Title: Ghana's Health Workforce Policy Evolution from 1996 to 2020: A document analysis

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Key Words:–

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ABSTRACT

Background

There is paucity of evidence on the interaction between health workforce policies, their intended strategic objectives, and health workforce indices to aid the understanding of past policy failures and successes and to plan for future health workforce policy implementation in Ghana.

Methods

Using the READ approach of document analysis, we explored the public health sector health workforce policy environment of Ghana to gauge the impact major health workforce policies have had in determining the production of and demand for essential health workforce.

Findings

Ghana have undergone three distinct phases of health workforce policy evolutions, following its health sectors reforms in the 1990s – an expansionary production and recruitment policy drive between the late 1990s and 2011, a seeming policy vacuum between 2012 and 2018, and a phase of policy streamlining from 2020 where fiscal realities began shaping issues of health workforce production and demand.

Conclusion

The distinct phases of the health workforce policy evolution had differing impacts on the production of and demand for essential health workforce, with instances of misalignment between policy objectives and implementation.

BACKGROUND

The health workforce, which comprises all individuals involved in the provision of health services, is a crucial health system building block (Zurn et al., 2004). Besides the provision of essential services and the promotion of health and prevention of disease, the health workforce is involved in research and innovation to improve the quality of care and outcomes for patients and plays a critical role in the management of health systems, including planning, budgeting, and policy development (Manyazewal, 2017; WHO, 2010).

To ensure that the health workforce plays these critical roles effectively, it is essential that policies informing training/production, employment, and conduct exist. These policies should aim to ensure an adequate supply of skilled health workers, address distribution imbalances, support the development of health workers, ensure a safe and supportive work environment, and promote equity and diversity in the health workforce.

By investing in health workforce policies, countries have been established to improve the quality of health services, increase access to care, and achieve better health outcomes for their populations (Liu & Eggleston, 2022)

In recognising this symbiotic relationship and in a bid to address general health system challenges, Ghana embarked on health sector reforms in the early 1990s (Dovlo, 1998). The health workforce policy landscape featured prominently in these reforms with the strategic intent of improving the availability, accessibility, quality, and efficiency of the health workforce, thereby improving health outcomes, and contributing to the attainment of universal health coverage.

Despite the age-old implementation of the health workforce policies, there is paucity of evidence on the interaction between institutions, interests and ideas in the health workforce policy process to aid the understanding of past policy failures and successes and to plan for future policy implementation (Walt et al., 2008). Again, notwithstanding the centrality of health policy analysis to health reforms, less attention has been given to such analysis in low and middle-income countries, especially Ghana (Erasmus, Orgill, Schneider, & Gilson, 2014; Gholipour, Rouzbehani, & Yavari, 2016).

This paper, therefore, draws attention to the temporality of health workforce policy and intended policy objectives, and then explores the health workforce policy environment of the public health sector of Ghana, employing a long-date view of inclusion to allow for the analysis of major health workforce policies following the health sector reforms in the early 1900s up until 2020.

METHODS

Broadly defined as the systematic collection, documentation, analysis, interpretation and organisation of data, soft or hard (Bowen, 2009), this study employed the *'READ'* approach to document analysis (Dalglish et al., 2020). Document analysis has been a longstanding method used in health research, particularly in the areas of health policy (Adam et al., 2011; Bowen, 2009; Collins, 2005; Gorsky & Mold, 2020). Over time, however, the concept has evolved to become more systematic, rigorous and transparent, following the development of more structured approaches to enhance reliability and validity.

The *'READ'* approach entails the systematic review of documents to provide the context in which they were developed, generate questions, measure changes in the different transformational epochs and corroborate other sources of the research subject. The approach

systematically collects and elicits information from documents and consists of four steps: (1) "readying "the documents, (2) extracting data from the '*readied'* documents, (3) analysing the data collected, and (4) distilling findings from the analysed data. Using this approach, we *'**r**eadied'* major publicly available health workforce policies, ***e**xtracted* and ***a**nalysed* data from them, and then ***d**istilled* the findings, to answer the review question "what has been the impact of the major of health workforce policies in determining the production of and demand for essential health workforce in Ghana?".

*'**R**eadying' the Documents*

The READ approach requires researchers to first set the parameters for their project in terms of the nature and number of documents they plan to analyse, based on the research question. In line with this requirement, the study included documents whose nature bordered on (1) relevant health laws and statutes, (2) health sector policies and strategies, (3) health workforce strategic plans, (4) personnel management policies and guidelines, (5) relevant reports of human resources for health, and (6) relevant peer-reviewed papers on production and recruitment of health workers in Ghana.

The Ghanaian public health system experienced a complete shift in policies and administration since the decentralisation of health service delivery, following the promulgation of the Ghana Health Service and Teaching Hospitals Act of 1996 Act 525 (Benoit, 2014; GoG, 1996). We aligned the analysis to cover the time frame of 1996 to 2020, allowing for the critical minimum duration of ten years required to render a fair evaluation of the impact of the policies (Sabatier & Weible, 2019). In the readied documents, we reviewed the policy decisions that were made and impact on the production of and demand for essential health workforce.

A manual search of the policy repository and website of the Ghana Ministry of Health (www.moh.gov.gh) and systematic search in PUBMED using the keywords, as summarised in Table 1,the detailed search string specified in Box 1 and the Boolean operators - AND, OR, NOT to concatenate key terms, were done. These searches unearthed a total of 297 records, which were reviewed initially by their titles, abstracts/executive summaries, and foreword, and pruned down to 76. The 76 records were subsequently fully read against the inclusion and exclusion criteria of all public health workforce policies crafted and/or implemented between 1996 – 2020 and all private health workforce policies respectively, further pruning down the total number down to 5 policies.

