

Scale, Causes, and Implications of the Primary Care Nursing Shortage

Logan MacLean,¹ Susan Hassmiller,² Franklin Shaffer,³
Kathleen Rohrbaugh,³ Tiffany Collier,¹
and Julie Fairman¹

¹School of Nursing, University of Pennsylvania, Philadelphia, Pennsylvania 19104-4217; email: lmac@nursing.upenn.edu, colliert@nursing.upenn.edu, fairman@nursing.upenn.edu

²Robert Wood Johnson Foundation, Princeton, New Jersey 08543; email: shassmi@rwjf.org

³CGFNS International, Inc., Philadelphia, Pennsylvania 19104; email: fshaffer@cgfns.org, krohrbaugh@cgfns.org

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Abstract

As the demand for health care consistently rises and many individuals, even within developed countries, lack access to primary care services, a better understanding of how primary care is defined, the main causes of the primary care shortage both within the United States and across the globe, and key solutions to these issues are paramount. Upon review of the US and international primary care literature, the authors first briefly discuss the fluidity of how primary care is defined and how it is applied in nations with differing levels of health care infrastructure. The main causes of the deficit both domestically and globally are then examined. Finally, upon careful review of the research produced within the past seven years, this article suggests strategies that maximize the primary care workforce: the effective use of technology, task shifting, interprofessional teams, and more consistent primary care data to build workforce strategies.

Health care

infrastructure:

the physical and organizational structures necessary to provide adequate health care

Migrant workforce:

workers who have traveled outside their home country to find employment

INTRODUCTION

For more than four decades, governments and philanthropic agencies have tried to document and predict the primary care nursing workforce needed to meet the demands of nations (54). In the past seven years alone, researchers have produced numerous reports and journal articles and developed or updated at least ten different databases that include the nursing primary care workforce, expenditures on nursing workforce and services, health statistics, and health care infrastructure (32, 34, 35, 40, 42, 55, 56, 58, 65, 67, 68). In this review, we critique seven years of primary care nursing workforce research from 2005 to 2012, focusing on the broader regional and international studies. We begin by defining primary care in its broadest terms and then critique the criteria or standards for measuring the primary care nursing workforce in particular. We then present the emerging themes that contribute to the primary care nursing shortage and provide frameworks for future research. In general, our findings point to the instability of factors, as well as the stable aspects that determine global primary nursing care needs, nursing workforce supply, and the variability in which the nursing workforce is defined and utilized. Forces that can maximize or support the nursing primary care workforce and provide the foundation for policy strategies include the use of technology, task shifting, consistent databases, and support for team-based services.

Primary care can be defined as both the most basic and the most complicated form of health care service for various reasons. The simplicity of primary care lies in its ability to address fundamental human health care needs that do not require complex technology or drugs and can be provided by practitioners across many skill levels. However, some complexities arise within the framework of primary care through its broad mandate to address individuals within the context of their communities and families, which oftentimes are in flux, are ravaged by war, or are poorly differentiated. Primary care creates challenges in health care because it is so context dependent and involves multiple types of nursing providers, from professionals to nonprofessionals, making its workforce difficult to measure.

Since the 1990s, the definition of primary care has remained relatively stable, although the scope of primary care services may shift as countries develop and face different challenges. Several common aims guide nations' definition and application of primary care and include reducing exclusion and social disparities in health, organizing health services around people's needs and expectations, integrating health into all sectors, pursuing collaborative models of policy dialogue, and increasing stakeholder participation within health care (66). Other common aims are the requirements of a workforce that is appropriately trained and able to respond to changing needs and local realities as well as the recognition that each nation defines primary care according to its own needs and resources (64). For example, basic services in France may be different from the basic services identified by Senegal or Thailand. The ultimate goal of better health care for nations' citizens remains paramount across the globe.

