



Comparing the evolution of the advanced practice nurse role: Insights from Switzerland and Kenya

Carole Mackavey ^{a,*} , Sara Kohler ^b, Eunice Ndirangu-Mugo ^c, Rachel W. Kimani ^c, Constance S. Shumba ^d, Benard Daniel Mutwiri ^e, Colette Henderson ^f, Anna Jones ^g

^a University of Texas Health Science Center Cizik School of Nursing, Department of Graduate Studies, 6901 Bertner Room 615 Houston Texas 77030, United States

^b Leiterin MAS in onkologischer Pflege, Katharina-Sulzer-Platz 9, Postfach, CH-8401 Winterthur, Switzerland

^c Decker College of Nursing and Health Sciences, Binghamton University, New York, United States

^d Division of Epidemiology and Social Sciences, Institute for Health & Humanity, Director, Master of Science Global Health Equity, Medical College of Wisconsin, Milwaukee, WI 53212, United States

^e School of Nursing and Midwifery, East Africa The Aga Khan University, 3rd Parklands Avenue, Off Limuru Road, P.O Box 30270, GPO 00100, Nairobi, Kenya

^f School of Health Sciences, University of Dundee, NMC Nurse Advisor (Scotland) advanced practice, Chair - Scottish Advanced Practice Educators Network, Co-Chair - ICN NP/APN Network Comms, Scottish Committee member - Association of Advanced Practice Educators (AAPE UK), UK

^g Cardiff University, NMC Advanced Practice Advisor (Wales), Chair AAPE, UK

ABSTRACT

The article explores the evolution of Advanced Practice Nurse (APN) roles in Switzerland and Kenya, highlighting their development, challenges, and influence on healthcare delivery. Despite notable differences in income levels and healthcare infrastructure, both countries are committed to strengthening primary care through the deployment of APNs. Switzerland uses APNs to address provider shortages and improve chronic disease management, whereas Kenya uses them to increase access in underserved areas.

A comparative analysis explores how regulatory frameworks, educational models, scope of practice, and health system priorities influence the adoption of advanced practice nursing (APN). Switzerland's established healthcare system supports the integration of APNs, whereas Kenya faces distinct challenges, including workforce shortages and limited public awareness. Despite economic differences, both countries face similar challenges, including regulatory hurdles and cultural barriers.

The study uses policy documents, regulatory guidelines, and academic literature to analyze key factors, including educational pathways, licensure, prescriptive authority, and healthcare integration. Findings emphasize the importance of strong regulatory frameworks, standardized education, and cultural competence in maximizing the effectiveness of APNs. Embedding Advanced Practice Nurses (APNs) in primary care can help reduce healthcare disparities, improve access, and improve patient outcomes.

International collaboration is vital for advancing APN development globally. By exchanging insights and best practices, countries can enhance APN education and deployment strategies to address global healthcare challenges, ultimately improving primary care systems and healthcare delivery.

1. Introduction

More than half of the world's population lacks access to essential health services, and many face financial hardship when seeking care (Catton et al., 2024). These challenges, combined with the increasing complexity of patients and a global shortage of healthcare professionals, have accelerated the adoption of Advanced Practice Nurses (APNs) to improve access, affordability, and quality of care (Mackavey et al., 2024).

Although titles and scopes vary internationally, APNs typically include two key roles: Nurse Practitioners (NPs) and Clinical Nurse Specialists (CNSs) (International Council of Nurses [ICN] 2020). In some

countries, such as the United States and Australia, APNs are referred to as Advanced Practice Registered Nurses (APRNs). They are part of a broader category known as Advanced Practice Providers (APPs), which also includes physician assistants (Goemaes et al., 2016). See Table 1 Commonly used titles for Advanced Practice Nurses.

The International Council of Nurses (ICN) emphasizes that APN roles are shaped by local contexts and regulatory frameworks, resulting in diverse interpretations and applications across healthcare systems (ICN, 2020; OECD et al., 2011; Cashin et al., 2015). Globally, APNs are increasingly recognized as key contributors to healthcare delivery, particularly in addressing provider shortages, expanding access to care, and improving patient outcomes. While the scope of practice,

* Corresponding author.

E-mail address: Carole.L.Mackavey@uth.tmc.edu (C. Mackavey).

educational requirements, and professional autonomy vary significantly across countries, the overall trend indicates a growing reliance on APNs to lead clinical innovation, support integrated care models, and respond to evolving population health needs (Mackavey et al., 2025).

2. Comparative development of APN roles in primary Care: Switzerland vs. Kenya

This article examines the development of Advanced Practice Nursing (APN) roles in primary care across two distinct healthcare systems: Switzerland, a high-income nation, and Kenya, a lower-middle-income country. It traces how APNs have evolved and been integrated into each system, highlighting progress and ongoing challenges. By comparing these two environments, the article underscores common obstacles to role development, such as regulatory barriers, professional resistance, and limited educational infrastructure. It identifies shared opportunities to broaden access and improve the quality of care. Through this comparative approach, the study examines how APNs can significantly contribute to healthcare delivery, particularly in underserved areas, and what lessons each system can learn from the other. This analysis addresses global health workforce issues. The World Health Organization (WHO) emphasizes the vital role of Advanced Practice Nurses (APNs) in achieving Universal Health Coverage, particularly in underserved regions (World Health Organization, 2024). Understanding how APNs are utilized in both high- and low-resource settings informs strategies for workforce planning, education, and policy development. APNs also promote equity in health outcomes by expanding access to care for rural and marginalized populations. Insights from Switzerland and Kenya can guide curriculum development, clinical training, and capacity-building efforts tailored to local needs (Mackavey et al., 2025).

Furthermore, this comparison supports global collaboration and policy advocacy. Evidence from diverse contexts strengthens the case for recognizing and expanding APN roles, encouraging international cooperation among nursing organizations, educators, and health ministries. It highlights the importance of context-sensitive strategies that respect cultural, economic, and systemic differences while pursuing the shared goal of strengthening nursing leadership and improving patient care worldwide.

3. Switzerland: Structured growth amidst systemic challenges.

In Switzerland, APNs are a relatively recent addition to primary care, introduced in response to an aging population, rising multimorbidity, and a looming shortage of general practitioners (Gysin et al., 2019). Despite Switzerland's strong healthcare infrastructure, the integration of APNs has been gradual, owing to unclear legal frameworks, limited reimbursement mechanisms, and resistance from some medical professionals. Nevertheless, pilot programs and academic initiatives are steadily gaining acceptance, paving the way for APNs to become essential members of primary care teams (Gysin et al., 2019).

4. Kenya: Expansion driven by urgency

In contrast, Kenya has embraced APNs as a strategic response to severe workforce shortages and limited physician access, particularly in rural and underserved regions. The APN role has evolved more organically, with nurses often assuming expanded responsibilities in areas such as diagnosis and treatment, chronic disease management, health education, and preventive care (Shumba et al., 2025). Although formal regulation and recognition of APNs in Kenya are still developing, their impact on improving healthcare access and outcomes is increasingly acknowledged. The current ICN definition of APNs is:

"A Nurse Practitioner/Advanced Practice Nurse is a registered nurse who has acquired the expert knowledge base, complex decision-making skills, and clinical competencies for expanded practice, the characteristics of which are shaped by the context and/or country in which s/he is credentialed to practice. A master's degree is recommended for entry-level" (ICN, 2020).

