

Bridging the gap: Factors strengthening human resources for achieving universal healthcare among medical technologists in Quezon Province

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Abstract

This study investigates the status and challenges of health human resources to advance the realization of universal healthcare in the Philippines. Amid the increasing demand for healthcare services driven by population growth, urbanization, and socioeconomic development, the country faces persistent issues such as workforce shortages, skill-mix imbalances, and misdistribution of allied health professionals. Using mixed methodologies, including surveys, and comparative analyses, the research evaluates workforce conditions, and identifies barriers to equitable deployment and utilization. Findings revealed a predominantly young, unmarried female workforce concentrated in private laboratories, with limited years of experience and occupying lower position. Despite a generally functional workforce distribution and satisfactory skill-mix, ongoing concerns about workload, compensation, and the depth of training programs persist. These outcomes reflect broader national trends cited by global frameworks such as the World Health Organization's Workforce 2030, and the HRH2030 Philippines Final Report, which highlight the need for strategic, context-adapted human resource interventions. The study recommends adopting WISN staffing tools, enriching professional development programs, standardizing compensation across sectors, and strengthening governance through streamlined credentialing and interagency collaboration. Ultimately, the research underscores the importance of data-driven workforce planning to build a resilient, equitable, and effective healthcare system, and contributes significantly to policy dialogue on achieving universal healthcare in Quezon Province and beyond.

Keywords: *workforce sustainability, health systems resilience, health workforce planning, strategic capacity building, healthcare transformation*

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1. Introduction

Universal healthcare aims to ensure that all individuals have access to essential healthcare services without experiencing financial hardship. Achieving this goal requires a strong and sustainable health workforce. Globally, healthcare systems continue to face increasing pressure from rising health concerns, escalating costs, workforce shortages, and inadequate recognition of healthcare professionals' contributions (Nguyen et al., 2025; Figueroa et al., 2019; Sipos et al., 2024; Gilles et al., 2025). The World Health Organization (2019) estimates that an additional 18 million health workers will be needed worldwide by 2030 to achieve Universal Health Coverage (UHC). These workers must be equitably distributed, adequately trained, and sufficiently motivated to provide quality healthcare services. Health systems must also ensure efficient service delivery, effective health information systems, access to essential medicines, sustainable financing, and good governance.

In the Philippines, the demand for healthcare services continues to rise due to population growth, urbanization, an aging population, and the expansion of the middle class (De Dios, 2016). The healthcare system is divided between public and private sectors, with the public sector primarily focusing on preventive care, primary healthcare, and health education, while private hospitals specialize in areas such as cardiovascular diseases, cancer, pulmonology, and orthopedics. The pandemic further accelerated the upgrading and expansion of hospital facilities nationwide (Uy et al., 2022). Despite these developments, the country continues to experience shortages in healthcare infrastructure and professionals, including doctors, nurses, medical technologists, and allied health workers (Pepito et al., 2025). The low bed-to-population ratio and the lack of skilled personnel, particularly in specialized areas, remain major concerns (Tomas et al., 2025).

The implementation of the Universal Health Care Law of 2019 significantly expanded healthcare access in the Philippines by automatically enrolling all Filipinos, including Overseas Filipino Workers (OFWs), into the National Health Insurance Program under PhilHealth. This legislation broadened coverage to include consultations, laboratory tests, and other healthcare services, strengthening the country's movement toward universal healthcare coverage. Government reforms, combined with private sector participation, have contributed to the continuing growth of the healthcare industry. Private investments in hospital infrastructure, healthcare technology, diagnostics, and pharmaceutical manufacturing

have increased, particularly in the CALABARZON region, Central Luzon, and the National Capital Region. The growing demand for affordable medicines has also expanded the market for generic pharmaceuticals, supported by favorable government policies and foreign investment opportunities. Healthcare technology and diagnostic services continue to expand rapidly, improving access to health information and healthcare delivery systems (Chung et al., 2025; De Dios, 2026; Sarmiento et al., 2025).

