

Job outlook by education, 2004-14

Starting a good career requires making preparations and wise decisions—decisions based, in part, on information about the job market. The U.S. Bureau of Labor Statistics (BLS) provides job market information to students and jobseekers by developing projections of both job growth or decline and job openings in hundreds of occupations. Analysts then use these projections to study the overall future demand for workers by education level.

The two articles that follow evaluate job opportunities by education level. The first article considers the job outlook for people who do not have a bachelor's degree. The second article describes the job outlook for people who have, or plan to pursue, a bachelor's or higher degree. Both articles highlight occupations that are expected to be in demand, and both include information on the earnings and education that workers in those occupations attain.

But the articles present only a sample of the occupations for which BLS develops projections. For a more complete picture of job outlook, see BLS publications such as the 2006-07 editions of the *Occupational Outlook Handbook* and *Occupational Projections and Training Data* bulletin. Information about these and other resources is available at the end of each article.

The 2004-14 job outlook for people who don't have a bachelor's degree

by Olivia Crosby and Roger Moncarz



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If you want a job right after high school, projections show many openings will be available. But if you want a job with above-average earnings, you'll probably need some training before you join the workforce.

Good news for those not planning to earn a 4-year degree: Millions of job openings are projected for high school graduates over the 2004-14 decade, according to the U.S. Bureau of Labor Statistics (BLS). But jobseekers will probably need training beyond a high school diploma, particularly if they want a job with high pay.

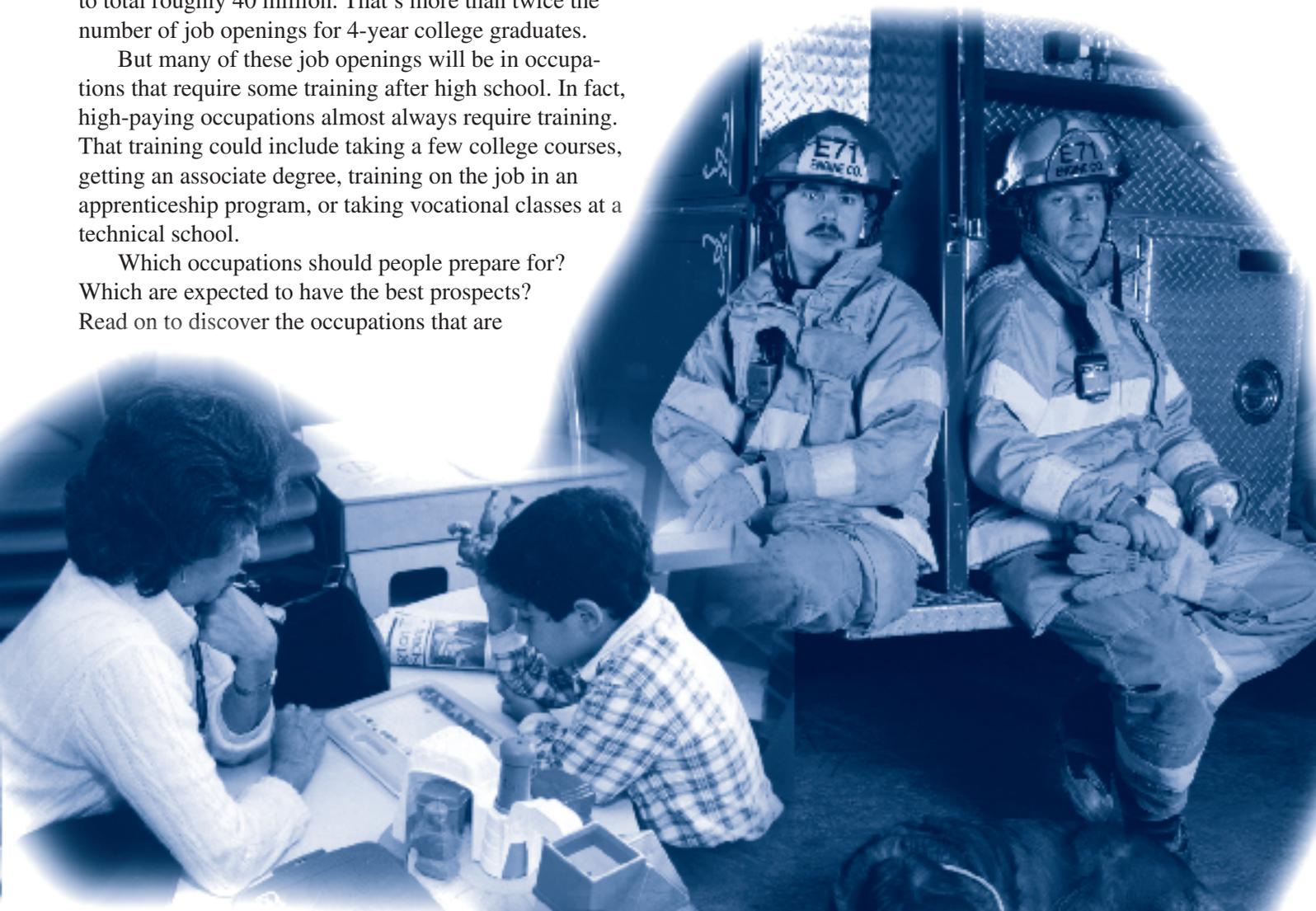
Most jobs are filled by workers who do not have a bachelor's degree, and BLS expects that to continue in the future. Between 2004 and 2014, job openings for workers who are entering their occupation for the first time and who don't have a bachelor's degree are expected to total roughly 40 million. That's more than twice the number of job openings for 4-year college graduates.

But many of these job openings will be in occupations that require some training after high school. In fact, high-paying occupations almost always require training. That training could include taking a few college courses, getting an associate degree, training on the job in an apprenticeship program, or taking vocational classes at a technical school.

