

EXECUTIVE SUMMARY

PURPOSE

This report presents the findings of a study sponsored by the Employment and Training Administration (ETA) to enhance understanding of the factors that contribute to occupation-specific labor shortages. It also identifies steps that can be taken to reduce the probability of such shortages occurring, and if they do occur, to alleviate their effects. The report is based on case studies of four occupations that currently or previously experienced labor shortages: special education teachers, paraprofessional home care workers, electrical and electronic engineers, and tool and die makers. Research for the case studies was conducted in 1990.

BACKGROUND

The term "labor shortage" has no universally agreed-upon definition. It sometimes refers to a shortfall in the total number of individuals in the labor force, and sometimes denotes the possible mismatch between workers and jobs in the economy. Even when the term is used to refer to a particular occupation, a number of definitions have been proposed and used. For this report, we use a definition of a labor shortage provided by the Department of Labor in the Request for Proposals (RFP) for this study: "a market disequilibrium between supply and demand in which the quantity of workers demanded exceeds the supply available and willing to work at a particular wage and working conditions at a particular place and point in time." This study combines analysis of existing data sources with interviews of individuals knowledgeable about the labor markets of the four occupations selected.

RESULTS IN BRIEF

Our research indicates the presence of occupational shortages in two of the four occupations studied -- special education teachers and home care workers. While there was evidence of spot shortages in the two other occupations studied -- electrical and electronic engineers and tool and die makers -- there did not appear to be general shortages. A variety of underlying factors, particularly government intervention and institutional barriers, were found to lead to labor shortages. For example, wages paid to special education teachers and home care workers are substantially affected by the public sector, while wages paid to electrical and electronic engineers and tool and die makers are largely determined by private-sector employers. There are, however, other underlying (non-monetary) conditions that affect the willingness of workers to enter and remain within an occupation (e.g., job status, regularity of hours, certification requirements, lengthy and costly training periods, and working conditions). There are also a variety of demand-side conditions that can substantially affect the need for particular types of workers (e.g., increased demand for particular types of goods, changes in technology and emergence of new specialties within fields, decreases in government spending, and slow economic growth).

At the most general level, the consequence of a labor shortage is that particular goods and services are not provided. Such shortages, however, can also have impacts on the quality of life and create bottlenecks in the production of other goods and services. There are a variety of steps that the private and public sectors can undertake to reduce or eliminate occupational shortages. For example, in addition to increasing salaries and fringe benefits, employers can intensify recruitment, provide training, and increase overtime. The public sector can expand information available to help employers and workers better

anticipate and recognize shortages. Where regulation may substantially affect either wage levels or entry requirements for professions, government agencies should closely monitor the effects of such regulation.

PRINCIPAL FINDINGS

1. Occupational Shortages Were Found in Special Education and Home Care Occupations; Evidence for Shortages Was Less Certain in Electrical and Electronic Engineering and Tool and Die Occupations

Overall, we found two occupations -- special education teachers and home care workers -- where there are clear shortages of workers to fill available positions. In the other two occupations -- electrical and electronic engineers and tool and die makers -- the evidence for shortages is less certain. In the case of electrical and electronic engineers, while there is evidence of spot shortages, especially in some emerging technological areas, there now appears to be an overall surplus of available manpower because of recent cutbacks in defense spending and the recession. The primary concern is whether, and to what extent, shortages may emerge in the future. For tool and die makers, while there also appear to be spot shortages and considerable difficulty in hiring experienced workers, there does not appear to be a general shortage. However, employers have major concerns over their ability to replace an aging workforce with younger workers who possess the requisite basic skills to learn the profession.

2. A Variety of Underlying Factors -- Particularly Government Intervention and Institutional Barriers -- Lead to Labor Shortages

In the two occupations where there is clear evidence of labor shortages, labor market conditions are more directly influenced by government intervention and other institutional barriers than in the two occupations where shortages are less clearly in evidence. In both shortage occupations, wages paid to workers are directly limited by

what the public sector is willing and able to pay for the services produced by these occupations. In contrast, in the two occupations where shortages are less of a problem, wages paid to workers are determined by a large number of private-sector employers.

