Developing a Multi-Regional Statewide Nursing Workforce Forecast Model Requires Innovation and Collaboration

Cynthia Bienemy, PhD, RN

A key message from the Institute of Medicine's report, *The Future of Nursing: Leading Change, Advancing Health,* addresses the need for better health care workforce data collection and information infrastructure, which is a prerequisite for effective workforce planning and policy making. Health care workforce forecasting models provide a mechanism for making future projections, which can be valuable in quantifying supply and demand and identifying the most appropriate strategies to prevent future shortages. Forecasts or predictions about future nursing supply and demand at the state level, although becoming more prevalent, are limited to a minority of states using a variety of methodologies. The Louisiana Multi-Regional Statewide Nursing Workforce Forecasting Model offers a unique and powerful tool to both monitor and forecast changes in the supply of, and demand for nurses at both the state and regional levels relative to specific health care settings. Development of such a model requires collaboration with agencies and/or entities having access to state-level data as well as the support of stakeholders interested in using the model in strategic planning and policy development.

Nurses have been, and will continue to be at the center of health care in the United States. Therefore, collecting and analyzing high-quality and timely data will be needed to assess how the nursing workforce is and will be adjusting to the transformation that the health care system is expected to undergo over the next decade (Buerhaus, 2012; Institute of Medicine, 2010). A health care system that functions appropriately has a workforce that directly impacts quality, cost, and access to health care. Yet, because the health care needs of each state as well as the regions within those states (i.e., urban vs. rural) are unique, it is almost impossible to determine the size and composition of the health care workforce needed using national data and trends. Health policies designed to expand access, improve quality, and control costs must take into account the supply, distribution, education, and utilization of the health care workforce at the state and regional levels in order for these policies to succeed (Martiniano, McGinnis, & Moore, 2010; McEllistrem-Evenson, 2009).

Knowledge of the supply and demand for registered nurses (RNs), advanced practice registered nurses (APRNs), and licensed practical nurses (LPNs) is the first step in determining the nursing workforce that will be needed to provide care to over 300 million American citizens (U.S. Census Bureau, 2012). To ensure that there is a sufficient supply of nurses to meet the future demand for health care, it is essential that workforce planners, policy makers, health care providers, and nursing educators have a means of predicting the future demand for all types of nurses. Having the ability to predict future nursing supply and demand using forecasting models that incorporate state- and regional-level data will assist these groups in the allocation of resources needed for nursing education, program development, and recruitment efforts in both the health care system and education sectors (Budden, Zhong, Moulton, & Cimiotti, 2013).

Forecast studies for RNs, APRNs, and LPNs can be valuable in quantifying supply and demand, as well as gaps in supply and demand, and identifying the most appropriate strategies to prevent future shortages. To quantify RN, APRN, and LPN supply/demand gaps now and in the future, it will be important to have accurate data, including the number of active RNs, APRNs, and LPNs as well as their demographic, education, and practice characteristics, and work locations. A lack of relevant and timely data on the nursing workforce is a significant barrier to identifying where nursing shortages currently exist, where they may exist in the future, and where they may be most severe. The absence of this information impedes the development of effective health workforce programs and policies to alleviate shortages and the ability to evaluate these programs and policies for effectiveness (Martiniano et al., 2010).

Using Forecasting Models to Predict Nursing Supply and Demand

In the past, states have relied on national projections for nursing supply and demand reported by the Health Resources and Services Administration (HRSA) to address nursing workforce supply and demand issues (Biviano, Tise, Fritz, & Spencer, 2004). Although

the HRSA model was seen as the best available source for state-level workforce projections, there were limitations related to the model. Many at the state level did not find the HRSA model to be user friendly and some of the state-level projections were found to be inaccurate (Health Policy Institute of Ohio, 2009). Over the last decade, states have been playing a more significant role in collecting data required to study nursing workforce supply and demand. Many states have created state nursing workforce centers for the purposes of collecting and analyzing workforce data and improving nurse recruitment and retention. At present, approximately 33 states have nursing workforce centers, and each of these states is either actively collecting state-level nursing workforce data or in collaboration with other state entities in collecting and/or reporting on the nursing workforce at the state level (The National Forum of State Nursing Workforce Centers, 2013).

