Review

Najibullah Safi, 1 Ahmad Naeem, 2 Merette Khalil, 3 Palwasha Anwari, 4 and Gulin Gedik 3

1 WHO Country Office, Kabul, Afghanistan. 2 Ministry of Health, Kabul, Afghanistan. 3 WHO Regional Office for the Eastern Mediterranean, Cairo, Egypt.

4 Independent consultant, Kabul, Afghanistan. (Correspondence to: Merette Khalil: merette.ramses@gmail.com)

Abstract

Background: Afghanistan has the second lowest health workforce density and the highest level of rural residing population in the Eastern Mediterranean Region. Ongoing insecurity, cultural, socio-economic and regulatory barriers have also contributed to gender and geographic imbalances. Afghanistan has introduced a number of interventions to tackle its health worker shortage and maldistribution.

Aims: This review provides an overview of interventions introduced to address the critical shortage and maldistribution of health workers in rural and remote Afghanistan.

Methods: A review of literature (including published peer-reviewed, grey literature, and national and international technical reports and documents) was conducted.

Results: The attraction and retention of health workforce in rural and remote areas require using a bundle of interventions to overcome these complex multidimensional challenges. Afghanistan expanded training institutions in remote provinces and introduced new cadres of community-based health practitioners. Targeted recruitment and deployment to rural areas, financial incentives and family support were other cited approaches. These interventions have
increased the availability of health workers in rural areas, resulting in improved service delivery and health outcomes. Despite these efforts, challenges still persist including: limited female health worker mobility, retention of volunteer community-based health workforce, competition from the private sector and challenges of expanding scopes of practice of new cadres.

**Conclusions:** Afghanistan made notable progress but must continue its efforts in addressing its critical health worker shortage and maldistribution through the production, deployment and retention of a “fit-for-purpose” gender-balanced, rural workforce with adequate skill mix. Limited literature inhibits evaluating progress and further studies are needed.

**Keywords:** human resources, health workforce, Afghanistan, public health, training

Citation: Safi N; Naeem A; Khalil M; Anwari P; Gedik G. Addressing health workforce shortages and maldistribution in Afghanistan. East Mediterr Health J. 2018;24(9):951–958. https://doi.org/10.26719/2018.24.9.951

Received: 15/04/18; accepted: 01/08/18

Copyright © World Health Organization (WHO) 2018. Some rights reserved. This work is available under the CC BY-NC-SA 3.0 IGO license (https://creativecommons.org/licenses/by-nc-sa/3.0/igo).

**Introduction**

The World Health Report 2006 declared a global health workforce crisis; today, more than a quarter of the world’s countries still suffer shortages and a global shortfall of 17 million health workers is projected by 2030 (1). Since human resources are arguably the most essential asset of any system or organization, strengthening the health workforce and addressing the critical shortage must be made a priority in moving towards Universal Health Coverage (UHC) (2,3). Imbalanced distribution, especially in rural and remote areas, poses a barrier in access to quality health services. Half of the world’s population lives in rural areas, but 75% of doctors and 62% of nurses serve urban populations, which suggest a need to increase production, deployment and retention of rural-practicing health workers of all cadres (1).
Afghanistan has an estimated population of 31.6 million, of which nearly 77% lives in rural settings (Central Statistic Organization 2018 population estimates) (4). Afghanistan has the second lowest health worker density in the Eastern Mediterranean Region (EMR), with a ratio of 4.6 medical doctors, nurses and midwives per 10,000 people, considerably below the threshold for critical shortage of 23 health care professionals per 10,000 (2,4). This figure breaks down to 1.2 doctors, 2.1 nurses and 1.3 midwives per 10,000 people (4). However, the ranges for these densities are wide when comparing provinces; for instance, the density of doctors is eight times greater in Kabul than it is in Kunar (with approximately 0.5 doctors per 10,000 people in Kunar compared to 4 doctors per 10,000 people in Kabul). Nooristan has eight times as many nurses and five times as many midwives compared to its neighbouring province Kunar (with estimated densities ranging 0.5–4.2 per 10,000 people and 0.5–2.5/10,000 respectively) (4). Geographic imbalances are prominent as there are 16.7 health workers per 10,000 in rural areas, compared with 36 per 10,000 in urban areas; most qualified health workers are in urban areas serving only 23% of the population (5). Doctors, nurses and midwives make 26% of the health workforce, whereas community health workers make up almost 46% (Figure 1).