5. Literature review

To examine the development, practice, regulation, and education of Advanced Practice Nursing (APN) Primary Care roles in Switzerland and Kenya, a comprehensive literature search was conducted using electronic databases. The sources included PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Scopus, and Google Scholar. The search used a combination of Boolean operators and keyword phrases to ensure relevant and thorough results. The keywords and phrases included: "Advanced Practice Nursing in Switzerland and Kenya," "APN practice and regulation," "APN in Switzerland," "APN in Kenya," and "APN education in Switzerland and Kenya."

Search filters were applied to include articles published between 2018 and 2025, with a focus on primary care, policy development, educational frameworks, and clinical practice. Both qualitative and quantitative studies were considered, along with policy briefs and reports from international organizations such as the International Council of Nurses (ICN) and the Organization for Economic Co-operation and Development (OECD). Exclusion criteria included roles in the treatment of specific disease processes.

The initial search yielded 152 articles. After screening titles and abstracts for relevance, 40 sources were selected for full-text review. An additional 39 studies were identified through hand searches of organizational records and web searches, addressing APN role development, regulation, and education in Switzerland and Kenya. (See Prisma Diagram).

6. Global environment of advanced practice nursing

Advanced Practice Nursing (APN) has become a potent evolutionary force in global healthcare, addressing workforce shortages, increasing patient complexity, and the need for cost-effective care (Catton et al., 2024; Mackavey et al., 2024). The International Council of Nurses (ICN, 2020) defines APNs as nurses with advanced expertise, clinical skills, and decision-making authority for expanded roles. While APN roles are

Table 1

Commonly Used Titles Globally.

Commonly used titles for Advanced Practice Nurses
<ul style="list-style-type: none"> • Nurse Practitioner (NP) • Advanced Nurse Practitioner (ANP) • Advanced Nurse (AN) • Clinical Nurse Specialist (CNS) • Advanced Practice Nurse (APN) • Nurse Midwife (CNM/ CM/ CPM/ APM) • Nurse Anaesthetist (CRNA) • Women's Health Nurse Practitioner (WHNP) • Advanced Clinical Nurse Specialist (ACNS) • Advanced Clinical Practitioner (ACP)

well established in high-income countries, their growth in low- and middle-income regions, particularly in sub-Saharan Africa, is accelerating (Geyer & Christmals, 2020; Gray et al., 2024). The importance of contextual adaptation and stakeholder engagement in implementing APN roles (Porat-Dahlerbruch et al., 2025; Bryant-Lukosius & DiCenso, 2004). These principles are particularly relevant in Switzerland and Kenya, where unique cultural, economic, and regulatory environments influence APN integration. Switzerland's regulatory uncertainty.

7. Historical development of the APN role in Switzerland

Switzerland began developing Advanced Practice Nursing (APN) roles in 1990 through a collaborative Master's program with Maastricht University in the Netherlands (Keinath et al., 2023). The first domestic Master of Science in Nursing (MScN) program launched at the University of Basel in 2002, initially preparing Clinical Nurse Specialists (CNSs) for research and leadership roles in university hospitals (Gysin et al., 2019).

By 2010, APN education remained broad, but has since evolved to include specialization tracks in CNS, Nurse Practitioner (NP), and research-focused pathways. Although APNs primarily work in inpatient settings, recent public and private pilot programs have introduced them into primary care to address the shortage of general practitioners (GPs) and improve care quality through interprofessional collaboration (Gysin et al., 2019; Sottas et al., 2019; Schönenberger et al., 2020). Despite ongoing regulatory and professional hurdles, APNs are increasingly recognized by both nurses and physicians for their contributions to healthcare delivery. As of 2022, 505 nurses in Switzerland held a Master's degree, of whom 60% were actively practicing as APNs (Swiss Nurses Association [SBK] et al., 2022).

8. Policy and regulatory framework

Switzerland is currently undergoing significant policy discussions to formalize APN roles. The Pflegeinitiative (Nursing Initiative), led by the Federal Office of Public Health (FOPH), aims to address workforce shortages and define APN competencies (Cignacco et al., 2024). Regulatory decisions regarding Master's-level qualifications are expected by Spring 2026 (Machado et al., 2025). A national competency exam for MScN graduates is under consideration to standardize qualifications (Maher-Imhof and Altherr (2024)). Meanwhile, the APN-CH association, formed by SBK, the Association of Academically Prepared Nurses (VfP), and Swiss ANP, offers voluntary registration and actively contributes to policy development (Keinath et al., 2023).

APNs in Switzerland are commonly referred to as nursing experts, APN (Maher-Imhof and Altherr (2024)). Most currently work as CNSs or NPs in hospital settings, with growing numbers joining the APN-CH organization (Altermatt-von Arb et al., 2023). However, the scope of practice remains undefined at the national level, with no legal framework in place. Responsibilities typically include advanced clinical assessment, diagnosis, and management of complex conditions, as well as roles in education, consultation, and leadership, though these vary by canton and practice setting (Beckmann et al., 2024; Josi et al., 2020).

9. Switzerland's regulatory uncertainty

Switzerland's APN development began in the late 1990s, with formal education programs, such as the MScN, being offered across its multilingual regions (Maher-Imhof and Altherr (2024)). Despite a strong academic foundation, the country lacks a unified legal framework governing APN practice, leading to role ambiguity and varying scopes of practice across cantons (Machado et al., 2025; Beckmann et al., 2024).

Research has identified challenges in interprofessional collaboration and resistance among primary care physicians (Josi et al., 2020; Gysin et al., 2019). Pilot programs have demonstrated the value of APNs in improving care quality and alleviating shortages of General Practitioners (Lauber et al., 2022; Schönenberger et al., 2020), but

professional recognition remains inconsistent. The APN-CH organization has proposed minimum standards for certification and specialization to ensure consistency and elevate the profession (Maher-Imhof and Altherr (2024)).

Switzerland's multilingual environment, comprising German, French, Italian, and Romansh, complicates APN education and practice, necessitating tailored curricula and communication strategies (Bundesamt für Statistik, 2022; Sari & Yüce, 2020). Additionally, comparisons with other European systems reveal that historical and cultural factors continue to shape the development of APN (Beil-Hildebrand & Smith, 2022).

Historical Development of the APN Role in Kenya.

Kenya's APN growth is directly tied to national health priorities, including the Kenya Health Policy Framework 2014–2030 and efforts toward Universal Health Coverage (UHC) (Government of Kenya, 2010; Ministry of Health, 2014). APNs are viewed as a strategic solution to healthcare access challenges, particularly in rural and underserved areas (East et al., 2014; Kimani & Gatimu, 2023; Miseda et al., 2017). Despite advancements, Kenya faces significant barriers. The shortage of qualified educators and the limited number of clinical training sites hinder the expansion of APN capacity (Mbuthia et al., 2022; Fitzgerald et al., 2012). Medical residency programs dominate hospital settings, reducing opportunities for APN students to acquire practical experience (Tjia et al., 2023). Additionally, resistance from physicians and unclear role definitions impede APN integration (Wheeler et al., 2022; Ndirangu-Mugo et al., 2024). Kenya has taken steps to define APN roles through the Nursing Council of Kenya (NCK, 2022; Ministry of Health, 2022), and graduate programs are now available at Aga Khan University and Masinde Muliro University (AKU, 2024; Shaibu et al., 2020). However, systemic issues such as poor retention, workforce migration, and inadequate succession planning continue to impede sustainable development (Christmals, 2018; Malwela et al., 2016).

