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Improving collection and use of interprofessional health workforce data: Progress and peril

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ABSTRACT

Background: Policymakers and other stakeholders need robust data to understand how health care system changes affect the health care workforce and the care it provides, evaluate the effectiveness of health care finance and delivery innovations, and build an adequate supply of nurses and other health professionals to care for an aging and diverse population of patients. In 2011, the Institute of Medicine released a report that called for the creation of an infrastructure to collect and analyze interprofessional health workforce data and issued specific recommendations to reach that overarching goal.

Purpose: This paper examines progress toward each of the main data-related recommendations of the Institute of Medicine Committee on the Future of Nursing, and identifies strategies that can achieve further gains in health workforce data collection.

Methods: Multiple documents and websites were reviewed to identify the extent to which each of the Institute of Medicine's recommendations have been implemented.

Discussion: There has been little progress toward the Institute of Medicine recommendations regarding data collection, with a few exceptions related to improvements in national data on ambulatory care. This can largely be attributed to a lack of funding.

Conclusion: Although there are active and strong collaborative relationships across many key stakeholders, there have not been sufficient resources dedicated to ensuring that new programs advance. More leadership, advocacy, and resources will be needed to build the robust data infrastructure called for by the Institute of Medicine.

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Introduction

Well-coordinated, evidence-based health workforce planning programs are required to ensure the United States has an adequate workforce to meet future health care needs. The Institute of Medicine (IOM) committee on the Future of Nursing recognized the importance of effective policy-making in this area and the need for timely, accurate, and comprehensive data to support it (IOM, 2011). They highlighted the need for robust data and information systems for all health professions not only to identify and remedy current and emerging shortages but also to evaluate the role of nurses and other health professionals in the effectiveness of health care financing and delivery innovations such as bundled payments, medical homes, accountable care organizations, and health information technology. Their recommendations for improved data collection and analysis were explicitly linked to the work of the National Health Workforce Commission and the National Center for Health Workforce Analysis (NCHWA), both of which were established as part of the Affordable Care Act.

The overarching data recommendation of the IOM committee was:

> Recommendation 8: Build an infrastructure for the collection and analysis of interprofessional health care workforce data. The National Health Care Workforce Commission, with oversight from the Government Accountability Office and the Health Resources and Services Administration, should lead a collaborative effort to improve research and the collection and analysis of data on health care workforce requirements. The Workforce Commission and the Health Resources and Services Administration should collaborate with state licensing boards, state nursing workforce centers, and the Department of Labor in this effort to ensure that the data are timely and publicly accessible.

Three main areas of health workforce data needs were identified by the committee. The first area is on core data sets on health care workforce supply and demand. The committee recommended both that state health professional licensing agencies collect data as part of the license renewal process and that the federal government enhance their comprehensive National Sample Survey of Registered Nurses (NSSRN). These data should support both national and regional analyses and measure the numbers of health professionals, their education and training, their places of employment, the roles they play, and the services they provide. The committee emphasized the importance of data collection and analysis across all health professions—not just nursing—because no single health profession works in isolation.

Second, the committee recommended that there be surveillance of health care workforce market conditions, supported by the core data sets. A national strategy is needed to monitor health care labor markets on a frequent basis so that emerging trends can be identified and problems can be addressed early. Many federal agencies routinely monitor economic trends to identify the potential emergence of economic recessions, rising unemployment, expansions of trade deficits, and other concerns. Similarly, regular analysis of new health workforce data could alert policymakers and industry leaders of emerging issues and assess the potential impact on access to high-quality health care services. Such data collection and surveillance systems will require collaboration between multiple federal and state government agencies, employers, professional associations, educational institutions, and state nursing workforce centers.

Finally, the committee recommended that there be coordination across federal and state agencies to ensure that data systems support health care workforce effectiveness research. Research on how the health workforce contributes to access to and quality of patient care requires multiple sources of data to generate knowledge about the roles of health professionals and interprofessional teams on the delivery of high-quality, efficient health care. Enhanced data from federal surveys such as the National Ambulatory Medical Care Survey, insurance claims, and clinical information systems are necessary for meaningful research. At present, many of these data sources are focused on physicians, and it is difficult or impossible to identify the unique roles of nurses and other health professionals in the delivery of health care. Research that explores the comparative effectiveness of different models of care delivery requires that each type of health professional be identifiable. Ideally, data would identify complementarities in the roles of those providing care.

