


The Research and Policy Importance of Nursing Sample Surveys and Minimum Data Sets

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Abstract

This article reviews the information gathered by the National Sample Survey of Registered Nurses (NSSRN) and other sources of data on the registered nurse (RN) workforce. It examines how the data have been used to create knowledge about the RN workforce and highlights the relative strengths and weaknesses of different data sets. Recommendations for future data collection affirm the Institute of Medicine's recommendation that both license-record based minimum data and the NSSRN be collected in order to help the United States and states meet current and future nursing needs.

Keywords

nursing /health care workforce issues, research methodology, federal legislation

Since 1977, the U.S. federal government had conducted surveys of registered nurses (RNs) in the United States to gather detailed information about their supply, education, and practice characteristics. This survey, called the National Sample Survey of Registered Nurses (NSSRN), was fielded every 4 years from 1980 to 2008 by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services. Many states also have conducted surveys of RNs for their own use in workforce research and planning. The data from these surveys provide rich information that has been used to understand cycles of RN shortage and surplus, the factors associated with nurses' educational attainment, reasons RNs choose to work outside nursing, and RNs' future plans regarding nursing employment. In addition, national and state-level agencies use these data to develop forecasts of the future supply of RNs, develop policy strategies to address workforce shortages, and evaluate programs.

The value of these surveys was recognized by the Institute of Medicine (IOM) Committee on the Future of Nursing in 2010 when it recommended that HRSA enhance the NSSRN by increasing its frequency to every other year, expanding the sample size, and releasing results more quickly (IOM, 2010). The IOM also recommended that HRSA work closely with states to support the collection of additional data through RN licensing processes. This state-level data collection would focus on creating a "minimum data set (MDS)" of basic information about education and employment, while the NSSRN would provide more in-depth information. By recommending both that MDSs be developed and that the NSSRN be continued and conducted more frequently, the

IOM underscored the value of both types of data. Basic licensure data are essential to program planning and policy making, and more detailed sample surveys are critical to national and state-level research and policy development.

Despite the IOM's recommendations, HRSA last conducted the NSSRN in 2008. The survey was not fielded in 2012, there has not been a solicitation for proposals to conduct the survey in 2013 or 2014, and no statement about any future NSSRN has been made. HRSA has engaged in some preliminary work to support development of a national MDS but, as described below, MDS creation will be the responsibility of states and thus progress toward complete national data will likely be slow. Thus, the loss of the NSSRN creates a significant gap in information about the RN workforce of the United States. While some of this gap can be filled with other data sources, there will remain important lapses in knowledge if the NSSRN is not reinstated.

This article reviews the information gathered by the NSSRN and how the data have been used to create knowledge about the RN workforce. It also explores alternative sources of data, highlighting their relative strengths and weaknesses. It concludes by affirming the value of the NSSRN, and supporting the IOM's recommendation that both license-record based minimum data and the NSSRN be

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collected in order to help the United States and states meet current and future nursing needs.

The History and Approach of the NSSRN

There have been efforts to collect data about the RN workforce of the United States since the mid-1900s. In the 1940s, the American Nurses' Association (ANA) began to develop an inventory of RNs using data obtained as part of license renewal (Reichelt & Young, 1985). These data focused on education and employment status, but policy leaders found the data did not provide sufficient information to understand the causes of persistent RN shortages or develop policies to address them. Thus, the federal government established the first NSSRN in 1977, with the ANA as the contractor conducting the survey, to develop a comprehensive national source of information about the nation's RN workforce and guide policies to ensure adequate RN supply in the future.

In fact, federal agencies are required to collect data on the nursing workforce. The Nurse Training Act of 1975 (Title IX, Public Law 94-63, Section 951), which was established to address a severe RN shortage that emerged in the 1970s, included a mandate to collect data on the nursing workforce to provide national and state-level estimates on the number and distribution of nurses, type of employment and practice location, numbers working full-time and part-time, average rates of compensation by type of practice and location of practice, employment and activities of nurses with advanced training and graduate degrees, and immigration of nurses from other nations. Section 792 of the PHS Act (42 USC 295k, enacted 1992) continued this mandate by calling for a program to collect, compile, and analyze data on health professions, including nurses, and the Health Professions Education Partnerships Act of 1998 (Public Law 105-392, Section 806 (f)) expanded the data collection by requiring that information about workforce diversity be obtained, along with more data about education and practice. Most recently, the Affordable Care Act established the National Health Workforce Commission, which would provide advice and guidance to federal agencies regarding health workforce policy. However, Congress has not appropriated funds to support the Commission, and thus the Commission has not been able to meet or engage in any work. The lack of funding to support health workforce policymaking is likely a factor underlying the failure to conduct the NSSRN on its historical schedule.