Despite these advancements, major challenges persist within the Philippine healthcare system. Significant geographical disparities remain, particularly in rural and underserved areas where access to healthcare services is limited (Collado, 2019; Evangelista et al., 2022). Many Filipinos continue to rely heavily on public healthcare facilities, which often experience understaffing and treatment delays due to the migration of healthcare professionals to Western countries (Robredo et al., 2022; Caino & Castillote, 2024). Workforce shortages, imbalances in skill mix, and the unequal distribution of healthcare resources continue to hinder the achievement of equitable healthcare delivery (Alibudbud, 2023). Additionally, Health Professional Education must continuously adapt to evolving healthcare needs by addressing curricular rigidity, professional silos, outdated pedagogical approaches, and limited responsiveness to local healthcare contexts (Guignona et al., 2021). Interprofessional education (IPE) and interprofessional collaborative practice (IPCP) have been identified as important strategies to strengthen collaboration among healthcare professionals and improve comprehensive patient care (Herath et al., 2017). In response to these concerns, the study specifically sought to assess the current state of health human resources in terms of workforce distribution, skill mix, and training programs; and identify the challenges hindering the equitable distribution and effective utilization of healthcare professionals.

2. Methodology

2.1. Research Design

The study utilized a descriptive-evaluative research design using a quantitative approach. This design is appropriate because the study aims to accurately describe the current status of health human resources and evaluate the challenges hindering equitable distribution without manipulating variables. By employing quantitative methods, specifically structured surveys, the researcher can transform complex observations into numerical data, allowing for

a precise assessment of workforce distribution, demographics, and existing training programs.

2.2. Participants of the Study

The participants of this study consist of Senior Medical Technologists currently employed in clinical laboratories within Quezon Province. The researcher employed non-probability purposive sampling. This technique was selected because the study requires "information-rich" cases specifically professionals who possess the seniority and experience necessary to provide a comprehensive assessment of the workforce. To ensure the appropriateness of the sample, participants were selected based on the following criteria: (1) Active membership in PAMET (Philippine Association of Medical Technologists) - Quezon Chapter. (2) Employment as a Senior Medical Technologist. (3) Willingness to participate as evidenced by a signed informed consent. Participants were categorized based on age, sex, civil status, employment status, years of experience, rank, and work hours to provide a nuanced context for the data.

Table 1 presents the demographic profile of the 152 respondents categorized by age, sex, marital status, years of experience, position, hours worked and laboratory ownership. The data reveals a predominantly young adult demographic, with the 25 to 34 age group constituting the largest segment at 46.1% (n=70). When combined with the 18 to 24 and 35 to 44 cohorts, individuals aged 18 to 44 account for 77.7% of the total sample. Conversely, representation diminishes in the older cohorts. Respondents aged 45 to 54 represent 13.2%, while the 55 to 64 age group is the least represented at 9.2%. This distribution indicates a trend where participation is inversely proportional to age, suggesting that the findings of this study primarily reflect the perspectives of early-to-mid-career adults.

As to the sex distribution and marital status, a significant majority of the participants are female, accounting for 80.3% while males make up only 19.7%. On the other hand, the majority of participants are single, making up 60.5%, married individuals represent 38.2%, and a small fraction, only 1.3%, are separated.

The workforce is heavily skewed toward the early-career stage, with 39.5% of them having 0 to 5 years of experience. When grouped with those in the 6–10 and 11–15-year brackets, a substantial 75% of the sample possesses 15 years of experience or less. The scarcity of veterans, those with over 25 years of experience (totaling only 10.4%), indicates a

potential deficit in "institutional memory," which can impact how long-held organizational values and complex historical contexts are passed down to newer staff. In terms of position, the majority (63.2%) occupy entry-level or rank-and-file positions. Supervisory positions account for 28.9% of the population and 7.9% are in middle management roles. The majority (82.9%) work the standard 8-hour daily schedule, while 14.5% work 12 hours and only 2.6% work 16 hours per day. In terms of employment sector, most participants (65.8%) are employed in the private sector, whereas 34.2% work in the government sector.

