hourly wage for women</b>	<b>Total number</b>	<b>Percentage of total</b>	<b>Average hourly wage</b>
Business and finance	176,561 (15,101)	1	\$23.28 (0.92)	425,086 (22,646)	3	\$20.07 (0.48)	601,647 (28,308)	2	\$21.01 (0.44)
Cleaning and maintenance	1,424,809 (42,606)	7	13.54 (0.19)	1,170,599 (37,425)	8	10.81 (0.16)	2,595,409 (58,475)	8	12.31 (0.13)
Construction and extraction	2,990,651 (61,194)	15	18.98 (0.21)	46,962 (7,543)	0	15.47 (1.15)	3,037,612 (63,183)	9	18.93 (0.21)
Education, training, and library	68,569 (9,416)	0	20.23 (1.24)	443,042 (23,117)	3	14.48 (0.37)	511,611 (26,111)	1	15.25 (0.37)
Food preparation and serving	1,130,349 (38,010)	6	11.80 (0.18)	1,413,263 (41,067)	9	10.54 (0.13)	2,543,612 (57,897)	7	11.10 (0.11)
Health care practitioners and technicians	82,657 (10,337)	0	21.02 (1.34)	403,525 (22,066)	3	18.24 (0.42)	486,181 (25,455)	1	18.71 (0.42)
Health care support	104,308 (11,611)	1	14.09 (0.78)	1,018,734 (34,943)	7	12.43 (0.18)	1,123,042 (38,621)	3	12.58 (0.18)
Installation, maintenance, and repair	1,906,499 (49,154)	10	19.66 (0.21)	59,214 (8,469)	0	15.93 (0.87)	1,965,712 (50,978)	6	19.55 (0.20)
Management	986,936 (35,545)	5	25.37 (0.44)	750,644 (30,039)	5	19.93 (0.40)	1,737,580 (47,958)	5	23.02 (0.31)
Office and administrative support	1,282,703 (40,457)	7	16.60 (0.24)	4,029,572 (68,330)	27	15.89 (0.13)	5,312,276 (83,028)	15	16.06 (0.11)
Personal care and service	218,181 (16,783)	1	13.77 (0.44)	965,021 (34,019)	6	11.82 (0.28)	1,183,202 (39,635)	3	12.18 (0.24)
Production	2,946,861 (60,760)	15	17.07 (0.16)	1,260,306 (38,814)	8	12.38 (0.15)	4,207,167 (74,117)	12	15.67 (0.12)
Protective service	596,364 (27,689)	3	18.05 (0.42)	198,440 (15,492)	1	14.26 (0.56)	794,804 (32,519)	2	17.10 (0.35)
Sales and related	1,369,766 (41,788)	7	17.31 (0.26)	1,882,320 (47,271)	12	12.80 (0.18)	3,252,085 (65,337)	9	14.70 (0.16)
Transportation and material moving	3,168,669 (62,927)	16	16.15 (0.16)	608,201 (27,060)	4	12.76 (0.32)	3,776,870 (70,309)	11	15.61 (0.14)
<b>Total</b>	<b>19,382,809</b> (140,810)	<b>100</b>	<b>\$17.48</b> (0.07)	<b>15,188,084</b> (123,910)	<b>100</b>	<b>\$14.06</b> (0.07)	<b>34,570,893</b> (193,659)	<b>100</b>	<b>\$15.98</b> (0.05)

Source: GAO analysis of data from the Current Population Survey.

Note: Standard errors are shown in parentheses below the point estimates. This list represents about 95 percent of the total less-educated workforce; occupations with a small number of workers were omitted. Because of the omissions, columns will sum to less than the totals listed in the table. The wages are annual averages of monthly data.