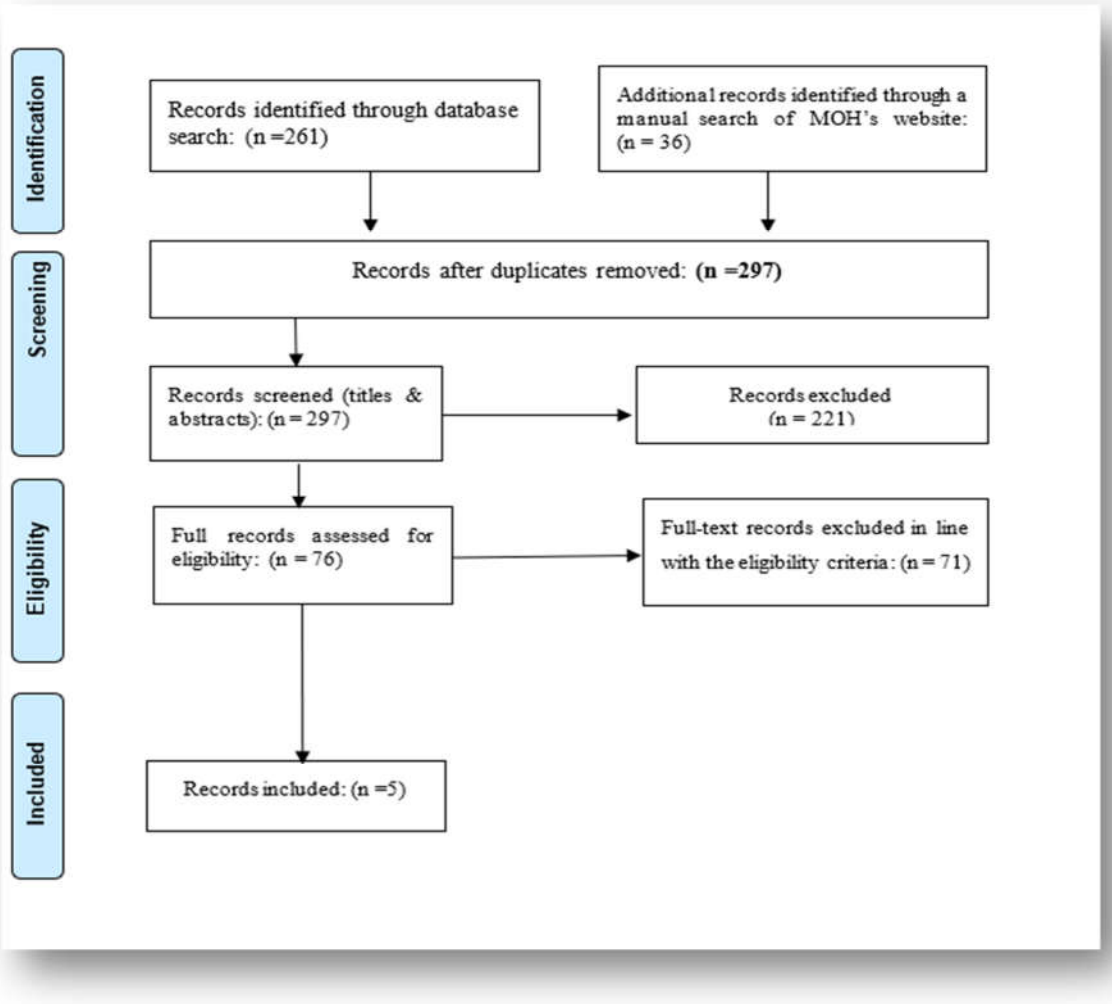
Table 1:Summary of Systematic Search

Key Word	Alternative word(s)
Human Resources for Health	Health Workforce, Health Workers, Doctor, Physician, Midwife, Pharmacist, Biomedical scientist
Production	Training, Development, Education
Recruitment	Demand, Employment, Deployment, Posting
Ghana	

Box 1: Search Strategy

"impact" AND "human resources for health" OR "Health workforce" OR "health workers" OR "Doctor*" OR "physician*" OR "Nurse*" OR "midwi*" OR "pharmac*" OR "Biomedical Scientist*" and "policy" AND "produc*" OR "train*" AND "demand" OR "recruitment" AND "Ghana"

Figure 1:Summary of Systematic Search Results



Source

***E**xtracting Data from the 'readied' Health Workforce documents*

During this stage of the study, we charted the identified data components from the 'readied' health workforce policies, that relate to the study's overall objective of assessing the impact of policies on the production and demand for health workforce. A customised Microsoft Excel template was used to chart and organise the data (See supplementary material 1).

***A**nalysis of Readied Documents*

Narrative synthesis, an approach to the systematic review and synthesis of findings from studies that use words and text to summarise and explain findings, was used in the analysis of the readied policy documents (Kastner et al., 2012; Lisy & Porritt, 2016). The choice of this method was informed by its ability to investigate identified similarities and differences (Krippendorff, 2018). The analysis was then guided by the five-stage framework approach, where we familiarised ourselves with the extracted data, identified policy themes, indexed, charted and mapped the findings, and then interpreted the findings (Aldhouse & Kitchen, 2018). This led to the identification and generation of emerging policy themes, which were reviewed, revised, and documented until data saturation was reached. From this iterative process, the main issues or policy direction on the production of and/or demand for health workforce were unearthed from the policy documents and described.