Socioeconomic factors further complicate APN implementation. High out-of-pocket healthcare costs (World Bank, (2024)), budget constraints (Ministry of Health, 2016; The National Treasury, 2023), and uneven workforce distribution worsen health disparities (Masaba et al., 2020; Moses et al., 2021). APNs and Advanced Practice Midwives (APMs) are especially crucial in maternal and family health, where obstetricians are often absent in rural areas (Perriman et al., 2018; Torrens et al., 2020).

10. Comparative insights and emerging opportunities

Both Switzerland and Kenya face similar challenges in developing APN roles, including regulatory uncertainty, workforce shortages, and cultural resistance. However, their approaches differ: Switzerland's progress is academically driven but slowed by fragmented regulation, while Kenya's approach is practical and policy-focused, addressing urgent healthcare needs. Opportunities for both countries include establishing standardized national frameworks for APN education and practice (ICN, 2020; Schober et al., 2020), strengthening interprofessional collaboration and public awareness (Josi et al., 2020; Mbuthia et al., 2023), expanding APN roles in maternal and family health, especially in rural areas (Poghosyan & Maier, 2022; Nashwan et al., 2024), and leveraging APNs to meet Sustainable Development Goals, particularly SDG 3 and SDG 1 (McCarthy et al., 2013; Rutledge et al., 2014).

11. Economic and healthcare infrastructure

Switzerland is a high-income country with a compulsory health insurance system. It ranks second among Organisation for Economic Co-operation and Development (OECD) nations in per capita healthcare expenditure, with a total of 86.3 billion Swiss francs in 2021 for a population of 8.7 million (OECD, 2023; Swiss Federal Council, 2024). The system is universal but individually funded, with citizens required

to choose and pay for their own insurance plans. Monthly premiums vary, and individuals are responsible for 10% of healthcare costs up to a 700 CHF annual deductible. Despite its reputation for excellence, the Swiss healthcare system is expensive and in need of reform (Tikkane-nosa et al, 2025; OECD et al., 2011). The system's emphasis on individual responsibility, regulated competition, and universal coverage offers a unique model for balancing equity and efficiency in healthcare delivery (International Affairs Forum, 2025). However, demographic shifts, rising service demands, and evolving care needs are placing significant pressure on the workforce. Projections indicate that Switzerland will require an additional 45,000 nurses and 27,000 nurse assistants by 2038 (FOPH, 2024), underscoring the urgency of expanding APN roles to ensure system sustainability and maintain high-quality care.

12. Kenya's healthcare system

Kenya's healthcare system operates under a mixed model that includes public, private, and faith-based providers, all of which contribute to service delivery across the country. The Ministry of Health oversees national policy, regulation, and strategic planning, while county governments manage most service-delivery functions under the 2010 constitutional devolution reforms (Nyawira et al, 2023). This structure aims to improve responsiveness and equity by bringing decision-making closer to communities (Generis Legal Intelligence, 2024). Kenya's healthcare system operates under a mixed model that includes public, private, and faith-based providers, all of which contribute to service delivery across the country. Community health units provide basic preventive and promotive services, while dispensaries and health centers offer primary care. Higher-level facilities, including county and national referral hospitals, manage more complex cases and provide specialized care (Karimi et al, 2025). This stepwise referral system is intended to streamline patient flow and optimize resource utilization, although gaps in infrastructure and staffing often undermine its effectiveness (Generis Legal Intelligence, 2024).

Recent assessments highlight ongoing efforts to strengthen the health system through universal health coverage (UHC) initiatives, digital health innovations, and expanded infrastructure. Kenya has made progress in expanding insurance coverage through the National Health Insurance Fund (NHIF), though affordability and enrollment barriers persist (Ministry of Health, 2025).

13. Socioeconomic and cultural Influences

Switzerland's strong financial resources support advanced medical infrastructure and high-quality education, facilitating the growth of specialized nursing roles (Machado et al, 2025). The country has a nurse-to-patient ratio of 18.7 per 1,000, which contributes to effective care delivery (OECD et al., 2011). However, gaps remain, particularly in access to care for older adults. One-third of individuals aged 65 and older report difficulty accessing healthcare professionals (Altermatt-von Arb et al, 2023).

Switzerland's multilingual landscape, with four official languages (German, French, Italian, Romansh), complicates APN education and practice. Educational materials must be available in multiple languages, making it difficult to standardize curricula and assessments across regions (Sari & Yüce, 2020). According to the Swiss Federal Statistical Office (2022), 61.8% of the population speaks German, 22.6% speaks French, 8.2% speaks Italian, and 5% speaks Romansh, with 23.1% reporting another primary language.

14. Education and training of APNs

Switzerland offers MScN programmes through Universities and Universities of Applied Sciences across its linguistic regions:

Entry requirements include: a Bachelor of Science in Nursing, proficiency in English, two years of RN experience, and fluency in the local

language for clinical communication (Beil-Hildebrand & Smith, 2022).

Programmes vary in structure. Four universities offer specialized tracks for CNSs and NPs, while three provide generic APN preparation (Maher-Imhof and Altherr (2024)). APNs are trained as nursing experts, with roles defined along a continuum of advanced practice responsibilities (Bryant-Lukosius & DiCenso, 2004). See Table 2: Language Areas and Universities.

15. Comparative policy analysis

Advanced Practice Nurses (APNs) have emerged as vital contributors to healthcare systems worldwide, particularly in addressing workforce shortages, increasing patient complexity, and the demand for cost-effective care (Catton et al., 2024; Mackavey et al., 2024). The development and integration of APN roles vary significantly across countries, shaped by distinct policy frameworks, educational structures, cultural perceptions, and socioeconomic conditions. This article presents a comparative analysis of the evolution of the APN role in Switzerland and Kenya, two nations with contrasting healthcare systems and economic profiles.

Switzerland, a high-income country with one of the world's most advanced healthcare infrastructures, began formalizing APN roles in 1990 through a joint Master's programme with Maastricht University (Keinath et al., 2023). The University of Basel launched the first domestic MScN programme in 2002, initially focusing on Clinical Nurse Specialists (CNSs) in academic and hospital settings (Gysin et al., 2019). Over time, Swiss APN education evolved to include specialization tracks in CNS, Nurse Practitioner (NP), and research pathways (Maher-Imhof and Altherr (2024)). However, despite strong academic foundations and high healthcare spending, CHF (francs) 86.3 billion in 2021 (Swiss Federal Council, 2024; OECD, 2023), Switzerland lacks a unified legal framework regulating APN practice. The ongoing "Pflegeinitiative," led by the Federal Office of Public Health, aims to define APN competencies and establish national standards, including a proposed national exam for MScN graduates (Gignacco et al., 2024; Machado et al., 2025). Professional organizations such as APN-CH have advocated for voluntary registration and policy reform (Keinath et al., 2023), but integration into primary care remains limited to pilot initiatives (Sottas et al., 2019; Schönenberger et al., 2020). Cultural perceptions also influence APN acceptance; while nursing is respected, it is often viewed as an auxiliary profession (Josi et al., 2020), and public awareness of APNs is low unless introduced by general practitioners. Switzerland's multilingual environment further complicates APN education and regulation, requiring curricula and assessments to be adapted across German-, French-, Italian-, and Romansh-speaking regions (Sari & Yüce, 2020; Bundesamt für Statistik, 2022).

