By the year 2011 we are likely to experience significant shortages in the number of Registered Nurses available to meet the health care needs of the public (Ryten, 1997). Given this projection and the current time of economic restraint, it is imperative that HHR strategies be developed or re-examined to ensure more efficient, effective, and equitable provision of health services (Reid, 1992). This fact sheet provides a brief overview of the methods available for forecasting HHR. A separate fact sheet details the application of forecasting models to nursing.

Guiding principles for sound workforce planning methods which are often ignored by policy makers include (Hall, 1988):

- workforce projection models must be applicable to national and regional realities;
- planning for individual health care sectors and professions should not be done in isolation from related categories;
- at least as much attention should be given to requirements as to supplies;
- attention must be given to developing policies that support mobility and attrition as a way of bringing supply and requirements into balance;
- quality and efficient utilization is equally important to the quantity of personnel in modelling activities; and
- the reasonableness of all projections must be tested.

**CONCEPTUAL FORECASTING METHODS**

Forecasting studies, regardless of methods used, address supply and/or demand side issues. Most methods used are not particularly accurate in long term forecasting and estimating the needs of larger populations/geographic areas.

**Supply Side Forecasting**

- extensively addressed in the literature in terms of: methods of estimating current stock, new entries, attrition, and mobility; factors which influence workforce participation and retention; factors which influence workforce productivity; and factors which influence workforce entry
- examples include manpower to population ratios and econometric models that focus on factors affecting labour participation

**Shortcomings**

- much of the work in physician manpower planning has been based on the assumption that need is synonymous with contemporary supply (Lomas, Stoddart, & Barer, 1985)
- supply projection approaches are not neutral: they require an estimation of migration, mortality, and fertility rates - estimates which become increasingly unstable the farther into the future one projects (Lomas, Stoddart, & Barer, 1985)
long term estimates for nursing are more susceptible to inaccuracy than those for the physician workforce due to variation of labour force participation within and across age cohorts

**Demand Side Forecasting**
- demand side forecasting methods are used to quantify demand for health services and related health human resource requirements
- two common approaches to demand side forecasting are:
  1) health need/service target methods which explore the appropriateness or necessity of health care interventions, unmet health care needs, unmet demand, utilization, and cost-effectiveness of specific health professions in care delivery and;
  2) utilization (including econometric models) approaches which concentrate on demographic characteristics and utilization patterns in the general population and market factors which influence utilization of services (e.g., access to services, preferences of health consumers)

**Shortcomings**
- health needs approaches require detailed data that may not be available for all components of the health care system -- the quality of data and the technology needed to work with detailed demand data are also significant challenges
- the complex data requirements increase the risk of error due to inaccuracies
- single health occupation studies are common, but do not consider important issues such as inadequate service levels or the effects of shared competencies and substitution between health occupations

**ANALYTICAL FORECASTING METHODS**

Three broad categories of analytical forecasting methods are: (a) population based models (from social sciences and demography); (b) micro or macro economic models (using stochastic and regression techniques); and (c) operations research methods (employed most often in estimation of short term, local staffing needs). There are other methods in the literature such as the use of theoretical frameworks and business models.

**COMPARISON OF FORECASTING APPROACHES**

In 1994, Birch and colleagues used Ontario data to provide examples of various conceptual approaches to HHR modelling in nursing (Birch, Lavis, Markham, Woodward, & O’Brien-Pallas, 1994). Estimates of various scenarios were developed using a variety of data sources, taking into account the gross national product allocation for the health care sector. Depending on which conceptual model was used, the estimated number of nurses required, as well as future resources predicted, varied considerably. The variance of results demonstrates the need for using multiple models to estimate nursing resources. There is a need for testing shocks to the system and alternate views of how nursing care may be delivered in the future.

**RECOMMENDATIONS**

- Need studies with a comprehensive model for health care resources that include economic concepts relative to the relationship among supply and demand for nursing services that include links to other health services (Prescott, 1991; Lomas, Stoddart, & Barer, 1985; Birch et al., 1994)
- Need to incorporate political, social, and situational issues affecting workload into forecasting methods.


