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## **Producing Poverty: The Public Cost of Low-Wage Production Jobs in Manufacturing**

by Ken Jacobs, Zohar Perla, Ian Perry, and Dave Graham-Squire

### **INTRODUCTION**

Much attention has been given in recent years to low-wage work in the fast-food industry, big-box retail, and other service sector industries in the U.S. The rise of low-wage business models in the service sector has often been contrasted to business models of the past, when blue collar jobs in the manufacturing industry supported a large middle class in the United States.

Recent research by the National Employment Law Project (NELP), however, found that manufacturing production wages now rank in the bottom half of all jobs in the United States.<sup>1</sup> In decades past, production workers employed in manufacturing earned wages significantly higher than the U.S. average, but by 2013 the typical manufacturing production worker made 7.7 percent below the median wage for all occupations. During the same time period productivity in the U.S. manufacturing sector increased at a rate one-third higher than in the private, non-farm economy overall.<sup>2</sup> The median wage for production workers in the manufacturing industry in 2013 was \$15.66, with 25 percent of these workers earning \$11.91 or less. The NELP researchers also found that, since 1989, there has been a significant increase in hiring of frontline production workers through temporary staffing agencies, where the wages are often lower and the work more precarious.

When a day's labor no longer affords the basic necessities, working Americans rely on public assistance programs funded by U.S. taxpayers to close the gap. Recent research by David Autor and colleagues has documented the impact of increased exposure to trade from low-wage countries on wages and use of safety net programs.<sup>3</sup> In this research brief we estimate the public cost of low wages in frontline production jobs in the manufacturing industry by detailing state and federal expenditures on safety net programs for workers in this industry and their families. This brief is the latest in a series that explores the pressures placed on safety net programs by low-wage industries.

For this analysis we focus on jobs held by frontline manufacturing production workers, defined as non-supervisory production workers who work at least 10 hours per week for at least 27 weeks per year either directly in the manufacturing industry, or in production occupations highly associated with manufacturing in staffing agencies. We analyze utilization rates and costs in the five largest means-tested public benefit programs for which data is available: Medicaid, Children's Health Insurance Program (CHIP), the Federal Earned Income Tax Credit (EITC), food stamps (the Supplemental Nutrition Assistance Program, or SNAP), and basic household income assistance (Temporary Assistance for Needy Families, or TANF).







## Key Findings

- Overall, we find that between 2009 and 2013 the federal government and the states spent \$10.2 billion per year on public safety net programs for workers (and their families) who hold frontline manufacturing production jobs. This includes workers directly hired by manufacturers and those hired through staffing agencies.
- A third (34 percent) of the families of frontline manufacturing production workers are enrolled in one or more public safety net program. For those workers employed through staffing agencies, the percentage of families utilizing safety net programs is 50 percent—similar to the rate for fast-food workers and their families.
- The high utilization of public safety net programs by frontline manufacturing production workers is primarily a result of low wages, rather than inadequate work hours. The families of 32 percent of all manufacturing production workers and 46 percent of those employed through staffing agencies who worked at least 35 hours a week and 45 weeks during the year were enrolled in one or more public safety net program.
- Eight of the ten states with the highest participation rates in public programs that support frontline production workers' families are in the American south; the other two states are New York and California.

## DATA AND DEFINITIONS

According to the most recent Occupational Employment Statistics (OES),<sup>4</sup> non-supervisory production occupations in manufacturing totaled 5.8 million jobs in May 2014. Production jobs account for slightly more than half of all jobs in the manufacturing industry, and include assemblers and fabricators, machinists, tool and die makers, and metal and plastic workers, among others. Major manufacturing occupations that are not classified as production include management, business and financial, software developers and programmers, engineers, scientists and sales.