In 2015, the IOM convened the Committee for Assessing Progress on Implementing the Recommendations of the Institute of Medicine report, The Future of Nursing: Leading Change, Advancing Health (IOM review committee). The committee concluded that "Little progress has been made on building a national infrastructure that could integrate the diverse sources of the necessary data, identify gaps, and improve and expand usable data not just on the nursing workforce but on the entire health care workforce." This article reviews progress toward the original IOM recommendations and identifies changes needed to achieve the IOM committee's vision for the future of nursing data collection. It also highlights best practices of states in data collection, to guide nursing leaders in their advocacy for and implementation of local data collection systems.

Progress Toward the Recommendations

The committee's recommendations regarding data revolved around the role of the National Health Care

Workforce Commission as a key entity that would bring together leaders from multiple professions and industries to guide data collection, workforce planning, and evaluation for the nation, states, and communities. The Affordable Care Act specifically noted that nursing workforce capacity is a high priority area for the work of the commission. The IOM committee explicitly recommended that the Government Accountability Office ensure that the commission include "adequate" nursing expertise. Nurses are the largest health occupation in the United States, accounting for about 23% of health care practitioners, technical, and support occupations (US Bureau of Labor Statistics [BLS], 2013), and thus, it was appropriate that two of the initial commission members were nurses. The first set of appointments in September 2010 included Peter Buerhaus, PhD, RN, FAAN, as Chair of the commission; two commission members were nurses, five were physicians, and one was a dentist. Other members of the commission include public health leaders, educators, and a legal expert.

Challenges Facing the Commission

The commission is currently unable to carry out its statutory responsibilities due to that fact that authorized appropriations have yet to be released by Congress. Although members of the commission were appointed on September 30, 2010, the commission is legally prohibited from meeting and members are legally prohibited from communicating until operational funds are released. For the first time since the authorization of the commission, the President's proposed fiscal year (2015) budget did not request funding for the National Health Care Workforce Commission. In past years, the president's budget had requested $3 million for the commission to begin its work to ensure that the United States had an adequate health care workforce. The IOM review committee's assessment was that the commission was going to remain nonoperational, and thus, national and state data-related efforts toward collection of core data, developing surveillance systems, and coordination across federal and state agencies would need to occur without the commission's guidance.

Collecting and Maintaining Core Data Sets About Nurses

The IOM committee recommended that core data about the nursing workforce be collected through two mechanisms: (a) brief surveys of nurses when they obtain and renew licensure from state boards of nursing, often called "minimum data sets" and (b) an in-depth national sample survey conducted periodically.

Collecting Minimum Data Sets
The IOM committee made two specific recommendations related to the collection of minimum data sets (MDSs). First, they recommended that the National Commission and NCHWA work closely with state licensing boards (nursing, medicine, dentistry, pharmacy, and others) to develop and promulgate a standardized MDS that can be used to examine demographics, numbers, skill mix, and geographic distribution. Such a data set would be created by adding a short survey to the license issuance and renewal process. Alternatively, professional and certification organizations could field a regular survey of members, as some do now. The advantage of state licensing boards conducting the survey is that all licensed nurses would be included, not only those holding a professional membership or certification. The IOM committee also recommended that the data collected by states be standardized and warehoused by NCHWA and made publicly accessible for research and analysis purposes. If state licensing boards and professional organizations use standardized questions, the data can be aggregated across states to better understand the national registered nurse (RN) workforce. Yearly data also could include unique identifiers for each respondent to support longitudinal analysis of transitions between occupations and types of employers, factors that predict changes in education level, and other professional changes.