Which occupations should people prepare for? Which are expected to have the best prospects? Read on to discover the occupations that are

projected to have the most openings over the 2004-14 decade for people who do not have a bachelor's degree and which occupations tend to pay well. Next, learn more about career fields—including construction, maintenance and repair, healthcare, and computers—that are expected to provide many opportunities for new workers. A later section of this article describes in detail the methods used to develop this information.

All of the numbers in this article are estimates. They are based on projections of future job growth and decline



and on estimates of how many workers will leave their occupations and, thus, make room for new workers. The results shown here also rely on survey data that describe the education levels of current workers. And the results assume that future workers will have education levels similar to those of current workers.

Job openings and occupations

Between 2004 and 2014, BLS expects about 55 million job openings to be filled by workers who are new to their occupation. Of this total, more than 40 million openings are projected to be filled by workers who do not have a bachelor's degree and who are entering their occupation for the first time. About 25 million of these openings are expected to be held by workers who have a high school diploma or less education. Another 15 million openings are expected for workers who have some college education or an associate degree but do not have a bachelor's degree.

Job openings are expected in every type of occupation. But some occupations and career fields are projected to have more job openings and better earnings than others.

Occupations with potential

Two main factors determine whether an occupation will have many job openings. One factor is how many workers will leave the occupation permanently. Large occupations—that is, occupations in which many jobs exist nationwide—have more workers and, thus, also have more workers who leave the occupation and create openings. Occupations that have few training requirements or low earnings also have more workers who leave. And occupations that have many older workers usually provide more openings because of retirements.

The second factor affecting job openings is job growth. Some occupations gain new jobs faster than others, providing more openings.

The occupations that are expected to need the most new workers between 2004 and 2014 employ workers who have widely varying levels of education. People in some occupations can start work after high school. In other occupations, especially higher paying ones, workers often have more education or training. Sometimes, people can enter these occupations if they don't have training after high school, but they often earn less while they train on the job.

Occupations with the most openings. Chart 1 shows the occupations projected to have the most job openings between 2004 and 2014 for people who have less education than a bachelor's degree. Most of these occupations involve working with the public.

The chart also shows the occupations' 2004 median earnings. (Median earnings are the point at which half of the workers in the occupation make more than that amount, and half make less.) All but four of the occupations in the chart had median earnings below \$28,580—the median for all workers in 2004.

But median earnings don't show the wide variation in pay that exists in some occupations. For example, earnings for some customer service representatives, such as those who provide help for complex computer problems, are sometimes significantly higher than the median. These workers are usually highly skilled and have several months of on-the-job training; some also have a bachelor's degree.

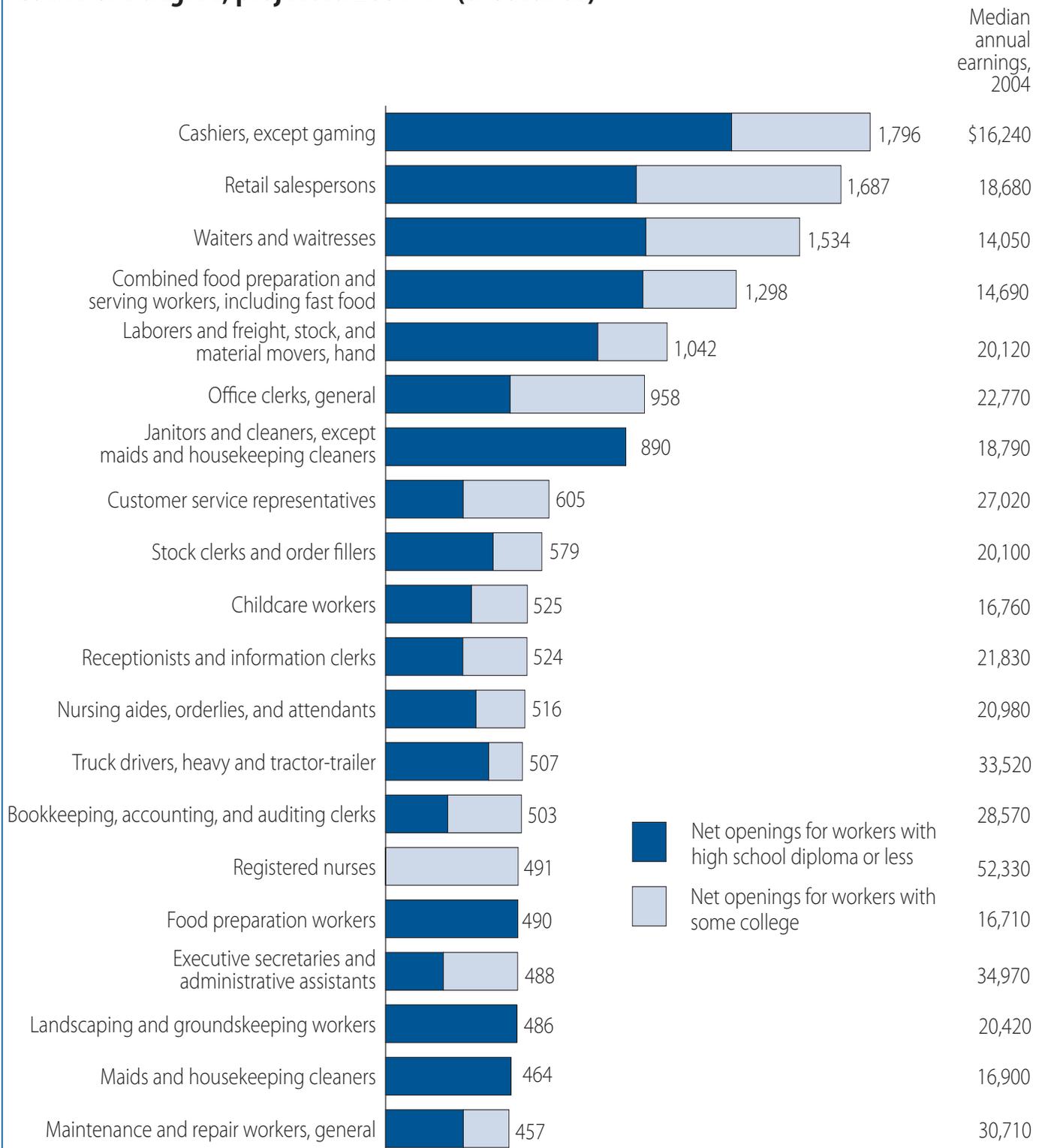
You can enter most of the occupations shown on the chart if you have a high school diploma or less education. Workers often qualify for jobs after less than 1 month of on-the-job training. But six of the occupations—customer service representatives; truck drivers; bookkeeping, accounting, and auditing clerks; registered nurses; executive secretaries and administrative assistants; and general maintenance workers—require more training. These are also the highest paying occupations on the chart.