**Appendix V: Representation by Industry and Occupation for Less-Educated and Low-Wage Workers**

**Table 8: Low-Wage Workers by Industry, Calendar Year 2010**

<b>Industry</b>	<b>Number of men</b>	<b>Percentage of total</b>	<b>Average hourly wage for men</b>	<b>Number of women</b>	<b>Percentage of total</b>	<b>Average hourly wage for women</b>	<b>Total number</b>	<b>Percentage of total</b>	<b>Average hourly wage</b>
Agriculture and mining	329,434 (20,683)	4	\$8.33 (0.12)	107,225 (11,393)	1	\$8.25 (0.18)	436,659 (24,127)	2	\$8.31 (0.10)
Construction	740,624 (30,833)	9	8.94 (0.07)	75,271 (9,548)	1	8.63 (0.23)	815,895 (32,946)	4	8.92 (0.06)
Educational services	304,957 (19,832)	4	8.62 (0.12)	1,103,943 (36,358)	10	8.53 (0.06)	1,408,901 (43,224)	7	8.55 (0.05)
Financial activities	243,492 (17,727)	3	8.34 (0.17)	550,487 (25,753)	5	8.93 (0.08)	793,979 (32,503)	4	8.75 (0.08)
Health care and social assistance	437,041 (23,724)	5	8.60 (0.11)	2,665,586 (56,006)	23	8.73 (0.04)	3,102,627 (63,844)	16	8.71 (0.03)
Information and communication	119,124 (12,407)	1	8.61 (0.23)	147,331 (13,352)	1	8.62 (0.17)	266,455 (18,856)	1	8.62 (0.14)
Leisure and hospitality	1,269,569 (40,252)	16	8.59 (0.05)	1,674,666 (44,639)	14	8.23 (0.05)	2,944,234 (62,220)	15	8.38 (0.03)
Manufacturing	1,038,250 (36,447)	13	8.98 (0.06)	785,701 (30,727)	7	8.93 (0.06)	1,823,951 (49,124)	9	8.96 (0.04)
Other services	442,601 (23,874)	5	8.28 (0.11)	813,248 (31,256)	7	8.32 (0.07)	1,255,849 (40,826)	6	8.31 (0.06)
Professional and business services	840,802 (32,834)	10	8.77 (0.06)	837,329 (31,711)	7	8.68 (0.06)	1,678,131 (47,138)	8	8.72 (0.04)
Public administration	248,916 (17,923)	3	8.59 (0.15)	301,406 (19,082)	3	8.84 (0.11)	550,323 (27,078)	3	8.72 (0.09)
Retail trade	1,349,290 (41,479)	17	8.76 (0.05)	2,130,408 (50,220)	18	8.67 (0.04)	3,479,699 (67,542)	18	8.71 (0.03)
Transportation and utilities	535,895 (26,257)	7	8.67 (0.09)	247,540 (17,298)	2	8.90 (0.11)	783,436 (32,287)	4	8.74 (0.07)
Wholesale trade	277,162 (18,909)	3	8.82 (0.13)	152,722 (13,594)	1	8.77 (0.13)	429,884 (23,940)	2	8.81 (0.10)
<b>Total</b>	<b>8,177,158</b> (98,214)	<b>100</b>	<b>\$8.70</b> (0.02)	<b>11,592,864</b> (110,776)	<b>100</b>	<b>\$8.62</b> (0.02)	<b>19,770,021</b> (153,544)	<b>100</b>	<b>\$8.65</b> (0.01)

Source: GAO analysis of data from the Current Population Survey.

Note: Standard errors are shown in parentheses below the point estimates. The wages are annual averages of monthly data.



