nearly twice as likely as men (21 versus 12 percent) to earn in the 3.36-4.35 range, while blacks and Hispanics (both about 19 percent) had only slightly higher proportions than whites (16 percent) in this earnings category.

IN SUMMARY, the 5.1 million workers with earnings at the minimum wage or below consisted largely of young persons and women. The majority were part-time workers and mostly in service and sales occupations. Because many of these workers have earnings from tips and commissions supplementing their hourly wage, the proportion actually earning \$3.35 or less among workers paid hourly rates may be overstated by the numbers presented here. However, among workers not paid an hourly rate-for example, salaried workers or those paid at daily rates or piece ratesthere may be some who have average hourly earnings of \$3.35 or less; their numbers cannot be reliably estimated from the survey data.⁶ About 9.6 million workers paid at hourly rates were reported as earning between \$3.36 and \$4.35 per hour (that is, up to \$1 above the current minimum wage); their demographic characteristics were very similar to those of workers earning the minimum wage or below.

_____FOOTNOTES_____

¹ See *BLS Measures of Compensation*, Bulletin 2239 (Bureau of Labor Statistics, 1986) for a complete description of the earnings series available from the Current Population Survey as well as from other BLS surveys such as the Current Employment Statistics Survey, Area Wage Surveys, and Industry Wage Surveys.

² Information for 1984 was published in Earl F. Mellor and Steven E. Haugen, "Hourly paid workers: who they are and what they earn," *Monthly Labor Review*, February 1986, pp. 20–26.

³ Some States and the District of Columbia have minimums different from the Federal level. For example, four of the New England States had minimums of 3.45-3.55 during part or all of 1986. The District of Columbia has minimums which differ by occupation and industry, such as a 4.50 rate in beauty culture occupations in 1986. Many States have minimums at or below 3.35. In cases where an employee is covered by both State and Federal minimums, and the rates differ, he or she is entitled to the higher wage.

⁴ See *Report of the Minimum Wage Study Commission*, vol. I, p. 107, for a more complete list of full and partial exemptions.

⁵ The Northeast region includes the New England States: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; and the Middle Atlantic States: New Jersey, New York, and Pennsylvania. The South includes the South Atlantic States: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia; the East South Central States: Alabama, Kentucky, Mississippi, and Tennessee; and the West South Central States: Arkansas, Louisiana, Oklahoma, and Texas.

⁶ Crude estimates of the hourly earnings of all wage and salary workers can be made by dividing usual weekly earnings by usual weekly hours. However, an error of as little as \$1 or 1 hour in the reported numbers can result in an "above minimum wage" earner estimated as earning below, or vice versa. In a situation where a small error can make a large analytical difference, hourly earnings estimated by a procedure requiring precise reponses to *two* separate questions may not be reliable. For information on a test to gauge the accuracy in reporting of earnings data, see Larry Carstensen and Henry Woltman, "Comparing Earnings Data from the CPS and Employer Records," *Proceedings of the Social Statistics Section* (American Statistical Association, 1979), pp. 168–73.

Revisions of State and local area labor force statistics

VALYRIE K. LAEDLEIN

With the release of January 1987 data, the Bureau of Labor Statistics introduced its annual revision of labor force, employment, and unemployment data for States and local areas. These revisions incorporate more current and comprehensive data that become available after initial estimates are made. This report presents, for the first time, detail on the revision procedure and a brief analysis of the differences between preliminary and revised estimates.

Background

The Local Area Unemployment Statistics program produces civilian labor force data for all States, metropolitan areas, counties, and cities with a population of 25,000 or more. In addition to their variety of uses by private industry and individuals, the data constitute one of the bases for the allocation of Federal funds to States and local areas under a variety of programs administered by the Department of Housing and Urban Development, the Department of Labor, and others.