Customer service representatives, who often receive 1 month to 1 year of training, usually start their jobs by observing experienced workers. Truck drivers usually need 1 month to 1 year of training on the job; some attend vocational schools to learn the basics of commercial driving. Bookkeeping, accounting, and auditing clerks also require 1 month to 1 year of training, and many have an associate degree in business.

Registered nurses, unlike the other occupations on the chart, almost always have some college training. In fact, among registered nurses in 2005, more than 35 percent had an associate degree and more than 55 percent had a bachelor's or higher degree. Executive secretaries and administrative assistants usually need 1 month to 1 year of on-the-job training, and more than 45 percent of these workers have completed some college coursework. Most general maintenance workers learn on the job or in vocational classes they take during, or after, high school.

Chart 1

Occupations with the most job openings for workers who do not have a bachelor's degree, projected 2004-14 (thousands)



Occupations with high earnings and lots of openings. According to BLS data, about 360 of the occupations expected to provide openings for high school graduates also had higher-than-average median earnings in 2004. Chart 2 shows the high-paying occupations that are expected to have the most openings. All require technical skills or supervisory responsibilities. And all usually require moderate or long-term on-the-job training, college courses, or vocational classes.

Nearly half of the occupations on the chart relate to construction or maintenance and repair. Some of these occupations require physical strength, but many, such as painters, do not. Completing a formal apprenticeship increases your chances of getting a job in these occupations. Taking algebra classes and vocational classes in high school also helps people qualify. Seven of these occupations have very high median earnings—above \$43,600.

Another way to a high-paying career is to work toward becoming a supervisor. Many high school graduates transfer to managerial occupations as they gain experience.

According to some studies, having formal training or taking college courses can increase the chances of becoming a supervisor.

Competing with college workers. Some of the occupations in these charts are expected to provide jobs for workers who have a bachelor's degree, as well as for workers who don't. When an occupation includes workers who have different levels of education, workers with more education are often better able to compete for jobs. This is particularly true if the occupations require academic skills, such as mathematics or science.

If you do not have a bachelor's degree, you can increase your competitiveness in a number of ways. For example, you can gain work or volunteer experience, take high school or college courses that relate to an occupation, or complete a certification.

Additionally, consider contacting your State's labor market information office to learn about work, volunteer, education, and training opportunities. You can also find out which training programs have high placement rates and which occupations are most in demand in your area.

Most high-paying occupations require some training after high school.



Chart 2

High-earning occupations with the most job openings for workers who do not have a bachelor's degree, projected 2004-14 (thousands)

