Identifying Critical Occupations for an Industry

There are many ways in which 'critical' occupations could be defined for an industry. The criticality of an occupation to an industry depends on the relative importance of the occupation in delivering the industry's main goods or services and the supply and demand for the occupation across all industries. Presumably, the most critical occupations are those that are essential to providing an industry's goods or services and are difficult to maintain at optimal staffing levels.

Unfortunately, there is little direct information on the importance of occupations relative to industry outputs. Occupational supply and demand information is more readily available for some occupations than others. Five approaches are presented here that use industry staffing patterns alone or in combination with occupational wage and training data. The accompanying Excel spread sheets show the results of each approach.

Most numerous occupations. This approach is based on the assumption that the most numerous occupations in an industry perform essential functions for the delivery of an industry's main goods or services. It appears to work best when a few occupations are critical to goods or service delivery. If the main work involves many occupations it may be difficult to discern critical occupations using this approach. For many industries, the most numerous occupations have lower usual education levels and lower average wages, but this is not true for all industries.

Lease numerous occupations. The assumption here is that because these occupations make up a relatively small proportion of the total industry employment, they have the potential to become critical if supply cannot meet demand. This approach often picks up both higher level occupations, such as managers, and lower level occupations, such as janitors. It appears to be the least useful approach.

Highest paying occupations. Occupations in high demand relative to supply should earn higher wages than occupations in low demand. These occupations tend to have higher education levels, but this depends on the industry.

High education/high wages. This approach assumes that occupations requiring higher levels of education have the potential for having a supply that is slow to adjust to demand, which will increase wages. Within a given level of education, some occupations may pay more than others.

Most annual openings. This approach is based on the assumption that occupations with large annual need will be critical to functioning. Annual openings can arise from two processes: growth and replacement needs. Occupations that are growing will need new workers to fill newly created vacancies. However, even declining occupations will have openings as people leave the occupation entirely through retirement, death, or a change of occupations. Some occupations have high replacement needs because people leave the occupation for higher paying occupations or because the occupation has a high proportion of older workers.

Summed Rankings. This approach collapses multiple criticality factors into a single score by summing the industry rankings for size of the occupation, wages, and education level. A better

approach would be to index or weight the variables in some way to better account for their relative importance to the industry.

Other data could be used as indicators of potential shortages. Some data can be used to evaluate the worker supply pipeline. For example, through the Ohio Skills Bank Data Tool (http://ohiolmi.com/asp/SB/SkillsBank.htm) information about training and education program completers can be compared to estimated annual openings for many occupations. Wage increases relative to costs indexes can show upward wage pressure, which may indicate a shortage of workers.

These approaches have limitations. There may be an adequate supply of workers in an occupation, but they may lack the specific skills needed by an employer (occupational vs. job specific skills). Staffing patterns change. For example, the proportion of production workers in manufacturing industries has decreased because technology has increased worker productivity.

Notes: U.S. staffing patterns were used because fewer data are suppressed. In general, state variations should be minor. No staffing pattern was available for Transportation Services (NAICS 480); data for Transportation and Warehousing (480-490) were substituted. Labor market data were not available for occupations listed at less–detailed classifications. It may be possible to identify more-detailed occupational classifications or substitute labor market information from similar occupations, which would improve the analyses.