Afghanistan’s critical health workforce shortage is a result of historic underinvestment in education and training, migration, lack of infrastructure and equipment and poor remuneration (2,3). Other challenges also include lack of opportunities for career advancement, staff absenteeism, moonlighting, and weak management (2). Ongoing insecurity, harsh geographical terrain, cultural and socio-economic barriers have also contributed to the overall shortage as well as gender and geographic imbalances in the health workforce. As per the global pattern, many health workers (especially specialists and female doctors) prefer to work in Kabul and other regional centres for a notably better standard of life (i.e. security, employment, transportation, health care and education for their children) (5). In addition, the historic policies limiting girls’ education (during the Taliban regime from 1995 to 2001) affecting health workforce production are still felt and encountered today, especially in more rural provinces. While Afghanistan has made significant advancements in the last two decades in increasing female education (World Bank shows female enrolment has increased from 6.6% in 2003 to 40% in 2017), enrolment does not translate into graduation, employment rates, or rural retention. The most recent DHS in 2015 showed 13% of urban females completing some secondary schooling, compared to 5.6 fully completing secondary schooling and only 4.2 completing more; their rural counterparts were 5.2%, 1.5% and 0.6% respectively. Furthermore, in 2003 only a third of health facilities had a female health worker, and only about a quarter of the health workforce was female (1,6). The conservative culture – more pronounced in rural areas – restricts women from receiving health services from male providers, amplifying the need for female health workers.

Afghanistan has been rebuilding its health system, with notable expansion of its Human Resources for Health (HRH). This review provides an overview of interventions used to tackle
the critical shortage and distributional imbalances of health workers in rural and remote areas in Afghanistan.

Methods

A review of published and grey literature was conducted, searching PUBMED using key terms, such as: Afghanistan, health workforce, human resources for health, doctors, nurses, midwives, community health workers, retention, incentives, recruitment, deployment, rural, remote, underserved, fragile, fragile-state, post-conflict and low-income, mainly in literature after 2000. In addition to this, national plans, demographic health surveys, and technical documents produced by the Afghanistan Ministry of Public Health, and external development partners, were studied to understand the HRH situation. Unfortunately, there are inconsistencies in the available HRH data which prevents more comprehensive analysis across cadre, province and gender.

Results

Studies have shown that there is no model intervention that can be used to address critical shortages of health workers (7). Afghanistan uses a “bundle” approach, in accordance with the global recommendations to tackle its health workforce challenges (Table 1). Strategies related to recruitment, expanding production, focused deployment and retention have been used to address gender and geographic maldistribution.

Expanding education and production

From 2009 to 2011, there had been a 70% increase in medical students in Kabul; however, less than 20% medical students graduated from rural regional centers and only 25% were female (5). Although the production of female doctors has increased due to gender-based enrollment quotas, their attraction and retention to rural areas continues to pose a challenge towards equitable distribution. In 2012, only a quarter of nursing graduates from Institutes of Health Sciences (usually in more urbanized areas) were female; Afghanistan tackled this issue by expanding nursing education to regional and provincial institutes, and introduced community nursing education in an effort to produce more female nurses in rural areas (5).

Acknowledging the immediate need for scaling up the health workforce, HRH National Strategy 2012 targeted training an additional 7000 nurses, 6000 midwives, 800 physiotherapists, 600 psychosocial counsellors, and 20 000 volunteer community health workers, all trained in their provinces and bonded for employment locally, with the aim of retaining graduates in rural regions (5). Committed to rural health workforce production, Afghanistan expanded these pre-service trainings to many rural provinces. One study from 2015 showed there were 708
students preparing to graduate in nursing, midwifery, dentistry, pharmacy, physiotherapy and technology from Kabul’s Ghazanfar Institute of Health Sciences (GIHS), compared to 2046 at the Institutes of Health Sciences in rural provinces (4).