In December 2014, HRSA released projections extending through 2025 using the new Health Workforce Simulation Model (HWSM). "The HWSM is an integrated microsimulation model that estimates the future demand for and supply of health care workers in multiple professions and care settings" (Health Resources and Services Administration [HRSA], 2014, p. 1). Although the HWSM can provide national benchmarks for comparison, and may be the best available resource, the assumptions on which the HWSM is based may not hold true for all states. For example, the HWSM is based on the assumption that RN demand in 2012 equaled RN supply (HRSA, 2014). Yet in 2012, the RN nursing supply in Louisiana was 39,016 full-time equivalents (FTEs) and nurse demand was 42,995 FTEs (Louisiana Center for Nursing [LCN], 2013). The HWSM also is based on the assumption that RNs will continue to train at the current levels. Over the last 5 years, enrollment in Louisiana's pre-RN licensure programs has decreased by 5%. There has only been an overall 2% increase in the number of graduates from Louisiana's pre-RN licensure programs over the past 5 years; in fact, between 2012 and 2013 there was actually a 0.3% decrease in the number of graduates (Louisiana State Board of Nursing [LSBN], 2013a). These findings illustrate how important it is to use state-level data, when available, to determine the future supply and demand for nurses at the state and regional level.

The Collection of Nursing Workforce Data in Louisiana

The Louisiana State Board of Nursing (LSBN) and the Louisiana State Board of Practical Nurse Examiners (LSBPNE) have been collecting data about Louisiana's nursing workforce for over 20 years through the annual licensure renewal process and annual reports submitted by schools of nursing. The Louisiana Center for Nursing (LCN [Louisiana's Nursing Workforce Center]) was established through a Senate Resolution in 2008 as a division of LSBN. The charge to the LCN was to collect, analyze, and report on Louisiana's RN workforce. Although the LSBN and LSBPNE are the repositories for RN and APRN data and LPN licensure data, respectively, the work that has come out of the LCN reflects a community of collaborators with a vested interest in maintaining an adequate nursing workforce in Louisiana. The LCN worked closely with The National Forum of State Nursing Workforce Centers to ensure that the elements contained in The Forum's minimum datasets for nursing supply, education capacity, and demand were collected in Louisiana. The Nurse Demand Project (LCN, 2012), a first for Louisiana, represented a collaborative effort among the Nursing Supply and Demand Council (NSDC), the Department of Health and Hospitals Department of Health Standards, the Louisiana Hospital Association (LHA), the Louisiana State Nurses Association (LSNA), the Louisiana Organization of Nurse Executives (LONE), Louisiana's Long Term Care Association, and the Home Care Association of Louisiana. The work that has come out of the LCN has supported the mission of LSBN by ensuring access to a nursing workforce that not only administers safe, effective, patient-centered care but also is adequate in number. In 2012, LSBN revised its vision statement to include nursing workforce: "LSBN will be a leader in regulatory excellence that advances nursing workforce, education, and practice" (LSBN, 2013b).

Creating a Statewide Multi-Regional Forecast Model: A Collaborative Process

In September 2012, LCN received funding from the Louisiana Health Works Commission (LHWC) and LSBN to develop a nursing workforce forecasting model that could be used to predict supply and demand for RNs, APRNs, and LPNs through 2020 at both the regional and statewide level. The Northeast Ohio Nursing Initiative (NEONI) Forecasting Model (The Center for Health Affairs, 2015) was used as a template for Louisiana's Multi-Regional Statewide Nursing Workforce Forecasting Model. The NEONI Forecaster, although a very dynamic forecasting tool, was limited to 17 counties within Northeast Ohio, whereas Louisiana's Multi-Regional Statewide Nursing Workforce Forecasting Model is believed to be the only nursing workforce forecasting model that has the ability to predict supply and demand for RNs, APRNs, and LPNs at both the regional and statewide level, and identify gaps (either a shortage or a surplus) through the year 2020. The NEONI group, composed of Craig Moore, PhD, economist and private consultant; Patricia Cirillo, PhD, statistician and president of Cypress Research Group in Northeast Ohio; and Lisa Anderson, MSN, RN, vice president with the Center for Health Affairs in Cleveland, Ohio, in collaboration with Cynthia Bienemy, PhD, Director for the LCN, developed Louisiana's Multi-Regional Statewide Nursing Workforce Forecasting Model.