For home care workers, we found evidence of shortages in many areas of the country -- especially in rural areas, on the West Coast, in the Great Lakes states, and in states with low unemployment rates. Low wage levels, primarily because of government regulation, appear to be the most significant factor contributing to shortages. Wages paid to home care workers, particularly those serving patients covered by Medicaid and Medicare, are generally not much different from those paid to workers in fast food restaurants and are often less. The following conditions have led to a substantial increase in the demand for home care workers:

- a dramatic increase in the size of the elderly population (especially those over 75 years of age), who are the major users of home health care services;
- a decline in the availability of informal home care (e.g., greater female labor participation rates have reduced the ability of women to care for the disabled and elderly);
- adoption of cost containment policies under Medicaid and Medicare, which have resulted in a greater reliance on less expensive home care rather than on institutional (i.e., inpatient hospital and nursing home) settings; and
- expansion both in the eligibility for and the range of home care services provided under federal and state health care programs.

At the same time, there are a host of underlying conditions that affect significantly the ability and/or willingness of workers to become home care workers, including:

- extremely unstable work environments, particularly in terms of irregular hours;
- near poverty-level wages and few fringe benefits;
- need for transportation, especially within rural settings; and
- limited advancement potential and low job status.

Hence, shortages of home care workers, while strongly linked to low wage levels, also result from an explosive growth in the demand for home health care services and poor working conditions that limit willingness and ability to work within the field and result in high rates of turnover among home care workers.

In the case of **special education teachers**, we found that shortages -- which vary considerably by geographic area within the country -- are partially linked to inflexibility in wages, although wages are not quite as important a factor as they are for home care workers. Probably more important are other factors that affect the demand for these workers and the willingness of workers to enter and remain within the field. A particular problem within the field of special education is "burnout," which results in high levels of turnover. We found that the demand side is substantially influenced by government actions, particularly federal and state laws that have increasingly mandated quality standards for special education. This has resulted in maximum class-size standards for special education classes, which increase the demand for special education teachers. In addition, increasing emphasis on early intervention with the developmentally disabled has increased the demand for special education teachers. On the supply side, while there is a large pool of qualified special education teachers, there is a major challenge both to attracting and to keeping fully certified special education teachers within the field. The most often cited factor affecting the supply of special education teachers is high attrition. In addition, there are a number of other factors that affect the ability or willingness of workers either to enter or to stay within the special education field, including:

- varying state certification requirements, which discourage geographic mobility;
- lengthy training periods, with many states mandating a total of five or six years of college study;

- limited wage differentials for special education teachers compared to their general education peers, despite additional stresses and greater training requirements; and
- the loss of prestige that was formerly attached to teachers and teaching.

Institutional rigidity in adjusting wages for special education teachers plays an important role in creating shortages. School boards, because of limits on local revenues and pay equity concerns, are generally reluctant to adjust wages for special education teachers, even where shortages exist.

In the case of **electrical and electronic engineers**, we concluded that there is not currently a shortage. However, because of shifting demand and supply conditions, some analysts feel that shortages are likely to emerge soon (by the mid-1990s) and last well into the next decade. In comparison to the home care and special education occupations, there appear to be relatively few government or institutional restrictions on wages paid to electrical and electronic engineers. Despite the ability of employers to increase wages to adjust to labor market conditions, there are concerns about the following demand-side conditions:

- continued projected growth in demand for electronic and electrical products, which is expected to result in annual employment growth for electrical and electronic engineers about double the average for all U.S. occupations;
- an increase in replacement demand due to increasing retirements; and
- rapid emergence of new fields and specialties, together with obsolescence of existing skills of engineers within the field.

At the same time that demand for electrical and electronic engineers is expected to increase substantially, there are potential constraints on the number of new engineering graduates at all levels. Because of the changing age distribution of the U.S. population (i.e., a decrease in the size of the age cohort entering college/university in the 1990s), there is concern over the possibility of a substantial decrease in the number of new

engineering graduates at all degree levels. Further, some analysts argue that there is relatively little time to react to the projected shortfall of engineers because of the long lead time in training.