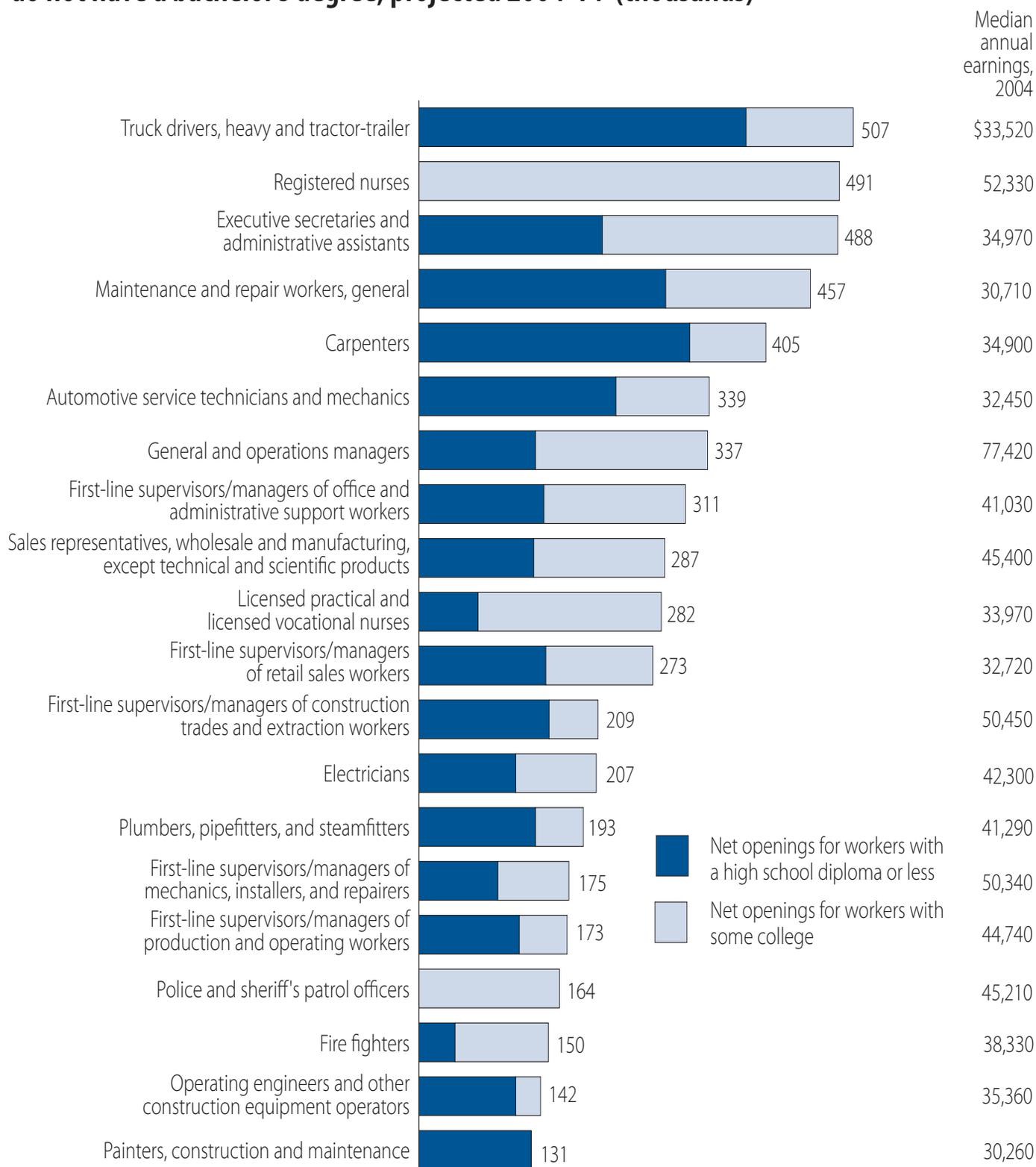


Table 1
Selected office and administrative support occupations

Occupation	Net job openings for workers without a bachelor's degree, projected 2004-14 (thousands)	Median annual earnings, 2004	Most significant source of postsecondary education or training	Percent of workers aged 25 to 44 with...		
				High school diploma or less	Some college or associate degree	Bachelor's or higher degree
Office clerks, general	958	\$22,770	Short-term on-the-job training	39%	42%	20%
Customer service representatives	605	27,020	Moderate-term on-the-job training	37	41	22
Stock clerks and order fillers	579	20,100	Short-term on-the-job training	63	29	8
Receptionists and information clerks	524	21,830	Short-term on-the-job training	47	39	13
Bookkeeping, accounting, and auditing clerks	503	28,570	Moderate-term on-the-job training	38	45	17
Executive secretaries and administrative assistants	488	34,970	Moderate-term on-the-job training	36	46	18
Tellers	313	21,120	Short-term on-the-job training	46	41	13
First-line supervisors/managers of office and administrative support workers	311	41,030	Work experience in a related occupation	33	38	29
Postal service mail carriers	105	44,450	Short-term on-the-job training	52	38	10
Legal secretaries	99	36,720	Postsecondary vocational award	36	46	18

Career fields with prospects

Good opportunities exist in almost every career field. The tables in this section show the expected job openings and common educational requirements for occupations in eight different fields. Career fields that are projected to have the most openings are discussed first.

The tables show occupations expected to have many openings over the 2004-14 decade. The tables also show 2004 earnings and the education levels of current workers aged 25 to 44. Also listed is the specific type of training—such as on-the-job training, a vocational certificate, or an associate degree—that BLS analysts deemed most significant in the occupation.

Office and administrative support. People who have good organizational skills can expect many opportunities in office and administrative support occupations. Between 2004 and 2014, these occupations are expected to provide about 7 million openings for workers who do not have a bachelor's degree. You can qualify for many of these openings, such as those for receptionists and information clerks, right after high school without much additional training. (See table 1.) Summer jobs or high school classes in English, typing, and computer-related subjects can pave the way.

Other occupations, such as customer service representatives or executive secretaries and administrative assistants, often require months of on-the-job training. Many office workers also take some college courses to hone their skills, earn certificates, and increase their chances for advancement.

Maintenance, repair, and production. People who have mechanical skills can expect many opportunities;

nearly 5 million openings are projected in maintenance, repair, and production between 2004 and 2014.

As table 2 shows, education varies widely in this group. General maintenance and repair workers, who are projected to find the most openings, usually train on the job in a few months. Some workers also take vocational classes. Welders and machinists, who are among the highest paid workers shown on the table, often train in apprenticeship programs for a year or more, earning wages as they go. Automotive service technicians and mechanics also sometimes complete apprenticeship programs, but more often, they earn certificates at vocational schools.

Healthcare. For workers who like helping people and who have an interest in science, healthcare occupations are expected to provide some of the most plentiful and highest paying career opportunities in the economy. Overall, healthcare occupations are projected to provide more than 3 million job openings between 2004 and 2014 for workers who don't have a bachelor's degree. Many of these openings are expected to come from fast job growth in the occupations.

As table 3 shows, training varies widely in the healthcare field. For example, the most significant source of preparation for home health aides is 1 month or less of on-the-job training. Nursing aides usually need vocational training, but a large number of aides have also taken college courses—either to earn certifications, qualify for specific jobs, or prepare for other, higher paying healthcare occupations. Some aides may have completed college coursework unrelated to their job.