The NSSRN established several distinctive approaches to data collection that were highly successful and continued through 2008. First, the survey was a sample survey, for which a specific group of RNs—or sample—is selected to receive the survey, rather than the entire population of RNs. For each cycle of the NSSRN, the sample has been designed so that there are sufficient numbers of respondents from every state to generate both national and state-level estimates

of the characteristics of the RN population (Spetz, 2011). Second, the survey is conducted using multiple modes of contact. The main component of the data collection is through mailed surveys, but this is supplemented with telephone contact and, in 2004 and 2008, a web-based option to complete the survey. The telephone contact is intended both to remind nonrespondents to complete the survey and to obtain complete information from respondents who skip key questions or provide inconsistent data. Third, the survey questionnaire has been comprehensive, with questions about education, employment, and demographics. The questionnaire is revised slightly between each survey cycle, but has been consistent enough across years to allow for detailed comparisons of key statistics. The 2008 survey was 16 pages long, and even with this length achieved a 62.4% response rate. Every NSSRN has achieved a response rate as least as high as this, and the number of RNs represented in the data files has been approximately 30,000 since 1980 (Spetz, 2011).

The main drawback of the NSSRN is that it has been conducted only once every 4 years. Labor markets can change significantly during a 4-year period, and thus this gap makes it difficult to assess the impact of economic and policy changes that occur more rapidly than the 4-year data collection cycle (Nooney, Cleary et al., 2010). In addition, the length of the questionnaire and large sample make the data preparation and analysis cumbersome; results have typically been released a year or more after the time the data collection closes. Although the NSSRN includes data on a large number of nurses, small subpopulations such as certain clinical specialties and racial/ethnic groups are not well-represented in the data and thus estimates for these populations are imprecise (Hanrahan et al., 2003; Nooney, Cleary et al., 2010).

Other Sources of RN Data

Other data sources can be used to study the RN workforce. These include state license data; license renewal-based "MDS"; data from the U.S. Bureau of Labor Statistics' Current Population Survey (CPS); and data from the U.S. Census Bureau's American Community Survey.

State License Data

All U.S. states and the District of Columbia maintain records on the RNs licensed to practice in their state. Some RNs are licensed in multiple states, and thus simply counting licensing data will double-count some nurses. In addition, there is a national Nurse Licensure Compact that allows nurses residing and licensed in participating states to practice in other participating states without obtaining additional licenses (National Council of State Boards of Nursing [NCSBN], 2009). Thus, an RN licensed and residing in North Carolina is permitted to work in South Carolina without having a license from South Carolina. The license records for South Carolina will not count this RN as part of their supply. The

National Council of State Boards of Nursing (NCSBN) has developed a data repository into which state licensing boards can contribute their data; this database, called NurSys, identifies nurses who are licensed in multiple states to produce unduplicated counts of nurses in participating states. The main advantage of these data systems is that they include all RNs, not just a sample of them.

State licensing data have several disadvantages. Most states collect only basic demographic information: year of birth, initial RN education, year of completion of that education, and year of first licensure in that state. Some states also collect information about nurses' gender, racial/ethnic background as part of the licensing process. Another disadvantage is that demographic information may not be updated. All states require that nurses regularly renew their licenses, but states may not ask for updated information about additional education completed. In theory, license records could be analyzed to examine residence changes of nurses, and for some states to study nurse diversity, if the state collects such data. Finally, not all states release these detailed data to the public; public data are usually limited to simple mailing lists, making these data of limited use for understanding the nursing workforce.