Finally, in the case of **tool and die makers**, while the evidence does not appear to support the claim by some employers that there is a severe shortage, there are some supply-side conditions which could result in future labor shortages. Unlike the three other occupations studied, there appear to be few demand-side factors that have or are likely to result in shortages of tool and die makers. The primary source of concern within this field is on the supply side: will there be sufficient entry of new workers to the field to replace the large number of retiring tool and die makers? Major concerns are the following:

- an apparent bias on the part of younger workers (and their parents) against "blue collar" employment, which constrains the number of workers willing to enter the profession;
- lack of knowledge about employment opportunities within the machine trades, especially among high school administrators, counselors, and parents;
- poor basic skills among the pool of youth likely to enter the machine trades;
- the relatively long and costly training period for tool and die makers, which affects willingness to enter the field and makes it difficult for firms (especially smaller ones) to provide the types of training needed to become tool and die makers; and
- lack of vocational training facilities, especially within high school settings.

The key question within this occupation is whether adequate information and incentives can be provided by employers to attract younger workers to the tool and die occupation and, once attracted, whether these workers will have the necessary basic skills and determination to master the various technical skills that are required.

3. Labor Shortages May Result in Loss of Production of Goods and Services

At the most general level, the consequence of a labor shortage is that particular goods and services are not provided. The impact of not providing goods and services varies by occupation. A shortage of special education teachers, for example, results in some school districts being unable to fill teaching positions with fully qualified teachers. This, in turn, may result in larger class size than mandated by law or in instruction of the learning disabled by unqualified teachers. This could lead to greater costs to society in the long run if the learning disabled are less productive and more dependent. In the case of home care workers, shortages may result in denial or delay of necessary care, reduction in the level of home care services received by clients, and/or diminished quality of care. The result for the elderly and others in need of assistance is a decrease in the quality of life. Shortages of electrical and electronic engineers or tool and die makers may lead to bottlenecks in the production of goods and services, and ultimately to loss in productive capability of U.S. industry. In turn, this may result in job losses for other U.S. workers, loss of domestic production of goods and services, and increases in imports.

4. Employers Utilize a Variety of Strategies to Respond to Shortages Depending Upon the Conditions That Brought About the Shortage and the Extent to Which the Employer Is Affected by the Shortage

In our case studies, we found a variety of employer responses to shortages. The responses adopted depend upon the conditions that brought about the shortage and the extent to which the employer is affected by the shortage. Employers are more likely to implement strategies that involve relatively short-term commitments of resources (e.g., intensified recruitment, use of overtime, and signing bonuses) than longer-term commitments of resources (e.g., increase in salaries and fringe benefits which affect all employees, and intensified training).

CONCLUSIONS AND RECOMMENDATIONS

We first discuss strategies that may help to anticipate shortages or recognize them. We then suggest approaches that may be appropriate for reducing or eliminating shortages once they are present.

1. Anticipating Labor Shortages

We conclude that we cannot project occupational supply and demand well enough to anticipate shortages adequately. Cohen's work¹ points to how labor market projections and data can be used to identify occupations that are prone to future shortages. For example, occupations that are good candidates for shortages are likely to experience wage increases as the labor market tightens. *Thus, we recommend that further research on "leading indicators" of shortages be supported.* However, given economists' current lack of ability to develop reasonably accurate projections, we recognize that projections should be treated as general indicators rather than precise forecasts.