Having a job in one occupation while training for

Table 2
Selected maintenance, repair, and production occupations

Occupation	Net job openings for workers without a bachelor's degree, projected 2004-14 (thousands)	Median annual earnings, 2004	Most significant source of postsecondary education or training	Percent of workers aged 25 to 44 with...		
				High school diploma or less	Some college or associate degree	Bachelor's or higher degree
Maintenance and repair workers, general	457	\$30,710	Moderate-term on-the-job training	58%	34%	8%
Team assemblers	410	23,750	Moderate-term on-the-job training	72	23	6
Automotive service technicians and mechanics	339	32,450	Postsecondary vocational award	66	31	4
First-line supervisors/managers of mechanics, installers, and repairers	175	50,340	Work experience in a related occupation	46	42	12
Helpers—production workers	174	20,180	Short-term on-the-job training	80	15	5
First-line supervisors/managers of production and operating workers	173	44,740	Work experience in a related occupation	59	28	13
Welders, cutters, solderers, and brazers	125	30,620	Long-term on-the-job training	75	23	2
Inspectors, testers, sorters, samplers, and weighers	116	28,410	Moderate-term on-the-job training	53	33	14
Bus and truck mechanics and diesel engine specialists	108	35,780	Postsecondary vocational award	66	30	3
Machinists	102	33,960	Long-term on-the-job training	66	30	4

another is a common advancement strategy for healthcare workers. Emergency medical technicians and paramedics, for example, need certification and some formal training before they start working. With additional training and experience, these workers can progress to higher levels of certification and new job duties. To receive the highest level of certification, most paramedics must earn an associate degree.

In part because the skills they need are becoming more complex, healthcare workers are getting more train-

ing. Often, this extra education pays off. Although many dental assistants train on the job, for example, about 25 percent of workers aged 25 and older have an associate degree. And median earnings of dental assistants who have an associate degree are about 20 percent higher than earnings of those who have a high school diploma or less education.

For some healthcare occupations, BLS analysts were able to draw conclusions about the level of competition that future jobseekers might face. Analysts gathered data,

Table 3
Selected healthcare occupations

Occupation	Net job openings for workers without a bachelor's degree, projected 2004-14 (thousands)	Median annual earnings, 2004	Most significant source of postsecondary education or training	Percent of workers aged 25 to 44 with...		
				High school diploma or less	Some college or associate degree	Bachelor's or higher degree
Nursing aides, orderlies, and attendants	516	\$20,980	Postsecondary vocational award	61%	33%	7%
Registered nurses	491	52,330	Associate degree	2	40	58
Home health aides	431	18,330	Short-term on-the-job training	61	33	7
Licensed practical and licensed vocational nurses	282	33,970	Postsecondary vocational award	23	71	6
Medical assistants	273	24,610	Moderate-term on-the-job training	35	53	11
Dental assistants	189	28,330	Moderate-term on-the-job training	33	57	10
Pharmacy technicians	107	23,650	Moderate-term on-the-job training	32	53	15
Emergency medical technicians and paramedics	74	25,310	Postsecondary vocational award	18	65	17
Radiologic technologists and technicians	57	43,350	Associate degree	9	68	23
Dental hygienists	56	58,350	Associate degree	4	66	30

Occupation	Net job openings for workers without a bachelor's degree, projected 2004-14 (thousands)	Median annual earnings, 2004	Most significant source of postsecondary education or training	Percent of workers aged 25 to 44 with...		
				High school diploma or less	Some college or associate degree	Bachelor's or higher degree
Carpenters	405	\$34,900	Long-term on-the-job training	73%	21%	6%
First-line supervisors/managers of construction trades and extraction workers	209	50,450	Work experience in a related occupation	65	25	10
Electricians	207	42,300	Long-term on-the-job training	51	43	6
Construction laborers	194	25,160	Moderate-term on-the-job training	80	14	6
Plumbers, pipefitters, and steamfitters	193	41,290	Long-term on-the-job training	67	28	5
Operating engineers and other construction equipment operators	142	35,360	Moderate-term on-the-job training	77	20	2
Painters, construction and maintenance	131	30,260	Moderate-term on-the-job training	75	18	7
Cement masons and concrete finishers	72	31,400	Moderate-term on-the-job training	83	14	3
Sheet metal workers	72	35,560	Long-term on-the-job training	67	31	2
Roofers	65	30,840	Moderate-term on-the-job training	88	10	3

such as information on the number of people who have recently completed training programs, along with anecdotal evidence. Analysts concluded that over the 2004-14 decade, there could be excellent opportunities in the following healthcare occupations:

- Clinical laboratory technologists and technicians
- Dental assistants
- Dental hygienists
- Medical records and health information technicians
- Nursing, psychiatric, and home health aids
- Registered nurses
- Respiratory therapists.

These occupations usually employ people who have some on-the-job training or education after high school.

Construction. An interest in building can lead to a career with prospects. Nearly 2.5 million job openings are projected for workers entering construction occupations between 2004 and 2014. And most of these occupations pay more than the median for all occupations.

There are many types of construction occupations. Some require outdoor work, others don't; some involve a high level of mathematics, others require math skills that are more basic. Many workers in construction occupations start in apprenticeships, taking vocational classes and getting paid for on-the-job training. Some workers receive college credit for the vocational classes that they take.

Table 4 shows the construction occupations that are expected to have the most job openings over the 2004-14 decade. In 2004, median earnings for all but construction laborers were above the median for all occupations.

For two of the occupations on the table—plumbers, pipefitters, and steamfitters and carpenters—BLS analysts had enough information to conclude that job openings could outnumber jobseekers in some years and in some locations. Prospects for these workers are expected to be excellent.

BLS analysts also concluded that three additional construction occupations—insulation workers; brickmasons, blockmasons, and stonemasons; and roofers—are also expected to provide good opportunities.

Police and other protective service. Workers who keep the public safe from crime, disasters, and fire are projected to be in high demand. Between 2004 and 2014, protective service occupations are expected to provide about 1.1 million job openings for workers who don't have a bachelor's degree. As table 5 shows, most of those openings are projected to be in three occupations: security guards, police and sheriff's patrol officers, and fire fighters.

Security guards can usually qualify for their jobs with a high school diploma or less education. Once employed, security guards often receive some on-the-job training. Guards who carry weapons must have training and licensure. Guards working in specialized fields, such as nuclear power plant security, receive extensive formal training after being hired and usually earn more than other guards.