Nursing is the largest health profession that has adopted recommendations for MDS surveys. In 2004, the National Forum of State Nursing Workforce Centers (National Forum) was established with 13 state participants to provide a sustainable network for collaboration and communication among statewide nursing workforce entities. One of the original goals—that is still a priority—is to assure standardized core nursing supply and demand data sets (National Forum, 2014). A study led by the Florida Center for Nursing in 2003 found that 70% of the participants had a significant role with workforce data collection and/or analysis (Cleary & Rice, 2005). By December 2008, 26 National Forum states were identified as collecting nurse workforce data (Nooney et al., 2010). With funding from the Center to Champion Nursing in America and in-kind contributions from the members of the National Forum, the Florida Center for Nursing led an effort to reach consensus on the content of MDSs for nurse supply, nurse demand, and nurse education. Created through a rigorous process of consensus building, the National Forum ratified the recommendations for the content of the three data sets in September 2009.

In 2015, National Forum reported that 31 states collected the Nursing Education Program Dataset, 30 collected the Nursing Supply Dataset, and 20 collected the Nursing Demand Dataset (National Forum, 2015); detailed information about which states collect data is provided on their website at http://www.nursingworkforcecenters.org/minimumdatasets.aspx. The dashboard that tracks progress toward implementing the IOM committee's recommendations surveyed all states regarding their data collection, including those without State Nursing Workforce Centers (Spetz et al., 2013). In early 2014, 16 states were collecting the complete set of 14 supply MDS variables queried for the dashboard, and an additional 19 states were collecting

at least 12 variables. Between 2010 and 2014, 22 states increased the number of supply variables they collect about their RN workforce. State-level data from the dashboard are available at http://campaignforaction. org/dashboard.

The National Council of State Boards of Nursing (NCSBN), in collaboration with the National Forum of State Nursing Workforce Centers, made an attempt to develop a database that would allow state licensing boards to share MDSs through the NCSBN's nationwide license verification system—Nursys. Initial recommendations were that state boards of nursing should survey nurses during the relicensure process, and these data would then be submitted to NCSBN as part of Nursys and warehoused at their Chicago offices for analysis. Few states have agreed to share their nurse survey data due to issues of confidentiality, and it seems doubtful that Nursys will be able to deliver the data necessary to make accurate nationwide estimates of nurse supply in the foreseeable future.

Since the IOM committee's recommendations, NCHWA has led a program to develop guidelines for a Health Professions Minimum Data Set Survey (Hosenfeld, 2013). NCHWA began with an assessment of the types of data collected for physicians, nurses, advanced practice nurses, physician assistants, physical therapists, pharmacists, dentists, dental hygienists, occupational therapists, psychiatrists, psychologists, social workers, licensed professional counselors, and substance abuse counselors (Hosenfeld, 2013). They considered the alignment of key variables across data sources and drafted recommendations for data elements and terminology. They convened stakeholder organizations to finalize the recommendations, and some professions have started to incorporate the recommendations into their data collection. Data have been collected for physician assistants and occupational therapists, and pharmacy data have been incorporated into previously existing systems. NCHWA has maintained a close relationship with the National Forum of State Nursing Workforce Centers throughout this process.

Several states provide models of successful RN workforce data collection systems. Florida, Texas, New York, and California have excellent data, and all use different approaches to data collection and data sharing. In Florida, the Florida Center for Nursing collects all three minimum data sets. In 2009, in collaboration with the Florida Board of Nursing, a nurse workforce supply survey was incorporated into the online licensure renewal system. An e-file of the data is provided to the Florida Center, and the analysis results are reported biennially in sync with the nurse license renewal cycle. Although participation is voluntary, response rates are consistently high as evidenced by the 2012 to 2013 renewing cohort: licensed practical nurses (94%), RNs (96%), and advanced RN practitioners (97%). Annually since 2007, the Florida Center conducts an online survey of all nursing education programs in the state; participation rates for the academic year 2012 to 2013 survey were similar to prior years at 57% for the

154 licensed practical nursing programs, 51% for the 154 associate degree nursing programs, 59% for the 37 baccalaureate nursing programs, and 61% for the 37 post-licensure baccalaureate and higher degree programs. In 2007, the Florida Center initiated a biennial paper survey of nurse employers, attaining response rates ranging from 16% for home health agencies (16%) to 57% for public health departments (Florida Center for Nursing, 2014). The outcome of these data collection efforts is the ability to publish supply, demand, and education reports that include trended information over time, offer recommendations to address areas of concern, and provide an objective basis for decision making and policy formation. The Florida Center's work is published freely for public use and researchers can access deidentified data.