Additionally, Afghanistan increased the number of health professional education institutions from nine medical, one pharmacy and one dental in 2012 to 32 medical, four pharmacy and six dental in 2017 (4,5). Its most notable expansion has been with regards to nursing and midwifery: In 2009, there were only 21 pre-service training programmes. Afghanistan introduced community-based nursing and midwifery cadres and expanded nursing and midwifery education to 8 institutes in rural provinces, with an additional 76 community-based pre-service training programmes across most provinces. These community-based trainings are contracted out to private and international NGOs (4–8). Furthermore, Afghanistan established a standardized competency-based curriculum, leading to almost no difference in skills between midwifery graduates from private, public and community-based programmes (9). Afghanistan also built a national accreditation programme for midwifery education. By mandating that all midwifery schools achieve accreditation, over 91% were in compliance with national standards (10). Afghanistan has extended this model in building its accredited Community Health Nurse Education program, and can apply it in training emerging health professionals in bio-medical engineering, medical technology and environmental health.

Despite these efforts, Afghanistan still suffers from a shortage of health workers, and a lowered density of doctors, nurses and midwives from 7.6 in 2010 to 4.6 in 2017, particularly in the rural areas (4,5). Deployment of Community Health Workers (CHWs) has become a common strategy to expand primary health care at the community level in many low- and middle-income countries with high rural population densities (11). Examples of national programmes include Ethiopia’s 30 000 Health Extension Workers, Brazil’s 250 000 Community Health Agents, the Islamic Republic of Iran’s 91 000 Behvarz, Pakistan’s 100 000 Lady Health Workers, and India’s 700 000 Accredited Social Health Activists (11–13). Afghanistan has been using CHWs for decades to address the shortage of skilled health professionals, especially in rural areas (14). Community health workers are the first point of contact for patients in rural and remote areas and are responsible for implementing the Basic Package of Health Services at health posts, serving as village primary care providers (15). Given their pivotal role in rural health care, Afghanistan has expanded its programme in the last decade, doubling its CHWs from 20 000 in 2011 to 40 000 in 2016 (of which 50% are female) (5,14). Today, CHWs make up almost 50% of the health workforce in Afghanistan (Figure 1) (4,5).

Introduction of new cadres

While Afghanistan has introduced multiple new cadres of health professionals, this section outlines two cadres that have specifically addressed the lack of female health workers in rural areas. Afghanistan introduced the community midwife in response to the historically high
maternal mortality rate resulting from lack of skilled birth attendants (6). Community midwives (CMs) are recruited from and deployed to rural areas and trained in specific community-based pre-service programmes (16,17). There is little difference between midwives and community midwives in terms of their training and practice; the main difference is their geographic location (9,10). The demand for community midwives in rural areas is high, as seen by the high employability rates of community nominated and educated midwives compared to their urban peers (9,16). Furthermore, the production of midwives has increased rapidly, almost 10-fold, from 467 in 2002 to 2167 in 2008, to 3484 in 2012, and 4600 in 2016 (18,19,20).

In an attempt to address the shortage of female health workers in rural and remote areas, the community health nurse (CHN) was introduced in 2011 (21). While this cadre is not exclusively female, it is an attempt to increase the number of female nurses administering preventative, curative and rehabilitative ‘first-line’ care (21). Since 2011, there have been a total of 54 cohorts in 30 of Afghanistan’s 34 provinces, enrolling a total of 1647 students (21). Notably, two provinces with over 96% rural population are actively enrolling and producing three cohorts of CHNs simultaneously. Many health facilities have celebrated the impact of the ‘female CHN’ on increasing the utilization of maternal and child health services.

**Strategic rural recruitment and deployment**

The strongest motivator associated with rural recruitment and retention is rural origins (22). Working environment, respectability, financial incentives and opportunities for professional advancement represent the other personal, professional and social factors (7,23). Due to this, efforts have been made to recruit rural and community-nominated candidates, across all cadres, in hopes of increasing their retention in rural areas (23).

Community health workers are community members, nominated by a village health council (VHC), and then trained for a four-month period on prevention of infectious diseases, health promotion, family planning, and treatment of simple illnesses. While most CHWs are illiterate, they receive pictographic training manuals and continuous professional development in the form of a three-day refresher-training every six months (24). With regard to community midwives, 9th grade rural female students are hand-picked by their communities to attend community midwifery schools; community leaders formalize the nomination through a signed letter of support (8,17). Similarly, most CHNs are recruited from, trained and deployed back in provinces where over 80% of the population is rural-residing (21).