The underlying concepts and definitions of all labor force data published from the Local Area Unemployment Statistics program are consistent with those of the Current Population Survey (CPS), a survey of about 59,500 households conducted monthly by the Bureau of the Census for the Bureau of Labor Statistics. All annual average data for States are drawn directly from the CPS. Monthly CPS data are used directly as the official labor force levels only for the 11 largest States and two large areas.¹ These States and areas have a sufficiently large sample in the CPS to yield monthly estimates that meet BLS standards of reliability.

For the remaining 39 States and the District of Columbia, as well as for all areas, monthly estimates are developed by State employment security agencies, using the prescribed methodology from the Local Area Unemployment Statistics program. This methodology, commonly referred to as the "Handbook" methodology, uses establishment data derived from the Current Employment Statistics program and administrative data on State unemployment insurance claimants to develop the labor force estimates for these States and areas.² These derived Handbook estimates are adjusted by incorporating statewide monthly CPs data to arrive at the official preliminary estimates.

Revision process

The annual revision process, also called benchmarking, adjusts preliminary monthly estimates and historical

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monthly and annual average data by taking into account updated population estimates, revised employment figures from the Current Employment Statistics program, newly available decennial census data, and changes which occur from time to time in the geographic definitions of statistical estimating areas or in the estimating methodology.

Revisions to area data are made annually for 2 years of historical data (the minimum required for legislative purposes). Therefore, at any given time, BLS will have newly benchmarked area data for the most recent 2 years, plus preliminary monthly estimates for the current production year. Historical Handbook estimates at the statewide level are revised as necessary for all years in the database. Consequently, the fully consistent series for all States extend back to at least 1976. Indeed, data are available as far back as 1970 for many States, as well as for New York City and the Los Angeles-Long Beach Metropolitan Statistical Area.

Incorporation of updated population estimates. CPS annual average labor force data are revised each year to reflect new annual statewide population estimates issued by the Bureau of the Census for the most recent year or years. These revisions are often described as adjustments for updated "population controls." Monthly statewide data for the revised year(s) are adjusted correspondingly to reflect the new annual average data. Therefore, each year BLS issues a revised monthly and annual average State labor force data series for all affected years. Table 1 shows the effect of revisions to population controls by comparing, for 1985, the original CPS annual average unemployment levels with the revised levels.

The nature of the methodology for estimating local area labor force data suggests that any revisions to statewide estimates necessitate a change in area estimates to maintain consistency between the State and area data series. Independent estimates of the levels of employment and unemployment are created for geographically exhaustive Labor Market Areas within each State; estimates for counties and cities within those areas are disaggregated from the independent Labor Market Area estimates. For both employment and unemployment, the sums of all Labor Market Area estimates are then forced to add up to the adjusted statewide estimates, using a straight-line ratio adjustment. Therefore, because of this procedure of additivity adjustment, revisions to State estimates (such as those effected by population controls) will automatically require the revision of all area estimates.

Adjustment for revised employment inputs. Prior to the annual revision process of the Local Area Unemployment Statistics, the Current Employment Statistics program conducts its own revision process, using statistics from a universe count of industry employment as its benchmark. The revised Current Employment Statistics data become the new employment inputs (or benchmark) on which revised Local

 Table 1.
 Difference between CPS preliminary and revised estimates (based on updated population controls) of unemployment levels, by State, 1985 annual averages [Numbers in thousands]

	Preliminary	Revised	Diffe	rence
51816	estimates	estimates	Amount	Percent
Alabama Alaska Arizona Arkansas California Colorado Connecticut Delaware District of Columbia Florida	160 24 96 91 101 83 17 27 319	160 24 96 91 935 101 83 17 27 320	0 0 4 0 0 0 1	0 0 0.4 0 0 0 0 0 0 3
Georgia Hawaii Idaho Illinois Indiana Iowa Kansas Kentucky Louisiana Maine	187 27 37 513 215 113 62 161 229 30	188 27 37 513 215 112 62 161 228 30	1 0 0 -1 0 -1 0 0 -1	.5 0 0 0 9 0 0 4 0
Maryland	103 121 433 133 115 159 31 44 41 21	104 120 433 133 116 158 31 44 42 21	1 -1 0 1 -1 0 0 1 0	1.0 8 0 6 0 2.4 0
New Jersey New Mexico New York North Carolina North Dakota Ohio Oklahoma Oregon Pennsylvania Puerto Rico Rhode Island	218 57 544 167 20 455 112 117 442 211 25	217 57 544 168 20 456 112 116 443 211 25	-1 0 1 0 1 0 -1 1 0 0	5 0 .6 0 .2 0 9 .2 0 0 0
South Carolina	107 18 180 564 43 13 161 171 100 171 18	107 18 180 565 43 13 160 170 100 171 18	0 0 1 0 -1 -1 0 0	0 0 0 6 6 0 0