In Texas, three data sets are collected through relationships established by the Texas Center for Nursing Workforce Studies (TCNWS). Supply data are collected by the Texas Board of Nursing (TBON) through their licensure process. Once a year, the data are collected from the TBON and processed by the Texas Health Professions Resource Center for the TCNWS. The data are cleaned and geocoded to drill down to the nurses working in a nursing position at a Texas address. The TCNWS and the TBON collaborate on the Nursing Education Program Information Survey, an annual survey that goes out to all professional, vocational, and advanced practice registered (APRN) nursing education programs in Texas. Although this survey is mandatory for all professional and vocational nursing programs, there is also 100% participation from nursing education programs that lead to APRN authorization in Texas. The Texas Higher Education Coordinating Board is another source for nursing education numbers in Texas. The TCNWS has been collecting nurse staffing data through employer surveys since its inception. Nurse staffing surveys have been sent to hospitals every other year since 2004, and additional employers of nurses have been surveyed since 2008. As of the 2013 to 2014 data collection cycle, hospitals, long-term care facilities, home health and hospice facilities, and governmental public health agencies have been surveyed and their response rates were 63%, 38%, 43%, and 77%, respectively. The TCNWS employs the use of task forces for each employer surveys to form collaborative relationships with representatives from these settings who provide input on the surveys and their implementation as well as help garner support and participation from these employer groups. Since the ratification of the nurse minimum data sets established by the National Forum, the TCNWS and the TBON have worked toward incorporating as much of these data sets as possible into nurse data collection in Texas.

New York has a voluntary survey that is included as part of reregistration of nurses, physicians, nurse practitioners, physician assistants, dentists, and dental hygienists. The RN survey is available to those reregistering both online and on paper; the surveys conducted between 2007 and 2013 represent more than

40% of the state's licensed RNs. The data are analyzed by the Center for Health Workforce Studies at the University at Albany, State University of New York. The center also conducts an annual survey of New York RN education programs to obtain information about applications, admissions, and graduations. In 2013, the response rate for this survey was 90%. In close collaboration with multiple provider organizations, the center conducts an annual provider demand survey of the human resources directors of hospitals, nursing homes, home health care agencies, and federally qualified health centers. Summary reports for these surveys, which include regional analyses, are published on the Center's website and are used by government, nursing, and other health care leaders to formulate workforce policies in the state.

California uses a different data collection approach than many other states; rather than conducting a survey of all RNs when they renew their licenses, the California Board of Registered Nursing conducts a sample survey every 2 years. Since 2005, the University of California, San Francisco (UCSF), has been contracted by the state to conduct the survey, which was mailed to 10,000 RNs with active California licenses in the past three survey cycles. The survey questionnaire, which is fielded on paper but available as a web survey to those who prefer to respond online, includes about 70 items, many of which are aligned with the NSSRN. The questionnaire includes more than 30 items related to RN job satisfaction and work experience, most of which can be compared over time. The sample is selected to ensure that each of nine regions in California have sufficient data to report regional demographics and employment patterns. Response rates have averaged 60% since 2004, and the data are weighted using standard methods to ensure the results are representative of regional and statewide RN populations. UCSF produces a report that provides extensive results from the survey, as well as a public-use deidentified data file for research use. UCSF also has collected data from California RN education programs for the Board of Registered Nursing annually through an online survey; all prelicensure programs provide information about applications, enrollments, graduations, and demographic characteristics of students and faculty. These data are summarized in the annual schools report, and an interactive Excel workbook is available to the public to examine the data by region and by type of education program (associate degree, baccalaureate, entry-level masters). The school data and the sample survey are used by UCSF to produce biennial forecasts of future RN supply in California. Finally, UCSF has collaborated with the Hospital Association of Southern California and HealthImpact (formerly the California Institute for Nursing and Health Care) to conduct annual surveys of hospital chief nursing officers and human resources directors, with support from the Gordon and Betty Moore Foundation. The survey questionnaires are designed to include MDS elements as well as a series of questions focusing on employment of newly graduated RNs. All these data are shared with HealthImpact, which is the state nursing workforce center, to support their work toward improving nursing in California, as well as the California Action Coalition.

