

Where Are We? | Brief Number 1

# The Nursing Education Pipeline

A literature review from 2014 to 2025

## The State of Global Nursing

A catalyst for evidence-based workforce policy

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The Global Nursing Workforce Centre (GNWC)

*A collaborative initiative between TruMerit\* and the International Council of Nurses*

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## About the Global Nursing Workforce Centre

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A joint initiative of the International Council of Nurses (ICN) and TruMerit™ (formerly CGFNS International), the Global Nursing Workforce Centre is a clearinghouse for research from around the world focusing on the nursing workforce. In addition to collecting and organizing nursing workforce research papers and publications, the Centre analyzes findings to identify trends, summarizes policy recommendations, and highlights data and policy gaps. Its goal is to influence policy, improve working conditions, and enhance the quality of patient care across diverse health systems.

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Research Center Director and Chairman, IRB,

Almoosa Health Group Adjunct Professor,

Prince Sultan Military College of Health Sciences, Saudi Arabia

## Authors and Affiliations

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### The Nursing Education Pipeline A literature review from 2014 to 2025

**Julia To Dutka, EdD**

Chief, Global Health Workforce Development Institute  
TruMerit

**Niamh Farrell, PhD**

Senior Research Associate, Center for Global Research and Policy,  
Global Health Workforce Development Institute  
TruMerit

**Carina McCormick, PhD, MBA**

Psychometrician, Center for Global Assessment and Certifications,  
Global Health Workforce Development Institute  
TruMerit

**Jessica Custer, BA**

Program Administrator, Global Nursing Workforce Centre,  
Global Health Workforce Development Institute  
TruMerit

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3600 Market Street, Suite 400, Philadelphia, PA 19104, USA



# Foreword

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## Forging a new era in global nursing workforce policy and research

**Howard Catton, RN, MA, BS (Econ) (Hons)**  
Chief Executive Officer, International Council of Nurses

**Peter Preziosi, PhD, RN, CAE**  
President and Chief Executive Officer, TruMerit (formerly CGFNS International)

The future of healthcare is inextricably linked to the future of nursing. Today, when health systems worldwide are grappling with unprecedented challenges—from aging populations to the increasing burden of non-communicable diseases, from the long-term consequences of the COVID-19 pandemic to workforce shortages—the need for strategic investment in nursing has never been more urgent. Yet, despite the wealth of research being conducted on the nursing workforce, there remains a fundamental void: the absence of a central repository for collecting and analyzing this knowledge to inform global workforce strategies and policy solutions.

To address this, TruMerit™ (formerly CGFNS International) and the International Council of Nurses (ICN) are proud to announce the launch of the Global Nursing Workforce Centre. This collaboration is a bold and necessary step toward ensuring that nursing workforce data and research translate into actionable policy recommendations that drive meaningful change. Our goal is to establish a global hub where data is aggregated, analyzed, and mobilized to influence policy, improve working conditions, and enhance the quality of patient care across diverse health systems.

### A catalyst for evidence-based nursing workforce policy

The Global Nursing Workforce Centre will function as an authoritative repository of research on the global nursing workforce, categorizing existing studies, identifying trends, and synthesizing findings to generate impactful policy insights. While the world does not lack nursing workforce research, it lacks a unified mechanism to systematically harness and interpret these insights for global application. By providing a structured approach to collecting and analyzing nursing workforce data, the Centre will fill this critical void and guide investment in sustainable nursing workforce development.

#### Specifically, the Centre will:

- **Curate and centralize** published nursing workforce research to ensure that critical insights are not lost or siloed.
- **Conduct systematic analyses** to identify emerging trends, gaps, and best practices.
- **Generate policy briefs and reports** that translate evidence into actionable recommendations.
- **Highlight workforce challenges and solutions** in areas such as professional development, scope of practice transformation, nurse migration, and workforce retention.
- **Advance a future-focused agenda**, exploring topics like AI in nursing, interprofessional collaboration, and evolving models of care delivery.

## A strategic approach to global nursing workforce solutions

Health systems worldwide face a stark reality: the maldistribution of nurses poses significant challenges in population health management and the profession remains undervalued in many policy arenas. The Global Nursing Workforce Centre will take a **three-pronged approach** to driving change:

- 1. Globally resonant research.** The Centre will focus on workforce issues that have relevance across regions, ensuring that its work informs policy on an international scale.
- 2. Policy-relevant insights.** By aligning research with pressing health policy priorities, the Centre will bridge the gap between workforce data and policy action.
- 3. Solution-based recommendations.** Moving beyond problem identification, the Centre will prioritize research that highlights viable interventions, ensuring that nursing workforce challenges are met with tangible, evidence-driven solutions.

## Addressing the most pressing nursing workforce challenges

The Centre will undertake a comprehensive research agenda spanning **education, workforce conditions, care delivery models, and health system impact**. This agenda will focus on the themes identified in the Centre's "**The State of Global Nursing**" series of reports and briefs—the first of which is unveiled here in the following pages—providing both retrospective and prospective views on the state of the global nursing workforce. Key areas will include:

### Workforce migration & mobility

Understanding the movement of nurses and their work within countries and across borders to inform ethical, sustainable workforce policies.

### Education & career pathways

Examining nursing education trends and competency development to address evolving health needs.

### Retention & work environment

Identifying strategies to improve job satisfaction, workplace safety, and mental well-being.

### Advanced practice nursing & leadership

Assessing the impact of specialist nursing roles and leadership development on health outcomes.