**Appendix V: Representation by Industry and Occupation for Less-Educated and Low-Wage Workers**

**Table 9: Low-Wage Workers by Occupation, Calendar Year 2010**

<b>Occupation</b>	<b>Number of men</b>	<b>Percentage of total</b>	<b>Average hourly wage for men</b>	<b>Number of women</b>	<b>Percentage of total</b>	<b>Average hourly wage for women</b>	<b>Total number</b>	<b>Percentage of total</b>	<b>Average hourly wage</b>
Cleaning and maintenance	816,201 (32,355)	10	\$8.75 (0.06)	964,916 (34,017)	8	\$8.39 (0.05)	1,781,116 (48,550)	9	\$8.55 (0.04)
Construction and extraction	728,783 (30,588)	9	9.01 (0.07)	24,240 (5,420)	0	8.55 (0.23)	753,023 (31,657)	4	9.00 (0.06)
Education, training, and library	95,713 (11,123)	1	8.23 (0.26)	729,860 (29,624)	6	8.54 (0.07)	825,572 (33,140)	4	8.51 (0.07)
Farming, fishing, and forestry	260,426 (18,331)	3	8.24 (0.12)	95,013 (10,726)	1	8.38 (0.16)	355,439 (21,773)	2	8.28 (0.10)
Food preparation and serving	939,792 (34,695)	11	8.58 (0.06)	1,366,822 (40,397)	12	8.21 (0.05)	2,306,614 (55,169)	12	8.36 (0.04)
Health care practitioners and technicians	65,777 (9,222)	1	8.86 (0.33)	373,913 (21,245)	3	8.81 (0.10)	439,690 (24,211)	2	8.82 (0.10)
Health care support	88,554 (10,699)	1	8.98 (0.19)	962,486 (33,975)	8	8.79 (0.05)	1,051,040 (37,370)	5	8.81 (0.05)
Installation, maintenance, and repair	398,894 (22,670)	5	8.79 (0.10)	26,540 (5,671)	0	8.75 (0.35)	425,434 (23,816)	2	8.78 (0.09)
Management	227,841 (17,149)	3	8.24 (0.18)	311,999 (19,413)	3	8.63 (0.13)	539,839 (26,819)	3	8.47 (0.11)
Office and administrative support	662,800 (29,181)	8	8.86 (0.07)	2,019,132 (48,921)	17	9.09 (0.04)	2,681,932 (59,427)	14	9.03 (0.03)
Personal care and service	210,136 (16,471)	3	8.71 (0.12)	1,013,136 (34,848)	9	8.32 (0.06)	1,223,272 (40,296)	6	8.39 (0.05)
Production	910,718 (34,159)	11	8.87 (0.06)	748,646 (29,999)	6	8.83 (0.06)	1,659,365 (46,877)	8	8.85 (0.04)
Protective service	346,161 (21,125)	4	8.89 (0.11)	153,613 (13,633)	1	8.84 (0.13)	499,774 (25,808)	3	8.87 (0.08)
Sales and related	848,967 (32,992)	10	8.61 (0.07)	1,848,666 (46,855)	16	8.55 (0.04)	2,697,633 (59,598)	14	8.57 (0.03)
Transportation and material moving	1,280,424 (40,422)	16	8.68 (0.05)	428,623 (22,739)	4	8.52 (0.09)	1,709,047 (47,567)	9	8.64 (0.04)
<b>Total</b>	<b>8,177,158</b> (98,214)	<b>100</b>	<b>\$8.70</b> (0.02)	<b>11,592,864</b> (110,776)	<b>100</b>	<b>\$8.62</b> (0.02)	<b>19,770,021</b> (153,544)	<b>100</b>	<b>\$8.65</b> (0.01)

Source: GAO analysis of data from the Current Population Survey.

Note: Standard errors are shown in parentheses below the point estimates. This list represents about 95 percent of the total low-wage workforce; occupations with a small number of workers were omitted. Because of the omissions, columns will sum to less than the totals listed in the table. The wages are annual averages of monthly data.

# Appendix VI: Characteristics of Less-Educated and Low-Wage Workers, Calendar Year 2010

Characteristic	Less-educated workers			Low-wage workers		
	Men	Women	Total	Men	Women	Total
<b>Total workers</b>	<b>19,382,809</b>	<b>15,188,084</b>	<b>34,570,893</b>	<b>8,177,158</b>	<b>11,592,864</b>	<b>19,770,021</b>
	(140,810)	(123,910)	(193,659)	(98,214)	(110,776)	(153,544)
<b>Age (in percent)</b>						
Age 25-34	28.7	21.7	25.6	41.1	30.5	34.9
	(0.4)	(0.4)	(0.3)	(0.6)	(0.5)	(0.4)
Age 35-44	27.4	25.2	26.4	23.9	25.5	24.8
	(0.4)	(0.4)	(0.3)	(0.5)	(0.4)	(0.4)
Age 45-54	28.8	32.1	30.2	21.1	26.9	24.5
	(0.4)	(0.4)	(0.3)	(0.5)	(0.5)	(0.4)
Age 55-64	15.1	21.1	17.7	14.0	17.1	15.8
	(0.3)	(0.4)	(0.2)	(0.4)	(0.4)	(0.3)
<b>Average age (in years)</b>						
	42.4	44.6	43.4	40.0	42.2	41.3
	(0.076)	(0.083)	(0.057)	(0.125)	(0.099)	(0.079)
<b>Job status (in percent)</b>						
Part-time	14.7	28.9	20.9	26.5	40.8	34.8
	(0.3)	(0.4)	(0.3)	(0.6)	(0.5)	(0.4)
Full-time	85.3	71.1	79.1	73.6	59.2	65.2
	(0.3)	(0.4)	(0.3)	(0.6)	(0.5)	(0.4)
<b>Marital status (in percent)</b>						
Unmarried	36.2	42.6	39.0	47.2	45.9	46.5
	(0.4)	(0.4)	(0.3)	(0.6)	(0.5)	(0.4)
Married	63.9	57.4	61.0	52.8	54.1	53.5
	(0.4)	(0.4)	(0.3)	(0.6)	(0.5)	(0.4)
<b>Own children in household (in percent)</b>						
No	60.0	60.4	60.1	64.5	54.8	58.8
	(0.4)	(0.4)	(0.3)	(0.6)	(0.5)	(0.4)
Yes	40.0	39.7	39.9	35.5	45.2	41.2
	(0.4)	(0.4)	(0.3)	(0.6)	(0.5)	(0.4)
<b>Race/ethnicity (in percent)</b>						
White	56.3	59.5	57.7	45.9	56.4	52.0
	(0.4)	(0.4)	(0.3)	(0.6)	(0.5)	(0.4)
Hispanic	28.3	20.5	24.9	33.2	21.2	26.2
	(0.3)	(0.4)	(0.3)	(0.5)	(0.4)	(0.4)
Black	10.7	14.5	12.4	14.3	16.1	15.3
	(0.3)	(0.3)	(0.2)	(0.4)	(0.4)	(0.3)
Asian	3.0	3.7	3.3	4.5	4.4	4.5
	(0.1)	(0.2)	(0.1)	(0.2)	(0.2)	(0.2)
Other	1.7	1.8	1.7	2.1	1.9	2.0
	(0.1)	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)