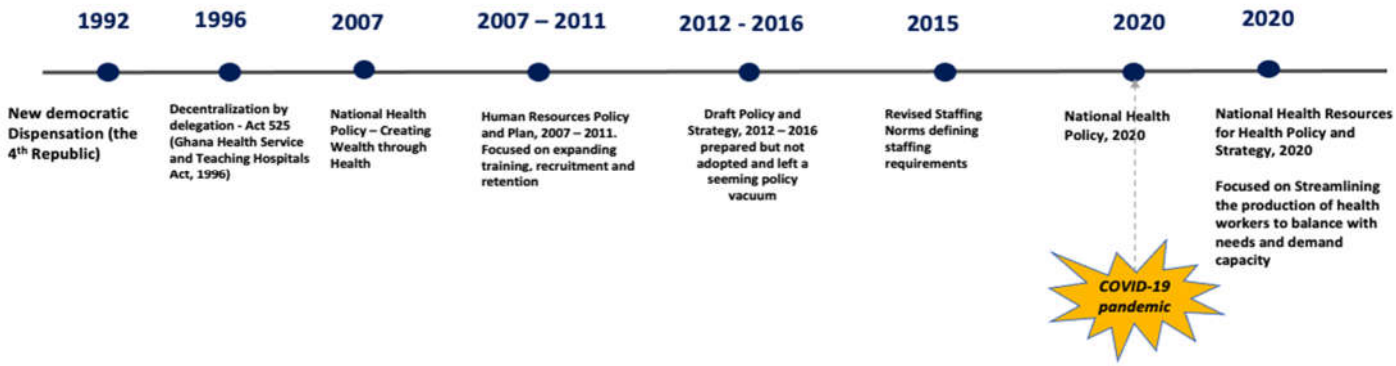
Distilling the Findings

After '*r*eadying' the policy documents, *e*xtracting health workforce production and/or demand policy direction(s) from the documents, and *a*nalysing the emergent policy themes, we distilled the results from the synthesis. Conceptual charts were created, and the authors' positionality in the research area used to identify outliers. Finally, the findings were distilled and stated relative to the review question.

FINDINGS

The analysis of policy documents revealed an incremental approach to health workforce policy from the early 1990s to the early 2000s, revealing three distinct phases of health workforce policy evolutions in Ghana since the health sector reforms. We observed an expansionary production and recruitment policy drive between the late 1990s and 2011, a seeming policy vacuum between 2012 and 2018, and a phase of policy streamlining from 2020, where fiscal realities began shaping issues of health workforce needs and demand. Figure 1 provides a timeline snapshot of the policy and strategic trajectory of Ghana since the 4th Republic in the early 1990s.

Figure 2:Evolution of Health Workforce Policy in Ghana



Expansionary Health Workforce Production and Recruitment - the late 1990s to 2011

Ghana faced critical health system challenges, which led to health system reforms with the enactment of the Ghana Health Service and Teaching Hospitals Act, Act 525 of 1996. The coming into being of the act led to the decentralisation of health service provision from the MoH to its newly created and existing agencies, with the Ghana Health Service leading the charge for providing primary to secondary level health services and the teaching hospitals for tertiary services and research (GoG, 1996). The Ministry of Health, meanwhile, retained the policy development and pre-service health workforce training functions (MoH, 2023).

With the decentralisation of health service delivery in the country, the Ministry of Health instituted national-level policy reforms through the National Health Policy: Creating Wealth Through Health (2007), which had four thematic health workforce strategic intents: (i) increasing the production, recruitment and retention of health workers, focusing on middle-level health professionals; (ii) strengthening supervision, performance appraisal, accountability and overall human resource management; (iii) refining systems for compensation, incentives, and sanctions; and (iv) promoting effective health workforce legislation and regulation. These four strategic intents of the policy were further elaborated with concrete targets in the Human Resource Policy and Strategies for the Health Sector (2007 – 2011) that laid down the strategies

for the period 2007-2011 to ensure sufficient availability, effective management, and utilisation of human resources to achieve service delivery goals.

Box 2: Summary of selected HRH training targets, 2007 – 2011

- 10% increase in the intake of doctors per year
- 10% increase in the intake of pharmacists per year
- 5% increase per year for all types of pre-service and post-basic professional nurses
- 20% annual increase for diploma midwives
- 10% increase per year for laboratory technicians