Table 1*Demographic profile*

Demographics	F	%
Age Group		
18 to 24	22	14.5
25 to 34	70	46.1
35 to 44	26	17.1
45 to 54	20	13.2
55 to 64	14	9.2
Sex		
Male	30	19.7
Female	122	80.3
Marital Status		
Single	92	60.5
Married	58	38.2
Separated	2	1.3
Years of experience		
0 to 5	60	39.5
6 to 10	28	18.4
11 to 15	26	17.1
16 to 20	8	5.3
21 to 25	16	10.5
26 to 30	6	3.9
31 to 35	4	2.6
36 to 40	2	1.3
41 to 45	2	1.3
Position		
Entry Level/ Rank and File	96	63.2
Middle Management	12	7.9
Supervisory	44	28.9
Hours Worked		
8 hours per day	126	82.9
12 hour per day	22	14.5
16 hours per day	4	2.6
Employment sector		
Government	52	34.2
Private	100	65.8
Total	152	100

2.3. Instrumentation and Data Gathering Process

The primary instrument for this study was a researcher-made survey questionnaire, which was subjected to validation by experts and approved by the research adviser. The instrument was structured to assess the current state of health human resources (workforce distribution, skill-mix, and training) and identify barriers to effective utilization.

Formal permission was secured from the Dean of the College of Medical Technology at Calayan Educational Foundation, Inc. The questionnaire was drafted and validated to ensure clarity and relevance. Due to geographical dispersion across Quezon Province, the survey was administered via Google Forms. The researcher contacted eligible participants, clearly explaining the study's objectives and procedures. Before accessing the survey items, participants were required to complete a digital informed consent form integrated into the Google Form.

2.4. Data Analysis

Data were tabulated and analyzed using percentage and weighted arithmetic mean. A 5-point scale was utilized to measure levels of agreement or assessment. Each mean score was assigned a verbal interpretation (e.g., Strongly Agree to Strongly Disagree) to translate numerical data into actionable insights.

2.5. Research Ethics

Ethical integrity was maintained throughout the study by adhering to the following protocols:

Informed consent. All participants were fully briefed on the study's purpose. Participation was entirely voluntary, and respondents retained the right to withdraw at any stage.

Confidentiality and privacy: Personal information and individual responses were kept strictly confidential. Data were analyzed in aggregate form to ensure that no individual participant or laboratory could be identified.

Safety and welfare: The study posed no physical or psychological risk to the participants. The use of an online platform ensured that the data gathering process did not interfere with the participants' professional duties.

4. Results and Discussion

Table 2 shows that the responses regarding work distribution in the healthcare institution generally reflect a positive view, with most scores falling within the Agree range.

Table 2

Work distribution in the healthcare institution

Indicators	Mean	SD	Rank
There is a share of staff performing health care related job	3.30	0.67	1
Wages or salaries are comparable of other health care institution	2.96	0.74	9
Workloads are evenly proportionate with the number of hours	2.96	0.68	9
Working conditions of health workers are adequate to attract, retain and motivated	2.99	0.72	8
Healthcare institution provides working environment incentives e.g. Flexible working hours, work autonomy etc.	3.00	0.75	7
There are clear policies and procedures for hiring recruitment and retention	3.20	0.71	2
Human resources distributed appropriately among the different types and levels of health services (hospital, OPD, preventive care, etc.)	3.05	0.71	6
There is a mechanism used to improve performance and optimize productivity	3.11	0.70	4
Job descriptions are detailed at each level of the health care delivery system	3.16	0.65	3
There is a clear career structure for lower-level position.	3.09	0.65	5
Composite mean	3.08	0.56	

Legend: 1.00 – 1.75 Strongly Disagree; 1.75 – 2.50 Disagree; 2.50 – 3.25 Agree; 3.25 – 4.00 Strongly Agree