This strategy of recruiting students from rural backgrounds has yielded higher deployment and retention rates of community nursing and midwifery students, as they have the continued support of their families and the recognition from their communities when they return to serve.
According to one study, 96% of community midwifery graduates were employed (63% in rural areas) compared with 74% midwives chosen by the Institutes Health Sciences (43% in rural) and 82% (of whom only 9% in rural) by the National University Entrance Examination (9). Almost 60% of CHN graduates are deployed to public sector health facilities, in provinces with over 85% rural populations (21). Notably, provinces such as Bayman, Kapisa, Laghman and Uruzgan have a deployment rate over 80%, where over 95% of the population lives in rural areas (10).

Financial incentives

Afghanistan has developed a national salary policy to standardize salaries and benefits paid to health care workers employed through the Basic Package of Health Services (BPHS) programme, and to motivate staff to work in rural and under-served areas. The policy includes payments of hardship allowances for rural and isolated areas, up to 250% of their base salary for female health providers (15,25). However, it is well recognized that financial incentives are not the only motivating factor in attracting or retaining health workers to rural and remote areas (26). One study on midwives in Afghanistan ranked higher salaries in rural areas as lowest motivating factor at 9%, preceded by mandatory service at 33% and family and community support at almost 60% (7,9).

Social factors

One of the biggest issues related to the deployment of the health workforce in rural and remote Afghanistan is that of insecurity. One benefit of recruiting and deploying students from rural backgrounds is their existing acclimation to the culture, pace and lifestyle, for those already residing in these insecure areas (7,17,22). According to one study related to midwife deployment in Afghanistan, lack of security was cited by 42% as the most important deterrent from opting to work in rural and remote areas, while the remaining 58% reported other concerns including lack of medical equipment, proper schools for children and difficult living conditions (6–8,10,26). This increased insecurity in remote areas further affects the mobility of health professionals, especially females. To increase the retention of female health workers in rural and remote areas, Afghanistan has started to provide opportunities for male family members and spouses to deploy to the same health facilities or villages through establishing linkages and collaboration with the Ministry of Labour and Social Affairs, providing recommendation letters for spouses to facilitate their job search, and improving the housing and schooling facilities around health facilities (17,23,24). Additionally, public recognition remains a motivational factor in pursing rural posts; in the case of the community-nominated health workers, midwives and nurses, family and community support and pride facilitate their effectiveness and retention to their communities.

Discussion

Afghanistan has made noteworthy progress in its post-conflict development by increasing the
densities of health workers, from 1 doctor, 1.29 nurse and 0.24 midwives per 10 000 people in 2003, to 1.2 doctors, 2.1 nurses and 1.3 midwives in 2017 (4,6). Despite these achievements, Afghanistan must continue developing its health workforce to surpass the threshold for critical shortage, and addressing gender and geographic imbalances in order to achieve the ambitious HRH 2030 agenda, UHC and the Sustainable Development Goals.

Since 2003, Afghanistan has doubled its female health workforce and further closing the gender-gap. In 2016, almost 50% of Afghanistan’s health workforce is women (Figure 2) (5,6). Since 2012, the percent of female allied health workers (dentists, laboratory technicians, radiologists and physiotherapists) increased from 9% to 46% in 2016, while other cadres still lag behind with less than a quarter of their health workers being female (4,5). These successes surely have strong implications on improving service delivery and increasing health outcomes.

The number of health facilities providing BPHS has been increased from 1087 in 2004 to 1784 in 2011, and now 2604 in 2017 (6,27,28). Number of health facilities with at least one female health worker has been increased from 45% (2000) to 74% in 2011 to 92% in 2017 (4,6,27). Moreover, as a result of increasing the female health workforce and increasing the quality and availability of maternal health services, the maternal mortality ratio has improved significantly from 1100 (in 2000) to 396 per 100 000 in 2015 (19,20,28,29).

In addition to this, Afghanistan’s efforts have increased the density of health workers in rural areas from 4.5 health workers per 10 000 (in 2009) to almost 17 health workers per 10 000 (in 2012) (5,30). While almost half of Afghanistan’s provinces have over 95% rural populations, provinces with the highest rural residing communities like Kunar, Ghazni, Faryab and Helmand still had the lowest densities of doctors, nurses and midwives; their utilization of CHWs at health posts was around the national average (only 0.6 active post/1000) (4). While Afghanistan’s bundle of interventions has yielded improvements in closing the gender and geographic imbalances, there are still a number of cultural, financial and regulatory barriers inhibiting equitable distribution and accessibility to health workers.