### Technology & innovation

Exploring how AI, robotics, and digital health can support nursing practice and patient care.

## The time for action is now

The global nursing workforce is at a crossroads. Policymakers cannot afford to make decisions based on fragmented data or outdated assumptions. The Global Nursing Workforce Centre will serve as a **trusted source of evidence and insights**, ensuring that nursing workforce policies are informed by data, not by crisis response. By leveraging the collective expertise of TruMerit and ICN, this initiative will drive meaningful change in how nursing is recognized, valued, and integrated into health system planning worldwide.



The Centre's work comes at a critical moment as the World Health Organization prepares to release the State of the World's Nursing (SoWN) 2025 report and advocates for extending the Global Strategic Directions for Nursing and Midwifery. These efforts highlight the urgent need for robust evidence to track progress since 2020, illuminate emerging challenges, and ensure that nursing workforce policies are informed by real-time insights. The Centre will play a pivotal role in strengthening this evidence base and translating findings into actionable strategies that support national health workforce plans through 2030, helping to achieve universal health coverage and the UN Sustainable Development Goals.

As non-governmental organizations committed to serving the global nursing community and public good, TruMerit and ICN recognize the urgent need to mitigate the potential fallout from geopolitical shifts, including the U.S. administration's recent decisions to withdraw from the World Health Organization and cut funding to the U.S. Agency for International Development and the National Institutes of Health. These policy changes threaten global health investments and could exacerbate disparities in the nursing workforce, deepening inequalities in healthcare access and labor market dynamics. In this context, the Centre's work must be timely, data-driven, and action-oriented to safeguard the future of the profession and the patients it serves.

**We invite policymakers, educators, healthcare leaders, and frontline nurses to engage with the Centre's work, contribute to its growing repository of knowledge, and help champion policies that secure the future of the global nursing workforce. The moment to act is now. Together, we can turn insights into action and build a healthier, more equitable world.**


## Introduction

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This review explores literature about the nursing education pipeline from 2014 to 2025 and seeks to identify gaps that may need to be filled in the future. Highlighting literature gaps provides stakeholders with opportunities to further study the bottlenecks that have hobbled efforts to improve access to nursing education, which fuels nursing workforce growth and development. This review also sheds light on where the literature clusters geographically. In doing so, researchers can explore where nursing education pipeline issues are under-examined, which are often the same places that have the most severe needs for educational and regulatory improvement.

Literature about the nursing education pipeline is vast and encompasses numerous topics. The scope of this review is focused on three specific pipeline topics: recruitment and retention, nursing student attrition, and nursing educator shortages. Relevant research was identified using keyword searches in library databases available through the University of Nebraska–Lincoln, Temple University, and Google Scholar.

The nursing education pipeline serves as an important indicator for understanding health workforce development and distribution. This pipeline should be thought of as a dynamic progression, flowing from student recruitment to enrollment in nursing school and then on to graduation, licensure, and employment in the nursing workforce. Successful and sufficient nursing student recruitment, admission, education, retention, and graduation are prerequisites for nurse licensure, practice, and effective care delivery. However, smooth movement through the nursing education pipeline can be interrupted by difficulties ranging from poor recruitment and retention of nursing students to insufficient numbers of nursing education programs and nurse educators, resulting in a persistent state of nursing shortages across practice settings worldwide.



**The nursing education pipeline serves as an important indicator for understanding health workforce development and distribution.**

## Recruitment and retention

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### 1. Starting the pipeline in secondary school

The first bottlenecks are typically encountered in recruiting students into nursing programs and then retaining them. These can be eased by extending the nursing pipeline to the secondary school level (Alluhidan et al., 2020; Hampe et al., 2025; Katz et al., 2016; Murray et al., 2016; Zhang et al., 2023). Outreach to secondary school students about nursing education programs would give potential nursing students insight into what a nursing career looks like through web-based and experiential learning, didactic presentations, and lectures from health professionals and nursing students. These pipeline programs demystify the nursing profession for potential nursing students and lead to increased interest in joining the nursing workforce (Hampe et al., 2025; Katz et al., 2016; Murray et al., 2016).

Other efforts to remedy the recruitment bottleneck include surveying secondary school students to determine their level of interest in nursing and then tailoring recruitment efforts to combat misinformation or negative sentiments toward the profession. In a 2023 survey, less than 1% of approximately 8,000 Chinese secondary students showed an affinity for becoming a nurse.





The results also indicated that Chinese secondary school students have little knowledge about the daily activities of nurses. They viewed the profession as holding reduced social prestige and prospects for career mobility as compared to a job in the economic or computer science sectors. They also feared potential burnout among nurses that they witnessed during the COVID-19 pandemic. Alternatively, the students who indicated they were attracted to a nursing career emphasized the importance of altruism and lauded the compassionate care displayed during the pandemic (Zhang et al., 2023).

**In a 2023 survey, less than 1% of approximately 8,000 Chinese secondary students showed an affinity for becoming a nurse.**

Similarly, a focus group study of Finnish nursing school applicants found that they had altruistic motivations for seeking a career in nursing, in addition to viewing nursing as a secure job prospect with various options in terms of settings or areas of practice. Despite these positive perceptions, there was also an inaccurate understanding of the profession among the participants, including failure to recognize the autonomy of the nurse and a lack of recognition related to upward mobility and career development opportunities in nursing (Glerean et al., 2019). In African countries, some students enrolled in nursing school as a bridge to medical school or because of government incentives that funded their education (Bryant et al., 2022).