Many manufacturers today also use temporary employment agencies to fill production jobs. To identify these workers, we define “manufacturing production occupations” as the six-digit Standard Occupational Classification production occupations that primarily reside in the manufacturing industry. We identified 56 such occupations<sup>5</sup> and found there were 580,000 jobs in these manufacturing production occupations in employment services. Applying our cut-off of 27 weeks worked per year and at least 10 hours per week, our analysis includes 93 percent of the directly-hired manufacturing workers and 72 percent of those hired through staffing agencies.

We examine utilization among these two groups of workers and their families of the following means-tested, safety net programs: Medicaid; Children’s Health Insurance Program (CHIP); the Earned Income Tax Credit (EITC); Supplemental Nutrition Assistance Program, or SNAP; and basic household income assistance under Temporary Aid to Needy Families (TANF). Medicaid/CHIP and TANF operate with shared funding from the federal government and the states, while the other programs are funded by just the federal government. Our analysis includes only the cash assistance portion of TANF, and it does not include costs for state Earned Income Tax Credits, child care assistance, or other state-funded means-tested programs.

To calculate the cost to the federal and state governments of public safety net programs for these

workers and their families, we mainly rely on two sources of data: the March Supplement of the U.S. Bureau of Labor Statistics’ Current Population Survey (CPS) from 2010–2014 (reporting on years 2009–2013), and administrative data from the Medicaid, CHIP, TANF, EITC, and SNAP programs for FY 2009–2015. All amounts are adjusted to and reported in 2015 dollars. Medicaid figures exclude aged, blind, and disabled enrollees. Our calculation method is described in the appendix.

It is important to note that there have been significant changes in Medicaid enrollment since implementation of the Affordable Care Act (ACA), but these changes are not reflected in this analysis because the data is not yet available. A key provision of the ACA, adopted by 31 states and Washington D.C., expanded Medicaid coverage starting in 2014<sup>6</sup> to low-income adults under age 65 including those without children living at home, with the federal government paying 100 percent of the cost through 2016. In addition, enrollment in “traditional” Medicaid—that is, among those who had been previously eligible—has also been boosted, in both expansion and non-expansion states, due to the individual mandate to obtain health insurance, as well as increased outreach, awareness, and system improvements to Medicaid related to the ACA, particularly since the opening of the health care exchanges in October 2013.<sup>7</sup> These costs will be shared by the federal government and the states as determined under traditional Medicaid formulas.

## FINDINGS

### Aggregate Level

Exhibit 1 (page 5) shows the total enrollment in and cost of the five safety net programs for families of frontline manufacturing production workers between the years 2009 and 2013. Overall, 34 percent of workers are themselves or have a family member enrolled in at least one of these programs. This compares to 26 percent for the U.S. workforce as a whole. The higher rate of public program utilization of manufacturing workers’ families in



## Exhibit 1: Enrollment and costs of the public safety net programs for frontline manufacturing production occupations\*

Program	(1) Number of workers with families enrolled	(2) Percent of workers with families enrolled	(3) Average program costs per enrolled family	(4) Total cost across the five programs (millions)**
EITC	1,601,000	27%	\$ 2,700	\$ 4,080
Medicaid/CHIP	955,000	16%	\$ 4,300	\$ 3,760
Food Stamps	878,000	15%	\$ 2,600	\$ 2,190
TANF	67,000	1%	\$ 3,100	\$ 190
<b>All Programs</b>	<b>2,019,000</b>	<b>34%</b>	<b>\$ 5,400</b>	<b>\$ 10,220</b>

Source: Authors' calculations from 2010–2014 March CPS, 2009–2013 ACS, 2014 OES, and program administrative data.

Note: Includes all frontline production workers in the manufacturing industry and all “manufacturing production workers” employed in Employment Service Industries. All costs reported in 2015 dollars.

\* Includes only employees working 27 or more weeks a year and usual hours of 10 or more per week.

\*\* Since some families have more than one manufacturing worker per family, column (4) will not equal (1)x(3).

the United States mirrors the now below-average wages for manufacturing production occupations.