Afghanistan’s conservative culture affects recruitment and mobility of female health workers. Permission from the male head of family is necessary for a female to join the health workforce. A male CHW must accompany their female counterparts, fulfilling auxiliary tasks in transportation, management and environmental tasks (14,15,24,31). This barrier is not unique to Afghanistan, as gender-based task allocation has been seen with female Behvarz in the Islamic Republic of Iran and Lady Health Workers in Pakistan (32). While historically there have been barriers to the recruitment and retention of female health workers due to traditional roles, family responsibilities and marriage, there has been an increase in the recruitment of female CHWs and community midwives as acceptability, community satisfaction, trust and improved health outcomes have been observed by their communities (8,15,32).
CHWs make up about half of Afghanistan’s total health workforce; these CHWs serve their communities on a voluntary basis (24). The biggest motivational push factor for volunteers is their desire to serve their community for religious and personal reasons. Recognition, and having the authority (and support from the community) to distribute contraceptives and simple medicines, provide counseling, and refer patients up to health facilities are attractive factors; however, delivering services without pay or remuneration offsets this pull. India, Ethiopia and Pakistan all utilize CHWs in delivering primary care; the only major difference is that their CHWs are salaried employees of the ministries and are often compensated in additional fringe benefits (12,13,31,33). Data regarding retention of CHWs are sparse and inconsistent, showing dropout rates ranging from 10–80%; the remuneration model (pay-for-service) and the “Family Health Worker” model (grandfathering school-aged children with the CHW curriculum) are proposed policies to address compensation and retention in Afghanistan (15,24). The high expenses, reliance on international assistance and collaboration between stakeholders are also factors to be considered.

Competition with the private sector, due to the considerable salary inequalities and remuneration, is another factor that affects recruitment and retention. Despite financial incentives, such as pay and grading increases, health workers employed by projects/programmes supported by international donors receive considerably more pay and allowances than their civil servant counterparts (e.g. doctors working for NGOs get 50% more salary than civil servants, and ‘super-salaried’ consultants often receive five times more) (5,15,33). NGOs under contracted out arrangement for the implement of BPHS and EPHS are obliged to abide by the national salary policy, in addition to the recruitment guidelines, in order to reduce competition and inequalities. This overreliance on international donors is not unique to Afghanistan and is an issue faced by many post-conflict health systems in recovery, such as Sudan, Somalia, Democratic Republic of Congo, Cambodia and Zimbabwe (34).

While introducing new cadres increases the availability and accessibility of the health workers, multi-sectoral cooperation is required to address the implications of task-shifting and expanding scopes of practice on accreditation, formal recognition, curriculum development and certification. Separating registered nurses and CHNs as different cadres has been a challenge for regulatory bodies, as there are ambiguities in differentiating their scopes of practice (21).

Finally, there is little literature discussing the strategies used by low- and middle-income, developing, or post-conflict countries on addressing the shortage of health workers. Inconsistencies in data, from varied national and international sources have resulted in weaker evidence. There are even fewer studies documenting the effectiveness or impacts of these interventions on rural and remote recruitment and retention (26). Further studies and more
specific data stratifying for cadres, gender and geographic location would be helpful in monitoring the direct impact of these interventions and evaluating the continued challenges in distribution and retention.

**Conclusion**

Despite the insecurity and geographic, economic and social barriers, Afghanistan is working to address its health workforce shortage, gender and geographic maldistribution through a bundle of interventions to achieve strategic recruitment, production, deployment and retention. Afghanistan has made progress in reducing gender imbalances and improved the availability of health workers in rural areas, resulting in improvements in access to health care and health indicators. However, the health system and health workforce challenges continue to have shortages with skill imbalances, rural deployment and concerns with the quality and performance of health workers. The need for further strengthening the health workforce remains pressing, including: expanding education capacities with emphasis on the quality of education; improving health systems management to retain motivated and well trained health workforce; and strengthening health workforce governance through improving engagement and coordination of leadership and all relevant stakeholders.