THE PRIMARY CARE NURSING WORKFORCE

The United States, Australia, Canada, New Zealand, and the United Kingdom depend on migrant health professionals (both physicians and nurses) to provide primary nursing care. Additionally, the supply of primary care physicians influences the need for nurses in primary care. But the actual number of nurses in the migrant workforce providing primary care is not clear; studies have not documented a breakdown of the proportion of foreign-born nurses providing primary care in any of the countries listed above, and many nurses may shift between varying types of practices in one location (e.g., they may practice obstetrics one day but attend to acute care the next). In general, migrant nurses tend to comprise a significant proportion of the nursing workforce and tend to

work in acute care hospitals, long-term care, or rehabilitation facilities. Nurses tend to migrate from the Philippines, where there is currently an oversupply, and from Caribbean countries. In the United States, migrant nurses comprise 11.9% of the workforce, compared with 15.2% in the United Kingdom, 17.2% in Canada, 24.8% in Australia, and 23.2% in New Zealand (36, 39). With the exception of Canada, the migrant nurse workforce is increasing globally. However, owing to the vast amount of inconsistent quantitative data available, it is difficult to accurately forecast the workforce trends. In general, the issue of nurse migration seems to take on new urgency as the pool of highly trained and credentialed nurses, relative to the demand for them in host countries, decreases (9); however, this is only one of many difficulties underlying the primary care nursing workforce globally.

Much of the world's primary care workforce is geographically maldistributed to urban areas, although countries differ in how they define urban and rural (62). The nursing workforce in particular is also inadequately distributed across private and public institutions. This is the case in the United States and in most other countries. Internal migration of nurses in many countries due to disasters and wars also contributes to the difficulty of gaining a reasonable perception of the workforce (1). The World Health Organization (WHO) estimates that less than 55% of people across the globe live in urban areas, but more than 60% of nurses and 58% of other types of health care workers live in urban areas. In South Africa, for example, most of the nation's larger health care institutes are located in urban areas, and many are privately owned. Although most primary care services occur outside of these types of institutions, in many countries they employ more than half of a country's nurses and two-thirds of the physicians and serve 20% of the population (37). This type of maldistribution is replicated in many countries, including the United States, Australia, China, India, and South America (1, 6, 11, 62, 63).

A 2011 WHO report estimates that there are more than 59.2 million health care workers in the world, with ~66% providing direct care (37). The report also estimates that more than 4.3 million health workers, including physicians, nurses, pharmacists, dentists, laboratory technicians, emergency medical personnel, public health specialists, health sector managers, and administrative staff, will be needed to meet the health Millennium Development Goals (e.g., 80% coverage rate for deliveries by skilled birth attendants and immunization against measles) by 2015. These broad estimates are not intended, nor could they be used, as policy-formulating data. For example, there is an extreme imbalance of nurses worldwide; the nurse-to-patient ratio is ten times higher in Europe than in Africa or Southeast Asia and ten times higher in North America than in South America (37) (**Figure 1**).

CAUSES OF THE PRIMARY CARE NURSING WORKFORCE SHORTAGE

Several key issues led to the current global primary care nursing shortage, but in general, the data to date are inadequate to build strategies. Most of the reports map out provider-to-population ratios that may skew overall workforce needs. Few studies base their analyses on community-based needs, which perhaps more accurately predict the type of provider needed to meet specific national health goals (12, 59). On a macro level, most reports cite a shortage of nurses and a growing demand for nurses both in the United States and abroad. Although each country defines the nursing workforce and its own needs differently, global primary care nursing shortages create a dynamic push and pull between more developed countries (MDCs), which can, but do not, produce an adequate workforce, and less developed countries (LDCs), which have fewer resources to produce an adequate workforce and which lose additional providers to MDCs (2, 4) (**Figure 2**).

Internal migration: movement of individuals from one place to another within the same country (usually from rural to urban areas)

WHO: World Health Organization

Community-based needs: the needs of a group of people with similar characteristics within a specific location