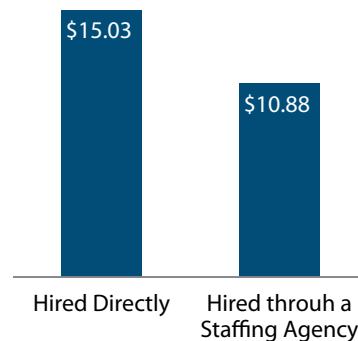
The program with the largest share of workers enrolled is EITC, with around a quarter of production workers in these industries enrolled. The total cost to the federal and state governments across the four programs was \$10.2 billion a year.

The share of frontline manufacturing production jobs employed through staffing agencies (employment services) has been growing since the 1990s. In 1989, less than 1 percent of all production workers were employed by staffing agencies, but by 2000 it had risen to 6.1 percent.<sup>8</sup> We estimate that in 2014 there were 580,000 jobs in manufacturing production occupations in employment services, 9 percent of all frontline manufacturing production workers.<sup>9,10</sup>

Workers employed in production occupations through staffing agencies earn significantly lower wages than those who are hired directly by the manufacturers. The average hourly wage for manufacturing production occupations in employment services in 2014 was \$12.05, compared to \$16.56 for directly-hired manufacturing workers.<sup>11</sup>

The largest occupational grouping for manufacturing production occupations in employment services was Assemblers and Fabricators, with 308,000 jobs. According to the OES, the median wage for these workers is \$10.88 when employed by a staffing agency, while it is \$15.03 for workers directly hired—a 38 percent differential (Exhibit 2).

### Exhibit 2: Median wage of assemblers and fabricators hired directly and hired through a staffing agency



Source: Occupational Employment Statistics 2014

### Exhibit 3: Enrollment and costs of the public safety net programs for manufacturing production occupations in employment services only

Program	(1) Number of workers with families enrolled	(2) Percent of workers with families enrolled	(3) Average program costs per enrolled family	(4) Total cost across the five programs (millions)*
EITC	180,000	43%	\$ 2,800	\$ 490
Medicaid/CHIP	100,000	24%	\$ 4,800	\$ 470
Food Stamps	113,000	27%	\$ 2,700	\$ 310
TANF	8,000	2%	\$ 2,600	\$ 20
<b>All Programs</b>	<b>209,000</b>	<b>50%</b>	<b>\$ 6,200</b>	<b>\$ 1,290</b>

Source: Authors' calculations from 2010–2014 March CPS, 2009–2013 ACS, 2014 OES, and program administrative data.

Note: Manufacturing production occupations includes workers employed in both the manufacturing and employment service industries. All costs reported in 2015 dollars. Includes only employees working 27 or more weeks a year and usual hours of 10 or more per week.

\* Since some families have more than one manufacturing worker per family, column (4) will not equal (1)x(3).

Exhibit 3 looks at safety net program utilization among production workers in just the temporary services industry. The percentage of workers with families enrolled in one or more safety net program is fully 50 percent, compared to around one-third of families when workers from both industries are included (Exhibit 1). This is similar to the rates found in our previous research for fast-food workers (52%), homecare workers (48%), and childcare workers (46%).<sup>12</sup> The total cost to the federal and state governments for public assistance to families of manufacturing production workers in employment services was \$1.29 billion a year.

The high utilization of public safety net programs by frontline manufacturing production workers is a result primarily of low-wages, not inadequate work hours. When we restrict the analysis to employees working at least 35 hours a week and 45 weeks a year, the results barely change. The families of 32 percent of all manufacturing production workers and 46 percent of those employed through staffing agencies full-time year-round were enrolled in one or more public safety net program.

### State Level Utilization

Exhibit 4 presents rates of family enrollment in each of the public safety net programs by state for the 39 states with survey sample sizes large enough to generate reliable estimates. Eight of the ten states with the highest participation rates among production workers' families in public programs are in the American south; the other two states are New York and California. Mississippi has the highest participation rate at 59 percent. Looking only at federal EITC, for which eligibility rules are consistent across states, we see similar results. States with the lowest participation rates during this time period include Wisconsin, Maine, and New Hampshire.