Area Unemployment Statistics Handbook estimates for States and local areas are based. All independent estimates developed by using the Handbook methodology are affected, as are data for local areas disaggregated from the Labor Market Areas.

Incorporation of decennial census data. Breaks in series, requiring historical revisions, are created when BLS incorporates new decennial census data for States and local areas into labor force estimates. Decennial census data, like CPS and Local Area Unemployment Statistics estimates, are based on place of residence. However, employment data from the Current Employment Statistics program are based on employees' "place of work" because the data come from a survey of business establishments. To make these employment data consistent with the CPS, "residency-adjustment ratios" are applied to the monthly employment data derived from the Current Employment Statistics program. These residency-adjustment ratios are developed by using decennial census data and Current Employment Statistics data for the census year. Several years after each decennial census, new residency-adjustment ratios are developed by incorporating updated census data and are used in creating the monthly Handbook estimates for the remainder of the decade. To provide for consistent historical data, previous years' estimates (within the decade) must be revised using the new ratios. For example, the new residency-adjustment ratios for the 1980's were developed in late 1985. All esti-

Table 2. Difference between preliminary and revised estimates (benchmarked to CPs annual averages) of unemployment levels, by State, 1986 annual averages [Numbers in thousands]

	Broliminan	۲.	Difference	
State	estimates	Revised estimates	Amount	Percent
Alabama Alaska Arizona Arkansas California Colorado Connecticut Delaware District of Columbia Florida	181 28 107 93 887 121 66 15 25 319	185 28 110 94 892 126 66 14 25 320	4 0 3 5 5 0 -1 0 1	2.2 0 2.7 1.1 .6 4.0 0 -7.1 0 .3
Georgia	175 25 41 462 186 102 68 156 261 30	178 24 41 461 185 100 67 156 261 30	3 - 1 - 1 - 1 - 2 - 1 0 0 0	1.7 - 4.2 0 2 5 - 2.0 - 1.5 0 0 0
Maryland Massachusetts Michigan Minnesota Mississippi Missouri Montana Nebraska Nevada New Hampshire	101 118 385 126 134 155 32 42 33 18	105 117 385 118 136 154 33 40 32 16	4 - 1 0 - 8 2 - 1 1 - 2 - 1 - 2 - 1 - 2	3.8 9 0 - 6.8 1.5 6 3.0 - 5.0 - 3.1 - 12.5
New Jersey New Mexico New York North Carolina North Dakota Ohio Oklahoma Oregon Pennsylvania Puerto Rico Rhode Island	197 62 526 169 21 425 132 116 384 188 20	196 62 526 170 21 426 131 114 386 188 21	- 1 0 1 0 1 - 1 - 2 2 0 1	5 0 .6 0 .2 8 - 1.8 .5 0 4.8
South Carolina South Dakota Tennessee Texas Utah Vermont Virginia Washington Wisconsin Wyoming	103 16 180 721 43 13 148 174 87 170 23	100 16 185 726 45 14 145 179 88 169 22	- 3 0 5 2 1 - 3 5 1 - 1 - 1	- 3.0 0 2.7 .7 4.4 7.1 - 2.1 2.8 1.1 6 4.5

Table 3. Difference between preliminary and revised estimates (benchmarked to CPs annual averages) of civilian unemployment rates, by State, 1986 annual averages [Percent of labor force]