MDC: more developed country

LDC: less developed country

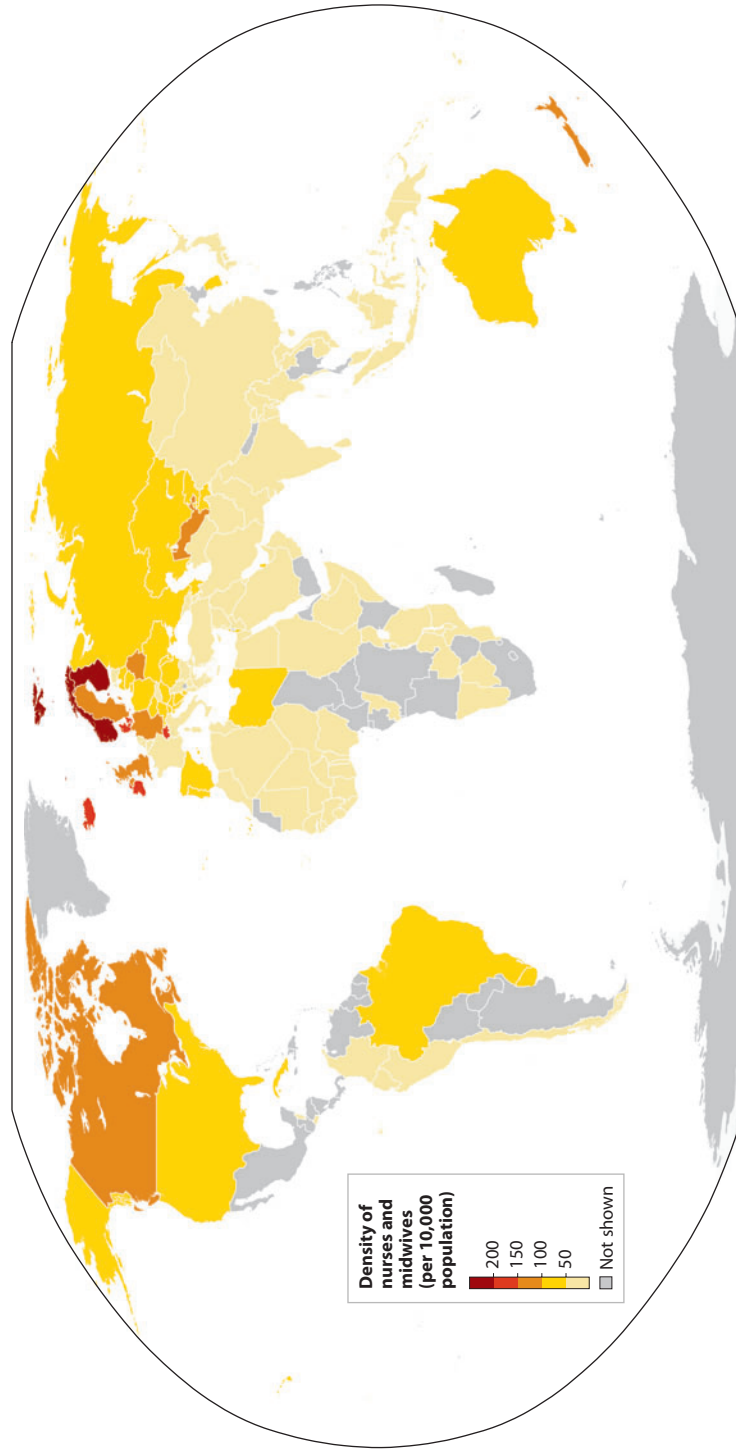


Figure 1

Distribution of nurse and midwife workforce. Data from Reference 65, with permission from the World Health Organization.