Exhibit 5 provides the total cost of participation in each safety net program among production workers' families, by state. California is at the top with \$1.26 billion spent on these programs for production workers' families, followed by Texas, Illinois, New York, and Michigan—all larger states with significant manufacturing sectors.

## Exhibit 4: Family participation rates in public safety-net programs for production occupations in manufacturing and temporary services, by state

State	EITC	Medicaid / CHIP	Food Stamps	TANF *	Total Participation
Mississippi	49%	20%	24%	1%	59%
Georgia	39%	15%	22%	1%	47%
California	37%	28%	14%	4%	45%
Texas	35%	19%	18%	1%	42%
Arkansas	31%	21%	15%	0%	41%
Tennessee	28%	18%	22%	2%	40%
Alabama	34%	16%	21%	1%	39%
New York	32%	19%	17%	1%	39%
North Carolina	32%	15%	18%	0%	39%
South Carolina	32%	11%	16%	1%	39%
Florida	34%	13%	21%	1%	38%
Arizona	30%	15%	18%	0%	36%
Illinois	29%	20%	19%	0%	36%
Louisiana	25%	16%	14%	0%	35%
Massachusetts	20%	21%	11%	1%	34%
New Jersey	31%	16%	13%	1%	34%
Nebraska	24%	14%	11%	1%	32%
Idaho	26%	15%	15%	0%	32%
Rhode Island	25%	15%	18%	1%	31%
West Virginia	20%	14%	11%	1%	31%
Oklahoma	24%	15%	14%	0%	30%
Michigan	22%	14%	18%	1%	30%
Colorado	23%	15%	10%	1%	28%
Kentucky	23%	13%	13%	1%	28%
Missouri	23%	12%	13%	1%	28%
Maryland	22%	11%	13%	1%	27%
Indiana	22%	11%	9%	0%	27%
Kansas	21%	12%	10%	1%	27%
Pennsylvania	17%	12%	9%	0%	26%
Iowa	16%	15%	12%	1%	26%
Connecticut	19%	15%	8%	1%	26%
Virginia	24%	10%	11%	1%	26%
Minnesota	17%	15%	8%	1%	25%
Oregon	19%	13%	25%	2%	25%
Washington	15%	16%	16%	1%	25%
Utah	23%	10%	10%	1%	25%
Ohio	20%	9%	10%	1%	24%
Wisconsin	15%	13%	11%	1%	22%
Maine	13%	12%	12%	1%	22%
New Hampshire	15%	9%	8%	1%	20%
<b>All states</b>	<b>27%</b>	<b>16%</b>	<b>15%</b>	<b>1%</b>	<b>34%</b>

\*Results below 0.5 percent round down to 0.



**Exhibit 5: Costs of the public support programs for production occupations in manufacturing and temporary services, by state (\$ millions)**