Participants agree that there is a fair distribution of healthcare-related tasks among staff (mean = 3.30) and that clear policies and procedures for hiring, recruitment, and retention are in place (mean = 3.20). The distribution of human resources across various healthcare services, such as hospitals, outpatient departments (OPD), and preventive care, is also perceived as appropriate (mean = 3.05). In addition, mechanisms to improve performance and optimize productivity are viewed positively by respondents (mean = 3.11). However, while participants generally perceive the organizational structure as clear and functional, several areas of concern remain evident. Wages and salaries are viewed as somewhat lower compared to those offered by other healthcare institutions (mean = 2.96), and the distribution of workloads relative to working hours is also perceived as less than ideal (mean = 2.96). Working conditions, although considered adequate to some extent, may still be insufficient to fully attract, retain, and motivate healthcare staff (mean = 2.99).

Furthermore, although incentives such as flexible working hours and work autonomy are provided (mean = 3.00), respondents indicate that improvements in these incentives may still be necessary to enhance employee satisfaction.

Job descriptions are generally considered detailed and clearly defined at each level of the healthcare delivery system (mean = 3.16), and respondents also acknowledge the presence of a clear career structure for lower-level positions (mean = 3.09). The overall summary mean score of 3.08 suggests that respondents perceive the work distribution system as functional and generally well-organized. Nevertheless, concerns regarding wages, workload balance, and working conditions highlight areas that require further attention to improve staff satisfaction and operational efficiency.

The findings are supported by the study conducted by Koca et al. (2024), which closely aligns with the respondents' perceptions regarding workload distribution and working hours. Their research demonstrated that excessive workloads negatively affect the quality of work life among tertiary healthcare workers and utilized structural equation modeling to show that perceived workload imbalances contribute to lower job satisfaction and reduced well-being. Similarly, Baumgartner et al. (2024) reported that factors such as organizational policies, working conditions, salary, recognition, supervision, career advancement, and growth opportunities significantly influence the recruitment and retention of allied health professionals, particularly in hospital settings. These findings also correspond with respondents' moderate agreement regarding the availability of clear career structures and incentives such as flexible working hours and work autonomy.

Table 3 reflects a generally positive perception of skill mix, with most mean scores falling within the Agree range. Respondents largely agree that improving the quality of care is a top priority, as indicated by a mean score of 3.20, reflecting strong support for this focus. Cost-effective technological innovations and new medical interventions also received favorable feedback, with a mean score of 3.08, suggesting that respondents recognize efforts to balance cost efficiency with healthcare advancement. New programs and initiatives in the health sector, as well as strategies aimed at improving quality, cost containment, and performance, were also positively received, with mean scores ranging from 3.00 to 3.11. Additionally, respondents indicated that there is room for professional role changes and the promotion of new services among staff, as reflected in mean scores of 3.00 and 3.09, respectively. However, several areas still require attention. Addressing staffing inequities

received a mean score of 2.93, indicating that respondents believe improvements in this area are still ongoing. Similarly, while schemes to address staff shortages and improve the management of organizational costs were somewhat acknowledged, the responses toward these issues were less strongly positive, both obtaining mean scores of 2.92. The overall summary mean score for skill mix was 3.03, suggesting that the current skill mix strategy is viewed as satisfactory but may benefit from further refinement, particularly in addressing staffing disparities and improving cost management.

Table 3*Skill mix in the healthcare sector*

Indicators	Mean	SD	Rank
There is a scheme or program responses to shortages of staff in particular occupation or profession	2.92	0.67	8
Improved management of organizational costs, specifically labor costs are implemented	2.92	0.67	8
Improved quality of care is utmost essential	3.20	0.54	1
Cost effective on Technological innovation and new medical intervention	3.08	0.63	4
New health sector programs or initiatives are in place	3.11	0.72	2
Cost containment, improvements in quality of care and performance are introduced	3.03	0.63	5
Scope for changes in role for different occupations and professions are oriented	3.03	0.67	5
Establishing a new service is promoted among the staff	3.00	0.71	7
New processes/ procedures are very well introduced	3.09	0.75	3
Staffing inequities are being settled	2.93	0.73	10
Composite Mean	3.03	0.57	