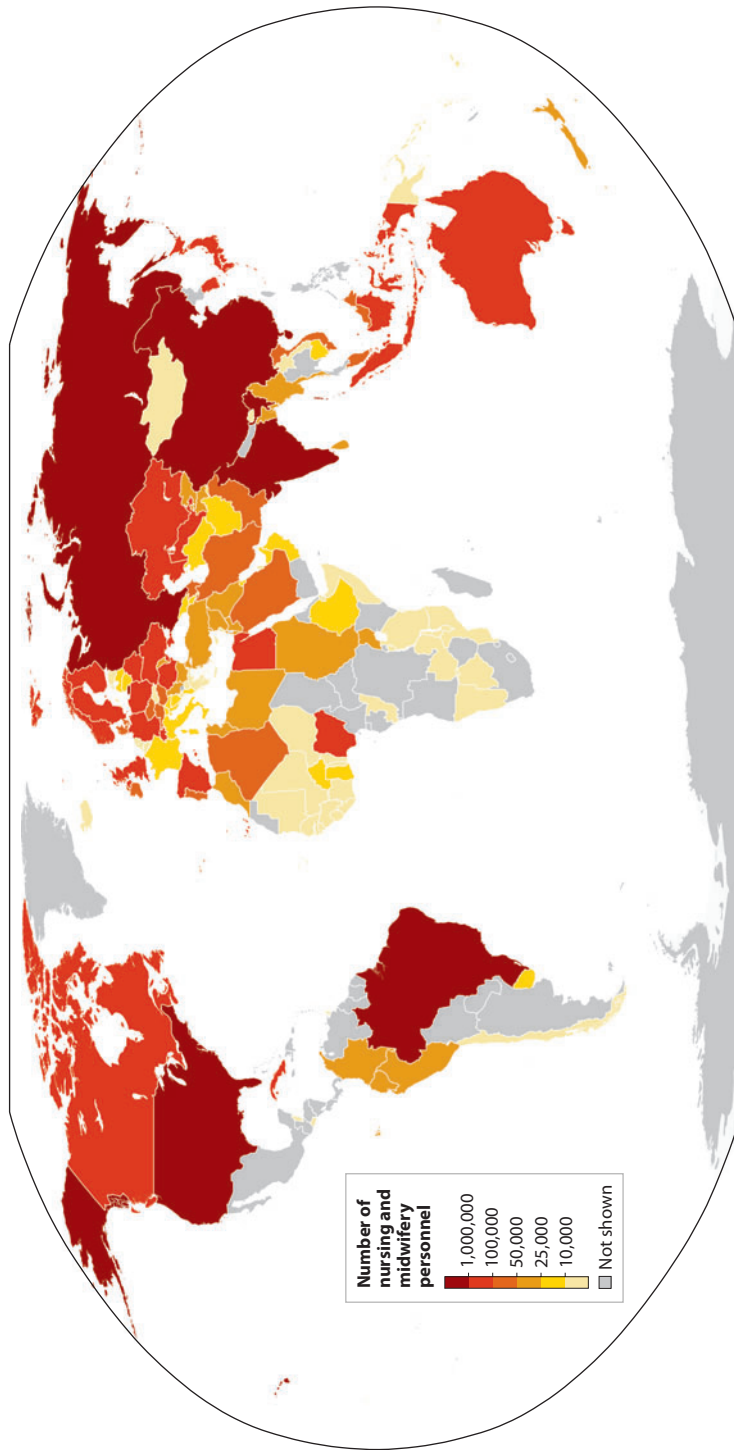


Figure 2

Number of nursing and midwifery personnel. Data from Reference 65, with permission from the World Health Organization.

NP: nurse
practitioner

PA: physician assistant

Issues in the United States

In the United States, three overarching issues affect the primary care workforce supply: (a) lack of a sustainable health care workforce caused by decades of poor workforce planning; (b) poorly constructed payment incentives (many health promotion, disease prevention, and patient education services are not reimbursable), which drive potential physician and nursing candidates away from primary care; and (c) geographic maldistribution exacerbating shortages in rural and disadvantaged urban areas (9, 15, 16). Nurses, both nurse practitioners (NPs) and generally prepared nurses, have tried to fill the gaps; they and others, such as physician assistants (PAs) and nurse midwives, have become normative providers and will be needed to provide primary care to the 30 million newly insured customers as a result of the 2010 Affordable Care Act (28). Demand will also be spurred by the shift from acute care to chronic care management and by the aging and growth of the US population (16). New models of care that rely on teamwork, such as medical homes, are seen as part of the solution to the primary care shortage in the United States. Even so, services and payments within the US health care system will remain fragmented over the long term, unlike the systems in New Zealand, Canada, Australia, and other Western European countries, which are population based. Reimbursement systems favor acute care, which has caused an overproduction of certain types of medical specialists such as radiologists and heart surgeons and an underproduction of primary care providers such as pediatricians, family practitioners, primary care physicians, and NPs. Additionally, the scope of practice barriers—the state regulations that define the boundaries of services each profession can provide—restricts patient access to care by NPs and PAs by preventing these clinicians from providing the full range of services based on their education and training (9, 13, 15, 27, 28). High proportions of NPs and PAs typically work in areas where the physician workforce is limited or absent. Thus, practice barriers have a high impact on access to care.