State	EITC	Medicaid / CHIP	Food Stamps	TANF	Total Cost
California	531	413	227	86	1,259
Texas	396	291	191	2	881
Illinois	240	192	154	3	589
New York	180	245	104	17	507
Michigan	165	167	122	6	452
Georgia	208	103	115	1	427
North Carolina	200	142	94	1	424
Ohio	175	139	93	13	414
Tennessee	124	181	97	4	400
Indiana	155	103	68	2	321
Pennsylvania	111	144	59	2	316
Minnesota	64	205	30	2	301
Alabama	139	62	70	3	269
Florida	124	53	71	2	249
Wisconsin	85	87	54	3	229
Mississippi	113	68	44	1	218
Massachusetts	43	138	24	6	207
New Jersey	74	99	32	2	205
Kentucky	73	82	39	2	194
South Carolina	109	51	50	1	194
Missouri	79	62	44	3	184
Arizona	56	75	34	0	162
Arkansas	74	54	34	0	156
Washington	37	66	35	5	143
Virginia	59	43	27	2	120
Iowa	40	49	29	2	120
Oklahoma	49	37	29	0	113
Oregon	37	43	35	3	109
Louisiana	47	31	22	0	98
Kansas	41	35	18	1	92
Connecticut	24	41	14	2	80
Colorado	31	28	16	1	75
Nebraska	30	27	13	1	67
Utah	29	17	14	2	61
Maryland	22	24	12	1	55
Rhode Island	15	20	11	1	46
Idaho	15	10	10	0	34
West Virginia	11	12	6	1	30
New Hampshire	11	11	6	1	26
Maine	6	10	5	1	20
<b>All states</b>	<b>4,084</b>	<b>3,759</b>	<b>2,188</b>	<b>191</b>	<b>10,222</b>

## CONCLUSION

Manufacturing plays an important role in the U.S. economy.<sup>13</sup> Manufacturing has a ripple effect—creating demand for goods and services from other economic sectors. It is an important source of innovation and productivity growth. Historically, blue collar jobs in manufacturing provided opportunities for workers without a college education to earn a decent living. For many manufacturing jobs, this is no longer true. While employment in manufacturing has started to grow again following the great recession, the new production jobs created are less likely to be union and more likely to pay low wages.<sup>14</sup>

When jobs do not pay enough for workers to meet their basic needs, they rely on public assistance programs to fill the gaps. Just as manufacturing production jobs now pay below the median for all occupations in the United States, public program utilization by families of frontline manufacturing production workers is now above average for all

occupations—with one-third of families of frontline manufacturing production workers utilizing one or more public safety net program on average each year from 2011 to 2014. Utilization rates by families of workers employed in manufacturing production occupations through temporary staffing services is even higher, at 50 percent, close to the rate for fast-food workers.

U.S. states and the federal government provide significant subsidies to attract and retain manufacturing plants.<sup>15</sup> Many of the subsidies, however, have no wage requirements, have requirements that are below existing market levels, or only apply to full-time permanent positions.<sup>16</sup>

This public cost of low-wage work should be fully taken into account in the cost-benefit analysis of city and state subsidies. Conditioning subsidies on strong wage requirements across the workforce would reduce state and federal costs for public assistance, and allow states and local governments to better target how their tax dollars are used.

## APPENDIX: METHODOLOGY

This analysis draws on three sources of data: the American Community Survey (ACS) from 2009–2013, the March Supplement of the U.S. Bureau of Labor Statistics’ Current Population Survey (CPS) from 2010–2014, and administrative data from the Medicaid, CHIP, TANF, EITC, and SNAP programs for FY 2009–2014. Due to a lack in reporting, administrative data on Medicaid is only available through 2011. All amounts are adjusted to and reported in 2015 dollars. Medicaid figures exclude aged, blind, disabled, and breast and cervical cancer program enrollees, foster care youth, and those with an unknown basis of eligibility. We limit our sample of workers to those who worked at least 27 weeks per year and at least 10 hours per week. We adjust the weights of data from the March Supplement to the CPS so that costs for each of the public programs match state-level administrative data. With a few exceptions, our adjustments to program participation information in the CPS increase enrollment estimates, due to underreporting in the CPS.

While the CPS contains both enrollment and cost estimates of public programs, the sample sizes available are too small to provide estimates of all of the subpopulations of interest. In response, we incorporated data from the American Community Survey (ACS), which has a much larger sample but less information on participation in public programs. We bridge the gap between the two surveys by modeling program enrollment for the working population in the CPS and applying this model to the working population in the ACS. A more detailed description of our methods can be found in Allegretto et al. (2013).<sup>17</sup>

## Identifying Workers in Manufacturing Production Occupations Hired through Employment Services

We relied on the 2014 Occupational Employment Statistics (OES) to identify workers hired through temporary employment agencies to fill manufacturing production jobs. To identify these workers, we define “Manufacturing Production Occupations” as the Standard Occupational Classification (SOC) production occupations that primarily reside in the manufacturing industry.