In contrast, Kenya, a lower-middle-income country, has made notable policy strides in defining APN roles despite facing significant resource constraints. The National Nursing and Midwifery Policy (2022) formally recognizes APNs and NPs as specialists with master's level education and advanced clinical competencies (Ministry of Health, 2022). The Nursing Council of Kenya further categorizes APNs, CNSs, and NPs, granting them authority to prescribe, diagnose, and discharge patients (NCK, 2022; Kimani & Ndirangu-Mugo, 2023). However, implementation remains in its infancy due to the absence of licensure

Table 2
Institutions and Languages spoken.

Language Area	Institutions
German-speaking	University of Basel, Zurich UAS, Eastern Switzerland UAS, Kalaidos UAS, Bern UAS, Lucerne UAS (in development)
French-speaking	University of Lausanne, Haute Ecole Spécialisée de Suisse occidentale (HES-SO)
Italian-speaking	Scuola universitaria professionale della Svizzera italiana (SUPSI)

pathways, limited educational access, and systemic barriers, including workforce shortages and the uneven distribution of healthcare professionals (Ndirangu-Mugo et al., 2024). Kenya's healthcare system is characterized by high out-of-pocket costs (22.8% of total health expenditure; World Bank, (2024)), (2024)), limited access in rural areas, and a nurse-to-patient ratio of approximately 1:30 (Kimathi, 2017; Niohuru, 2023). Although APN education is offered at Aga Khan University and Masinde Muliro University of Science and Technology (Kimani & Ndirangu-Mugo, 2023), geographic and economic disparities restrict broader access. Kenya's multilingual landscape, characterized by Swahili and English alongside more than 40 Indigenous languages, complicates efforts to standardize APN curricula and communication (Kretzer & Oluoch-Suleh, 2022). Cultural perceptions also pose challenges; nurses are traditionally seen as caregivers rather than autonomous clinicians, and physician resistance to task-shifting has slowed APN integration (Mbuthia et al., 2023; Kinuthia et al., 2022). Moreover, limited public awareness and inadequate compensation have contributed to poor retention and migration of highly trained nurses, further straining the healthcare workforce (Kimani & Gatimu, 2023; Malwela et al., 2016).

Despite their differences, both Switzerland and Kenya share standard drivers for APN role expansion, including the need for task-shifting, rising patient complexity, and the pursuit of sustainable healthcare models (ICN, 2020; Geyer & Christmans, 2020). Switzerland benefits from strong infrastructure and academic capacity but faces regulatory issues and cultural ambiguity. Kenya has demonstrated bold policy leadership, but struggles with resource limitations, professional resistance, and workforce retention. To fully realize the potential of APNs, both countries must invest in education, formalize regulatory frameworks, and promote public and professional awareness. By learning from each other's experiences, Switzerland and Kenya can strengthen their healthcare systems and unlock the transformative potential of Advanced Practice Nurses in delivering equitable, high-quality care.

16. Key Aspects compared

The following table provides details about the comparison discussed in the narrative above Table 3.

17. Challenges and opportunities for APN role development

17.1. Switzerland

In Switzerland, the development of Advanced Practice Nursing (APN) roles faces several structural and professional challenges. One notable issue is the parallel emergence of physician-facilitated roles in both primary and inpatient care, such as Medical Practice Assistants (MPAs) and Physician Associates (PAs), which at first glance resemble APNs in function (Josi et al., 2020). However, a key distinction lies in autonomy: MPAs and PAs operate under physician supervision, whereas APNs are trained to function independently and make autonomous clinical decisions within their scope of practice. In Switzerland, the development of Advanced Practice Nursing (APN) roles faces several structural and professional challenges. One notable issue is the emergence of physician-facilitated roles in both primary and inpatient care, such as Medical Practice Assistants (MPAs) and Physician Associates (PAs), which initially resemble APNs in function (Josi et al., 2020). However, a key difference is autonomy: MPAs and PAs operate under physician supervision, whereas APNs are trained to work independently and make autonomous clinical decisions within their scope of practice. Despite Switzerland's long-standing tradition of nursing education and its diverse specializations, APNs continue to encounter resistance from some medical professionals who are hesitant to delegate patient care responsibilities (Josi, 2020). This reluctance is compounded by significant variability in APN training, competencies, and practice standards across regions. Role ambiguity remains one of the most pressing barriers

Table 3
Crosswalk.

Criteria	Crosswalk between two countries	
	Kenya	Switzerland
Healthcare System Context	Low-middle-income country Public and private healthcare systems, resource-constrained and high out-of-pocket expenditure on health. Only a small percentage of Kenyans have access to the optional social health insurance. The early stages of development were recently established less than a decade ago. The APN role in Kenya is primarily supported by the Aga Khan University (AKU), which launched its program in 2020 (AKU, 2024), and Masinde Muliro University, which introduced its APN training around 2018. These programmes have marked significant milestones in the development of APN education and practice. Primary care, rural health, task-shifting, and nurse-led services to improve access.	High-Income Country Compulsory Health insurance for all residents. The healthcare system integrates the public and private sectors. Early stages of introducing APNs in Primary Care since the first Master's Programme in 1998. Introduced in acute care settings with CNS development. More recently, there have been efforts to expand into primary care – Pilot projects in public and private practice are underway.
Education & Training	Following the ICN Guidelines recommendation of a Master's program. Emerging master's programmes; training varies by institution. A master's degree or above from a recognized university (Ministry of Health, 2022). APNs have two pathways: a nurse practitioner, often working in PHC and community settings, or a clinical nurse specialist, often deployed in specialized hospital departments, academic health centers, and government health agencies.	Chronic disease management, geriatric care, specialized care. Master's level programmes The four universities have divided their programmes into diverse tracks or pathways, preparing their students for the specific roles of CNSs or NPs. Three other programmes have a generic form of APN preparation. Admission Criteria Hold a bachelor's degree in nursing. Have varying degrees of clinical experience
Scope of Practice	Relevant bachelor's degree with a Second Upper-Class Honors or a cumulative Grade point average (GPA) of 3.00 on a scale of 4.00A License to practice At least two years of practice experience following completion of an undergraduate pre-registration nursing program Evidence of research capability through either research, paper presentations, or peer-reviewed publications, and work experience	Although expanding, NPs and CNSs can still prescribe and perform some diagnostics within their scope of practice. APNs have been integrated into health service delivery and are working alongside physicians and consultants to manage patients in two healthcare facilities. There is no nationwide, legally defined scope of practice for APNs in Switzerland. Clinical Nurse Specialists, especially in hospital settings. APNs are now being introduced into primary care. Regulations regarding APN practice can differ based on the canton (region). Prescribing under physician supervision primarily for NPs