Future recruitment efforts could emphasize the positive, caring aspects of nursing and provide more information about what a nurse's job actually entails, including the autonomy of the role of the nurse and career mobility prospects. Furthermore, nurse academics should be included in public discourse to increase visibility of the profession (Glerean et al., 2019).

## **2. Addressing culturally congruent care**

Recruiting and retaining minority students to provide culturally congruent care to diverse populations has been documented as an additional demographic challenge affecting the nursing education pipeline (Barbé et al., 2018; Bennett et al., 2021; Bleich et al., 2014; Harris & O'Rourke, 2014; Metcalfe & Neubrander, 2016; Murray et al., 2016). Achieving adequate health workforce staffing is a critical component in efforts to improve health outcomes across all care settings, for both minority and non-minority patients (Blume et al., 2021).

Cultural barriers between patients and providers can exacerbate poor health conditions because of culturally incongruent care practices. Research shows that minority patient populations achieve better health outcomes when receiving care from a provider of the same ethnic/racial background, as cultural nuances are better understood and trust levels are higher. The need for culturally appropriate care is even more dire when a minority patient population suffers increased health disparities (Wilson et al., 2018). Alleviating this bottleneck in the pipeline will continue to be critical as patient populations become increasingly more diverse around the world.

**Cultural barriers between patients and providers can exacerbate poor health conditions because of culturally incongruent care practices.**

### 3. Achieving balance in gender representation

Recruitment and retention of men to the nursing profession remains a persistent challenge, with male nurses making up only a small percentage of the overall global nursing workforce (Flaskerud & Lesser, 2018; Guy et al., 2022). Men hesitate to join the profession due to stereotypes including nursing being considered women's work, assumptions around male nurses and homosexuality, and stigma related to the view that male nurses are a sexual threat to female patients (Guy et al., 2022; Teresa-Morales et al., 2022). Men also face discrimination from women in the profession, as men are viewed as competition for available leadership positions (Flaskerud & Lesser, 2018).

Efforts to showcase nursing as a viable and exciting career path for men may help to increase recruitment and retention of male nursing students (Guy et al., 2022). Some claim that recruitment and retention of men would help alleviate the global nursing shortage because men may serve as more consistent members of the workforce, as compared to women, since they are less likely to have childcare obligations (Flaskerud & Lesser, 2018). Increasing gender diversity in nursing, including transgender and non-binary persons, may increase inclusivity in the profession and contribute to better patient outcomes. Recruitment campaigns should be extended to include a diversity of genders to promote nursing as a career choice for all (McMullan et al., 2025).



**Efforts to showcase nursing as a viable and exciting career path for men may help to increase recruitment and retention of male nursing students (Guy et al., 2022).**



# Nursing student attrition

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## 1. Providing academic and personal support for nursing students

Once enrolled in post-secondary nursing education, mentoring and peer-tutoring programs have been shown to help stabilize or improve nursing student retention rates (Metcalf & Neubrandner, 2016; Murray et al., 2016). Some programs also offer financial support via stipends to reduce the burden on students and increase their sense of belonging, yet student attrition rates remain relatively high (Larsson & Johnson, 2022; Metcalfe & Neubrandner, 2016; Schmiedeknecht et al., 2015).

In the past ten years, the world has seen nursing student attrition attributed to numerous factors, including stress and lack of psychological and emotional support (Bakker et al., 2019; Harris & O'Rourke, 2014; Kukkonen et al., 2016; Metcalfe & Neubrandner, 2016; Smith & Yang, 2017), misaligned expectations of the realities of nursing school (Bakker et al., 2019; Chan et al., 2019; Katz et al., 2016), pregnancy (Appiagyei et al., 2014), financial hardships (Larsson & Johnson, 2022; Metcalfe & Neubrandner, 2016; Appiagyei et al., 2014), lack of clinical opportunities (Alluhidan et al., 2020; Bvumbwe & Mtshali, 2018; Chan et al., 2019; Kimani & Gatimu, 2023; Middleton et al., 2014; Sanborn, 2023), safety issues within clinical opportunities (Bakker et al., 2019), and academic difficulties completing the coursework required for graduation, particularly in anatomy and physiology (Barbé et al., 2018; Bennett et al., 2021; Chan et al., 2019).

Although the intensity of these challenges may vary according to contexts and locations, students from minority, rural, and immigrant backgrounds are uniformly at particularly higher risk of dropping out because of these reasons (Barbé et al., 2018; Metcalfe & Neubrandner, 2016).

## 2. Improving self-esteem of nursing students

Negative perceptions of the field and low self-esteem among nursing students may contribute to retention issues in the profession post-graduation. A study of undergraduate nursing students indicates that positive perceptions of the nursing profession decreased over the course of nursing education due to initially unrealistic expectations, limited scope of practice, and a sense that nursing is second choice to the medical profession (Neumbe et al., 2023).

In countries where women have reduced social status, such as Vietnam, nursing is seen as a lowly profession because it is dominated by women (Nguyen et al., 2022). In a longitudinal study of nursing students in Turkey, self-esteem was high in the first year of nursing education but declined over the four-year period (Kaya & Dalgiç, 2022).

**Negative perceptions of the field and low self-esteem among nursing students may contribute to retention issues in the profession post-graduation.**

Nursing education programs must be mindful of these challenges and seek to maintain positive images of the profession throughout the course of study to improve perceptions of the students and increase their self-esteem. Increasing nursing students' self-esteem may lead to better coping skills when they become nurses, resulting in higher quality patient care and stronger levels of professional commitment (Kaya & Dalgiç, 2022).