State Relicensure Surveys

In order to learn more about the nursing workforce, some states have leveraged the license renewal process to obtain more information about RNs through short surveys. These surveys are usually included as part of license renewal forms, either on paper or online, and analysis of the data can be conducted by the state's licensing board, a state nursing or health workforce center, a university, or through a collaboration of any of these types of organizations (Nooney, Cleary et al., 2010). The effectiveness of this survey method varies widely, with response rates ranging from 22% to 99% (Spetz and Kovner 2011). Some states require that RNs complete the survey in order to renew a license; however, in many states the survey is optional and response rates have been lower than desired. For example, Wisconsin conducted relicensure surveys in 2001 and 2005, which were managed by the Wisconsin Nurses Association. In 2001, the response rate was 63%; in 2005, it was only 22%, after which the state discontinued the effort (Spetz & Lindler, 2007).

As of 2007, surveys conducted as part of RN license renewal—often called “relicensure surveys”—had been conducted in 14 states. Some licensing agencies enlist a university or state nursing workforce center to conduct analysis of the data, while others analyze the data internally. Access to the data for research purposes varies as well, with some states developing public-use research files and others blocking nearly all access to the data. An analysis of state-level data collection on the RN workforce conducted in 2012 for the Robert Wood Johnson Foundation's Campaign for Action found that some information is widely collected

either through sample surveys or license renewal surveys, while other data are less often obtained. For example, 45 states have information on the gender of their RNs, and 43 have the highest level of RN education attained. Only 34 have data on whether their RNs are employed in nursing, 21 know whether RNs have more than one nursing position, and 16 ask reasons RNs are not employed in nursing.

MDS Recommendations

In 2008, the Forum of State Nursing Workforce Centers (“Forum”) established an initiative to establish a national repository of RN workforce data based on surveys conducted by states. For this effort to be successful, the Forum recognized that standard questions needed to be asked so that data could be merged and compared across states. Through a careful process of research by an expert panel and feedback from the public, the Forum developed a set of recommended questions that constitute a “MDS” for measuring RN supply (Moulton et al., 2012; Forum of State Nursing Workforce Centers, 2009). The MDS consists of 18 questions that include education (initial and highest), location of education, year of education, whether the nurse is employed in nursing and in how many jobs, type of employment setting, employment location, job title, nursing specialty, hours worked per week, reasons for being unemployed, gender, and race/ethnicity. In 2011, the Forum identified 27 states that were collecting at least some nurse workforce data, although it was not reported how many of these were using a relicensure survey method or were using their recommended MDS questions (Moulton et al., 2012).

Bureau of Labor Statistics: CPS

The CPS is a monthly national probability sample of households that captures data on more than 100,000 people, which has had a relatively consistent set of questions since 1979. It is collected by the Bureau of Labor Statistics, and in most years about 3,000 RNs are represented in the data. In this survey, RNs are identified by their occupation, not their education or licensure. Thus, nurses who are retired or employed in nonnursing occupations will not be identified as RNs in the CPS. People who report their occupation is “RN” and that they are unemployed can be identified. Thus, the CPS cannot be used to examine decisions of RNs to work in the nursing profession, and the data will not facilitate analysis of the choice to leave the nursing profession or to retire. In addition, because the number of RNs represented in the CPS is relatively small, state-level analyses are generally not feasible with these data.

Education data provides only the highest grade or school or degree attained, and does not include information about the field of study. Thus, people who have completed RN education programs cannot be identified if their current occupation is not nursing; moreover, one cannot assume that

the highest education attained was in a nursing or nursing-related field. The location in which education was completed also is not recorded, so internationally educated RNs cannot be clearly identified.

The CPS has rich data on all household members, and thus can be used to study family structure, spousal employment, and extended family living arrangements. It also has detailed information about household income, including earnings, unemployment compensation, Social Security and Supplemental Security Income, public assistance received, pension and retirement income, interest and dividends, alimony and child support, and other sources of income.

Census Bureau: American Community Survey (ACS)

The American Community Survey (ACS) is a large-scale national survey administered by the U.S. Census Bureau. Roughly 65,000 households are surveyed every month over the course of a year, representing about 2.5% of the population. The full set of data is published annually in a series of pretabulated profiles, tables and maps. In addition to these pretabulated products, ACS data is available as a 1% public use microdata sample (PUMS) file. As with the CPS, nurses are identified by whether they self-declare that their occupation is nursing. In 2009, nearly 30,000 RNs were represented in the ACS (Bates & Spetz, 2012).