(continued on next page)

Table 3 (continued)

Crosswalk between two countries		
Criteria	Kenya	Switzerland
		(Lauber et al., 2022)
Policy and Regulatory Framework	Ongoing development of frameworks; the Nursing Council of Kenya is working on APN regulations Though scopes of practice authorize APNs to autonomously prescribe, diagnose, admit, discharge, and perform other advanced roles, issues exist with licensure and schemes of service.	The lack of a clear legal framework and established protocols hinders the full implementation and development of the APN role, including parameters for reimbursement of APN services that have yet to be established.
Role in Healthcare Teams	Though two healthcare institutions have effectively integrated APNs, hierarchical structures and physician resistance remain key challenges. There is no clear standard work role. Challenges such as limited legislation, structural barriers, and funding gaps continue to impede the full integration of APNs into the healthcare system. Sometimes limit evolving roles.	Integrated into multidisciplinary teams; recognized for clinical leadership and advanced practice. CNS work primarily in hospitals, while NPs work in outpatient settings.
Public Perception of APNs	Mixed and evolving perception: APNs are often seen as traditional nurses with limited authority, reflecting low public awareness of their advanced role and expertise. Efforts to educate the public and clarify APN responsibilities are ongoing.	Generally, there is a positive perception and growing recognition of their role in healthcare, but confusion persists about their scope of practice compared to that of physicians. Some skepticism from patients, healthcare professionals, and RNs who may see overlaps in their roles

to APN implementation (Beckmann et al., 2024; Machado et al., 2025). The absence of standardized national guidelines has led to inconsistent expectations regarding APN roles, resulting in disparities in practice quality and scope across cantons. Nonetheless, Switzerland offers significant opportunities to improve APN recognition.

Advanced Practice Nursing faces several persistent challenges that hinder its full integration into healthcare systems. Among the most pressing issues are inconsistencies in educational and training pathways, resulting in uneven preparation and qualifications across institutions (Kleinpell et al., 2023). Additionally, regional disparities in the scope of practice create confusion and limit APNs' mobility, while the absence of standardized role definitions contributes to limited professional recognition (Kleinpell et al., 2023). These issues are compounded by regulatory ambiguity and the slow acceptance of APN roles within broader medical and policy frameworks, ultimately delaying their potential impact on healthcare delivery (Marchado et al., 2025).

Creating a comprehensive national framework for APN roles could standardize education and professional development and align with international standards (ICN, 2020). Policy advocacy is also crucial for supporting nursing research and demonstrating the impact of APNs on patient outcomes. Notably, public support for the nursing profession—seen in initiatives like the Pflegeinitiative—provides a strategic opportunity to raise awareness and increase the visibility of APNs in both policy and practice.

18. Kenya

In Kenya, the evolution of APN roles is challenged primarily by

limitations in education and clinical training infrastructure. A critical barrier is the shortage of qualified educators, mentors, and preceptors, which restricts the capacity to train APNs effectively (Mbuthia et al., 2022). Clinical training sites are often dominated by medical residency programs, leaving limited opportunities for APN students to gain hands-on experience in hospital settings (Tjia et al., 2023). This bottleneck in clinical exposure, coupled with the absence of specialized APN benchmarking programs, impedes the development of a robust, contextually relevant APN workforce (Kimani & Gatimu, 2023).

A promising trend is the expansion of APN programmes across sub-Saharan Africa (SSA). Although APN roles are well established in Western countries, their increasing implementation in SSA, particularly in Kenya, demonstrates their effectiveness in bridging healthcare gaps (McCarthy et al., 2013). APNs contribute directly to achieving the Sustainable Development Goals (SDGs), notably SDG 3 (ensuring health and well-being for all) and SDG 1 (ending poverty), by providing health promotion, preventive care, and curative services (ICN, 2020; Schober et al., 2020). These roles provide a cost-effective alternative to physician-led models, especially for vulnerable populations.

Kenya has made notable progress in institutionalizing APN roles, including the development of a standardized curriculum (Mbuthia et al., 2022). Graduate-level training is now available at Aga Khan University and Masinde Muliro University of Science and Technology, supporting the emergence of a professional APN and Advanced Practice Midwife (APM) workforce (Shaibu et al., 2020). Although still evolving, the APM role is gaining prominence within Kenya's healthcare system, particularly in primary healthcare (PHC) models. Evidence from similar contexts underscores the effectiveness of APNs in improving health outcomes, suggesting that these roles can simultaneously address workforce shortages and enhance service delivery (Global Health Partnerships, 2025; Mackavey et al., 2024; Poghosyan & Maier, 2022).

Kenya's rural demographics further underscore the need for specialized care, especially in maternal and family health (World Health Organization, 2017). In many rural areas, obstetricians and gynecologists are unavailable, making APMs essential providers of high-quality, cost-effective care. Their contributions are critical to improving maternal and child health outcomes in resource-constrained settings (Perriman et al., 2018; Torrens et al., 2020). As recognition of their impact grows, APNs and APMs are increasingly positioned to reduce healthcare inequities, advance UHC goals, and drive sustainable improvements across Kenya's health system.

19. Lessons Learned for Future APN development

Policy recognition must be paired with practical implementation. While Kenya's formal acknowledgment of APNs in national policy is essential, progress stalls without licensure pathways and enforcement mechanisms (Shumba et al., 2025). To advance, regulatory frameworks should be operationalized through credentialing, scope definition, and integration into health systems. Education infrastructure provides the foundation for sustainable growth; Switzerland's robust academic programs promote specialization and research, whereas Kenya's limited access to graduate-level training hampers adaptability. This underscores the need to expand APN education, especially in underserved areas, and to invest in faculty development (World Health Organization [WHO] (2025)). Cultural perceptions also significantly influence role acceptance. Switzerland often views nursing as auxiliary, whereas Kenya considers nurses primarily caregivers rather than autonomous clinicians. Public education campaigns and interprofessional collaboration are essential to change these perceptions and foster respect for APN expertise (Committee for Assessing Progress on Implementing the Recommendations of the Institute of Medicine Report The Future of Nursing: Leading Change and Health (2016)).

Additionally, multilingual settings in both countries require curricula that are adaptable. Switzerland's four official languages and Kenya's diverse languages demand culturally and linguistically

responsive training standards that ensure equitable education and practice. Lastly, task-shifting remains a strategic priority (Nesidai et al., 2025). Both nations recognize APNs as vital to alleviating physician shortages and managing the increasing complexity of patient care, particularly in primary care, rural health, and chronic disease management. This demands clear role definitions and collaborative practice models.