## Nursing educator shortages

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### 1. Who is qualified to teach?

Once enrolled in post-secondary nursing education, mentoring and peer-tutoring programs have been shown to help stabilize or improve nursing student retention rates (Metcalf & Neubrandner, 2016; Murray et al., 2016). Some programs also offer financial support via stipends to reduce the burden on students and increase their sense of belonging, yet student attrition rates remain relatively high (Larsson & Johnson, 2022; Metcalfe & Neubrandner, 2016; Schmiedeknecht et al., 2015).

Another bottleneck in the nursing education pipeline involves an insufficient number of nursing programs, which is driven in part by nursing educator shortages. A dearth of nursing educators is deeply connected to recruitment and retention efforts and global nursing supply issues (Firth, 2022; Michaels-Strasser et al., 2021).

Numerous factors contribute to nursing educator shortages. One factor involves the preparation required to serve in a professorial role and to teach. This requirement varies by country and often corresponds to a country's educational entry to practice requirements. For example, if a first-level general nurse must be prepared at the post-secondary diploma level, nursing educators could be prepared at the baccalaureate or post-baccalaureate levels. Most nursing professors in developed countries are required to have a doctoral education to teach in universities, with a preference given to PhD-prepared individuals over those with clinical doctorates (e.g., DNP). However, a debate over the usefulness of a PhD preparation for nursing educators has led many to question whether this standard supports movement of students through the nursing education pipeline or instead contributes to bottlenecks (Bullin, 2018).

The literature asserts that many PhD, or equivalently prepared, nursing educators are inadequately trained for teaching due to the nature of their doctoral programs. These individuals are expected to seamlessly transition to the classroom and teach with minimal pedagogical training, as their doctoral programs are research-focused and research-intensive (Booth et al., 2016; Bullin, 2018; King et al., 2020). But this transition has been onerous for most beginning nursing faculty.

As it now stands, fewer nurses are opting for a PhD. This reduces the flow of nursing educators into the classroom, thus limiting the number of nursing students who can be trained and continue moving through the pipeline into the nursing workforce (Firth, 2022). Some suggest reducing the time to complete doctoral-level nurse training or being more flexible with minimum nurse educator credentials to move more nurses into the nursing education workforce (Bruce & Phetlhu, 2024; Vandyk et al., 2017). Enrollment in DNP programs in the United States, as opposed to PhD nursing programs, has increased, which indicates movement in a positive direction but that also comes with its own set of drawbacks. While more nurses are graduating from DNP programs and can fill vacant nurse educator seats, they are less prepared for the academic world and the nuances associated with it (Bullin, 2018; Ea et al., 2021; Yancey, 2020).



**Fewer nurses are opting for a PhD. This reduces the flow of nursing educators into the classroom.**



Programs supporting faculty development may help strengthen clinical teaching and will lead to qualified nursing faculty who are retained in the role. For example, Chamberlain College of Nursing at Chamberlain University in the United States implemented an eLearning faculty development course to enhance competencies for teaching clinical education. An evaluation of the course showed positive results in terms of increasing the clinical competencies of the nursing faculty (Phillips et al., 2019). International distance education is another tool available to increase the supply of nursing educators through online training in master's and doctoral programs (Anders & Kunaviktikul, 2021).

## 2. Facing an aging and stressed faculty

Retirement also contributes to the global shortage of nursing educators and subsequent education pipeline issues. Younger faculty need to be hired to replace nursing professors who have retired or wish to retire. While a retirement wave among baby boomers will exacerbate this problem (Dreifuerst et al., 2016; Vandyk et al., 2017), retirement itself is not simply a product of age. Nursing professors cite unmanageable workloads, making early retirement an attractive option for those who would otherwise still be in the classroom (Bittner & Bechtel, 2017; Boamah, 2021; Candela et al., 2015).

A review of the literature also indicates that stress, non-supportive working environments, issues with coworkers, salary concerns, and a lack of work-life balance can lead to increased burnout for nursing faculty and early retirement (Bittner & Bechtel, 2017; Boamah, 2021; Casale, 2017; Vandyk et al., 2017; Yedidia et al., 2014). Developing mentorship programs between junior and senior faculty has been shown to foster positive associations between nursing educators and their careers, leading to increased job satisfaction (Cooley & DeGagne, 2016; Jeffers & Mariani, 2017; Summers, 2017). These programs are not necessarily designed to offset the global nursing faculty shortage but may serve as a positive externality.

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## Discussion

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The Global Nursing Workforce Centre's research framework document, included in the Annex of this publication, provides an overview of a global nursing research agenda, starting with nursing education pipeline issues. The scope of this review is limited to three specific aspects of the nursing education pipeline: recruitment and retention, nursing student attrition, and nursing educator shortages.

A review of the literature shows that clear gaps exist. The first points to a dearth of research on nursing education sufficiency, beyond general statements about nurse educator shortages, recruitment and retention efforts, and high attrition rates. Future scholarship could attempt to remedy this deficiency by taking a country-level, granular approach to better understand where nursing education insufficiency exists and what is causing the pipeline issues. This could include data on the numbers of nursing schools operating in a country, educators teaching within these schools, students enrolled, and graduates who enter the workforce or remain unemployed. Detailed information could provide policy guidance for regulators and other stakeholders attempting to remedy nursing education sufficiency issues.