Most police train on the job at service academies; many also have degrees. Fire fighters usually also have degrees and train at fire department training centers and academies. And almost all fire departments require fire fighters to be certified as emergency medical technicians.

Table 5
Selected protective service occupations

Occupation	Net job openings for workers without a bachelor's degree, projected 2004-14 (thousands)	Median annual earnings, 2004	Most significant source of postsecondary education or training	Percent of workers aged 25 to 44 with...		
				High school diploma or less	Some college or associate degree	Bachelor's or higher degree
Security guards	349	\$20,320	Short-term on-the-job training	51%	36%	12%
Police and sheriff's patrol officers	164	45,210	Long-term on-the-job training	20	50	30
Fire fighters	150	38,330	Long-term on-the-job training	22	58	20
Correctional officers and jailers	118	33,600	Moderate-term on-the-job training	39	48	13
Lifeguards, ski patrol, and other recreational protective service workers	73	16,540	Short-term on-the-job training	33	38	28
Crossing guards	37	19,300	Short-term on-the-job training	72	22	5
First-line supervisors/managers of police and detectives	31	64,430	Work experience in a related occupation	17	53	30
First-line supervisors/managers of fire fighting and prevention workers	25	58,920	Work experience in a related occupation	14	61	25
Detectives and criminal investigators	16	53,990	Work experience in a related occupation	12	35	53
First-line supervisors/managers of correctional officers	11	44,720	Work experience in a related occupation	25	49	25

Science and engineering. Occupations related to science and engineering are expected to provide many high-paying opportunities, especially for those who have the right kind of training. About 370,000 openings in science-related occupations are expected between 2004 and 2014 for workers who don't have a bachelor's degree.

Engineering technicians, two types of which are shown on table 6, often have an associate degree. Most take college algebra and trigonometry. Some technicians earn a vocational certificate instead of a degree.

Survey technicians, also on the table, sometimes begin work right after high school. But many complete additional training, such as an associate degree or apprenticeship.

Computer. Rapid growth in information technology is expected to create many openings for people who like working with computers. Openings in computer-related occupations for workers who don't have a bachelor's degree are expected to total about 324,000 between 2004 and 2014.

In this field, credentials, such as industry certifications or an associate degree in a computer-related field, are especially important, in part because many college graduates compete for these jobs.

Some occupations are easier to enter than others for people who have skills but not a degree. According to industry experts, computer-savvy people who don't have a bachelor's degree may find it easiest to enter the occupations of computer support specialist, network and

Table 6
Selected science and engineering occupations

Occupation	Net job openings for workers without a bachelor's degree, projected 2004-14 (thousands)	Median annual earnings, 2004	Most significant source of postsecondary education or training	Percent of workers aged 25 to 44 with...		
				High school diploma or less	Some college or associate degree	Bachelor's or higher degree
Electrical and electronic engineering technicians	56	\$46,310	Associate degree	28%	54%	18%
Civil engineering technicians	33	38,480	Associate degree	28	54	18
Surveying and mapping technicians	30	30,380	Moderate-term on-the-job training	47	43	11
Architectural and civil drafters	27	39,190	Postsecondary vocational award	16	62	22
Industrial engineering technicians	22	43,590	Associate degree	28	54	18

Table 7
Selected computer occupations

Occupation	Net job openings for workers without a bachelor's degree, projected 2004-14 (thousands)	Median annual earnings, 2004	Most significant source of postsecondary education or training	Percent of workers aged 25 to 44 with...		
				High school diploma or less	Some college or associate degree	Bachelor's or higher degree
Computer support specialists	93	\$40,430	Associate degree	17%	42%	41%
Computer systems analysts	57	66,460	Bachelor's degree	9	25	66
Network and computer systems administrators	56	58,190	Bachelor's degree	13	35	51
Network systems and data communications analysts	52	60,600	Bachelor's degree	9	31	60
Computer and information systems managers	31	92,570	Bachelor's plus experience	7	23	70
Computer programmers	27	62,890	Bachelor's degree	6	22	72
Computer operators	24	31,070	Moderate-term on-the-job training	33	43	24

computer systems administrator, or network systems and data communication analyst.

The computer support specialist occupation is projected to provide the most openings for those who don't have a bachelor's or higher degree. (See table 7.) Specialists who don't have a 4-year degree increase their marketability by earning certifications or getting computer experience in other jobs.

Networking and computer systems administrators are also expected to have opportunities, whatever their level of education. Workers who don't have a bachelor's degree often begin their careers as computer support specialists, switching into the more highly paid administrator occupation after they gain experience.

Web masters, computer security professionals, and

Local Area Network (LAN) support staff are also expected to be in high demand. All of these workers are part of the occupation of network systems and data communications analysts. Many have a bachelor's degree, but others substitute coursework, experience, or certifications.

Each of these occupations had earnings that were above the median for all workers in 2004. But the earnings of workers who have a bachelor's degree are included in those figures; earnings might be lower for workers who have less education.