Source: Human Resource Policies and Strategies for the Health Sector 2007-2011

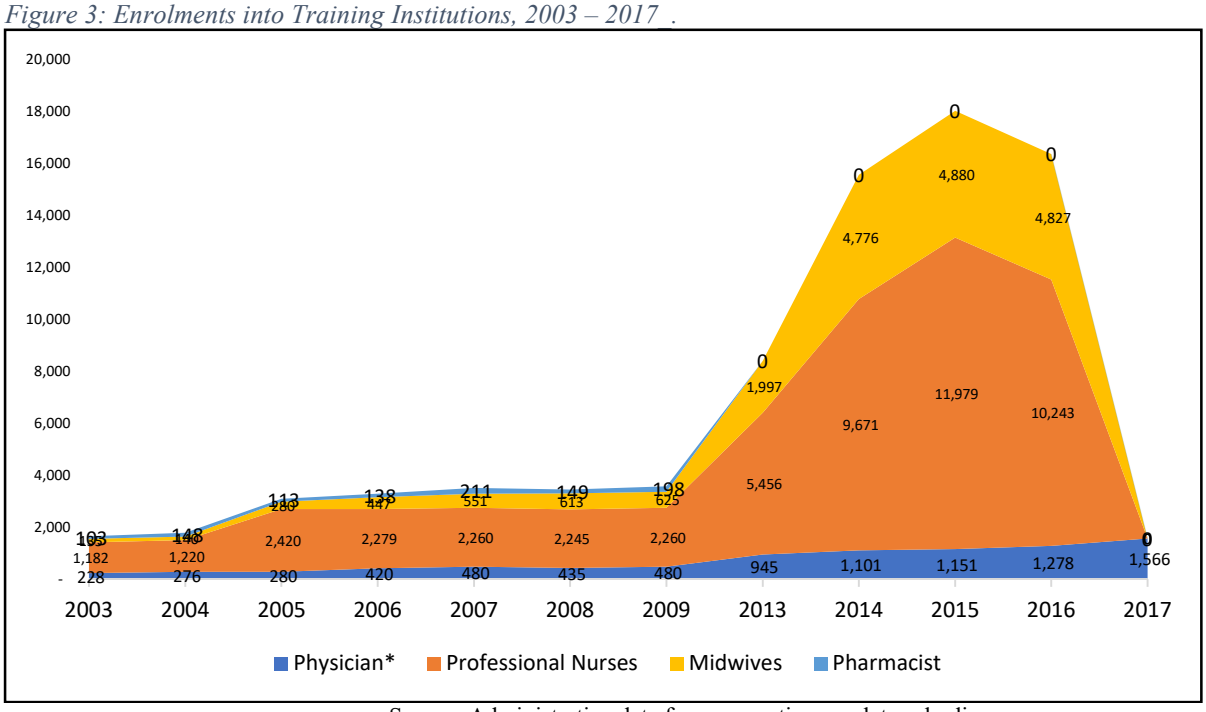
The National Health Policy and the Human Resources Policy and Plan marked an era of what seemed like an expansionary workforce production and recruitment drive. Broadly, the two policies anchored on having the requisite numbers and skill mix of mid-level cadres of health workers by (1) increasing supply mainly through creating and expanding production capacity, (2) establishing a Health Training Institutions' (HTI) Secretariat to coordinate the activities of health training institutions effectively, (3) liberalising training to allow for private for-profit participation, and (4) boasting a local capacity for the training of specialists.

At the back of these anchors, the Ministry of Health established about 21 health professions education institutions, while faith-based organisations such as the Christian Health Association of Ghana (CHAG) and the private for-profit sector jointly opened seven health professions education institutions in professional and associate nursing training (MoH, 2011). Additionally, postgraduate residency colleges for the training of medical specialists (Ghana College of Physicians and Surgeons), nursing and midwifery specialists (Ghana College of Nurses and Midwives), and pharmacy specialists (Ghana College of Pharmacists) were established as a way of curbing the brain-drain, occasioned by the pursuit of further training outside the country, and boasting local specialist production capacity as envisaged by the policy.

As a result of these policy interventions, the total training enrolments increased by 112.5% from 1,648 in 2003 to 3,502 in 2007, representing a 28% increase per annum for doctors, nurses, midwives, and pharmacists. However, in the expansionary dispensation from 2007, the annual enrolments across these cadres increased dramatically to 15,548 per year – mainly driven by an unprecedented increase in the intake of nurses and midwives. By 2015, the annual rate of increase averaged about 43% per annum. Given this rate of production, it became evident that although the expansionary policy was attaining its intended purpose, misalignments in its operationalisation manifested as recent commentaries assert that:

> *… instead of a planned average annual increase of 20% in the training of enrolled nurses from 2006 to 2011, there was an annual average increase of 61% without wage bill impact analysis or economic feasibility analysis for their employment (J. A. Asamani et al. 2020)*

Figure 3: Enrolments into Training Institutions, 2003 – 2017 .



Source: Administrative data from respective regulatory bodies

Recruitment-wise, the policy/strategy defined a staffing norm which informed training targets and the creation of funded positions for their employment (demand creation). This made recruitment into the public sector seemingly automatic. This was possible because trainees were paid training allowances and were fully integrated into the government payroll while in training. Upon their qualification, they were simply 'posted' and 'upgraded' as opposed to going through a process of job search and recruitment. Thus, the recruitment process into the health training institutions also served as the recruitment into the full-time job after completion (Appiah-Denkyira et al., 2013).

As shown in Table 2, between 1996 and 1999, there appeared to have been a stagnation in the density of the health workforce. For example, the density of doctors fluctuated between 0.68 and 0.70 per 10,000 population. That of professional nurses recorded a decline of 16%, from 3.53 to 2.96 per 10,000 population. Contrastingly, the density of pharmacists per 10,000 population remained unchanged at 0.12 per 10,000 population between 1996 and 1999. From the foregoing, this period, which coincided with the structural adjustment programme, was a period of stagnation for health workforce development.

Between 2000 and 2005, which coincided with the major health sector reforms, no notable improvements in health workforce densities were seen. For example, while the density of doctors reduced from 0.64 to 0.63 over the period, that of pharmacists and professional nurses stagnated at 0.13 and 2.91 per 10,000 respectively, albeit with slight improvements in between. The observed declines have been widely attributed to the massive brain drain of the health workforce, coupled with an inadequate capacity for production (Dovlo, 2005a, 2005b).

Unsurprisingly, the HRH policy of 2007-2011 sought to address these issues head-on. During this period of the expansionary drive, the density of doctors improved from 0.71 per 10,000 population in 2006 to 1.04 per 10,000 population in 2013, representing a 46.4% improvement in the availability of doctors relative to the population size. For professional nurses, there was a 70% improvement in density from 2.89 nurses per 10,000 population in 2005 to 4.91 nurses per 10,000 population increments in 2013. There were also some 53.3% and 11.26% increases in the density per population ratios of pharmacists and midwives, respectively. The highest rate

of improvements of about 218% and 184.4% were recorded in the density of the associate nursing category, where the density of Enrolled Nurses increased from 1.11 per 10,000 in 2006 to 3.53 per 10,000 population in 2013, and Community Health Nurses from 1.73 per 10,000 in 2006 to 4.92 per 10, 000 in 2013.