**Appendix VI: Characteristics of Less-Educated  
and Low-Wage Workers, Calendar Year 2010**

	Less-educated workers			Low-wage workers		
	Men	Women	Total	Men	Women	Total
<b>Education (in percent)</b>						
Less than high school	24.7 (0.4)	19.1 (0.4)	22.3 (0.3)	27.3 (0.6)	17.0 (0.4)	21.2 (0.3)
High school	75.3 (0.4)	80.9 (0.4)	77.8 (0.3)	38.5 (0.6)	38.8 (0.5)	38.7 (0.4)
Some college <sup>a</sup>	—	—	—	22.7 (0.5)	31.2 (0.5)	27.7 (0.4)
Bachelor's degree or higher <sup>a</sup>	—	—	—	11.5 (0.4)	13.1 (0.3)	12.4 (0.3)
<b>Marriage/children (in percent)</b>						
Married, with children	34.9 (0.4)	24.7 (0.4)	30.4 (0.3)	29.6 (0.6)	27.6 (0.5)	28.4 (0.4)
Married, no children	28.9 (0.4)	32.7 (0.4)	30.6 (0.3)	23.2 (0.5)	26.5 (0.5)	25.1 (0.4)
Unmarried, with children	5.1 (0.2)	15.0 (0.3)	9.4 (0.2)	5.9 (0.3)	17.6 (0.4)	12.8 (0.3)
Unmarried, no children	31.0 (0.4)	27.7 (0.4)	29.6 (0.3)	41.3 (0.6)	28.3 (0.5)	33.7 (0.4)
<b>Hourly wage—unadjusted</b>						
	\$17.481 (0.072)	\$14.062 (0.065)	\$15.979 (0.050)	\$8.699 (0.022)	\$8.619 (0.017)	\$8.652 (0.013)

Source: GAO analysis of Current Population Survey data.

Note: Standard errors are shown in parentheses below the point estimates. For all of the estimated proportions, standard errors have been adjusted using generalized variance functions provided by the Bureau of Labor Statistics. All estimates except for average age, hourly wage, and total workers, are proportions. Average age and hourly wage are means, and total workers is a count.

<sup>a</sup>As defined, the less-educated worker population does not include any individuals who have completed some college or obtained a bachelor's degree or higher.

# Appendix VII: Characteristics of Less-Educated Workers Employed in Retail Trade and Manufacturing Industries, Calendar Year 2010