2. Recognizing Labor Shortages

It is not a simple matter to determine if an occupation is experiencing a shortage. By the definition used in this study, an occupation has a shortage if the number of workers employed falls short of the number of workers employers would like to hire at the prevailing wage. The key information required to assess whether an occupation is experiencing a shortage is therefore vacancy data. Although the Bureau of Labor Statistics (BLS) formerly collected vacancy data, the program was discontinued several years ago for budgetary reasons. Because vacancies are the most important data for determining if

¹See Malcolm S. Cohen (1990). Study on the Feasibility of Using Labor Market Information for Alien Certification Determination. Ann Arbor, Michigan: Institute of Labor and Industrial Relations, University of Michigan.

shortages are present, the lack of these data makes it very difficult to determine which occupations have shortages. ***We therefore recommend that consideration be given to reestablishing BLS data on occupational vacancies.*** If a complete occupational vacancy series is not feasible, perhaps BLS and ETA could strongly urge employers to list vacancies for occupations of special interest (e.g., engineering specialties) with the state employment security agencies, and the results for these occupations could then be compiled at the national level.

3. Strategies for Reducing or Eliminating Occupational Shortages

To minimize problems with shortages resulting from government regulation, we recommend the following actions:

- ***Governments that directly or indirectly regulate wages in an occupation should monitor the services provided to assure that shortages are not leading to unmet needs (e.g., waiting lists for needed services).***
- ***In periods of rapidly rising wages, governments should make sure that adjustments to wages are made frequently enough to keep them competitive.***
- ***If wage increases are considered undesirable because of the cost implications, government regulators should consider actions to assure that services are provided equitably. For example, programs can be reduced in scope to reduce demand for the occupations experiencing shortages.***

Although the unregulated occupations covered by our case studies are not currently experiencing shortages, the literature indicates that fields such as engineering have experienced shortages in the past. Shortages are most likely to occur in occupations with long training periods and long reaction and response lags by firms, students, and workers. We have already noted that the lack of vacancy data makes it difficult to ascertain when a shortage exists and recommended reinstating some form of vacancy statistics.

In many instances shortages will be self correcting. As we explain in Chapter 2,

employers have incentives to raise wages, improve recruiting, and take other actions to eliminate the shortage. ***Thus, before taking strong action, government policymakers should review projections of occupational supply and demand to determine if the shortage is likely to be corrected by normal functioning of the labor market.***

Federal and state governments can assist employers and workers to adjust to shortages by publicizing occupations where shortages exist or are likely. BLS publications such as the Occupational Outlook Handbook and Occupational Outlook Quarterly can be valuable tools to employers, workers, and students. In addition, state employment services, the National Occupational Information Coordinating Committee (NOICC), and NOICC's state counterparts -- the State Occupational Information Coordinating Committees (SOICCs) -- provide occupational data and projections for workers, firms, and students. Although it is extremely difficult to evaluate the effectiveness of these institutions, an evaluation might reveal ways in which these organizations could be improved. ***The Department of Labor should consider evaluating the effectiveness of its occupational information programs with the goal of identifying any shortcomings and improving the flow of information to workers, students, and employers.***

Another potential bottleneck to alleviating shortages is a lack of appropriate training and educational programs. In some instances employers can train workers themselves, but in many occupations employers are dependent on schools and independent training programs. ***If a shortage is likely to persist, and one of the problems is a lack of adequate education and training programs, government can help eliminate the shortage by increasing support for these programs.*** The Employment and Training Administration has recently taken steps to upgrade the apprenticeship system in the United States, and this may help avoid shortages in some skilled occupations. On a selective basis, the government can

also support growth in institutions of higher education to increase the capacity to train professionals in selected fields.

Finally, permitting additional immigration for individuals in shortage occupations can provide additional workers relatively quickly. Immigration policies are often controversial, however, because increasing the supply when there is not a shortage can reduce the earnings of workers currently in the occupation. Even if there is a shortage, it may only be temporary, and workers may find their wages reduced in the future. ***Liberalizing immigration policies can be used to eliminate shortages, but care should be taken to ascertain that a shortage exists and that it is expected to persist.***

As we noted at the beginning of this study, labor markets are highly dynamic. To some extent, labor shortages are inevitable as labor demand by employers and labor supply of workers adjusts. In most instances, the natural working of the market will eliminate the shortage, but in some cases government actions can help reduce the time required or remove barriers to the process.