**Funding:** None.

**Competing interests:** None declared.

---

**Remédier à la pénurie et à la mauvaise répartition des personnels de santé en Afghanistan**

**Résumé**

**Contexte** : L'Afghanistan présente la seconde plus faible densité de personnels de santé et le niveau le plus élevé de population rurale dans la Région de la Méditerranée orientale. L'insécurité permanente, les barrières culturelles, socioéconomiques et réglementaires ont également contribué aux déséquilibres entre les sexes et les régions géographiques. L'Afghanistan a mis en place un certain nombre d'interventions pour remédier au problème de pénurie et de mauvaise répartition des personnels de santé.

**Objectifs** : La présente analyse donne un aperçu des interventions mises en place pour remédier à l'importante pénurie et à la mauvaise répartition critique des personnels de santé dans les zones rurales et isolées de l'Afghanistan.
Méthodes : On a procédé à une analyse de la littérature (y compris les publications de revues à comité de lecture, la littérature grise et les rapports et documents techniques nationaux et internationaux).

Résultats : Si l’on veut attirer et fidéliser les personnels de santé dans les zones rurales et isolées, il est nécessaire de mettre en place toute une série d’interventions pour relever ces défis pluridimensionnels et complexes. L’Afghanistan a créé des établissements de formation dans les provinces isolées, ainsi que de nouvelles catégories de praticiens communautaires. Le recrutement et le déploiement ciblés sur les zones rurales, les incitations financières et le soutien familial sont d’autres approches citées. Ces actions ont amélioré la disponibilité des personnels de santé dans les zones rurales, ce qui a permis de renforcer la prestation de services et les résultats sanitaires. Malgré ces efforts, des défis persistent, notamment la mobilité limitée des personnels de santé féminins, la fidélisation des personnels de santé communautaire bénévoles, la concurrence du secteur privé et les difficultés posées par l’élargissement des champs d’exercice des nouvelles catégories de praticiens.

Conclusions : Des progrès notables ont été accomplis en Afghanistan, mais le pays doit poursuivre ses efforts pour remédier à la pénurie critique en matière de personnels de santé et à leur mauvaise répartition grâce à la production, au déploiement et à la fidélisation d’une main-d’œuvre rurale « adaptée », avec un juste équilibre entre les sexes et faisant montre d’un éventail de compétences adéquates. Cependant, la littérature est peu fournie, ce qui ne permet pas d’évaluer les progrès et d’autres études sont nécessaires.
WHO EMRO | Addressing health workforce shortages and maldistribution in Afghanistan

الأهداف: تقدم هذه الدراسة لمحة عامة عن التدخلات التي تم إدخالها لمعالجة نقص وسوء التوزيع في العاملين الصحيين في المناطق الريفية والناائية في أفغانستان.

الطريقة: نجري دراسة للمنشورات (والمطالبات) التي تتضمن المحتوى المستند إلى نظرية التركة، والمنشورات الرئيسية، والقرارات الوطنية والدولية، والدوام القصير.

 النتائج: يتطلب اتخاذ إجراءات واستعراض القوى العاملة الصحية في المناطق الريفية والناائية استغلال حزمة من التدخلات لتجاوز هذه التحديات المعقدة والمتعددة. وقد وفرت أفغانستان منشأة التدريب في المناطق النائية، ودخلت فرقاً جديداً مجتمعة من الأطباء الممارسين. ومن الكارثات الأخرى التي أشارت إليها الدراسة تحقيق غاية محددة، ونشر العاملين الصحيين في المناطق الريفية، وتوفير الدعم الإداري. وقد زادت هذه التدخلات من توافر القوى العاملة الصحية في المناطق الريفية، مما أدى إلى تحسين تقديم الخدمات ونقل الصيدلة. وفي الوقت نفسه، لا يمكن أن يزحل هنا تحدي قائم: حدودية الجماهيرية، والاحتياجات، وконية القتال، ومتنازلة التدخلات التي تواجهه.

الاستنتاج:

حققت أفغانستان تقدماً ملحوظاً، ولكن يجب أن يتم التخلي عن الجهود في معالجة نقص العاملين الصحيين والتسوية في الميزة، فمن المهم أن يتم تضمين التدريس في القوى العاملة الصحية المحلية، والتنافس في التدريب الخاص والتحديات التي يواجهها.

References


5. Islamic Republic of Afghanistan Ministry of Public Health; Evaluation and Health


23. World Health Organization. Increasing access to health workers in remote and rural areas through improved retention (http://www.who.int/hrh/retention/guidelines/en/).