Cumulatively, the density of doctors, professional nurses, pharmacists, midwives, enrolled and community health nurses increased by 16.2% from 7.72 per 10,000 in 2006 population to 8.97 per 10,000 in 2013, clearly reflecting the expansionary measures in production, which translated into fulfilling some of the demand for the health workforce.

Table 2:Trends in the number and densities of health workers employed in the public sector, 1996 – 2022.

Year/Cadre	Doctors		Professional Nurses		Pharmacists		Midwives		Enrolled Nurses		Community Health Nurses		Biomedical Scientists		Total	
	Number in Public Sector Employment	Density per 10,000	Number in Public Sector Employment	Density per 10,000	Number in Public Sector Employment	Density per 10,000	Number in Public Sector Employment	Density per 10,000	Number in Public Sector Employment	Density per 10,000	Number in Public Sector Employment	Density per 10,000	Number in Public Sector Employment	Density per 10,000	Total Number in Public Sector Employment	Density per 10,000
1996	1,099	0.68	5,728	3.53	192	0.12									7,019	4.32
1998	1,191	0.70	4,947	2.90	228	0.13									6,366	3.74
1999	1,218	0.70	5,168	2.96	217	0.12	1,257	0.72	3,892	2.23	2,496	1.43			14,248	8.17
2002	1,200	0.64	4,320	2.31	252	0.13	2,161	1.15	3,850	2.06	2,666	1.42			14,449	7.72
2003	1,142	0.60	6,797	3.54	254	0.13		0.00	3,636	1.90	2,248	1.17			14,077	7.34
2005	1,272	0.63	5,793	2.87	292	0.14	2,872	1.42	2,967	1.47	4,920	2.44			18,116	8.97
2006	1,471	0.71	5,997	2.89	309	0.15	3,144	1.51	2,307	1.11	3,585	1.73	219	0.11	17,032	8.20
2007	1,676	0.79	6,301	2.95	318	0.15	3,117	1.46	2,316	1.09	3,706	1.74	238	0.11	17,672	8.29
2008	1,855	0.85	7,283	3.32	342	0.16	3,315	1.51	2,189	1.00	4,650	2.12	285	0.13	19,919	9.09
2009	2,033	0.90	7,924	3.52	429	0.19	3,838	1.71	2,004	0.89	6,305	2.80	343	0.15	22,876	10.17
2010	2,325	1.01	8,098	3.51	481	0.21	3,780	1.64	1,825	0.79	6,343	2.75	477	0.21	23,329	10.10
2011	2,477	1.04	9,777	4.12	534	0.23	4,034	1.70	2,659	1.12	7,596	3.20	566	0.24	27,643	11.66
2012	2,463	1.01	11,125	4.57	530	0.22	3,863	1.59	5,350	2.20	9,609	3.95	612	0.25	33,552	13.79
2013	2,588	1.04	12,245	4.91	574	0.23	4,185	1.68	8,797	3.53	12,285	4.92	649	0.26	41,323	16.56
2014	3,018	1.18	14,776	5.78	650	0.25	4,764	1.86	12,424	4.86	13,659	5.34	713	0.28	50,004	19.55
2015	3,164	1.21	16,862	6.43	666	0.25	5,582	2.13	16,263	6.21	15,814	6.03	794	0.30	59,145	22.57
2016	3,365	1.25	19,120	7.12	684	0.25	7,208	2.68	18,195	6.77	15,290	5.69	827	0.31	64,689	24.08
2017	3,666	1.33	21,807	7.92	686	0.25	9,554	3.47	21,301	7.74	15,706	5.71	839	0.30	73,559	26.72
2018	4,196	1.49	21,374	7.58	671	0.24	10,492	3.72	20,527	7.28	14,692	5.21	875	0.31	72,827	25.83
2019	3,390	1.17	22,960	7.95	629	0.22	11,910	4.13	24,935	8.64	15,720	5.44	890	0.31	80,434	27.86
2020	3,723	1.26	28,706	9.71	657	0.22	13,280	4.49	26,002	8.80	15,461	5.23	1,289	0.44	89,118	30.15
2021	4,347	1.44	40,577	13.43	1,022	0.34	19,141	6.33	34,193	11.31	17,643	5.84	1,751	0.58	118,674	39.27
2022	4,136	1.34	45,163	14.63	992	0.32	23,316	7.55	36,240	11.74	17,471	5.66	2,099	0.68	129,417	41.92

Data sources: number employed was extracted from Government payroll data for various years and supplemented with data from the MOH recruitment portal.
Note: blanks are missing data. They do not represent zeros.

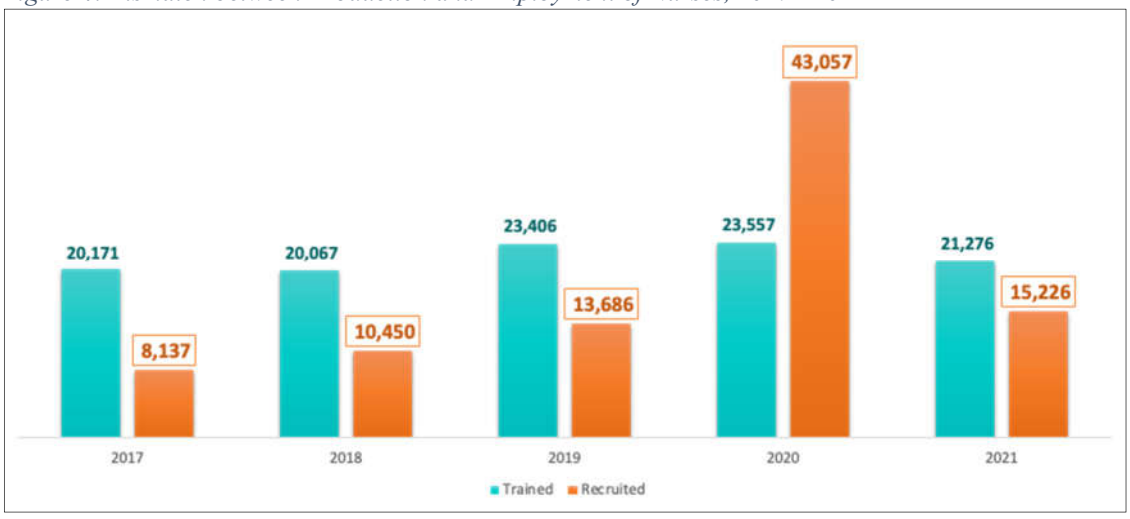
Policy Vacuum and Misaligned Production between 2012 and 2019