Characteristic	Less-educated workers in retail trade			Less-educated workers in manufacturing		
	Men	Women	Total	Men	Women	Total
<b>Total workers</b>	<b>2,250,327</b> (53,302)	<b>2,404,691</b> (53,273)	<b>4,655,018</b> (77,865)	<b>3,856,178</b> (69,151)	<b>1,594,513</b> (43,577)	<b>5,450,691</b> (84,070)
<b>Age (in percent)</b>						
Age 25–34	32.8 (1.1)	24.0 (1.0)	<b>28.3</b> (0.8)	23.7 (0.8)	16.8 (1.0)	<b>21.6</b> (0.6)
Age 35–44	25.7 (1.0)	24.6 (1.0)	<b>25.1</b> (0.7)	27.2 (0.8)	27.3 (1.2)	<b>27.2</b> (0.7)
Age 45–54	26.1 (1.1)	31.1 (1.0)	<b>28.7</b> (0.8)	31.5 (0.9)	34.5 (1.3)	<b>32.4</b> (0.7)
Age 55–64	15.4 (0.9)	20.3 (0.9)	<b>18.0</b> (0.7)	17.6 (0.7)	21.4 (1.1)	<b>18.7</b> (0.6)
<b>Average age (in years)</b>						
	41.6 (0.23)	44.1 (0.21)	<b>42.9</b> (0.16)	43.7 (0.17)	45.5 (0.24)	<b>44.2</b> (0.14)
<b>Job status (in percent)</b>						
Part-time	16.7 (0.9)	33.8 (1.1)	<b>25.5</b> (0.7)	10.1 (0.6)	15.8 (1.0)	<b>11.8</b> (0.5)
Full-time	83.3 (0.9)	66.2 (1.1)	<b>74.5</b> (0.7)	89.9 (0.6)	84.2 (1.0)	<b>88.2</b> (0.5)
<b>Marital status (in percent)</b>						
Unmarried	41.3 (1.2)	43.9 (1.1)	<b>42.7</b> (0.8)	32.0 (0.9)	41.9 (1.4)	<b>34.9</b> (0.7)
Married	58.7 (1.2)	56.1 (1.1)	<b>57.3</b> (0.8)	68.0 (0.9)	58.2 (1.4)	<b>65.1</b> (0.7)
<b>Own children in household (in percent)</b>						
No	62.3 (1.2)	61.3 (1.1)	<b>61.8</b> (0.8)	60.6 (0.9)	62.2 (1.3)	<b>61.1</b> (0.8)
Yes	37.7 (1.2)	38.7 (1.1)	<b>38.2</b> (0.8)	39.4 (0.9)	37.8 (1.3)	<b>38.9</b> (0.8)
<b>Race/ethnicity (in percent)</b>						
White	64.2 (1.1)	66.8 (1.1)	<b>65.6</b> (0.8)	61.7 (0.9)	56.9 (1.4)	<b>60.3</b> (0.8)
Hispanic	21.2 (0.9)	16.3 (0.9)	<b>18.6</b> (0.7)	24.8 (0.7)	25.2 (1.3)	<b>24.9</b> (0.7)
Black	9.8 (0.7)	11.9 (0.8)	<b>10.9</b> (0.6)	9.2 (0.5)	10.2 (0.9)	<b>9.5</b> (0.5)
Asian	3.4 (0.4)	3.0 (0.4)	<b>3.2</b> (0.3)	2.9 (0.3)	6.1 (0.7)	<b>3.9</b> (0.3)
Other	1.3 (0.3)	2.0 (0.3)	<b>1.7</b> (0.2)	1.4 (0.2)	1.5 (0.3)	<b>1.4</b> (0.2)

**Appendix VII: Characteristics of Less-Educated Workers Employed in Retail Trade and Manufacturing Industries, Calendar Year 2010**

	Less-educated workers in retail trade			Less-educated workers in manufacturing		
	Men	Women	Total	Men	Women	Total
<b>Education (in percent)</b>						
Less than high school	19.3 (0.9)	18.4 (0.9)	<b>18.9</b> <b>(0.7)</b>	23.4 (0.8)	24.9 (1.2)	<b>23.9</b> <b>(0.7)</b>
High school	80.7 (0.9)	81.6 (0.9)	<b>81.1</b> <b>(0.7)</b>	76.6 (0.8)	75.2 (1.2)	<b>76.2</b> <b>(0.7)</b>
<b>Marriage/children (in percent)</b>						
Married, with children	31.63 (1.1)	23.2 (0.9)	<b>27.3</b> <b>(0.8)</b>	34.9 (0.9)	25.1 (1.2)	<b>32.0</b> <b>(0.7)</b>
Married, no children	27.03 (1.1)	32.9 (1.1)	<b>30.1</b> <b>(0.8)</b>	33.1 (0.9)	33.1 (1.3)	<b>33.1</b> <b>(0.7)</b>
Unmarried, with children	6.03 (0.6)	15.5 (0.8)	<b>10.9</b> <b>(0.5)</b>	4.4 (0.4)	12.8 (0.9)	<b>6.9</b> <b>(0.4)</b>
Unmarried, no children	35.31 (1.1)	28.4 (1.0)	<b>31.7</b> <b>(0.8)</b>	27.6 (0.8)	29.1 (1.3)	<b>28.0</b> <b>(0.7)</b>
<b>Hourly wage—unadjusted</b>						
	\$15.71 (0.18)	\$12.69 (0.14)	<b>\$14.15</b> <b>(0.12)</b>	\$17.92 (0.14)	\$14.35 (0.22)	<b>\$16.87</b> <b>(0.12)</b>

Source: GAO analysis of Current Population Survey data.