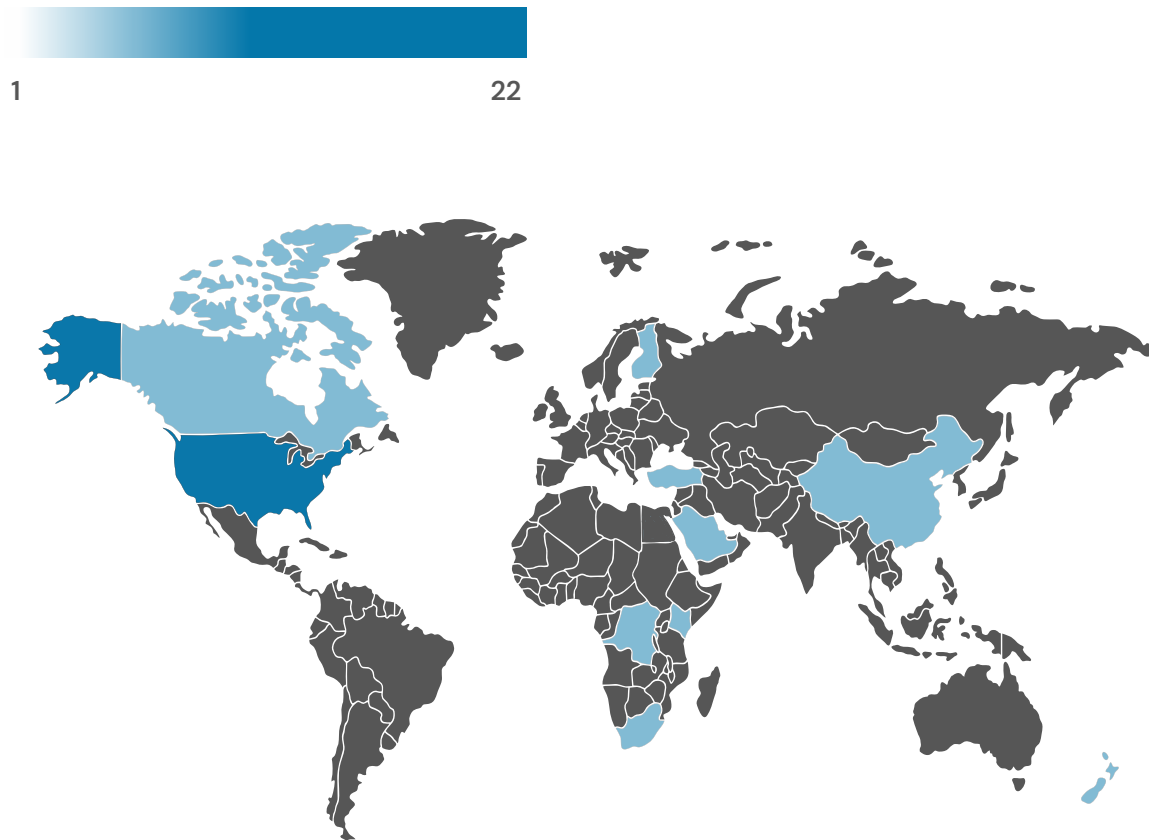
**The literature points to a dearth of research on nursing education sufficiency, beyond general statements about nurse educator shortages, recruitment and retention efforts, and high attrition rates.**

Another clear gap in the literature centers on the uneven distribution of research conducted across the world's regions, resulting in a paucity of data coming from middle- and low-income countries. As seen in Figure 1, research on nursing education pipeline issues has been heavily concentrated in the United States. More than half of the cited literature is based on research that was undertaken with U.S. populations and addressed issues specifically related to the U.S. nursing education pipeline. Research conducted in Canada, China, Finland, Kenya, Malawi, and New Zealand tied for second place with two articles each.

The research cited in this brief also contains five review articles that either did not specify a country where the research was conducted or included multiple countries with no regional focus. These were not included in Figure 1. This brief also contains information from two umbrella studies that included multiple countries, both of which focused on Sub-Saharan Africa. These two articles were also excluded from Figure 1, as not all of the topics included were germane to this brief. The authors conducted the literature search in English, which may have limited the results. However, research from developed anglophone countries was also lacking. Future research can fill this geographic gap, particularly in South America, Europe, North Africa, Central Asia, and the Middle East.

## Nurse education pipeline research

### Number of articles



**Figure 1. Geographic distribution of nurse education pipeline research.**

This brief was organized according to nursing education pipeline issue area: recruitment and retention, nursing student attrition, and nurse educator shortages. Within these overarching areas, there are sub-categories including demographic variables and their roles in pipeline issues, the factors pertaining to nursing student attrition and their impact, and the reasons behind faculty shortages and potential ways to remedy them.

As seen in Figure 2, the research cited in this review is distributed almost equally across issue areas. However, it is important to consider that the literature search methodology centers on keyword searches and the data thus collected cannot support further inferences. A more robust approach using a systematic or scoping review methodology could shift the literature distribution presented in Figure 2 to a configuration reflecting the research gaps on a more granular level in different cultural settings. Additionally, future studies could map issue areas onto geographic locations to offer greater insight into individual country's needs regarding the nursing education pipeline.