Education data is somewhat more detailed in the ACS than in the CPS. Since 2009, the ACS has provided the major field of study for an individual's bachelor's degree and thus one can identify whether a bachelor's degree is in a nursing major or other field. As with the CPS, the ACS collects demographic and family information, as well as data about income and other benefits such as health insurance. Some data about expenses also are collected.

Because the ACS has a larger number of RNs in the data, it is usually preferred to the CPS for analyses of the RN workforce. The CPS provides a longer time-series of data, so is advantageous for examining long-term changes over time at the national level. The ACS sample is large enough that it can be used to generate state-level estimates of RN characteristics for many states. Analyses that compare the ACS to the NSSRN demonstrate that the NSSRN's sampling approach, which is designed to ensure that state-level analyses can be conducted, does indeed produce more reliable information for smaller states (Bates & Spetz, 2012).

NSSRN Data Fields and Uses

Each NSSRN has been accompanied by a report published by HRSA providing in-depth information about the RN workforce (Roth, Graham, & Schmittling, 1979; Health Resources and Services Administration [HRSA], 1983, 1986, 1990, 2006, 2010; Moses, 1994, 1998; Spratley, Johnson, Sochaski, Fritz, & Spencer, 2002). After the report

is published, a datafile of the survey responses is produced for the public. The public-use data files from every NSSRN can be downloaded from HRSA's website at no charge. The data are well-documented and can be easily analyzed for those who want in-depth information not summarized in the published reports.

The data from the 2000 NSSRN was used by HRSA to develop national and state-level forecasts of the future supply of and demand for nurses (HRSA, 2002); these forecasts spurred efforts to implement policies and programs to remedy the shortage. These data have been used by other government organizations and committees such as the National Advisory Council on Nurse Education and Practice (NACNEP) to produce reports. Many states have used the NSSRN data to describe the size and characteristics of their RN workforce. And, the NSSRN data have been used by numerous researchers to both complete policy-focused analyses and conduct foundational research to understand the behavior of RNs and the RN workforce. In addition to these uses of the data, independent researchers have conducted numerous studies using various data from the NSSRN, as described below.

Education of Nurses

The NSSRN has traditionally collected in-depth information about RN education, and thus can be used to conduct research on the educational trajectories of nurses, the value of both nursing and nonnursing education, and the links between education and career paths. Research on nursing education that has used the NSSRN has included both descriptive analyses as well as empirically and theoretically rigorous studies.

As previously described, the CPS and ACS provide data only on the highest level of education completed; the CPS does not indicate the field of study, and the ACS only reports the field for baccalaureate education. The Forum's Supply MDS includes initial RN education and highest level of education attained in either a nursing or nonnursing field. The NSSRN obtains detailed information not only about the type of initial nursing education, but also for each additional degree completed. The survey also records the year and location (state or country) in which initial nursing education was completed, along with the location and year of completion of all additional nursing education. These data enable detailed analysis of the gaps between degree completions, the path along which an RN continues nursing education, the link between geography and education, and relationships between education and employment (e.g., Spetz, 2002).

Moreover, the NSSRN obtains data about nonnursing education. First, it asks respondents to report the highest level of education completed before initial RN education. These data have enabled researchers to quantify growing numbers of RNs who have entered the profession as a second career, often after completing postsecondary degrees in other

fields. The survey also requests information about nonnursing degrees completed after RN licensure, including the year and location of those programs. Respondents also indicate whether each nonnursing degree is related to their nursing work. This information can be used to understand the contributions of nonnursing education to nursing careers; for example, to learn how nurses with doctoral education in public health, sociology, and other fields serve as faculty, researchers, and leaders.

The NSSRN also is the only survey that specifically asks the country in which initial RN education was completed, and thus internationally educated RNs can be studied. This information has been used in research on the internationally educated RN workforce, ranging from descriptive studies (Brush, Sochalski, & Berger, 2004) to detailed analyses of employment, earnings, and changes over time (Xu & Kwak, 2006, 2007; Xu et al., 2010). The CPS and ACS record country of birth, as well as age of immigration; some researchers have used these items to estimate the number of RNs who are internationally educated and obtained similar numbers as the NSSRN (Auerbach, Staiger, Muench, & Buerhaus, 2012). But, because these other surveys do not include detailed education data the relationship between immigration and labor market outcomes can only be approximated with these other surveys.