It is worth noting that the period after 2013, characterised by a seeming policy incoherence, maintained an even further increase in expanding production and resulted in large recruitments and improvements in densities of the health workforce, particularly that of midwives, enrolled nurses and doctors. The density of midwives doubled during this period, from 1.86 per 10,00 population in 2014 to 3.72 per 10,000 population in 2018. In absolute terms, the number of midwives employed in the public sector increased by 120% from 4,764 to 10,492 over this period. For enrolled nurses, there was an almost 50% increase in their density, which resulted from expanding their employment by some 8,103 from 12,424 in 2014 to 20,527 in 2018, representing a 65.22% jump within the period.

While the density of doctors improved by some 26.27%, as a result of the addition of 1,178 doctors between 2014 and 2018, the same cannot be said of the pharmacists and community health nurses. Although the absolute number of pharmacists and community health nurses increased by 21 and 1,033 over the period, these increments were below par when compared with population increases, leading to declines of 4.16% and 2.43% in the density of pharmacists and community health nurses per 10,000 population. Here lies the policy incoherence – an unmitigated increase in midwives and, to some extent, nurses with less attention paid to pharmacists and community health nurses.

From 2012 when the HRH policy and strategy lapsed, policy implementation misalignment ensued due to the mismatch between the expansionary policies and inadequate absorptive capacity due to the lack of fiscal space to employ the produced numbers. Earlier reports had also warned that *" ... although enrolment [was] growing, the demand for places [was] even larger, and ... training institutions [were] struggling to absorb the number of potential applicants in light of capacity constraints"* (Appiah-Denkyira et al., 2013, p. 31). Due to this mismatch between the dwindling fiscal space and the increasing production of the health workforce, it became infeasible to absorb all the trained health workers, especially nurses and midwives, and administrative data show that nearly 70,000 trained health workforce were unemployed and looking for jobs as at April 2022 as in shown in Figure 3.

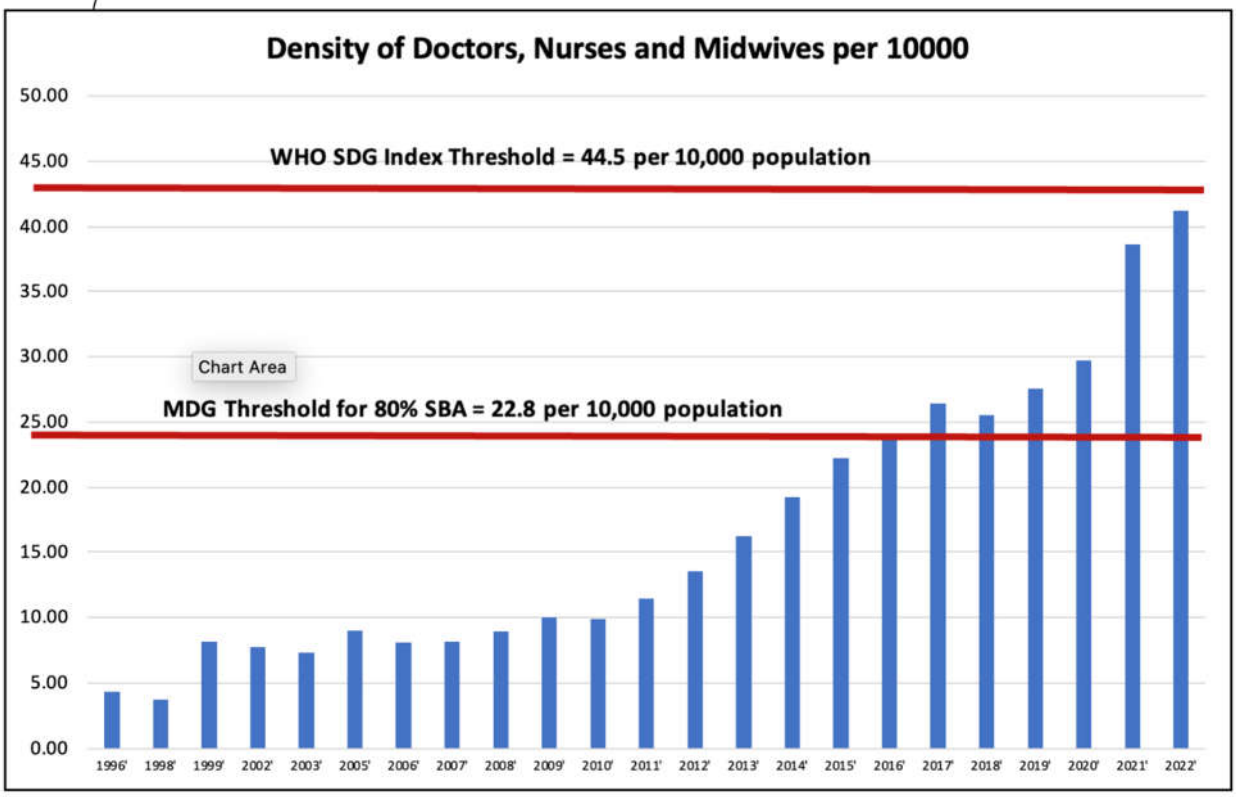
Figure 4:Mismatch between Production and Employment of Nurses, 2017 - 2021