## Number of Citations by Issue Area

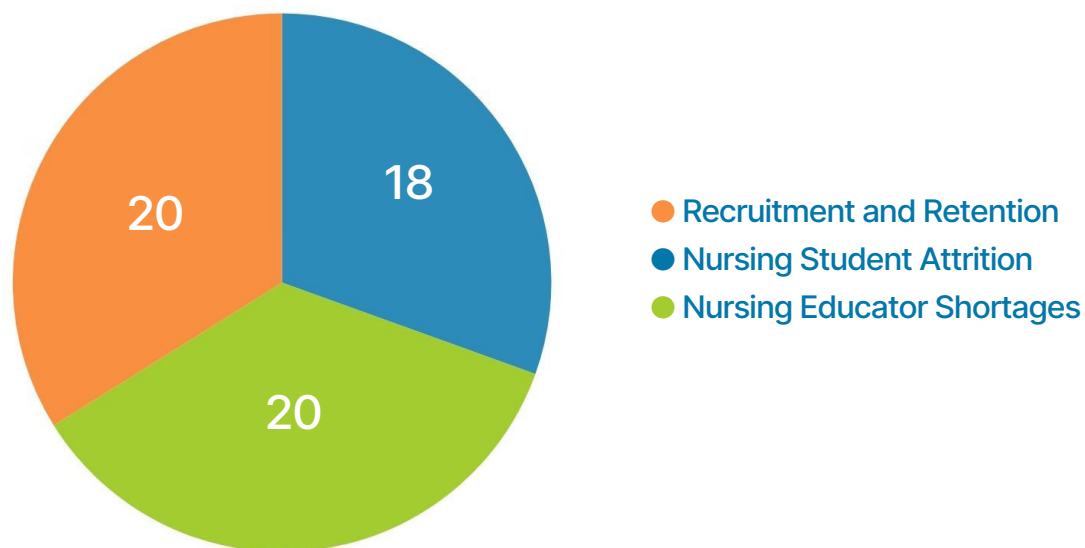


Figure 2. Relative distribution of citations on nursing pipeline issues.

## Conclusion

This brief serves as a launching pad for future research on nursing education pipeline issues ranging from nursing student recruitment and attrition once enrolled to faculty shortages. The research referenced in this brief offers solutions to mitigate them. Geographically, the research has come primarily from the United States. But the expansion of these research efforts into other countries and world regions, although still limited within the past decade, has been encouraging. The opportunities for diversification according to the issue areas outlined in this brief are promising. Future research focusing on the identified gaps will better serve nursing students, educators, regulators, and other stakeholders. More importantly, the solutions that this research can generate will serve patient populations around the world.

The Global Nursing Workforce Centre has prepared this brief and offered analyses to suggest future directions for research on nursing pipeline issues. This “Where Are We?” brief serves as an initial prototype to illustrate the vision undergirding The State of the Global Nursing Workforce: A Catalyst for Evidence-based Nursing Workforce Policy series. In future installments of this series, we intend to further identify gaps in current research and to help point the way toward generating new research from across world regions and all country income levels to paint a more complete picture. It is toward this goal of achieving inclusivity and connectivity as the cornerstones of the Centre’s scholarship that we must dedicate our effort.

**Future research focusing on the identified gaps will better serve nursing students, educators, regulators, and other stakeholders. More importantly, the solutions that this research can generate will serve patient populations around the world.**





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## ANNEX

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# The State of Global Nursing

## A catalyst for evidence-based workforce policy

### Framework Document

Over the past several decades, the nursing workforce has shouldered increasing responsibility in delivering care to the world's population across a myriad of contexts and roles. The Global Nursing Workforce Centre ("the Centre"), under the joint auspices of the International Council of Nurses and TruMerit™, formerly CGFNS International, believes that these contributions must be documented and recognized for their critical role in providing care and advancing health.

This is the first in a series of briefs, through which the Centre will serve as an authoritative repository of research on the global nursing workforce by taking a retrospective and prospective look at the nursing profession, capturing its triumphs and its setbacks, and applying critical analyses to generate impactful policy insights to inform future directions in nursing workforce studies. This series will document the state of the global nursing workforce, celebrate what the profession has accomplished, and identify gaps that still need to be filled, not only among high-resource countries but also across the socio-economic spectrum to include communities at all stages of development. This view of the nursing workforce will initially be based on a literature review and systematic analyses covering the profession across the world, from 2014 to 2025. Organized both topically and thematically to highlight nursing workforce challenges and solutions, it will be monitored and reported every five years by the Centre as a tribute to the profession and a service to the public. The Centre will also periodically issue policy briefs and monographs on special topics.

The framework below provides a conceptual overview of the research agenda undergirding the nursing workforce in four broad areas—education, practice, regulation, and policy. A fifth area, systemic issues, has been added to capture the persistent challenges facing the global nursing workforce. These systemic issues cut across the other four areas.

### 1. Education

#### a. Pipeline issues

- i. What are the demographic factors pertaining to nursing education and leading to nursing workforce pipeline issues?
- ii. What evidence is there about the sufficiency of nursing education? Is there a sufficient number of nursing schools offering nursing programs at different levels to meet national nursing workforce needs?
- iii. Are there faculty shortages facing nursing education? Where do they occur (e.g., ages of faculty and retirement risk)? How have countries handled these challenges? How do faculty readiness and workforce capacity factor in this challenge?

- iv. What are some incentives for nurses to become faculty? What are models of innovations in the use of nursing faculty (e.g., should a PhD be required to teach undergraduate students)?
- v. What is the impact of student attrition in nursing programs, including suspension/return rates?

#### **b. Technology issues**

- i. What technology is available and accessible to deliver and enhance nursing education? What are the challenges?
- ii. What are models of nursing education that incorporate training in the use of AI, remote monitoring tools, and telemedicine as part of nursing education and continuing professional development? What are the challenges and models of success?
- iii. What are the gaps in digital health education in low-resource countries? Are there success stories?