Legend: 1.00 – 1.75 Strongly Disagree; 1.75 – 2.50 Disagree; 2.50 – 3.25 Agree; 3.25 – 4.00 Strongly Agree

The responses correlate with the findings of Griffiths et al. (2023), which examined the cost and effectiveness of improved nurse staffing levels and skill mix in acute hospitals. Respondents expressed strong support for quality of care as the top priority, implying that a richer skill mix significantly improves patient outcomes, including reduced mortality and adverse events. This demonstrates that the respondents' positive perception of quality-focused strategies within healthcare institutions is supported by global evidence emphasizing the impact of proper staffing on the quality of healthcare delivery. Additionally, respondents expressed lower satisfaction regarding how staffing inequalities and shortages are addressed. Uneven skill distribution and insufficient staffing contribute to poorer patient outcomes and result in higher operational costs.

Table 4*Training programs in healthcare institutions*

Indicators	Mean	SD	Rank
There is institutional education and training strategy	3.18	0.65	1
Mechanism exists to link supply of trainees to the demand of health sector	3.05	0.67	10
There is education and training institution for the main HRH	3.09	0.69	9
Types of training activities are available for the health workforce	3.18	0.68	1
Training and other needs are identified	3.14	0.70	4
Accreditation criteria for health school is essential	3.14	0.64	4
There are strategies for providing continuous education	3.17	0.70	3
Continuous education exists in all major areas of laboratory	3.12	0.67	7
There is a plan to identify research needs	2.89	0.72	11
Monitoring and evaluation are available every training	3.13	0.68	6
The information or data gathered is used in planning	3.12	0.69	7
Composite Mean	3.11	0.59	

Legend: 1.00 – 1.75 Strongly Disagree; 1.75 – 2.50 Disagree; 2.50 – 3.25 Agree; 3.25 – 4.00 Strongly Agree

Table 4 shows that the responses regarding the healthcare institution's training programs indicate a generally positive perception, with most mean scores falling within the Agree range. Respondents agree that there is an institutional education and training strategy in place (mean = 3.18), as well as mechanisms to align the supply of trainees with the demand in the health sector (mean = 3.05). There is also strong recognition of the availability of various types of training activities for the workforce (mean = 3.18), and the identification of training and development needs is perceived as well-organized (mean = 3.14). The presence of accreditation criteria for health schools (mean = 3.14) and strategies for continuous education (mean = 3.17) also received positive feedback, indicating that structured plans are in place to maintain ongoing professional development.

Continuous education in major areas of laboratory work (mean = 3.12), along with the effective monitoring and evaluation of training programs (mean = 3.13), further supports the notion that education and training are institutional priorities. However, some areas still show room for improvement. For example, the mean score of 2.89 for the identification of research needs suggests that this aspect of training is less developed or not addressed as effectively as other areas. The overall summary mean score for training programs is 3.11, signifying that respondents generally view the institution's training programs positively, although certain aspects, such as research identification, may benefit from greater attention and refinement.

Empirical evidence on Continuing Professional Development (CPD) systems emphasizes the importance of accreditation criteria, structured evaluation systems, and institutional oversight in ensuring the quality and sustainability of continuing education programs (Farid et al., 2025; Ali et al., 2025; McMahon et al., 2024; Merry et al., 2023). Participants generally agreed that such systems are present in their institutions, particularly in the areas of accreditation and continuous educational strategies.