Notwithstanding the market failure occasioned by this policy vacuum, it is incontrovertible to state that it was during this phase of the policy evolution that the country attained the global MDG threshold for 80% skilled birth attendance rate and 22.8 density of doctors, nurses and midwives per 10,000 population. Again, at the end of the vacuum, Ghana had attained 61.52%

of the World Health Organisation's Global SDG threshold of 44.5 doctors, nurses, and midwives per 10,000 population.

Figure 5:Trend of Density of Doctors, Nurses and Midwives per 10,000 Population



Policy Streamlining and The Road to Recovery

To fill the policy vacuum at the sectoral and strategic levels, the sector revised its national and strategic policies in 2020. The Revised National Health Policy: Ensuring Healthy Lives for All (2020) aimed to promote, restore, and maintain good health for all people living in Ghana, through five strategic objectives, key amongst them being strengthening the healthcare delivery system to be resilient. As an implementation strategy, the revised national health policy sought to ensure equitable access to the appropriate quality and quantity of health workers, by assuring adequate availability, competence, and equitable distribution across sectors and geographical areas. These proposed strategies hinged on streamlining and improving the operations of health training institutions, as well as recognising and supporting the training of specialist cadres of all categories of health professionals.

With this paradigm shift, the hitherto expansionary increased production and centrally determined demand by the Ministry of Health metamorphosed into one of re-alignment and agency-specific health workforce needs determination and restricting the private-for-profit sector's role in the production of middle-level health professionals to clearly defined areas of need with corresponding quotas given by the Ministry of Health. The Ministry of Health was to, also, use scientific methods to determine the health workforce needs of the entire health sector (both public and private) to address new services, new facilities as well as new equipment (MoH, 2020).

Though a little too early to assess the impact of the policy streamlining drive, just two years into implementation, the data, however, suggest positive trends in the densities of all the sampled categories of health professionals. For example, the density of doctors and pharmacists

increased by some14.29% and 54.54% from 1.26 per 10,000 and 0.22 per 10,000 population in 2020 to 1.44 per 10,000 and 0.34 per 10,000 population in 2021, respectively, only to record marginal declines of 6.94% and 5.88% in 2022 when compared with the 2021 densities. Similarly, the densities of professional nurses, midwives, biomedical scientists, enrolled and community health nurses recorded average increases of 12.6%, 6.12%, 0.57%, 10.62% and 5.58% between 2020 and 2022, respectively.

However, the absolute number of doctors, pharmacists and community health nurses decreased by 211, 30 and 172 from 4,347 in 2021 to 4,136 doctors in 2022 (4.85%), 1,022 in 2021 to 992 pharmacists in 2022 (2.9%), and 17,643 in 2021 to 17,471 community health nurses in 2022 (0.97%), respectively.

Although the decrease in the absolute number of community health nurses vis-à-vis increases in the number of professional nurses and midwives represents a correlation that could be interpreted as the impact of the revised health workforce policy's strategic objective, of supporting the training of specialist cadres of all categories of health professionals, this observation is moot. A review of administrative data of the Ministry of Health posits this correlation to be the result of recruitment fluidity in the conversion of community health nurses and enrolled nurses to professional nurses and midwives on attainment of higher educational qualifications, given that 69% of the 3,638 health workforce converted in 2022 were converted to professional nurses and midwives (Obiri-Yeboah, 2023). Again, labour market rigidities, such as the lack of sufficient budget space for the health workforce and imbalances between production and demand for health workforce, occasioned the unemployment of community health nurses and enrolled nurses and resulted in dynamic surpluses of some 27,533 community health nurses and enrolled nurses as at end of 2022 (Asabir, 2023).

It could, incontrovertibly, be said that while the policy streamlining appears to be on a good footing towards attaining the strategic objective of supporting the training of professional nurses, midwives, and biomedical scientists, evidence is yet to be seen in streamlining the seeming over production of mid-level categories such as community health nurses and enrolled nurses.

DISCUSSION

In line with national health workforce challenges, Ghana has, over the last decades, undergone three phases of health workforce evolution. This health workforce policy evolution trajectory of Ghana mimics global health workforce trends such as the adoption of the United Nations' Sustainable Development Goals, especially goal 3, whose target 'c' implores countries to significantly increase the production, recruitment, and retention of the needed health workforce to meet the critical benchmark of 44.5 essential health workforce per 10,000 population.

The policy reforms, initially expansionary in nature and later 'contractionary', have had the net effect of increased production of mid-level professionals such as doctors, professional nurses, midwives, pharmacists, biomedical scientists, community health nurses and enrolled nurses, leading to significant increases in absolute numbers and densities per population.

In terms of stock, the total number of doctors, nurses (professional and associate), pharmacists and biomedical scientists employed in the public sector ranged from a minimum of 6,366 in 1998 to a maximum of 129,417 in 2022, averaging at 44,152 across the various health workforce policy epochs. The nursing cadres (professional and associate) constitute a disproportionate percentage of the national composition of the public health workforce. Data

triangulated from administrative sources revealed the country had a total absolute nursing cadres stock of some 98,874 as at end of 2022, representing about 76.4% of the total absolute number of the sampled health workforce cadres and about 1.56 folds of the African region's nurses' and midwives' composite stock as a share of the total health workforce of 49.1% (WHO, 2021). The stock of nurses and midwives, however, represents about 83.48% of the total number of nurses and midwives trained between 2017 and 2021, painting an occupational unemployment rate of 16.52%., which rate varied by the nursing cadre.