Advancement of the IOM committee's recommendation regarding collection of MDSs faces a number of challenges. Conducting such a survey requires that states dedicate financial and personnel resources to revise license issuance and renewal paperwork and online systems to include the questions; to enter paper data into a database; to review the data to ensure data quality and address potential data errors; and to analyze the data. Ideally, MDS surveys would be a mandatory part of the licensing process. However, among state nursing boards that collect MDS information, many allow optional provision of the data. Response rates as low as 22 percent have been reported when submission is not required (Spetz & Kovner, 2011).

When MDSs are collected, they are not always shared across agencies or with external organizations. For example, Massachusetts collects MDS information as part of RN license renewal but did not release any reports summarizing findings from the data until after two cycles of data collection. Most states do not have provisions for allowing public or researcher access to MDS data, although some states allow analysts at independent state nursing workforce centers to receive the data. Development of public-use data files in standardized formats would facilitate deeper analysis of the data and linking data across states for regional or national research.

The Campaign for Action is encouraging states to move forward with MDSs for their RN licensees. In late 2013, the foundation published a series of briefs explaining why states should collect MDSs (Fraher, Gaul, & Spero, 2013c), how they can develop data collection and analysis systems (Fraher, Gaul, & Spero, 2013a), and what data should be collected (Fraher, Gaul, & Spero, 2013b). These resources, along with those produced by the National Forum of State Nursing Workforce Centers and NCHWA, should help increasing numbers of states move forward with MDS collection.

Bolstering the NSSRN

The IOM recommended that the U.S. Health Resources and Services Administration (HRSA) enhance its long-standing NSSRN by conducting it every 2 years (rather than every 4 years); having a larger sample size to improve within-state analyses; expanding the data collected on APRNs; and ensuring that the results of the survey are released more rapidly. However, despite this recommendation, the NSSRN has not been conducted since 2008, ending more than 30 years of quadrennial surveys, and the NCHWA has not announced plans to conduct the survey in the future (Spetz, 2013). NCHWA conducted a National Sample Survey of Nurse Practitioners in 2012, but the survey was too small to support state-level analyses, and the data were not released until 2014 (NCHWA, 2014a).

With the demise of the NSSRN, a collaborative was established between the National Council of State Boards of Nursing (NCSBN) and the National Forum of State Nursing Workforce Centers to survey nationwide sample surveys of nurses in 2013 and 2015. The random samples of RNs were drawn from the NCSBN licensure database, and survey questions were based on the MDS items. Extensive details on the survey process and its findings are available elsewhere (Budden, Zhong, Moulton, & Cimiotti, 2013). Although the NCSBN surveys were mailed to larger samples of nurses than prior NSSRN surveys, both samples were small relative to the 4 million nurses currently licensed in the United States, and the NCSBN survey contained significantly fewer survey items than the NSSRN. After the 2013 survey was complete, NCSBN provided each state nursing workforce center and licensing board with their state's data, but the data were not analysis-ready, and the sample in each state was small. The NCSBN has not made national data from the 2013 survey available to workforce and policy analysts.