The NP population continues to outpace the production of both primary care physicians and PAs in the United States (19). However, generalist nurses, who are a core component of the primary care team, are expected to experience a significant shortage by 2025. Here, too, salaries in primary care, as well as in long-term care, are typically lower than in acute care institutions. Interest in nursing careers in the United States remains high, but nearly 50,000 qualified applicants applying to professional nursing programs across the country in 2008, including 7,000 applicants to master's and doctoral degree programs, were turned away owing to faculty and clinical placement shortages (9). A report by the American Association of Colleges of Nursing (AACN) on 2011–2012 enrollment and graduations in baccalaureate and graduate nursing programs found similar results and cited an insufficient number of faculty, clinical sites, classroom space, and clinical preceptors, as well as budget constraints, to be limiting factors (3). Thus, the United States often looks toward international migration of already trained nurses to bolster their workforce needs.

Geographical issues, for both nurses and primary care physicians, continue to exacerbate the problem. More than 20% of the US population, 64 million people, live in regions that the government has labeled health professional shortage areas. Forty-eight million individuals lack access to dental care, and another 77 million lack access to behavioral and mental health services (9). Both the physician and nursing supply vary two- to three-fold across these regions. Geographic misplacement aggravations are often due, in part, to where nurses are trained. Nursing schools that train students within community-based, rural, and underserved areas have higher rates of students who enter these areas and practices. However, most nursing education takes place in urban areas within highly specialized tertiary care hospitals with high-level intensive care units (9).

Issues Across the Globe

Many countries, primarily source countries, are plagued by lack of a sustainable nursing workforce, geographic maldistribution, and poorly constructed incentives, and they also experience an additional drain through international nurse migration. The inability or failure of governments to create and support a substantial financial investment in the education and employment of nurses and health care workers is a key reason for the global shortage of these primary care providers (36). LDCs experience further supply issues owing to internal factors such as corruption, poor governance, nepotism, and inefficiency in public services.

The inability to sustain a primary care workforce in many LDCs is a major issue that has many causes: poor remuneration, ill health among health workers, long hours, large workloads along with too many patients, government instability, and an aging workforce (36). The low, often-times delayed salaries in LDCs cause nurses and health workers to reduce their hours in health work to increase hours in other, better paying, areas. The scarcity of medicine and equipment, coupled with long hours, leads to fatigue and burnout.

A major primary care workforce issue for many source countries is nurse migration. A survey of health care workers conducted in six African countries found that the leading factors behind health care worker migration included better work conditions, efforts to obtain additional education and training, and higher or more realistic remuneration (4, 49). Other factors, including job satisfaction, perceptions of work environment, ability to utilize one's own professional skills, organizational environment, career opportunities, trust in management of health services, general political and administrative governance, bureaucratic efficiency and fairness, availability of protective gear (especially from HIV/AIDS), welfare, and benefits to health care workers during employment and retirement, have been listed as reasons for international migration (11, 17, 33, 44).

In addition to issues of maldistribution and migration generally speaking, many professional nurses in particular find themselves ill-prepared to provide primary care because nursing education programs worldwide have variable records of success incorporating primary care skills and knowledge into curricula. Education offerings for doctors, nurses, and dentists might be influenced by a shortage of faculty, lack of postgraduate training, lack of adequate mentorship, and lack of education standardization (25). Although various organizations provide standards and serve as resources for nursing education, such as the International Council of Nurses, conditions on the ground, such as poverty, wars and disasters, and the instability of the national government, influence health professional education (36, 62). In Brazil, for example, strong relationships and collaboration between education institutions and health service delivery produce a nursing workforce that is attuned to the country's needs even in hard-to-reach indigenous areas (64). In contrast, years of conflict in Sudan have ravaged its health care and education systems as well as its primary nursing care resources and provisions, making education standards difficult to set and health care dependent on entrepreneurs and relief agencies (26, 50). Thus, context is different for each country, and strategies to bolster the primary care nursing workforce will depend on place, stability of governments, and resources.

Source country: the country from which nurses, physicians, or other health care workers migrate

Remuneration: compensation for one's employment or services

STRATEGIES THAT MAXIMIZE THE PRIMARY CARE NURSING WORKFORCE: IMPLICATIONS FOR HEALTH POLICY

Many possible strategies can be used to maximize the primary care nursing workforce across the globe, including improving a nation's health care infrastructure and fixing the primary care shortage problems in MDCs, such as the United States, which pull valuable resources from other

Task shifting: the changing (addition or subtraction) of roles and responsibilities a health worker usually applies

mHealth: use of mobile apps for health-related activities

countries. Much has been written on these topics. Here we address strategies that either can be implemented at the point of care or will help to clarify the primary care nursing workforce and account for a variety of providers across the globe. These strategies include effective use of technology, task shifting, collection of more consistent data, and use of interprofessional care teams. All four mechanisms are also intertwined, build on each other, and provide a foundation for policy implementation.