Similarly, the insignificant stock of pharmacists and biomedical scientists relative to the total stock of the sampled health workforce [0.76% and 1.63%, respectively) mirrored the African Region's trend, where pharmacists represented about 2.63%, and laboratorians represented 10.36% of the total regional stock of health workforce.

Concomitantly, the increasing production and employment of the needed health workforce resulted in improved health workforce densities per population ratios across the policy trajectory, coinciding with similar trends in the Region (WHO, 2021).

These trends, however, have brought about colossal increases in the health workforce wage bill averaging at about 156% across the policy trajectory, with an accompanying need for discussions on fiscal space for health and the health workforce, inequitable distribution and productivity. For example, in an earlier analysis, Asamani et al. (2020) estimated the crude equity index of the best-staffed region to the worst-staffed region to be as high as 2.17 times and recommended redistributing 13.4% of the inequitably distributed staff, which could bridge the existing staffing situation by 30% (Asamani et al., 2020).

CONCLUSION

In sum, there is no denying the fact that the policy evolutions within the Ghanaian public health workforce space have solved some of the country's health workforce challenges, such as the hitherto limited production capacity and demand for health workforce. However, the evolutions have come with accompanying challenges, such as mismatches in the scale and skill mix of production, as well as the lingering lack of financial absorptive capacity (fiscal space) to employ the trained cadres.

Albeit the current health workforce policy and strategies have flagged these challenges for remedial action, it is recommended that further research be conducted to assess the production capacity vis-à-vis budget space for the health workforce, so as to inform the sustainable levels of health workforce production and demand.

LIMITATION

The policies reviewed were not formally evaluated, and hence some of the implementation contexts might have been lost. To mitigate this, a qualitative study with key informants is planned.

DECLARATIONS

Ethics approval

The study is part of a larger doctoral studies and has been granted full ethics approval by the North-West University' Health Research Ethics Committee (No. NWU-00122-22-A1) and Ghana Health Service Ethics Review Committee (No. GHS-ERC:018/08/22).

Consent for publication

Not applicable

Availability of data and materials

Data and materials of the study are available upon request to HI.

Competing interests

Not applicable

Funding

Not applicable

Authors' contributions

Under the academic supervision of CDC, YH and JN-O, HI conceived the study as part of a larger doctoral study for the award of PhD in health sciences. HI drafted the manuscript under the guidance of CDC and JN-O. CDC, JN-O and YH reviewed the draft manuscript with substantial inputs for finalisation. HI finalised the manuscript. All authors read and approved the manuscript for publication.

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Supplementary Material 1: Summary of Key Health Workforce Policies

S/N	Policy Document	Strategic Intent	Assessment of Extent of Implementation and Potential Impact
1	Ghana Health Service and teaching Hospitals Act of 1996 (Act 525)	▪ Decentralise the provision of health services to agencies – GHS for primary to secondary level, TH for tertiary services – and separate policy development function to remain with the MOH. ▪ Training function, to remain with the MOH and Priority setting for determining the need for recruitment (demand creation).	▪ Act provided for greater implementation autonomy in recruitment decisions of agencies but subject to the availability of resources as prioritised by the Ministries of Health and Finance. ▪ Management authority for core human resource functions such as recruitment, remuneration, personnel training, and development, however, remained centralised at the national units.
2	National Health Policy: Creating Wealth Through Health (2007)	▪ Increase the production, recruitment, and retention of health workers, focusing on middle-level health professionals. ▪ Improve retention, equitable distribution and increased productivity and responsiveness of human resources by (i) strengthening the systems for supervision, performance appraisal, accountability, and overall human resource management and (ii) continuously refining the systems for compensation and incentives, and implementation of sanctions and (iii) promoting effective legislation and regulation.	Policy had an overarching impact on production, recruitment, and retention, attracted significant government prioritisation for health within the health workforce, e.g., the health sector received 10.6% of GGE as compared to an average of 6% in the preceding years.
3	Human Resource Policy and Strategies for the Health Sector, 2007 - 2011	Ensure sufficient availability, effective management, and efficient utilisation of human resources to achieve service delivery goals.	▪ Expansionary production was achieved with many of the cadres surpassing the planned targets. ▪ Coordination and management of health training institutions enhanced following the setup of the Health Training Institutions' Secretariat and the postgraduate health colleges i.e., the Ghana College of Physicians and Surgeons (GCPS), Ghana College of Pharmacists (GCP), and the Ghana College of Nurses and Midwives (GCNM). ▪ Centrally determined staffing norms used to inform the automatic recruitment of trained health workers and their distribution.
4	National Health Policy, 2020	▪ Have an adequate health workforce with requisite knowledge, skills, competencies and attitude, who are equitably distributed and motivated to provide quality healthcare across sectors and geographical areas. ▪ Streamline and improve the operations of health training institutions, with conscious efforts to recognize and support the training of specialist cadres of all categories of health professionals	

S/N	Policy Document	Strategic Intent	Assessment of Extent of Implementation and Potential Impact
5	National Human resources for Health policy and Strategy, 2020	Ensure an adequate, concerted, and multi sectoral response to strengthening the health workforce to support the effective implementation and achievement of integrated interventions that meet the health and wellness needs of the population	▪ Policy has provided for a strategic shift from centrally determined norms to agency specific norms peculiar to their needs. ▪ The hitherto expansionary production drive has been streamlined to need-based, albeit there are still instances of overproduction of some mid-level cadres.