State	Preliminary estimates	Revised estimates	Difference
Alabama Alaska Arizona Arkansas California Colorado Connecticut Delaware District of Columbia Florida	9.6 10.9 6.8 8.7 6.7 7.1 3.8 4.6 7.6 5.7	9.8 10.8 6.9 8.7 6.7 7.4 3.8 4.3 7.7 5.7	0.2 1 .1 0 .3 0 3 .1 0
Georgia	5.9 5.1 8.6 8.1 6.7 7.1 5.6 9.2 13.2 5.3	5.9 4.8 8.7 8.1 6.7 7.0 5.4 9.3 13.1 5.3	0 3 .1 0 0 1 2 .1 1 0
Maryland Massachusetts Michigan Missesota Mississipi Missouri Montana Nebraska Nevada New Hampshire	4.3 3.8 8.8 5.6 11.6 6.1 7.9 5.2 6.3 3.1	4.5 3.8 8.8 5.3 11.7 6.1 8.1 5.0 6.0 2.8	.2 0 3 .1 0 2 3 3
New Jersey	5.0 9.2 6.3 5.3 6.4 8.1 8.3 8.6 6.8 18.9 4.0	5.0 9.2 6.3 5.3 6.3 8.1 8.2 8.5 6.8 18.9 4.0	0 0 0 1 0 1 0 0 0
South Carolina	6.4 4.6 7.9 5.8 4.4 5.1 7.9 11.7 7.1 9.3	6.2 4.7 8.0 8.9 6.0 4.7 5.0 8.2 11.8 7.0 9.0	2 .1 .1 0 2 .3 1 .3 .1 .1 1 3

mates since that time have been based on the new ratios, and data were revised historically back to 1980.

Changes in geographic definitions. The U.S. Office of Management and Budget periodically changes the geographic definitions of Metropolitan Statistical Areas, and other Labor Market Areas under which all Federal data collection is conducted, to conform with changes in the distribution of population. Revisions to historical data are required to produce a consistent time series. For example, in March 1985, with the publication of January 1985 data, the geographic definitions of many metropolitan areas, which were designated as Labor Market Areas, were changed by the addition or deletion of component counties. Historical data for redefined Metropolitan Statistical Areas and Primary Metropolitan Statistical Areas were revised to reflect the new definitions used in current data estimation; moreover, because of the additivity adjustment procedure, the data for all other Labor Market Areas within each State were affected and were also revised.³

Changes in estimating methodology. Revisions are also necessary when a change or enhancement in the estimating methodology is approved and instituted. To ensure consistency in the entire data series, a new or changed methodology must be used not only in current estimates, but also in revising historical estimates. Such methodological changes, therefore, are only instituted at the beginning of a calendar year and are required to be included in the revisions of all historical data.

Each of these adjustments illustrates the significance of the benchmarking process and the reasons for the inconsistency between newly revised, benchmarked data and unrevised, unbenchmarked data. Tables 2 and 3 illustrate the impact of the benchmarking process on preliminary statewide unemployment estimates. In both tables, unpublished preliminary annual average data for 1986 (calculated using published monthly data) are compared with the official 1986 CPs annual average data for each State. Table 2 presents the difference in the preliminary and revised unemployment levels, and table 3 compares civilian unemployment rates.

THE MAGNITUDE OF THE EFFECT of the annual revision process on the preliminary estimates varies by State and area, depending on the degree to which new inputs differ from the original inputs. The revised figures, however, are always considered to be a more accurate reflection of the actual labor market situation.

-----FOOTNOTES-----

¹ CPS direct-use States are: California, Florida, Illinois, Massachusetts, Michigan, New Jersey, New York, North Carolina, Ohio, Pennsylvania, and Texas. The two CPS direct-use areas are: New York City and the Los Angeles-Long Beach Metropolitan Statistical Area.