#### **c. Curriculum issues**

- i. What are the globally recognized nursing competency frameworks? What are model efforts to standardize the curriculum to ensure quality?
- ii. What efforts have been made to align nursing curricula to meet evolving healthcare needs, including primary care, public health, population health, aging populations and chronic diagnosis, and emerging/existing health issues? How are special needs being prioritized and incorporated into the curricula of low- and middle-income countries?
- iii. What efforts are in place to align nursing curricula across countries and regions to focus on essential competencies? How can variability in clinical hours and settings in education programs be addressed to achieve better curricular alignment across countries?
- iv. What is the role of critical thinking in nursing curricula?
- v. What is the extent of leadership training in nursing curricula?
- vi. How are nurses prepared to be independent and critical thinkers capable of addressing complex healthcare issues?
- vii. What are models of innovations in nursing education to prepare graduates for interdisciplinary teamwork, leadership, primary care, and public health roles?
- viii. What are examples of global workforce education models that are based on unified competency standards to facilitate workforce mobility?
- ix. How are nursing programs sufficiently preparing students for the workforce?
- x. What is the level of training related to clinical experience, simulation training, online and blended approaches, and exposure to various healthcare settings? What are examples of collaborative framework between academic faculty and clinical experts to create a seamless education for nursing students?

## **2. Practice**

#### **a. Scope of practice and role autonomy**

- i. What are the disparities in the level of autonomy granted to nurses across different countries?
- ii. What are the barriers to expanding nurse-led primary care models?
- iii. Where is the evidence of the underutilization of advanced practice nurses (APNs) in clinical decision-making roles?
- iv. How can specialist roles be enhanced? How can RN prescribing be advanced around the globe?
- v. How has the team-based model of care delivery affected the role of nurses in the health system? How is the role of the nurse viewed in the healthcare team (e.g., as a leader)?



- vi. What are models of local efforts to challenge the status quo? Where are these success stories?
- vii. What are some examples of global harmonization of ethical and legal considerations in nursing practice?
- viii. What are the constraints related to regulated scope of practice vs employer-based scope of practice (e.g., not able to work to full or optimal scope of practice)?

**b. Access to continuing education and professional development**

- i. How available, affordable, and accessible are high-quality continuing education programs for nurses worldwide?
- ii. What are the barriers for even distribution of opportunities for skills enhancement, particularly in rural and underserved areas?
- iii. What recognition mechanisms of specialized knowledge and skills are there to support career advancement for nurses?
- iv. What are examples of success with education providers offering continuing education on new models of care to address gaps in nursing education (e.g., digital transformation, application of AI)?
- v. What are the development opportunities for nurses to work effectively in primary health care and public health settings?
- vi. Where are the success stories and care models?
- vii. Are there opportunities to implement nurse practitioner programs across the globe? Where are the success stories?

**c. Workforce challenges**

- i. What do we know about unemployment and underemployment among qualified nurses despite global shortages? How do these patterns, particularly in low- and mid-resource countries, affect nurse migration?
- ii. What are the persistent challenges related to nurse migration? What efforts have been extended to address inequitable workforce distribution? What are some solutions to address trafficking and unethical processes or policies?
- iii. What impact will the aging of the nursing workforce have on care delivery? How are countries responding to this challenge?
- iv. What roles do stress, burnout, and mental health challenges play in the global nursing workforce? What effect do these conditions have on the quality of care and patient safety? What impact do these conditions have on the retention of nurses in the profession (e.g., driving nurses from the profession altogether or shifting from full-time to part-time/casual or agency nursing)? What are models of effective organizational interventions to reduce burnout?
- v. What is the impact of higher pay on nurse employment competition?
- vi. How do we ensure that nurses are sufficiently prepared to work effectively in interprofessional teams at multi-level opportunities?

**d. Transition to practice**

- i. What are examples of interventions to support nurse graduates in successfully transitioning to practice (e.g., mentorship, socialization into nursing, confidence building, management and leadership education)?

**e. Use of technology in practice**

- i. What are the levels of investment and regulation related to the use of AI, remote monitoring tools, telemedicine, and genomics?



**f. Evolving models of care**

- i. How do evolving models of care, including regulated and unregulated roles, impact the quality of patient care and the effectiveness of the healthcare team?

### 3. Regulation

**a. Mutual recognition and credentialing**

- i. What are the barriers to the mobility of nurses across countries and jurisdictions? How can training, as embodied by the curriculum, be agreed upon and accepted for specific levels of nursing practice across countries?
- ii. What standardized credentialing processes across borders are available? Is there a common standard and approach across countries? How do credentialing requirements differ for domestically prepared nurses vs internationally educated nurses?
- iii. What is the role of global certification in harmonizing standards across countries/jurisdictions?
- iv. What are the case studies of local and regional efforts (e.g., Compact in United States, EU, ASEAN) to facilitate nursing workforce mobility?
- v. What are best practices in regulation to support workforce mobility? What are models of right touch regulation? Are there examples of jurisdictions that offer the ability to remain licensed in a jurisdiction if the nurse migrates elsewhere?
- vi. Where are the success stories and evolving models?
- vii. What is the impact of the increasing role/influence of government in advancing regulatory control?
- viii. What are some models for changing credentialing requirements to alleviate nursing shortages?
- ix. How do international jurisdictions handle continuing competence for nurses?
- x. How do differences in scope of practice across jurisdictions impact health outcomes? Are these differences well documented?