Note: Standard errors are shown in parentheses below the point estimates. For all of the estimated proportions, standard errors have been adjusted using generalized variance functions provided by the Bureau of Labor Statistics. All estimates except for average age, hourly wage, and total workers are proportions. Average age and hourly wage are means, and total workers is a count.

# Appendix VIII: Annual Household Income for Less-Educated and Low-Wage Workers, Calendar Year 2009

Worker population	Gender	Number of workers in this category	That person's average wage and salary earnings	Average of other household wage and salary earnings <sup>a</sup>	Average of other household income <sup>b</sup>	Average total household income	Average wage and salary as a percentage of average household income	Average wage and salary earnings for full-year workers
<b>Less-educated workers</b>								
Married with child present	Women	3,950,758 (3,370)	\$25,814 (649)	\$42,281 (896)	\$7,049 (277)	\$75,145 (1,298)	34.3	\$31,906 (885)
	Men	6,303,535 (5,226)	40,937 (518)	22,510 (482)	4,127 (148)	67,574 (841)	60.6	44,603 (599)
Married with no child present	Women	4,710,708 (2,809)	29,073 (621)	38,897 (873)	11,414 (425)	79,384 (1,053)	36.6	33,992 (742)
	Men	4,872,486 (2,946)	43,908 (573)	27,538 (605)	6,238 (288)	77,684 (942)	56.5	46,893 (617)
Not married with child present	Women	1,888,808 (1,471)	24,463 (841)	8,540 (555)	4,434 (281)	37,438 (1,100)	65.3	28,842 (1,011)
	Men	634,935 (526)	35,720 (1,048)	11,896 (920)	3,835 (508)	51,452 (1,606)	69.4	39,073 (1,172)
Not married with no child present	Women	2,402,152 (1,486)	27,649 (545)	8,119 (574)	4,119 (286)	39,887 (789)	69.3	31,471 (567)
	Men	3,126,061 (1,859)	36,091 (694)	8,174 (512)	3,335 (240)	47,599 (929)	75.8	40,250 (769)
<b>Low-wage workers</b>								
Married with child present	Women	3,653,662 (3,154)	\$13,938 (142)	\$43,379 (856)	\$7,546 (384)	\$64,862 (958)	21.5	\$18,577 (158)
	Men	2,308,694 (1,839)	18,262 (224)	18,727 (753)	3,900 (244)	40,889 (822)	44.7	20,979 (216)
Married with no child present	Women	3,304,891 (2,006)	15,189 (177)	36,748 (1,278)	13,016 (637)	64,954 (1,340)	23.4	19,156 (173)
	Men	1,542,520 (972)	18,308 (303)	27,184 (1,606)	8,754 (631)	54,246 (1,657)	33.7	21,552 (303)
Not married with child present	Women	1,772,016 (1,406)	15,327 (228)	6,714 (483)	4,678 (283)	26,721 (541)	57.4	18,771 (225)
	Men	304,267 (230)	17,916 (603)	10,899 (1,400)	4,650 (750)	33,465 (1,733)	53.5	20,860 (608)
Not married with no child present	Women	2,168,518 (1,295)	16,109 (236)	8,440 (604)	5,241 (401)	29,790 (772)	54.1	19,516 (226)
	Men	1,676,396 (1,014)	17,774 (330)	9,570 (775)	3,734 (371)	31,078 (913)	57.2	21,112 (313)

Source: GAO analysis of Current Population Survey Annual Social and Economic data.

Note: Parentheses are used to show standard errors below the point estimates, with the exception of the number of workers column for which the number of survey observations is shown.

<sup>a</sup>Other household wage and salary earnings can include the wages/salary of others in the household who may not be less-educated or low-wage workers.

<sup>b</sup>Other household income includes government benefits (such as Social Security, public assistance, veterans' payments); retirement, investment, and rental income; and other sources of non-wage/salary income.

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# Appendix IX: GAO Contact and Staff Acknowledgments

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## GAO Contact

Andrew Sherrill, (202) 512-7215, or [sherrilla@gao.gov](mailto:sherrilla@gao.gov)

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## Staff Acknowledgments

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