The NSSRN has been used extensively to study the relationship between RN education and earnings. The detailed education information in the NSSRN has been central to this research and has enabled researchers to understand the independent contributions of initial RN education and postlicensure education (Booton & Lane, 1985; Link, 1988, 1992; Lehrer, White, & Young, 1991; Mennemeyer & Gaumer, 1983; Schumacher, 1997; Seago & Spetz, 2002; Spetz, 2002). Differences in the returns to education for urban and rural nurses have been measured as well (Pan & Straub, 1997).

Demographic Characteristics

All of the surveys described in this article include demographic information including age, gender, race/ethnicity, marital status, and whether children are present in the home. The NSSRN, ACS, and CPS also measure total household income. Starting in 2000, the NSSRN also asked about language fluency. This item has been used to study the value of bilingualism, finding that bilingual registered nurses receive wage premiums of up to 7%, and that the premium was associated with the fraction of the population that spoke Spanish in the RN's county of employment (Kalist, 2005).

Employment

The CPS and ACS provide basic information about employment—specifically, the industry in which the RN works and the number of hours worked per week. The MDS developed by the Forum of State Nursing Centers asks for

hours per week as well, and recommends that this be obtained for all nursing positions held. The NSSRN adds detailed questions about what the respondent considers to be his or her “principal” nursing position—the position in which the greatest number of working hours is spent. These questions include the specific job title and clinical areas in which the respondent works. The MDS also asks for job title and clinical specialty, although the response categories are not as detailed as in the NSSRN. The NSSRN questions about the clinical settings and patient populations with whom the nurse works have been revised over the years, including a substantial restructuring of these questions in 2008. The NSSRN also asks respondents to report the percent of their work time spent on each of set of activities, including direct patient care, teaching, and management. The NSSRN is unique in asking for data on the number of weeks they work per year, and hours per week, for each of their nursing positions. In some years, the NSSRN also has asked for information about hours worked on an overtime basis, and on-call hours. These additional variables provide insight about how employers meet their staffing needs during RN shortages, and the workplace stress faced by RNs.

Because the NSSRN provides data for all RNs, not just those working, the data can be used to study employment decisions of licensed nurses. And, because the data in the NSSRN are more detailed than in the MDS, the NSSRN allows for more detailed and sophisticated research on the predictors of employment. Prior research using the NSSRN includes studies of the effects of economic and sociodemographic variables on the supply of RN work (Buerhaus, 1991; Chiha & Link, 2003; Link & Settle, 1980) This research developed our understanding that wage increases have little effect on the number of nurses working, and can have a negative effect on the number of hours worked per week by married RNs (Chiha & Link, 2003; Link & Settle, 1980). This body of research played a role in leading states to expand the nursing education pipeline, because policymakers know they cannot assume that shortages will be remedied by wage increases drawing more currently licensed nurses into the labor market.

The large sample size of the NSSRN, and the fact that it is designed to adequately represent smaller states, facilitates analysis of specific subpopulations. For example, prior studies have used these data to study nurses employed through temporary placement agencies (Goodman-Bacon & Ono, 2007), occupational health nurses (Thompson, 2010), nursing faculty (Schumacher, 2012), and rural nurses (Pan & Straub, 1997; Skillman, Palazzo, Hart, & Butterfield, 2007; Skillman, Palazzo, Keepnews, & Hart, 2006). Some studies have used the NSSRN to focus on RNs living in specific states (Brewer, Feeley, & Servoss, 2003; Rosenfeld & Adams, 2008).

Questions about nonnursing employment are asked, and there is a set of questions for nurses who are not employed in nursing to report how many years have passed since they last

worked in nursing, the reasons for not working in nursing, and their intentions to return to nursing employment. The CPS and ACS do not include analogous data, and the MDS includes only a short list of reasons RNs are not working. The MDS question is not specific to nursing; it asks only the reason for being unemployed in general. Several studies have used the NSSRN to study RNs who are not employed in nursing, including reasons to not work and employment in other fields. This research cannot be conducted with other data sets. Black, Spetz, and Harrington (2010) used the 2004 NSSRN to study the factors that predict nurses' decisions to not work in nursing, and to work in other fields, as well as to examine in more detail the reasons nurses work in nonnursing positions (Black, Spetz, & Harrington, 2008; Rajapaksa & Rothstein, 2009). Nooney, Unruh, and Yore (2010) analyzed the timing of attrition using survival analysis, considering both the exit path taken (career change vs. labor force separation) and the major socioeconomic, family structure, and demographic variables predicting attrition.