Education and personal service. Career opportunities will continue to be plentiful for people interested in working with children or providing personal services to the public. About 2.6 million openings are expected in these fields between 2004 and 2014 for workers who

Table 8
Selected education and personal service occupations

Occupation	Net job openings for workers without a bachelor's degree, projected 2004-14 (thousands)	Median annual earnings, 2004	Most significant source of postsecondary education or training	Percent of workers aged 25 to 44 with...		
				High school diploma or less	Some college or associate degree	Bachelor's or higher degree
Childcare workers	525	\$16,760	Short-term on-the-job training	52%	34%	14%
Teacher assistants	433	19,410	Short-term on-the-job training	41	43	17
Personal and home care aides	400	16,900	Short-term on-the-job training	60	30	10
Hairdressers, hairstylists, and cosmetologists	215	19,800	Postsecondary vocational award	53	43	4
Preschool teachers, except special education	101	20,980	Postsecondary vocational award	21	31	48
First-line supervisors/managers of personal service workers	89	30,350	Work experience in a related occupation	49	37	14
Nonfarm animal caretakers	65	17,460	Short-term on-the-job training	55	32	12
Social and human service assistants	55	24,270	Moderate-term on-the-job training	15	28	57
Recreation workers	45	19,320	Short-term on-the-job training	19	29	52
Library technicians	41	24,940	Postsecondary vocational award	20	46	33

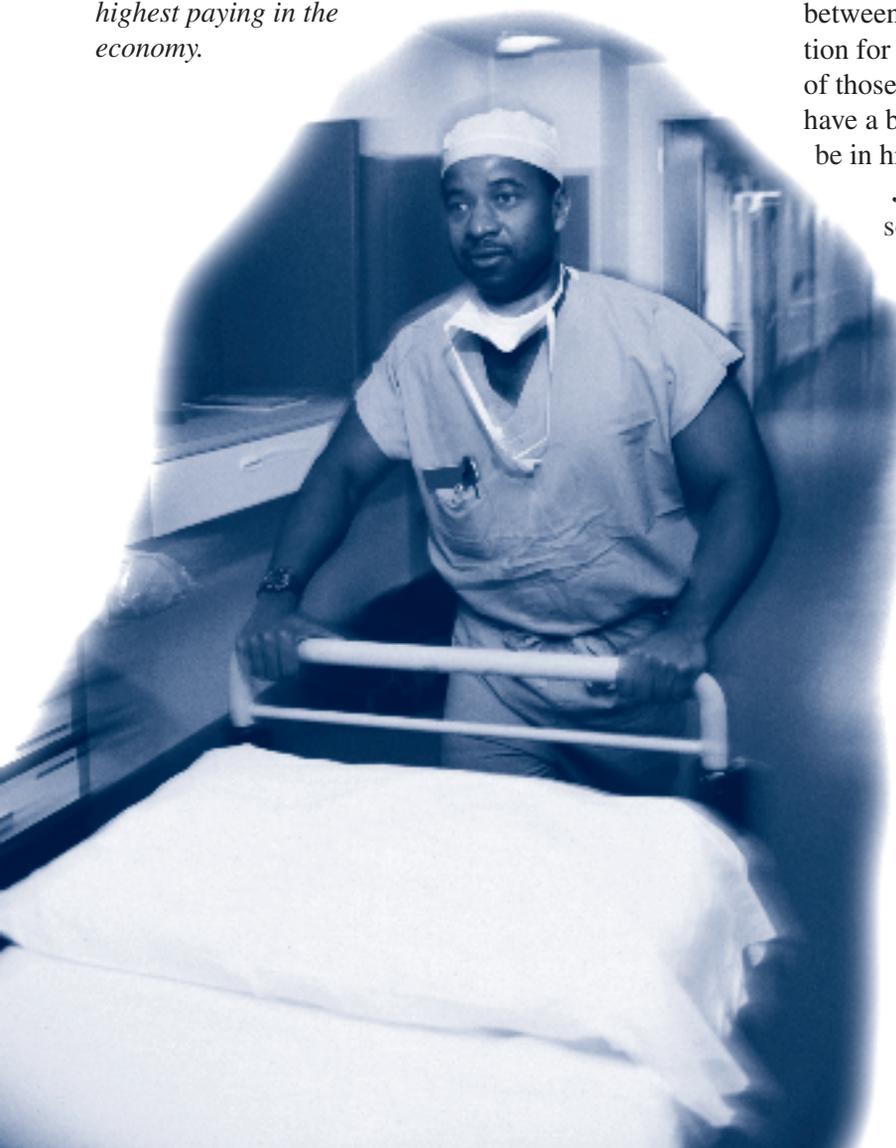
don't have a bachelor's degree.

Childcare workers, who are expected to have the most openings for high school graduates among occupations in this group, often qualify after a short period of training. But some earn an associate degree and certification to increase their opportunities. (See table 8.)

Teacher assistants are often required to have an associate degree or to pass an exam, but many others train on the job.

Working in education and personal service does not usually bring above-average earnings, however. Among the occupations on the table, only management occupations had median earnings higher than \$28,580, the median for all workers in 2004.

Healthcare occupations are expected to be among the fastest growing and highest paying in the economy.



How these numbers were developed

Measuring job outlook by education is complicated, and there are many ways to do it. This analysis used job openings as a way to measure outlook because the number of job openings helps to determine how easy it will be for workers to enter an occupation. First, the number of future job openings in each occupation was estimated. Then, survey data were used as an objective way to estimate how many job openings would be filled by workers with various levels of education.

Like any analysis based on projections and estimates, however, this one has limitations. Understanding these limitations will help you to better use the results. The methods and limitations are described in detail below.

Methods used

To determine job prospects, BLS analysts started by projecting the total number of job openings available between 2004 and 2014 for workers entering an occupation for the first time. Next, analysts estimated how many of those openings would be filled by workers who do not have a bachelor's degree and how many openings would be in high-paying occupations.

Job openings. Job openings come from two sources: the need to fill newly created positions and the need to replace workers who leave an occupation permanently. To estimate the number of openings that will come from newly created positions, analysts projected how much each occupation would grow or decline between 2004 and 2014.

There are many reasons why the number of jobs in an occupation might change. Sometimes, the demand for a certain type of good or service increases—for example, an aging population creates the need for more healthcare services and, as a result, more healthcare technicians. The way a good is produced or a service is provided also can create more jobs in a particular occupation, such as when library technicians gain jobs faster than librarians do because employment of technicians is considered a more cost-effective way to provide library services.