20. Conclusion

Kenya has made significant progress in establishing APN roles, including the creation of a standardized curriculum (Mbuthia et al., 2022). Graduate-level training is now offered at Aga Khan University and Masinde Muliro University of Science and Technology, supporting the development of a professional APN and Advanced Practice Midwife (APM) workforce (Shaibu et al., 2020). Although still evolving, the APM role is gaining importance within Kenya's healthcare system, especially in primary healthcare (PHC) models. Evidence from similar contexts highlights the effectiveness of APNs in improving health outcomes, indicating these roles can address workforce shortages while enhancing service delivery (Global Health Partnerships, 2025; Mackavey et al., 2024; Poghosyan & Maier, 2022). Advanced practice nursing continues to evolve globally. Advanced Practice Nurses (APNs) are increasingly recognized as essential contributors to meeting domestic healthcare demands and improving access to care (Mackavey et al., 2024). This article has examined the development of APN roles in two distinct contexts, Switzerland, a high-income country, and Kenya, a lower-middle-income country, highlighting both shared challenges and unique opportunities.

Despite differences in economic status and healthcare infrastructure, both countries face similar barriers to the development of APN roles, including workforce shortages, regulatory ambiguity, and limited public awareness. In both Switzerland and Kenya, APNs must navigate multilingual healthcare environments and serve culturally diverse populations. Communicating complex health information across language and cultural barriers presents a significant challenge. To address this, educational programmes must prioritize cultural competence, integrating training in communication skills, cultural awareness, and humility. Such preparation is critical to ensuring APNs can deliver equitable and effective care to all patients.

In Kenya, the shortage of qualified healthcare professionals in rural areas remains a pressing concern. APNs have the potential to significantly improve population health outcomes, particularly in underserved regions (Ndirangu-Mugo et al., 2024). However, the limited availability of trained APN educators and clinical training sites threatens the sustainability of these roles. Similarly, in Switzerland, the lack of standardized definitions and expectations for APN practice hinders broader implementation. Without clear national guidelines, APNs face role ambiguity and inconsistent recognition across cantons, limiting their integration into primary care (Wheeler et al., 2022).

Ultimately, both countries must invest in education, regulation, and public engagement to fully realize the potential of APNs. By addressing structural and cultural barriers and by fostering collaboration across disciplines, Switzerland and Kenya can strengthen their healthcare systems and advance the role of APNs in delivering high-quality, accessible care.

CRediT authorship contribution statement

Carole Mackavey: Writing – review & editing, Writing – original draft, Resources, Methodology, Formal analysis, Data curation, Conceptualization. **Sara Kohler:** Writing – review & editing, Writing – original draft, Resources, Investigation. **Eunice Ndirangu-Mugo:** . **Rachel W. Kimani:** . **Constance S. Shumba:** . **Benard Daniel Mutwiri:** . **Colette Henderson:** Writing – review & editing, Validation, Resources, Formal analysis. **Anna Jones:** Writing – review & editing, Resources,

Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

AKU. (2024). *Masters of science in advanced practice nursing | SONAM, East Africa | The Aga Khan University*. The Aga Khan University. Retrieved March 11, 2025 from <https://www.aku.edu/sonamea/programmes/Pages/msc-apn.aspx>.

Altermatt-von Arb, R., Stoll, H., Kindlimann, A., Nicca, D., Lauber, E., Staudacher, S., Sailer Schramm, M., Vökt, F., & Züninga, F. (2023). Daily practices of advanced practice nurses within a multi-professional primary care practice in Switzerland: A qualitative analysis. *BMC Primary Care*, 24(1), 26.

Beckmann, S., Schmid-Möhler, G., Spichiger, E., Eicher, M., Nicca, D., Ullmann-Bremi, A., & Petry, H. (2024). Mapping advanced practice nurses' scope of practice, satisfaction, and drivers of role performance. *Pflege*.

Beil-Hildebrand, M. B., & Smith, H. B. (2022). Comparative analysis of advanced practice nursing: Contextual and historical influences in north American and German-Speaking European Countries. *Policy, Politics, & Nursing Practice*, 23(3), 162–174.

Bryant-Lukosius, D., & DiCenso, A. (2004). A framework for the introduction and evaluation of advanced practice nursing roles. *Journal of Advanced Nursing*, 48(5), 530–540.

Bundesamt für Statistik. (2022). *Hauptsprachen seit 1919*. Retrieved March 19, 2025 from <https://www.bfs.admin.ch/bfs/de/home/statistiken/bevoelkerung/sprachen-religionen/sprachen.html>.

Cashin, A., Buckley, T., Donoghue, J., Heartfield, M., Bryce, J., Cox, D., Waters, D., Gosby, H., Kelly, J., & Dunn, S. V. (2015). Development of the nurse practitioner standards for practice Australia. *Policy, Politics, & Nursing Practice*, 16(1–2), 27–37.

Catton, H., Stewart, D., & Schober, M. (2024). Advancing health globally: Seizing the moment with advanced practice nursing. *International Nursing Review*, 71(2), 232–234.

Christmals, C. D. (2018). *The development of an advanced practice nursing (child health nurse practitioner) curriculum framework for sub-Saharan Africa: A multi-method study*. Johannesburg (South Africa): University of the Witwatersrand.

Cignacco, E., Schlenker, A., Ammann-Fiechter, S., Damke, T., de Labrusse, C. C., Krah, A., Kalberer, B. S., & Weber-Käser, A. (2024). Advanced midwifery practice in Switzerland: Development and challenges. *European Journal of Midwifery*, 8, Article 10.18332/ejm/185648.

Committee for Assessing Progress on Implementing the Recommendations of the Institute of Medicine Report The Future of Nursing: Leading Change, Advancing Health, Institute of Medicine, National Academies of Sciences, Engineering, and Medicine. (2016). Removing barriers to practice and care (Altman, S. H., Butler, A. S., & Shern, L., Eds.). In Assessing progress on the Institute of Medicine report The Future of Nursing. National Academies Press. <https://www.ncbi.nlm.nih.gov/books/NBK350160/>.

East, L. A., Arudo, J., Loefler, M., & Evans, C. M. (2014). Exploring the potential for advanced nursing practice role development in Kenya: A qualitative study. *BMC Nursing*, 13, 1–11.

Fitzgerald, C., Kantrowitz-Gordon, I., Katz, J., & Hirsch, A. (2012). Advanced practice nursing education: Challenges and strategies. *Nursing Research and Practice*, 2012(1), Article 854918.

Generis Legal Intelligence. (2024). Overview of the Healthcare System in Kenya. *Generis Global Legal Services*. <https://generisonline.com/overview-of-the-healthcare-system-in-kenya/>.

Geyer, N., & Christmals, C. D. (2020). *Advanced practice nursing in Africa* (pp. 63–76). Advanced practice nursing leadership: A global perspective.

Global Health Partnerships. (2025). *Unlocking the potential of advanced practice nurses to enhance health outcomes in Kenya*. <https://www.globalhealthpartnerships.org/unlocking-the-potential-of-advanced-practice-nurses-to-enhance-health-outcomes-in-kenya/>.

Goemaes, R., Beeckman, D., Goossens, J., Shawe, J., Verhaeghe, S., & Van Hecke, A. (2016). Advanced midwifery practice: An evolutionary concept analysis. *Midwifery*, 42, 29–37.

Government of Kenya. (2010). *Laws of Kenya: Constitution of Kenya*. National Council for Law Reporting. Retrieved from <https://www.kenyalaw.org>.