NSSRN respondents are asked about their employment and residence in the previous year, using a reference date one year prior. These data have been used to develop state-level RN supply forecasts. For example, Coffman and Spetz (1999) and Spetz (2007, 2009, 2011) used the data on changes in residence to estimate the movement of nurses to and from California, in order to model the impact of state-to-state migration on RN supply.

The NSSRN asks respondents several questions that provide important descriptive data. In 2000, a question was added asking whether the nurse's satisfaction had improved in the previous year, and the question was revised in 2004 to ask about job satisfaction in general (not compared to a previous year). RNs also are asked about their employment intentions—whether they plan to continue working in nursing in the near future. No other national survey includes these items.

Conclusions

There are multiple sources of data that provide information about the nursing workforce; HRSA may be able to exploit some of these data to fulfill their obligation to report data on the nursing workforce. The ACS and CPS can be used to study basic employment patterns of nurses who choose to work in nursing, and the MDS can be used to look at current education and employment status of all licensed RNs. In theory, MDS data could be linked over time to study RNs longitudinally and better understand job changes, career paths, and educational progression. However, at present only a minority of states collects most of the MDS elements, and it is not clear whether the data will be linked longitudinally. It is also not clear whether public-use research files will become available. In addition, none of these sources provides the scope of information regarding demographics, education, employment, and job and professional attitudes found in the NSSRN.

The discontinuation of the NSSRN thus leaves a large gap in data about the RN workforce that cannot be filled by the ACS, CPS, or MDS. Research on the employment decisions of RNs, their educational trajectories, specific subpopulations, job satisfaction, future employment intentions, and migration across states will be severely limited by the lack of the NSSRN. This loss comes at a particularly critical time. Although the economic recession that began in 2007 helped to relieve RN shortages, the future supply of RNs is in jeopardy (Staiger, Auerbach, & Buerhaus, 2012). The implementation of the Affordable Care Act is anticipated to create new pressures on the health workforce (Spetz, 2012), and policymakers need to assess strategies that may help ensure access to care. For example, without the NSSRN, one cannot easily examine the impact of the Nurse Licensure Compact on facilitating nurse employment across states or the effect of the Compact on nurse earnings. The importance of nonnursing graduate education on RN employment cannot be studied, including the preponderance of nonnursing degrees among RN faculty. As economic conditions change, it will be difficult to assess how nurses' employment patterns and intentions adjust, and thus future shortages will be harder to predict.

The other sources of information about RNs do provide some valuable information, and they should be leveraged to the greatest extent possible. The IOM Committee on the Future of Nursing recommended that HRSA facilitate the development and implementation of a MDS nationally, and NCSBN's collaboration with the Forum to implement this recommendation is an important contribution. Ideally, all states should collect MDS elements and contribute data to a national repository. In order to do so, state Boards of Nursing need funding to expand their data collection systems and analyze the data they would receive through a MDS survey. Legislation may be required in some states to authorize such data collection, appropriate funds, and guarantee public reporting.

In addition, there should be a national renewal of the NSSRN, which should include most (if not all) of the questions in the NSSRN that cannot be obtained elsewhere. This type of national sample survey could be built from the MDS, much as the ACS builds from short-form Census data, although this would require that HRSA be actively engaged with states in their collection of MDS data. Such coordination between every state and a federal agency might not be feasible. At the minimum, Congress will need to provide HRSA with adequate funds dedicated to health workforce data collection and analysis to ensure that the NSSRN can be conducted.

Health care and nursing leaders should encourage and support state and federal efforts to establish MDSs and relaunch the NSSRN. They also should urge all organizations that collect nursing data to implement mechanisms to ensure that researchers and analysts can access the data. By doing so, the value of data collection is multiplied, and health care leaders and policymakers have more information to

guide the development of policies to support the nursing workforce.

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