Creating a Surveillance System on Health Care Workforce Market Conditions

The IOM committee recommended that a national system be developed to systematically measure and project nursing workforce requirements by role, skill mix, region, and demographics. For more than a decade, the NCHWA and its predecessor agencies have developed and revised national and state nursing workforce projections. The NCHWA model has been widely used, although states found that the data supplied with the models tended to underestimate the supply and demand for nursing services (Nooney & Lacey, 2007). The new health care demand simulation model and health workforce supply model were released in late 2014, based on a microsimulation model developed by IHS Global, Inc. (NCHWA, 2014b). This report provided supply and demand projections for RNs and licensed practical nurses/licensed vocational nurses. A Web-based platform is now available with which states can generate supply and demand models by entering their state-based data and other assumptions about attrition from or entrance into the profession (https://desam-prod.hrsa.gov/Nursing Model/Account/Login?ReturnUrl=%2fNursingModel%2f) (IOM, 2015).

Some states have developed their own projection models, but these appear to be few in number because many states do not have the financial backing to sustain such an undertaking. In California, at the request of the California Board of Registered Nursing, forecasts of the supply and demand for RNs have been published every 2 years since 2005. The California forecasting model is provided as an Excel workbook in which users can change the assumptions of the model and learn how such changes might affect the forecasts. State-level forecasting reports have been generated through the Center for Health Workforce Studies at the University of Washington and the State University of New York in Albany. The Florida Center for Nursing and the Washington Center for Nursing are two examples of nursing workforce centers that are projecting the supply and demand for nursing services in their respective states using the MDS and validated analytic models.

Coordination Across Federal, State, and Local Organizations for Nursing Data Collection

The IOM Committee recommended that the Workforce Commission and NCHWA coordinate workforce research efforts with multiple federal agencies, state and regional educators, employers, and state nursing workforce centers. Interorganizational coordination is difficult due to the fact that organizations are divided by their identities and boundaries that are based on differences in status (Gittell & Weiss, 2004). Yet, developing a strong means of communication and collaboration among organizations at all levels is essential to work toward improving the capacity of the nursing workforce to deliver high-quality, efficient health care. Relationships that cross the boundaries of federal, state, and local organizations must be developed and maintained to advance the agenda on the health care workforce. Not doing so will only result in duplication of efforts and excessive spending at a time when funds are limited.

The federal government has played a key role in convening nursing stakeholders to identify emerging issues and important policies. In 1953, statisticians from the Division of Nursing Resources of the Public Health Service and the American Nurses Association established the Interagency Collaborative on Nursing Statistics (ICONS) to coordinate research efforts on issues as they relate to the nurse workforce. ICONS has developed a set of terminology based on the MDS and has considered an expansive list of topics related to education, regulation, care delivery, and supply and demand. Members of ICONS represent organizations responsible for the collection and analysis of nurse workforce data; yet, ICONS's only recent publication is a simple listing of data sources on nursing (ICONS, 2014).

The most prominent national surveys that include data about the nursing workforce are the Current Employment Statistics survey from the Bureau of Labor Statistics, which has information about labor markets and working conditions and the American Community Survey from the US Census Bureau, which collects data on individuals' employment, demographics, and economic circumstances. Because these surveys are not focused on the health care workforce, they do not have sufficient sample sizes to study relatively small professions or to disaggregate data for every state.

NCSBN has data that include licensure, discipline, and practice privileges of licensed nurses (RNs and licensed practical/vocational nurses) for states that contribute data to the NCSBN's NurSys data system

(NCSBN, 2016). These data are not made publicly available for research purposes at this time. Other nursing organizations, such as the American Association of Nurse Practitioners, have conducted surveys of their membership or the nursing specialty they represent, but these efforts are not coordinated.

Data sharing among organizations is a challenge especially if confidentiality was guaranteed during the time of data collection. In addition, data sources have to be integrated so that they are available to organizations at all levels. Experts have recommended that agencies develop systems that allow the sharing of as much data as possible but also realize that data security must be maintained at all times (Harris, Khan, Paul, & Thuraisingham, 2007). Developing systems that will allow interorganizational data exchange will be a costly venture that organizations will most likely struggle to implement and/or sustain due to fiscal restraints.