Effective Use of Technology to Redefine Nurses' Roles in Primary Care

The widespread availability of mobile devices, as well as the availability of free or low-cost social and medical applications (apps), has revolutionized health care across all settings. The International Telecommunication Union, a specialized agency of the United Nations that is responsible for issues that concern information and communication technologies, estimates that by the end of 2011, there were 6 billion mobile subscriptions, with an additional 0.9 billion subscribers by the end of 2013, suggesting that both providers and patients have access to information and diagnostic capabilities that increase access to care and better health care services (24, 45). A digital survey of US medical providers in Accreditation Council for Graduate Medical Education programs indicated that more than 85% used a smartphone and more than half used medical applications in their practices, particularly pharmaceutical, billing, and coding apps (14).

Although mHealth, a new term coined for the use of mobile apps, is a growing trend in industrialized nations, the field has emerged in recent years as a cost-effective strategy for providing care in LDCs without adequate numbers of physicians and nurses, patient educators, diagnostic resources, and other infrastructure. Diagnostic and treatment support systems are typically designed to provide primary care health care workers in remote areas advice about diagnosis and treatment of patients, typically by using device cameras, data decision trees, and general consultation via direct phone calls. The apps also give support for primary care nurses and other health workers who provide services beyond primary care, including specialty care such as dermatology, infectious diseases, and obstetrics, or provide reminders of immunization schedules and medication dosages. Patients themselves may directly access information and providers via telemedicine apps. Patients might take a photograph of a wound or rash and send it to a remote provider, such as a physician or nurse, for diagnosis. Then, the appropriate treatment is sent back to the patient or a local provider. Both diagnosis and treatment support projects attempt to mitigate the cost and time of travel for patients located in remote areas and to broaden the primary care nurse resources in general (52).

Many apps are already available, and more are being developed at a rapid pace. For example, at the 2013 Health Information and Management System Society 13 Convention, Portable Emergency Physician Information Database unveiled Infobutton, which provides clinicians and patients instant access to content-specific resources that can be easily integrated into any type of health care system in the world (43). Furthermore, WebMD, an organization that provides health news, medical reference databases, interactive tools, and other information and services, has partnered with Qualcomm Life to develop tools and apps that incorporate sensors that provide accurate clinical information (10, 53). PSgSoftware, based in North Carolina, created an app called iDoctor Pro for the iPhone, iPod touch, and iPad. This app provides health care workers with immediate access to create or review complete medical histories, including written records, images, and voice notes. These files are consolidated within the app, and information can be easily and safely passed between health care workers. Additionally, the software houses important medical tools such as a pregnancy wheel and calculators for body mass index and LDL cholesterol (18). Other applications being developed can take electrocardiograms of patients, hook up to portable

ultrasounds, and take blood tests, saliva tests, urine tests, and sweat tests. These monitoring systems and results can be viewed in real time by numerous health care workers in multiple locations (51). With near universal access to these apps and cheap pricing, health care workers have seen a much-needed increase in the number of tools that can help provide the necessary care to patients.

New uses of GPS (global positioning system) mapping can also support nurses to address a population's primary care needs and more effectively map epidemics or violence-prone areas (41). Properly developed, carefully certified, and judiciously used health care apps will help patients monitor their own health, give professionals the ability to assess patients without having to travel, and allow nations to use scarce providers in a more effective way.

Task Shifting

For professional nurses in the United States and many other countries, appropriate legislation and regulation are critical to nurses' work roles and occupational status, especially in an era of changing professional boundaries as well as widespread recruitment and immigration. Under these circumstances, and in other cases, task shifting can be regressive. For example, some internationally trained nurses may not receive credentials to work as nurses in the United States because of differences in education in the home country. They may be employed as nurses' aides or health care technicians, thus shifting their roles and responsibilities to different types of practice, mostly in areas of long-term care. In another example, US NPs are educated to provide primary care but, because of state regulations, may require physician oversight and agreements to practice. Patient access to primary care services may be limited if a physician is unavailable or unwilling to provide the required collaborative agreement for the NP to practice. In contrast, many LDCs do not have the resources to mandate nurse oversight nor do they expect skilled practitioners such as nurses to require oversight. Effective systems of credential evaluation, such as those provided by CGFNS International, Inc., provide standards for nurses to move from country to country and are critical to assessing the professional qualifications and competence levels of individual nurses. The standards help to prevent regressive task shifting (7, 48).