² For more detailed information on the Local Area Unemployment Statistics methodology, see *BLS Handbook of Methods*, Bulletin 2134–1 (Bureau of Labor Statistics, December 1982), Chapter 4.

³ See "Revisions in Definitions for Metropolitan Areas," *Employment and Earnings*, March 1985, pp. 6–11.

Occupational pay structure in nursing and personal care facilities

According to a Bureau of Labor Statistics wage survey,¹ occupational pay levels in nursing and personal care facilities spanned a broad range in September 1985, reflecting the diversity of skills required of the workers and where they were employed. Among 22 metropolitan areas studied, pay levels were usually highest in New York and generally lowest in Houston.² (See table 1.)

Earnings information was developed for full- and parttime workers in 15 occupations, accounting for threefourths to nine-tenths of an area's nursing home employment. The occupations were selected from two major employee categories—professional/technical and nonprofessional.

Locality averages for full-time general duty nurses typically fell between \$9 and \$10 an hour, with the lowest recorded in Buffalo (\$8.33) and the highest in New York (\$13.15). Within an area, general duty nurses usually averaged 20 to 30 percent more than licensed practical nurses and 1 to $1\frac{1}{2}$ times more than nursing aides. On the other hand, head nurses usually averaged 10 to 20 percent more than general duty nurses. Nursing aides, the most populous occupation studied, averaged from \$3.65 an hour in Houston to \$8.87 in New York, but typically had earnings between \$4 and \$5.

Similarly, other job averages tended to cluster between the highest and lowest area pay levels: licensed practical nurses, between \$7 and \$8.50 an hour; activities directors, housekeepers (who supervise the cleaning staff and perform some cleaning duties), and maintenance workers, between \$6 and \$7.50; cooks, between \$4.50 and \$6; and cleaners, food service helpers, and laundry workers, between \$4 and \$5.

Separate earnings information was also developed for full- and part-time workers in each of the surveyed occupations. Part-time workers were found in almost every occupation studied. In nearly all areas, average hourly earnings for part-timers were typically less than for full-time employees, but the wage differentials rarely exceeded 15 percent. One exception to this pattern, however, was among professional/ technical occupations in Milwaukee, where nearly threefifths of the professional/technical employees worked parttime. In six of the seven occupations, part-timers posted slightly higher average earnings than full-time workers.

Surveywide pay levels in full-time jobs typically rose 3 to 6 percent annually between May 1981 (when a similar nursing home study was conducted)³ and September 1985. During this period, wages and salaries in service industries increased an average of 7.1 percent a year, nationwide, according to the Bureau's Employment Cost Index.

Paid holidays, most commonly 6 to 9 days annually, were provided to at least nine-tenths of the full-time professional/ technical and nonprofessional employees in nearly all areas in September 1985. Virtually all full-time employees were provided paid vacations after qualifying periods of service. Typical vacation plans were at least 1 week of vacation pay after 1 year of service, 2 weeks after 2 years, 3 weeks after 5 years, and 4 weeks after 10 years or more.

Hospitalization, surgical, basic medical, and major medical insurance, for which the employer paid at least part of the cost, covered at least nine-tenths of the full-time workers in one-half of the areas and a majority in nearly all remain-

Occupation	Average hourly earnings of full-time workers				
	Lowest paying area	Pay levels	Highest paying area	Pay levels	Mid-range of area pay levels ¹
eaistered nurses:					
Head nurses	Buffalo	\$9.18	Los Angeles	\$14.58	\$11.06-\$12.22
General duty nurses	Buffalo	8.33	New York	13.15	9.25-10.60
ther professional/technical:					
Activities directors	Houston	5.46	New York	12.07	6.20-7.31
Dietitians ²	Kansas City	8.08	New York	12.15	8.68-10.69
Licensed practical nurses	Atlanta	6.20	New York	10.92	7.20-8.50
Occupational therapists ³	Seattle	7.71	New York	12.65	-
Physical therapists ⁴	Los Angeles	10.78	New York	15.28	-
onprofessional:					
Cleaners	Houston	3.77	New York	9.09	4.20-4.99
Cooks	Atlanta	4.42	New York	10.36	4.86-5.98
Food service helpers	Houston	3.73	New York	8.83	4.11-4.88
Groundskeepers ⁵	Dallas	4.52	Minneapolis	6.32	
Housekeepers	Houston	4.98	New York	10.82	6.01-6.99
Laundry workers	Houston	3.68	New York	8.91	4.20-5.10
Maintenance workers	Detroit	5.09	New York	9.88	6.13-7.08
Nursing aides	Houston	3.65	New York	8.87	4.10-5.04