Table 5

Challenges hindering the equitable distribution of healthcare professionals

Indicators	Mean	SD	Rank
The health sector continues to struggle with low productivity and unmet targets.	3.07	0.57	9
The recommended healthcare worker-to-patient ratio remains unmet, with an ongoing shortage of health human resources.	3.22	0.62	6
Achieving equitable distribution of health human resources is difficult due to the complex and ever-changing nature of health service contexts and levels.	3.16	0.52	8
The number of trained health workers is too low to perform competently.	3.04	0.64	10
The demand for health services has significantly increased, pushing illnesses to peripheral health facilities.	3.20	0.56	7
Industrial actions are often taken to secure concessions or benefits, typically of an economic nature.	3.03	0.49	11
High turnover rates indicate that many healthcare workers plan to leave their jobs within the next few years and do not expect to stay in their current positions for more than a year.	3.26	0.62	5
Healthcare workers report experiencing burnout.	3.36	0.64	4
Long hours, particularly exceeding fifty-five hours a week, are directly linked to serious health conditions.	3.37	0.67	3
Financial pressures from lower salaries, inflation, and student loan debt make it hard for healthcare workers to afford basic necessities.	3.50	0.58	1
Poor organizational structures in hospitals, clinics, and other institutions lead to worker frustration.	3.39	0.65	2
The slow adaptation to rapidly changing, life-altering technology is often hindered by regulatory and compliance challenges.	3.30	0.63	5
Composite Mean	3.24	0.42	

Legend: 1.00 – 1.75 Strongly Disagree; 1.75 – 2.50 Disagree; 2.50 – 3.25 Agree; 3.25 – 4.00 Strongly Agree

Table 5 shows that the responses regarding the challenges hindering the equitable distribution of healthcare professionals highlight significant concerns, with most mean scores falling within the Agree range. Respondents agree that the healthcare sector struggles with low productivity and unmet targets (mean = 3.07), while the recommended healthcare worker-to-patient ratio remains unmet due to the persistent shortage of health human resources (mean = 3.22). The complexity of health service contexts and levels is also

perceived as a major obstacle to achieving equitable distribution (mean = 3.16), and the number of trained healthcare workers is considered insufficient to perform competently (mean = 3.04). Additionally, participants noted that the demand for health services has increased significantly, placing added pressure on peripheral health facilities (mean = 3.20). Industrial actions, often driven by economic demands, are also viewed as common occurrences (mean = 3.03). High turnover rates, with many healthcare workers planning to leave their positions in the near future, were identified as a key issue (mean = 3.26), while burnout among healthcare workers (mean = 3.36) and long working hours (mean = 3.37) further compound these challenges.

Financial pressures, including low salaries, inflation, and student loan debt, make it difficult for healthcare workers to meet their basic needs (mean = 3.50), contributing to dissatisfaction and instability within the workforce. Poor organizational structures in healthcare institutions were also identified as sources of frustration among workers (mean = 3.39). Furthermore, the slow adaptation to rapidly changing technology, often hindered by regulatory and compliance challenges, adds another layer of complexity to the situation (mean = 3.30). The overall summary score of 3.24 indicates that respondents generally agree that these challenges are significant and negatively affect the equitable distribution of healthcare professionals. These findings suggest the need for strategic interventions to address workforce shortages, improve working conditions, and enhance the healthcare sector's ability to adapt to evolving demands.

The results are supported by the study of Xu et al. (2020). Their research on primary care providers in rural China indicated that dissatisfaction with salary and organizational structure significantly contributes to increased levels of burnout among healthcare providers, which, in turn, strongly predicts higher turnover intentions. Furthermore, the study emphasized that pressures experienced in rural and peripheral settings strengthen the connection to the increasing burden on peripheral health facilities, illustrating that these challenges are not unique to specific individuals or institutions but are part of a broader global healthcare workforce trend.

The findings presented in Table 6 reveal that the utilization of healthcare professionals is significantly hampered by systemic and economic factors. The overall summary mean of 3.23 indicates that respondents generally “Agree” that these challenges are pervasive within the healthcare sector.