**b. Standardized regulatory frameworks**

- i. Where is evidence of efforts to achieve a common accepted standard for nursing regulation and practice?
- ii. What impact does the absence of universal standards have on nursing education, regulation, and practice?
- iii. What are examples of international collaboration and global accreditation to establish standards and guidelines to bridge the gaps between education and practice?

### 4. Policy

**a. Uneven distribution of the global nursing workforce**

- i. What are the distributions of the nursing workforce among countries based on income level?
- ii. What are the distributions of the nursing workforce based on geography (e.g., urban areas versus rural areas and remote regions)? What efforts have been directed to facilitating training opportunities to deliver need-based population care?
- iii. What are the demographic shifts of the world's populations that highlight the imbalance in supply and demand of the nursing workforce?
- iv. Which health workforce sectors do nurses gravitate toward for employment?





## **b. Policy roles for nurses**

- i. What policies are there to address gender equity and diversity in the nursing workforce locally and globally?
- ii. What is the role of nurse leadership in health policy? How well are nurses represented in high-level health policy decision-making?
- iii. What efforts are there to prepare and position nurses for leadership roles in reference to the four pillars captured in this framework document?
- iv. Which strategies will allow nurses to participate in the formulation and execution of health policy?

## **c. Workforce planning**

- i. What types of data are needed to shape workforce planning models? What are examples of effective workforce planning models?

## **5. Systemic issues**

### **a. Recruitment vs retention**

- i. How are recruitment strategies for nurses balanced with retention efforts for existing nurses and those returning to the workforce?
- ii. What efforts (in terms of interventions and programs) have been made to improve workplace conditions and job satisfaction? What are models of flexible approaches to working hours, careers (e.g., children)?
- iii. How to develop nurse managers to lead retention policies/guidelines and protocols?
- iv. What are examples of interventions that address the mentor gap created by experienced nurses leaving the profession? This problem exacerbates new-to-practice nurses' stress, burnout, and intent to leave. Are extended residency programs a solution?
- v. How can evidence-based policies be developed to improve workplace conditions and job satisfaction in nursing, ensuring alignment and agreement among governments, regulators, professional bodies, and trade unions?

### **b. Migration vs unemployment, underemployment, and overemployment**

- i. What role does nurse migration play in managing workforce recruitment and retention?
- ii. What are sustainable solutions to manage nurse migration without depleting source countries of an already-scarce human resource?
- iii. What role do nursing unemployment and underemployment in local settings play in building a sufficient nursing workforce globally?
- iv. What is the impact of overemployment in local settings? What is the impact of access to education, good terms, conditions, and pay relevant to decision-making in nurse migration?
- v. Is the quality of care impacted by migration?

### **c. Workforce environment and support**

- i. What is the role of the nursing workforce in delivering primary care or general practice? What is the link between investment in nursing and health system outcomes and population health status/outcomes? What is the impact of having more nurses working in primary care on health system outcomes and population health status/outcomes?
- ii. What is the impact of rising trends in RN substitution on the quality of care?
- iii. What are the persistent issues in pay and gender equity for nurses?

- iv. What are models of successful interventions to reduce stress and burnout, to support manageable workload, to mitigate violence in the workplace, and to decrease the rate of nurse suicide?
- v. How has the relationship between the quality of nursing care and patient health outcomes been documented?
- vi. How do nursing shortages, including insufficient budgeted positions for nurses or difficulty filling existing positions, undermine patient safety and quality of care?
- vii. How does psychological safety in healthcare work environments influence patient safety, and what strategies can be implemented to enhance it?
- viii. What is the impact of climate change, war zones, and humanitarian scenarios on nursing work environments?

**d. Education and competency development**

- i. What efforts have been made to recognize nursing excellence? What venues and processes are available?
- ii. What policy efforts have been made to standardize global nursing curriculum competencies to facilitate international mobility and role alignment, especially as virtual nursing models evolve?
- iii. What initial nursing education and continuing professional development are available to support independent thinking and lifelong learning for nurses?

**e. Leadership and policy engagement**

- i. What strategies have been used to enhance nursing representation in policy and leadership roles?
- ii. What career-pathing guidance, mentorship, and training opportunities are available to equip nurses with political, strategic, and tactical readiness for active participation in health governance? Which of these approaches are most effective?
- iii. How does the recognition of nurse leaders in government decision-making roles influence healthcare policy and the representation of nursing perspectives in shaping national healthcare strategies?
- iv. What are examples of nurse-led models of care in health governance structure?

**f. Availability of data**

- i. What efforts can be undertaken to generate and synthesize comparable data across jurisdictions?
- ii. How does the lack of longitudinal data tracking nurses across the lifespan of their career, from education to retirement, impact workforce planning, policy development, and nursing outcomes?
- iii. How can improved and consistent data on international nursing mobility enhance workforce planning, policy development, and the global nursing workforce's effectiveness?

**g. Diversity, equity, and inclusion**

- i. How do competencies and education related to diversity, equity, and inclusion impact the effectiveness of nurses in supporting a diverse workforce and providing culturally competent care to diverse patient populations?
- ii. How do cultural competence and ethical dilemmas in nursing practice vary across different global contexts, and what impact do these variations have on patient care?
- iii. How do interprofessional collaboration competencies and models vary across the globe?



**h. Perceptions of the nursing profession**

- i. How do perceptions of the nursing profession vary culturally?
- ii. How does the understanding of the values of the newer generations influence the long-term desirability and sustainability of the nursing profession?

**i. Disparities in healthcare infrastructure and resources**

- i. How do disparities in healthcare infrastructure and resources across the globe affect access to care, patient outcomes, and healthcare equity?