ing areas. Provisions for life and accidental death and dismemberment insurance were also widespread. Dental insurance covered the majority of the full-time workers in New York, San Francisco, and Seattle, but less than onehalf in the other areas. Sickness and accident insurance covered four-fifths of the professional/technical and nonprofessional workers in New York, about one-half in Detroit, and between one-tenth and two-fifths in most other areas. Long-term disability insurance plans, found in 19 areas, were generally available to no more than one-fifth of an area's full-time work force.

Retirement pension plans, in addition to Social Security, covered nine-tenths of the full-time workers in New York, at least seven-tenths in Buffalo-Niagara Falls, nearly three-fifths in Milwaukee, almost one-half in Philadelphia, and between one-tenth and two-fifths of the employees in 14 areas. In most areas, employers typically paid the entire cost of these pensions. Retirement severance plans were reported in 15 areas, and applied to one-tenth or less of the full-time workers.

The 2,498 nursing and personal care facilities within the scope of the survey—those with at least 20 workers—employed approximately 289,000 workers in September 1985. Just over three-fifths were in full-time professional/technical or nonprofessional positions and nearly three-tenths worked part-time in these jobs. The remainder were in executive, administrative, or office clerical positions, or were members of a religious order.

Area employment in nursing homes tended to reflect the population sizes of the localities studied. For example, New York, the most heavily populated area in the survey, had the largest nursing home employment (40,546), followed by Philadelphia (24,367), Los Angeles-Long Beach (22,317), Chicago (20,686), Boston (19,885), Minneapolis-St. Paul (18,600), and Detroit (16,835). These seven areas ac-

counted for nearly three-fifths of the workers employed in nursing homes in the 22 areas studied. Employment in the remaining 15 areas ranged from 4,228 in Miami-Hialeah to 14,305 in St. Louis, but most of them recorded between 6,800 and 11,000 employees.

Nursing homes primarily providing skilled nursing care around the clock employed just over four-fifths of the fulltime workers in the survey. The remainder (nearly one-fifth) worked in facilities providing limited nursing and healthrelated care. These establishments, offering routine health care and employing a licensed practical or registered nurse on at least one shift, were common in three areas: Houston (90 percent of the full-time work force), Dallas-Fort Worth (58 percent), and Boston (39 percent).

Two-fifths of the full-time nonprofessional employees and nearly one-fifth of the full-time professional/technical workers were in facilities with collective bargaining agreements covering a majority of these employment groups. New York had, by far, the largest proportion of union workers in the industry—three-fourths of the professional and nine-tenths of the nonprofessional full-time workers.

A comprehensive report on the survey findings, *Industry Wage Survey: Nursing and Personal Care Facilities, September 1985* (Bulletin 2275), may be purchased from the Superintendent of Documents, Washington, DC 20402, or from the Bureau of Labor Statistics, Publications Sales Center, P.O. Box 2145, Chicago, IL 60690.

— FOOTNOTES ———

¹ Earnings data exclude premium pay for overtime and for work on weekends, holidays, and late shifts, as well as the value of room, board, and other prerequisities provided in addition to cash wages.

² Areas are Metropolitan Statistical Areas as defined by the U.S. Office of Management and Budget through June 1983.

³ See Industry Wage Survey: Nursing and Personal Care Facilities, May 1981, Bullet in 2142 (Bureau of Labor Statistics, 1982).