Other national data sets provide data about the delivery of health care and could be enhanced to support research on the relationship between nursing and patient outcomes. After the IOM committee report was published, the National Center for Health Statistics added items to the National Ambulatory Medical Care Survey, a national survey of ambulatory care services, to include data on nurse practitioners and other nonphysician clinicians in physician practices (CDC, 2015b). Similarly, the National Health Interview Survey, also conducted by the National Center for Health Statistics, modified a question to include nurse practitioners and physician assistants among the health care providers survey respondents may have seen in the prior year (CDC, 2015a; State Health Access Data Assistance Center, 2013).

Conclusions

Recognition of the value of health workforce data is evident. As the largest health occupation in the United States, nursing has received more attention than most other occupations; however, there has been little progress toward most of the recommendations of the IOM Committee on the Future of Nursing. This can largely be attributed to a lack of funding. MDSs have been adopted by many states, and enhanced in others, but states find it challenging to dedicate resources to the data collection, management, and analysis required to support MDSs. The NSSRN has not been conducted since 2008, likely due to funding cuts to NCHWA that occurred after that last survey; the 2012 National Sample Survey of Nurse Practitioners addressed a key subgroup of the nursing workforce but its sample was too small to support state-level analysis, and it is unknown whether it will be conducted again.

The IOM committee's recommendation that a monitoring system be developed to track emerging trends in the nation's health workforce and support policy analysis and evaluation has not been realized. In addition, forecasting models have not been updated frequently enough to support national and state policy-making to ensure an adequate future workforce.

Call to Action

The IOM review committee recommended that the Campaign for Action promote collaboration among organizations that collect workforce-related data, particularly since the National Health Care Workforce Commission is not able to fill this role. Through the Campaign's leadership, organizations can work together to determine how they might create more robust data sets, make data available to researchers, and provide analyses to policymakers and health workforce planners. The IOM review committee also charged states with the task of implementing the MDS and sharing their data with the NCSBN. The NCSBN and other nursing organizations that collect data should collaborate to share their data with each other.

The review committee noted that it would be ideal if nursing data could be warehoused by NCHWA, so that NCHWA would be a repository of multiple sources of data about nurses and other health professionals. The review committee also reiterated the original recommendation that NCHWA conduct a combined NSSRN and National Sample Survey of Nurse Practitioners more frequently than once every four years. Other federal agencies also can play an enhanced role in gathering information about the nursing workforce. The IOM review committee recommended, for example, that the American Community Survey include questions to ascertain whether a respondent is currently licensed as a nurse, so information about those licensed but not working in nursing can be tracked.

In addition to these recommendations of the IOM review committee, we propose that nursing leaders and advocates should play a role in supporting the implementation of the initial IOM committee recommendations. Nurses should communicate with their Congressional representatives to express support for budget provisions that provide adequate funds to NCHWA to carry out its mission of collecting data and evaluating the adequacy of the health care workforce. State boards of nursing can advocate for implementation of MDS questions as part of the license renewal process and request that most of these questions be mandatory. The support of the MDS by RNs will be essential to overcome legislative hurdles and ensure that high-quality data are collected. Nurses can support this recommendation by communicating with their state legislative representatives and state government agencies about the importance of improving data collection. And, nurses should be attentive to the surveys they receive because their individual completion of surveys supports state workforce planning needs.

Organizations that collect data about the nursing workforce, such as state government agencies, the

American Association of Colleges of Nursing, American Association of Nurse Practitioners, and NCSBN, should develop public-use deidentified data files for researcher use. They also should develop mechanisms to allow researchers to access and merge data that might contain identifiers. One possible approach is to have an in-house data service, through which a researcher can pay for programming time to merge and then deidentify data. This approach has been used by the National Database on Nursing Quality Indicators to support research. A second approach is to establish a confidential data analysis center, such as those provided for surveys such as the American Community Survey and the California Health Interview Survey, through which researchers can analyze restricted data in a virtual private network. Most federal agencies engaged in data collection have such systems in place, as do many states.

To ensure an adequate workforce, understand how changes in the health care system impact the workforce and the care it provides and evaluate the effectiveness of workforce innovations, improvements to data collection, analysis, and monitoring are needed. The IOM committee's recommendations all remain pertinent and all need wider recognition of the value of health workforce data, sufficient leadership and funding to advance.

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