Gray, D. C., Rogers, M., & Miller, M. K. (2024). Advanced practice nursing initiatives in Africa, moving towards the nurse practitioner role: Experiences from the field. *International Nursing Review*, 71(2), 205–210.

Gysin, S., Sottas, B., Odermatt, M., & Essig, S. (2019). Advanced practice nurses' and general practitioners' first experiences with introducing the advanced practice nurse role to Swiss primary care: A qualitative study. *BMC Family Practice*, 20, 1–11.

ICN. (2020). *ICN nurse practitioner/advanced practice nursing networking. Definition and characteristics of the role*. ICN Genève. Retrieved March 19, 2025 from https://www.icn.ch/system/files/documents/2020-04/ICN_APN%20Report_EN_WEB.pdf.

Josi, R., Bianchi, M., & Brandt, S. K. (2020). Advanced practice nurses in primary care in Switzerland: An analysis of interprofessional collaboration. *BMC Nursing*, 19, 1–12.

Karimi, J., Hussien, S., Wangia, E., Kimani, M.-I., Mohamed, M., Wanda, M., Muganda, R., Ndirangu, R., Mwai, D., Wanjala, M., & Richter, F. (2025). Approaches to implementing and financing primary health care in Kenya: A case of seven counties.

Frontiers in Health Services, 5, Article 1298379. <https://doi.org/10.3389/frhs.2025.1298379>.

Keinath, E., Dirksen, A., Lehwaldt, D., Glarcher, M., Essl-Maurer, R., von Dach, C., Eissler, C., Zumstein-Shaha, M., Glarcher, M., & Essl-Maurer, R. (2023). In *Nurse Practitioner Development in German-Speaking Countries: Germany, Austria, and Switzerland* (pp. 207–223). Springer.

Kimani, R. W., & Gatimu, S. M. (2023). Nursing and midwifery education, regulation and workforce in Kenya: A scoping review. *International Nursing Review*, 70(3), 444–455.

Kimani, R. W., & Ndirangu-Mugo, E. (2023). Nurse practitioner role in Kenya. *Nurse Practitioners and Nurse Anesthetists: the Evolution of the Global Roles*, 235–245.

Kimathi, L. (2017). Challenges of the devolved health sector in Kenya: Teething problems or systemic contradictions? *Africa Development*, 42(1), 55–77.

Kinuthia, R., Verani, A., Gross, J., Kiriinya, R., Hepburn, K., Kioko, J., Langat, A., Katana, A., Waudo, A., & Rogers, M. (2022). The development of task sharing policy and guidelines in Kenya. *Human Resources for Health*, 20(1), 61.

Kleinpell, R., Myers, C. R., & Schorn, M. N. (2023). Addressing Barriers to APRN Practice: Policy and Regulatory Implications during COVID-19. *Journal of Nursing Regulation*, 14(1), 13–20. [https://doi.org/10.1016/S2155-8256\(23\)00064-9](https://doi.org/10.1016/S2155-8256(23)00064-9)

Kretzer, M. M., & Oluoch-Suleh, E. (2022). (Hidden) potentials for african languages in curriculum reforms: Examples from Kenya and South Africa. *SN Social Sciences*, 2(8), 154.

Lauber, E., Kindlimann, A., Nicca, D., Altermatt-von Arb, R., Sgier, C., Staudacher, S., Sailer Schramm, M., Vökt, F., & Zúñiga, F. (2022). Integration of an advanced practice nurse into a primary care practice: A qualitative analysis of experiences with changes in general practitioner professional roles in a swiss multiprofessional primary care practice. *Swiss Medical Weekly (SMW)*, 152, Article w30199.

Machado, P. T., Eicher, M., Delouane-Abinal, A., Kupferschmid, S., & Roulin, M.-J. (2025). Clarification and development of advanced practice roles in a swiss French university hospital: An action research study. *BMC Health Services Research*, 25(1), 119.

Mackavey, C., Henderson, C., van Leeuwen, E. Z., Maas, L., & Ladd, A. (2024). The advanced practice nurse's development and identity: An international review. *International Journal for Advancing Practice*, 2(1), 36–44.

Mackavey, C., Henderson, C., & Morris, G. (2025). Empowering Advanced Practice Nurses: A Review of addressing Global Health needs. *Annals of Global Health*, 91(1), 45. <https://doi.org/10.5334/aogh.4723>

Maher-Imhof, R., Altherr, J., Eissler, C., Petrig, M., PiaHni, S., Ullmann-Bremi, A., Weibel, L., Dr. Habib, & Spichiger, E. (2024). *Minimal Standards for Certificates and Specializations of Advanced Practice Nurses (MiS-APN). APN-CH: Organisation der Reglementierung*. Retrieved March 15, 2025 from https://apn-ch.ch/assets/MiS-APN/240712_MiS-APN-paper.pdf.

Malwela, T., Maputle, S. M., & Lebese, R. T. (2016). Factors affecting integration of midwifery nursing science theory with clinical practice in Vhembe District, Limpopo Province as perceived by professional midwives. *African Journal of Primary Health Care and Family Medicine*, 8(2), 1–6.

Masaba, B. B., Moturi, J. K., Taiswa, J., & Mmisi-Phetoe, R. (2020). Devolution of healthcare system in Kenya: Progress and challenges. *Public Health*, 189, 135–140.

Mbuthia, D., Brownie, S., Jackson, D., McGivern, G., English, M., Gathara, D., & Nzinge, J. (2023). Exploring the complex realities of nursing work in Kenya and how this shapes role enactment and practice—A qualitative study. *Nursing Open*, 10(8), 5670–5681.

Mbuthia, F., Jebet, J., & Kirop, E. (2022). *Opportunities and challenges of Advanced Practice Midwifery (APM)*. in Kenya: A Discussion Paper.

McCarthy, C. F., Voss, J., Salmon, M. E., Gross, J. M., Kelley, M. A., & Riley, P. L. (2013). Nursing and midwifery regulatory reform in east, central, and southern Africa: A survey of key stakeholders. *Human Resources for Health*, 11, 1–7.

Ministry of Health. (2014). Kenya Health Policy 2014–2030. Retrieved from https://guidelines.health.go.ke:8000/media/Kenya_Health_Sector_Strategic_Plan_July_2018_June_2023.pdf MOH.

Ministry of Health. (2016). *National and County Health Budget Analysis, FY 2020/21*. Retrieved from https://guidelines.health.go.ke:8000/media/National_and_County_Budget_Analysis_FY_2020-21_April_2022.pdf MOH.

Ministry of Health. (2022). National Nursing and Midwifery Policy 2022–2032. *Ministry of Health Retrieved from* https://guidelines.health.go.ke:8000/media/National_Nursing_and_Midwifery_Policy_2022_-2032.pdf.

Ministry of Health (2025). Ministry of Health Accelerates Reforms to Achieve Universal Health Coverage accessed 12/18/2025 <https://www.health.go.ke/ministry-health-accelerates-reforms-achieve-universal-health-coverage#:~:text=As%20of%20January%202013%2C%202025,Fee%2Dfor%2DService%20model>.