We developed two separate measures of whether an occupation resided in the manufacturing industry. First, we calculated the fraction of workers in the occupation who worked in the manufacturing industry. For example, 81 percent of machinists (SOC code 51-4041) work for employers within the manufacturing industry. Second, to account for the impact of temporary workers, we calculated the same fraction, but removed any workers, in both the numerator and denominator, that worked in employment services. Again, for machinists, this fraction was 86 percent. We examined all six-digit production occupations (SOC codes 51-0000 to 51-9999) and included them as a manufacturing production occupation if either fraction exceeded 75 percent. Thus, machinists were included.

We identified 56 such occupations. These are listed, with their SOC codes, in Exhibit A1. Workers employed in the manufacturing industry were considered as direct hires while workers employed in employment services were considered temporary workers.

## Exhibit A1: Six-digit Standard Occupational Classification (SOC) codes identified as manufacturing production occupations

SOC Code	Occupation description
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers
51-2020	Electrical, Electronics, and Electromechanical Assemblers
51-2031	Engine and Other Machine Assemblers
51-2041	Structural Metal Fabricators and Fitters
51-2090	Miscellaneous Assemblers and Fabricators
51-3091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders
51-3092	Food Batchmakers
51-3093	Food Cooking Machine Operators and Tenders
51-4010	Computer Control Programmers and Operators
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic
51-4041	Machinists
51-4050	Metal Furnace Operators, Tenders, Pourers, and Casters
51-4060	Model Makers and Patternmakers, Metal and Plastic
51-4070	Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic
51-4111	Tool and Die Makers
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic
51-4192	Layout Workers, Metal and Plastic
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic
51-4194	Tool Grinders, Filers, and Sharpeners
51-4199	Metal Workers and Plastic Workers, All Other
51-5112	Printing Press Operators
51-5113	Print Binding and Finishing Workers
51-6031	Sewing Machine Operators
51-6042	Shoe Machine Operators and Tenders
51-6061	Textile Bleaching and Dyeing Machine Operators and Tenders
51-6062	Textile Cutting Machine Setters, Operators, and Tenders
51-6063	Textile Knitting and Weaving Machine Setters, Operators, and Tenders
51-6064	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders
51-6091	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers
51-6092	Fabric and Apparel Patternmakers
51-7011	Cabinetmakers and Bench Carpenters
51-7030	Model Makers and Patternmakers, Wood



## Exhibit A1: Six-digit Standard Occupational Classification (SOC) codes identified as manufacturing production occupations

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51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers
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51-2031	Engine and Other Machine Assemblers
51-2041	Structural Metal Fabricators and Fitters
51-2090	Miscellaneous Assemblers and Fabricators
51-3091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders
51-3092	Food Batchmakers
51-3093	Food Cooking Machine Operators and Tenders
51-4010	Computer Control Programmers and Operators
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic
51-4041	Machinists
51-4050	Metal Furnace Operators, Tenders, Pourers, and Casters
51-4060	Model Makers and Patternmakers, Metal and Plastic
51-4070	Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic
51-4111	Tool and Die Makers
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic
51-4192	Layout Workers, Metal and Plastic
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic
51-4194	Tool Grinders, Filers, and Sharpeners
51-4199	Metal Workers and Plastic Workers, All Other
51-5112	Printing Press Operators
51-5113	Print Binding and Finishing Workers
51-6031	Sewing Machine Operators
51-6042	Shoe Machine Operators and Tenders
51-6061	Textile Bleaching and Dyeing Machine Operators and Tenders
51-6062	Textile Cutting Machine Setters, Operators, and Tenders
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51-7011	Cabinetmakers and Bench Carpenters
51-7030	Model Makers and Patternmakers, Wood

## ENDNOTES

<sup>1</sup> National Employment Law Project (NELP). 2014. Manufacturing Low Pay: Declining Wages in the Jobs That Built America's Middle Class Wages. <http://www.nelp.org/content/uploads/2015/03/Manufacturing-Low-Pay-Declining-Wages-Jobs-Built-Middle-Class.pdf>.