Task shifting can also be progressive and has provided a much-needed nursing and lay workforce for primary care in many areas of the world that do not have enough professional nurses and physicians. In much of the world, primary care services are provided by informal, traditional, community, and allied health workers in health posts, dispensaries, rural maternity clinics, and health centers. In Zambia, for example, nurses and lay workers work collaboratively to perform much-needed cervical cancer screenings in newly established health centers and provide health education to women in the local community [L. Bush, unpublished speech (J. Fairman notes), University of Pennsylvania, School of Nursing, 2013].

The Joint Learning Initiative estimates there are 50+ million more lay health workers than professionally trained providers such as nurses worldwide (36). Many of these workers' roles are loosely defined and the duties they perform are even less standardized, making it difficult to measure the primary care workforce and services they provide. Lay workers provide a broad range of primary care services similar to those provided by nurses and physicians, including health education, treatment for acute and chronic illnesses, deliveries, prevention and treatment of infectious diseases, well-baby care, minor surgery, dental and physical examinations, and immunizations. In some studies, the term nurses may encompass both formally and informally trained personnel, such as traditional healers and allied health workers (12, 60). In Tanzania, for example, formal education programs are established to give health workers, such as community health workers and village health workers, the skills and knowledge to provide basic, low-cost, or free primary care services in areas without professional providers (12, 59). In many other

Interprofessional

team: a group with a common set of goals that leverages the various knowledge and skills of its members

countries, health workers either lack adequate training or are experientially skilled. In general, many countries in transition during wars, epidemics, and disasters or that experience exceptionally high health profession migration and low provider production rely on untrained or self-trained health workers. Task shifting is sometimes expected to be temporary until an adequate number of professional nurses can be obtained, or it may be permanent as new models of care incorporate different types of health workers with different roles (57, 62, 64). Regardless of the skill level or the expectations, these health care workers provide more services than would typically be provided without them, and policy makers will need to target potential workers and provide the knowledge and skills needed to maximize fragile primary care systems.

Interprofessional Teams

Providing opportunities for interprofessional teams with varying skill sets to unite through a common set of goals and collaborate on patient care is essential to maximizing the nursing primary care workforce (46). There is a general consensus in the literature that interprofessional teamwork will help achieve a stronger and more unified health care system when and if it can be applied (61). The WHO posits that interprofessional collaboration can help mitigate a global primary care health workforce crisis because growing evidence indicates that collaboration poses considerable benefits to health workers, health systems, and communities. These benefits have been noted in both education, such as increased diversity in staff, real-world experience, and greater understanding of the scope of practice of other practitioners, and in other areas of health, such as improved workplace productivity, patient outcomes, staff morale, patient safety, and access to health care (61). To maximize its effectiveness, interprofessional teamwork should come from a strong system of health professional education that fosters interprofessional collaboration. Faculty sharing and utilizing members across professional schools can maximize scarce faculty resources as seen at Makerere University in Uganda (22). The model provided by the WHO depicts a path from interprofessional education to collaborative practice to improved health outcomes. This model illustrates that local health needs caused by a fragmented health system can be met through the interprofessional education of both present and future health care workers. These health workers who have experienced collaborative practice can then lead and model new collaborative practice efforts to strengthen a health system, resulting in optimal health services and improved health outcomes. The WHO sees a team education and practice model as applicable across all types of health systems and nations. This model is, however, context-based, and national infrastructure must be put in place to support widespread and consistent collaborative education (61).

In many places, even in those with more health care resources and structured health care systems, much collaborative team practice and education occurs informally as situation-dependent personal agreements are made among health care providers. Unfortunately, team education and practice are not the norm worldwide and certainly not in the United States, where well-entrenched silos of professional education systems support education redundancy. Health system infrastructure, including payment and models of care, must be revamped to reap the benefits of interprofessional education and practice. Leaders are asked to champion this culture shift to refresh curriculum and training experiences and support policies, regulations, and legislation that eliminate barriers to collaborative practice (47). Health leadership education collaboratives are already in place in Uganda, Canada, India, and the United States (22). Specifically focusing on the United States, programs have been implemented in South Carolina, Pennsylvania, Arizona, California, Missouri, Massachusetts, Virginia, and Washington (21).