Miseda, M. H., Were, S. O., Murianki, C. A., Mutuku, M. P., & Mutwiri, S. N. (2017). The implication of the shortage of health workforce specialist on universal health coverage in Kenya. *Human Resources for Health*, 15, 1–7.

Moses, M. W., Korir, J., Zeng, W., Musiega, A., Oyasi, J., Lu, R., Chuma, J., & Di Giorgio, L. (2021). Performance assessment of the county healthcare systems in Kenya: A mixed-methods analysis. *BMJ Global Health*, 6(6), Article e004707.

Nashwan, A. J., Shaban, M. M., & Kamugisha, J. B. (2024). Bridging the gap: How investing in advanced practice nurses could transform emergency care in Africa. *International Nursing Review*, 71(2), 285–290.

Nck. (2022). *Mandate of the NCK at a glance*. Retrieved from <https://nckenya.com/company-overview/>.

Ndirangu-Mugo, E., Kimani, R. W., Onyancha, C., Mutwiri, B. D., May, B., Kambo, I., Tallam, E., Koech, N., Mukuna, A., & Henderson, C. (2024). Scopes of practice for advanced practice nursing and advanced practice midwifery in Kenya: A gap analysis. *International Nursing Review*, 71(2), 276–284.

Nesidai, B. A., Kithuka, P. M., Mekala, E. K., & Njoroge, P. W. (2025). Exploring task-shifting approaches in addressing specialist shortages to enhance access to healthcare services in rural Kenya: A systematic review. *East African Journal of Health and Science*, 8(2), 506–522. <https://doi.org/10.37284/eajhs.8.2.3776>

Niohuru, I. (2023). *Healthcare and disease burden in Africa: The impact of socioeconomic factors on public health*. Springer Nature.

Nyawira, L., Njuguna, R. G., Tssofa, B., Musiega, A., Munywoki, J., Hanson, K., Mulwa, A., Molyneux, S., Maina, I., Normand, C., Jemutai, J., & Barasa, E. (2023). Examining the influence of health sector coordination on the efficiency of county health systems in Kenya. *BMC Health Services Research*, 23(1), 355. <https://doi.org/10.1186/s12913-023-09344-4>

Oecd. (2023). *Health at a Glance 2023: OECD Indicators*. Retrieved March 19, 2025 from <https://www.oecd.org/en/data/indicators/health-spending.html?oecdcontrol-1-00b22b2429-var3=2023>.

OECD, Colombo, F., & Zurn, P. (2011). *OECD reviews of health systems: Switzerland 2011*. OECD Publishing.

Perriman, N., Davis, D. L., & Ferguson, S. (2018). What women value in the midwifery continuity of care model: A systematic review with meta-synthesis. *Midwifery*, 62, 220–229.

Poghosyan, L., & Maier, C. B. (2022). Advanced practice nurses globally: Responding to health challenges, improving outcomes. *International Journal of Nursing Studies*, 132, Article 104262.

Porat-Dahlerbruch, J., Miller, T., Boyd, J., Ellen, M. E., & Clark, R. R. S. (2025). The International Advanced Practice Nurse Integration Policy intervention Taxonomy: A 10-Country Nominal Group Consensus Technique Study. *International Nursing Review*, 72(3), Article e70096. <https://doi.org/10.1111/inr.70096>

Rutledge, C. M., Haney, T., Bordelon, M., Renaud, M., & Fowler, C. (2014). Telehealth: Preparing advanced practice nurses to address healthcare needs in rural and underserved populations. *International Journal of Nursing Education Scholarship*, 11(1), 1–9.

Sari, M. H., & Yüce, E. (2020). Problems experienced in classrooms with students from different cultures. *Journal on Efficiency and Responsibility in Education and Science*, 13(2), 90–100.

Schober, M., Lehwaldt, D., Rogers, M., Steinke, M., Turale, S., Pulcini, J., Roussel, J., & Stewart, D. (2020). Guidelines on advanced practice nursing.

Schönemberger, N., Sottas, B., Merlo, C., Essig, S., & Gysin, S. (2020). Patients' experiences with the advanced practice nurse role in swiss family practices: A qualitative study. *BMC Nursing*, 19, 1–10.

Shaibu, S., Ndirangu, E., Pallangyo, E., Mbuthia, G., Kimani, R., & Kambo, I. (2020). Introduction of an advanced practice nurse program in Kenya: a new era in nursing education.

Shumba, C. S., Daniel Mutwiri, B., Munene, D., Kimani, R. W., May, B., Kambo, I., Henderson, C., Mageto, I., Lehwaldt, D., & Ndirangu-Mugo, E. (2025). Stakeholders' Perceptions of the Roles and Regulations of Advanced Practice Nursing and Advanced Practice Midwifery. *Journal of Nursing Management*, 2025, Article 7475260. <https://doi.org/10.1155/jnm/7475260>

Sottas, B., Josi, R., Gysin, S., & Essig, S. (2019). Practice nurses in swiss primary care. 6. *Eurohealth*, 25(4).

Swiss Federal Council. (2024). *About Switzerland*. Retrieved December 2, 2024 from <https://www.eda.admin.ch/aboutswitzerland/en/home/wirtschaft/uebersicht/wirtschaft-fakten-und-zahlen.html>.

The National Treasury and Economic Planning. (2023). *The budget summary for the fiscal year 2023/24 And the supporting information*. he National Treasury – The National Treasury of Kenya Retrieved from https://www.treasury.go.ke/wp-content/uploads/2023/06/Budget-Summary-for-the-FY-2023_24.pdf.

Tjia, J., Pugnaire, M., Calista, J., Eisdorfer, E., Hale, J., Terrien, J., Valdman, O., Potts, S., Garcia, M., & Yazdani, M. (2023). Using simulation-based learning with standardized patients (SP) in an implicit bias mitigation clinician training program. *Journal of Medical Education and Curricular Development*, 10, Article 23821205231175033.

Torrens, C., Campbell, P., Hoskins, G., Strachan, H., Wells, M., Cunningham, M., Bottone, H., Polson, R., & Maxwell, M. (2020). Barriers and facilitators to the implementation of the advanced nurse practitioner role in primary care settings: A scoping review. *International Journal of Nursing Studies*, 104, Article 103443.

Wheeler, K. J., Miller, M., Pulcini, J., Gray, D., Ladd, E., & Rayens, M. K. (2022). Advanced practice nursing roles, regulation, education, and practice: A global study. *Annals of Global Health*, 88(1), 42.

World Bank. (2024). *Kenya | World Development Indicators* <https://databank.worldbank.org/embed/Kenya/id/f32a19ef>.

World Health Organization. (2017). Primary health care systems (primasys): Comprehensive case study from Kenya. In *Primary Health Care Systems (primasys): Comprehensive Case Study from Kenya*.

World Health Organization. (2024). *World health statistics 2024: Monitoring health for the SDGs, sustainable development goals*. World Health Organization.

World Health Organization [WHO]. (2025). State of the World's Nursing 2025 Accessed 12/18/2025 chrome-extension://efaidnbmnnibpcajpcgjclefindmkaj/<https://www.who.int/sites/default/files/2025-05/SOWN%202025.pdf>.