Table 6*Challenges hindering effective utilization of healthcare professionals*

Indicators	Mean	SD	Rank
The use of telehealth has grown significantly.	3.13	0.66	9
The increased use of smartphones and the development of innovative apps and e-commerce platforms by mobile app agencies have transformed client and patient interactions.	3.25	0.61	4
There is a pressing challenge of staffing shortages in providing quality patient care.	3.34	0.50	1
Regulatory challenges increase healthcare service costs and create confusion among the public.	3.29	0.54	3
Payment processing and invoicing issues make it difficult for patients to afford their treatments and medications.	3.21	0.64	6
The healthcare cost crisis directly affects the revenue of healthcare companies.	3.34	0.55	1
Healthcare data breaches, connected medical devices, and the need to maintain patient records attract malicious hackers to healthcare providers.	3.20	0.59	8
Connected medical devices and AI-integrated software applications are used to generate information.	3.13	0.62	9
The implementation of advanced health technology influences the perception of Electronic Health Records (EHRs).	3.24	0.56	5
The continuous rise in pharmacy prescription prices is due to the lack of market regulation and no entity to rationalize drug pricing.	3.21	0.47	6
Composite Mean	3.23	0.41	

Legend: 1.00 – 1.75 Strongly Disagree; 1.75 – 2.50 Disagree; 2.50 – 3.25 Agree; 3.25 – 4.00 Strongly Agree

Most notably, staffing shortages and the healthcare cost crisis tied for the highest rank, both obtaining a mean score of 3.34, interpreted as “Strongly Agree.” This suggests that the most critical barriers are not necessarily technological in nature, but rather human and financial. Research conducted by Alansari et al. (2025) emphasize that the global health workforce deficit continues to be a major threat to health system resilience, as personnel shortages lead to increased workloads and reduced quality of care. Furthermore, the data highlights a regulatory and economic paradox. Although the development of innovative applications and telehealth services is viewed as transformative, these advancements are overshadowed by the financial burden associated with regulatory challenges and rising prescription costs. According to Chang et al. (2026), the escalation of healthcare costs is outpacing general inflation, creating a “revenue-expenditure gap” that compels healthcare providers to prioritize financial sustainability over workforce optimization.

5. Conclusion

This study provided a comprehensive examination of the demographic profile, workforce conditions, and systemic challenges impacting medical technologists in the region. Findings revealed that the population is predominantly composed of younger, unmarried female professionals employed in private laboratories, with limited years of experience and concentrated in lower position. Furthermore, the assessment of current health human resources indicated a generally functional workforce distribution and satisfactory skill mix. However, persistent issues regarding workload, compensation, and training emerged. Challenges impeding equitable distribution and effective utilization, including staffing shortages, regulatory inefficiencies, and financial constraints, underscore the urgency for systemic reform.

The study reinforces the critical need for data-driven, context-sensitive strategies to enhance the capacity, distribution, and resiliency of the medical technology workforce in Quezon Province. These insights contribute to the broader discourse on achieving universal healthcare and offer valuable direction for policymakers, educators, and healthcare administrators. To advance health human resource development within the framework of universal healthcare, the following integrated strategies are recommended:

Policy and planning. The implementation of Workload Indicators of Staffing Need (WISN) and the formulation of local government unit-level recruitment mechanisms are imperative to ensure optimal workforce allocation.

Professional growth. Embedding research leadership competencies within training curricula and institutionalizing continuous education incentives will foster career progression and strengthen institutional capabilities.

Workplace reform. Promoting flexible scheduling and wellness initiatives, along with standardizing compensation across public and private laboratory settings, will improve employee well-being and equity.

Equity and access. The establishment of public-private convergence models and the strategic utilization of health human resources (HRH) data will aid in achieving distributive justice and service coverage.

Governance. Enhancing governance through streamlined credentialing systems and robust interagency collaboration will support efficiency, accountability, and policy coherence in workforce deployment.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Institutional Review Board Statement

This study was conducted in accordance with the ethical guidelines set by the Calayan Educational Foundation, Inc. (CEFI). The conduct of this study has been approved and given relevant clearances by the CEFI Research and Publication Office.

AI Declaration

The author declares the use of Artificial Intelligence (AI) in writing this paper. In particular, the author used Grammarly for refining grammatical accuracy, correcting punctuation, and enhancing the overall clarity and tone of the manuscript. Furthermore, the author used Gemini for improving the flow and articulation of specific phrases within the data discussion sections to ensure a more cohesive narrative. The author takes full responsibility for ensuring proper review and editing of contents generated using AI.

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