<sup>2</sup> Robert E. Scott. 2015. The Manufacturing Footprint and the Importance of U.S. Manufacturing Jobs. Economic Policy Institute briefing paper. <http://www.epi.org/publication/the-manufacturing-footprint-and-the-importance-of-u-s-manufacturing-jobs/>.

<sup>3</sup> David H. Autor, David Dorn, and Gordon H. Hanson. 2016. The China Shock: Learning from Labor Market Adjustment to Large Changes in Trade. NBER Working Paper No. 21906. <http://www.nber.org/papers/w21906.pdf>.

<sup>4</sup> From the May 2014 survey. Downloaded from <http://www.bls.gov/oes/data.htm>.

<sup>5</sup> See Appendix.

<sup>6</sup> Several states implemented the Medicaid expansion after January 1, 2014. See <http://kff.org/health-reform/slide/current-status-of-the-medicaid-expansion-decision/>.

<sup>7</sup> The New York Times reported in August 2014 that there were nearly one million traditional Medicaid/CHIP enrollees in nonexpansion states that year. Margot Sanger-Katz (August 11, 2014). Medicaid Rolls Are Growing Even in States That Rejected Federal Funds. New York Times. [http://www.nytimes.com/2014/08/12/upshot/medicaid-rolls-are-growing-even-in-states-that-rejected-federal-funds.html?\\_r=0](http://www.nytimes.com/2014/08/12/upshot/medicaid-rolls-are-growing-even-in-states-that-rejected-federal-funds.html?_r=0).

<sup>8</sup> NELP, Ibid.

<sup>9</sup> This does not include an additional 161,000 other production occupations in employment services, such as bakers, butchers, and upholsterers, that don't meet our criteria as "manufacturing production occupations."

<sup>10</sup> For a similar analysis, see: David Langdon, Ryan Noonan, Robert Rubinowitz, and Jane Callen. 2015. An Update on Temporary Help in Manufacturing, U.S. Department of Commerce Economics and Statistics Administration. <http://www.esa.doc.gov/sites/default/files/an-update-on-temporary-help-in-manufacturing.pdf>.

<sup>11</sup> Occupational Employment Statistics 2014.

<sup>12</sup> Ken Jacobs, Ian Perry, and Jenifer MacGilvary. 2015. The High Public Cost of Low Wages. University of California Berkeley Center for Labor Research and Education. <http://laborcenter.berkeley.edu/pdf/2015/the-high-public-cost-of-low-wages.pdf>.

<sup>13</sup> Scott, Ibid.

<sup>14</sup> NELP, Ibid.

<sup>15</sup> NELP, Ibid.

<sup>16</sup> Philip Mattera, Thomas Cafcas, Leigh McIlvaine, Andrew Seifter, and Kasia Tarczynska. 2011. Money for Something: Job Creation and Job Quality Standards in State Economic Development Subsidy Programs. Good Jobs First. <http://www.goodjobsfirst.org/sites/default/files/docs/pdf/moneyforsomething.pdf>.

<sup>17</sup> Sylvia Allegretto, Marc Doussard, Dave Graham-Squire, Ken Jacobs, Dan Thompson, and Jeremy Thompson. (2013). Fast Food, Poverty Wages: The Public Cost of Low-Wage Jobs in the Fast-Food Industry. <http://laborcenter.berkeley.edu/fast-food-poverty-wages-the-public-cost-of-low-wage-jobs-in-the-fast-food-industry/>.

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