Many occupations that employ people who do not have a bachelor's degree are projected to gain jobs rapidly. In fact, for 6 of the 10 fastest growing occupations, a bachelor's degree is not

the most significant source of training. The occupation projected to be the fastest growing of all occupations over the 2004-14 decade is home health aide. It usually employs people who train on the job.

The need to replace workers who leave an occupation permanently is expected to provide even more openings than job growth will. To estimate how many workers will need to be replaced during the 2004-14 decade, analysts studied both past trends in each occupation and the ages of current workers. In some occupations, workers usually stay for many years. In other occupations, people tend to leave more quickly. These considerations affect replacement needs.

Openings by education. After analysts projected the total number of job openings in each occupation, they estimated how many of those openings would be filled by workers who had one of three different education levels: a high school diploma or less, some college or an associate degree, or a bachelor's or higher degree. Analysts determined which levels of education were significant in each occupation by looking at the education levels of current workers as reported in data from the 2002-04 Current Population Surveys. If at least 20 percent of workers had a particular level of education, that level was deemed significant.

Expected job openings were divided among each of the significant education levels, according to how common that education level was for workers in the occu-

pation. For example, flight attendants include workers who have each of the three levels of education: About 20 percent have a high school diploma or less, about 47 percent have completed some college or an associate degree, and about 33 percent have a bachelor's or higher degree. Therefore, the expected openings for flight attendants were divided among these categories using the corresponding percentages. The openings for workers who had less education than a bachelor's degree were added to the totals used in this article.

In addition to describing the three educational attainment categories, this article discusses specific education and training requirements for some occupations. These discussions are based on occupational analyses conducted for the *Occupational Outlook Handbook*.

Openings by earnings. The earnings data in this article are from the BLS Occupational Employment Statistics survey. The survey reflects the 2004 earnings of all workers, without regard to education level or experience. Also, the survey does not include self-employed workers. In this analysis, occupations were considered high-paying if their median earnings were above the median for all workers in 2004.

Limitations of the data

To measure total job openings and openings by education level, BLS analysts needed to make some assumptions about the future. First, analysts assumed that the education levels in each occupation would remain roughly the



Over the 2004-14 decade, BLS projects about 2.6 million openings in education and personal service occupations for workers who don't have a bachelor's degree.

same over the 2004-14 decade. In reality, the educational characteristics of some occupations change over time. Many occupations—such as registered nurses and police officers—have shown a gradual increase in the education levels of their workers.

Analysts also ignored education levels that were uncommon in an occupation; as stated previously, if less than 20 percent of workers in an occupation had a given level of education, that level of education was ignored. So, for example, even though 16 percent of today's massage therapists have a high school diploma or less, none of that occupation's future openings were slated for workers with that level of education.

Another limitation of this study is that it focuses on the number of job openings expected in an occupation. Job openings give only a partial view of the prospects that workers can expect. The number of people who will compete for those openings is also important. For most occupations, BLS analysts do not have enough information about the future supply of workers to analyze the competition for jobs in specific occupations.

Finally, the accuracy of this study is limited by its use of survey data. Surveys always have some error because not every worker is counted and because the information gathered is sometimes incorrect. The education levels of many of the occupations studied here, including some in the tables, could not be counted with enough statistical accuracy because the number of workers surveyed was too small. In those cases, analysts substituted the education levels of similar occupations or groups of occupations that had larger numbers of workers.

Despite the assumptions and limitations of this analysis, however, there is evidence that the methods used produce accurate results. When existing jobs are separated into educational categories using this method, the results closely match current numbers.

For more information

To learn more about the occupations described here and about the hundreds of other occupations expected to provide openings for workers who don't have a bachelor's degree, see the 2006-07 *Occupational Outlook Handbook*, available in many libraries and career centers and online at www.bls.gov/oco. The *Handbook* describes the job outlook, education and training requirements,

job duties, and more for nearly 270 occupations.

Another BLS publication, the 2006-07 *Occupational Projections and Training Data* bulletin, explains in greater detail the methods used in this study and lists the projected job openings and worker education levels for every occupation studied by the BLS Office of Occupational Statistics and Employment Projections. The bulletin is available online at www.bls.gov/emp/optd/home.htm and is for sale by calling the Superintendent of Documents toll-free at 1 (866) 512-1800.

The *Occupational Outlook Quarterly* also has articles that describe occupations that don't usually require a bachelor's degree. For example, the summer 2005 issue (www.bls.gov/opub/ooq/2005/summer/contents.htm) contains articles about radiation therapists and machinery manufacturing. In other issues, the *Quarterly* describes training and education for workers who don't have a bachelor's degree; these include "Apprenticeship: Career training, credentials—and a paycheck in your pocket," in the summer 2002 issue (available online at www.bls.gov/opub/ooq/2002/summer/art01.pdf), and "Associate degree: Two years to a career or a jump start to a bachelor's degree," in the winter 2002-03 issue (online at www.bls.gov/opub/ooq/2002/winter/art01.pdf).

And to help workers prepare for a career, the U.S. Department of Education offers information about financial aid for people attending 2-year colleges, 4-year colleges, and vocational schools. Call the financial aid hotline toll-free at 1 (800) 4FED-AID (433-3243); write the Federal Student Aid Information Center, P.O. Box 84, Washington, D.C. 20044-0084; or visit online at www.studentaid.ed.gov.

Studying potential job openings is only a starting point when deciding on a career. Many other considerations are important, including individual skills and interests, personal circumstances, and the needs of local employers. To explore these and other factors in making your career decision, visit State labor market information offices and career centers. Information is available online at www.servicelocator.org or by calling the U.S. Department of Labor's toll-free helpline, 1 (877) US2-JOBS (872-5627).

Opportunities are as varied as the workers who seek them. And when it comes to training, finding what is best for you is one of the surest routes to reward. 