In many other countries, especially those with low numbers of health professionals, such as nurses, team practice is one of the only ways care can be provided. These teams consist of multiple

caregivers from professional to lay providers, and the members negotiate their roles within the context of their culture, the stability of the government, and financial resources. Smartphones seem to be one way that official and unofficial teams can be more effective and provide common goals, needed supervision, education, and training across large geographic areas (30).

Outcomes noted in the literature, although not conclusive in regard to improving health outcomes and which typically focus on the United States, do support the need for a more well-intentioned effort to train health care providers in a more collaborative learning environment to move health care in this direction. Although there is a greater emphasis on collaboration worldwide, challenges and disincentives for working in teams abound, including organizational and cultural barriers. Organizational barriers include team members working in different locations, lack of time set aside for meetings, inconsistent or ineffective communication processes, and the lack of role clarity (5, 29, 31). Academic barriers include incompatible student schedules across professional education programs and the lack of workload acknowledgment for professors working on the time-consuming efforts of interprofessional collaboration. Finally, as noted by the Institute of Medicine report on the “Future of Nursing,” all providers must be able to practice at the top of their education and training for the most effective teamwork to occur, and achieving this level of collaboration will require policy makers to provide resources, legislative framework, and incentives (8).

More Consistent Data

The need for more consistent data on the primary care nursing workforce, the trends in nursing migration, the return rates to source countries, and studies observing past attempted solutions both domestically and abroad to lighten the primary care deficit is paramount to move forward with viable plans for the future. Even definitions of nurse, and urban and rural, differ across surveys. Although consistent and more frequent data collection may appear obvious in improving primary care workforce strategies, this recommendation is not new and was suggested more than 30 years ago during the 1978 International Conference on Primary Health Care (54). Since that point, little progress has been made in this area as each agency, government, or professional organization develops its own collection database and definitions for the data to be collected.

When examining primary care deficits from country to country, it is difficult to directly compare data because they are often collected from several different sources that are established with different purposes with varying expectations of how specific health professional roles are defined (17). The overall lack of necessary data to both understand and react to national or regional primary care nursing workforce demands has often left many LDCs unprepared to engage in primary care planning. Although numerous organizations and nations have performed many surveys, the findings have included inadequately defined variables, such as nurse or primary care, or have grouped different types of nurses into one category. Even within the United States, where much research has been performed, the field has only a slowly growing database, typically found in state workforce offices, that links the health care needs of the public to nursing workforce needs or to the skills and knowledge needed by the nursing workforce (19, 36).

Finally, strategies to improve the primary care workforce are often implemented on a small scale, but there is limited attention on what services are delivered and the productivity of human capital involved in those services. In particular, the field lacks quality data that fully assesses the long-term effectiveness of strategies to increase access to primary nursing care in terms of overall health outcomes, impact, and human resource mobilization (63). The current primary nursing care environment strengthens the call for better data as well as for effective operational research and evaluation. This research is required to inform policy makers and senior managers of the most

current and effective solutions in primary care and to guide efforts to develop a sustainable health care workforce to address the health of an entire country's population (4).

CONCLUSION

In the upcoming decades, MDCs need to lead the effort to stabilize the primary care sector, decrease the disparities in health, and push for a sustainable primary care model. As evidenced in our findings, the shortages that occur within MDCs exacerbate primary care shortages within LDCs whose health care infrastructures are already weak. Specifically for the United States, lack of a sustainable nursing workforce, geographic maldistribution, and poorly constructed incentives have plagued the primary care system. Many LDCs experience additional internal factors, such as corruption, poor governance, and meager wages, as well as external issues, such as nurse migration, that further damage their abilities to provide adequate primary care to their populations.

These authors believe that the effective use of technology, task shifting, interprofessional care teams, and more consistent data are effective to help repair primary care shortages in MDCs and will be useful in LDCs to begin to maximize the efficiency of their already limited resources. However, MDCs like the United States must lead the implementation of these models in their own primary care systems as well as in others. If used together effectively, these strategies can maximize the abilities of the nursing primary care workforce and lay the foundation for additional primary care policies.

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