Increasing nurses and ward assistants in newborn units: the effects of a staffing intervention

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Photo courtesy of KEMRI-Wellcome Trust Research Programme

About this brief

This brief is the third in a series based on the HIGH-Q (Harnessing Innovation in Global Health for Quality Care) project and related research on neonatal care in Kenyan hospitals. This work was carried out by the KEMRI-Wellcome Trust Research Programme and the Kenya Paediatric Research Consortium (KEPRECON), with support from the University of Oxford.

HIGH-Q is a multi-disciplinary study evaluating how the introduction of new technologies and workforce innovations influences the quality of care in newborn units (NBUs). Ethnographic and observational research has also explored the everyday experiences of nurses, the physical environment of NBUs, and mothers' experiences within these settings. Each brief focuses on a different aspect of this work.

The brief was written by members of the HIGH-Q research team.

Introduction

Neonatal care in Kenya faces severe workforce shortages. Nurse-to-patient ratios commonly range between one nurse to 15 or 20 babies and can reach one nurse per 37 babies, far exceeding recommended levels. This results in missed tasks, such as failure to provide timely interventions and monitor vital signs, compromising patient safety and contributing to neonatal mortality.

Some useful initiatives, such as the NEST360 program, are introducing a bundle of technologies to newborn units (NBUs) and supporting ongoing quality improvement (QI). However, the critical issue of insufficient nurse staffing remains largely unaddressed despite nursing care being a key factor in patient outcomes. As a result, limited efforts are made to increase nurse staffing.

Nurses are skilled professionals but often perform non-clinical tasks like cleaning equipment and fetching supplies. This reduces their time to give direct care to patients. Introducing ward assistants (WAs) has been proposed as one way to support nurses, but the possible value of this approach has not been carefully examined in resource-limited settings. There are also concerns that lower-skilled staff like WAs may start to take on tasks that are beyond their training and should be done by nurses, potentially affecting the quality and safety of care.

The HIGH-Q intervention sought to examine the consequences of low nurse staffing and what effects adding nurses and WAs to newborn units (NBUs) might have over a period of 15 months and 7 months, respectively. This was the first study to evaluate how a planned increase in nurse staffing affects the quality of patient care. This brief summarises the evaluation's findings, highlighting positive effects, expected improvements that did not occur, and unintended consequences that emerged.

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Key findings: Summary of effects

1. Adding three extra nurses per NBU in four hospitals to existing teams of 10–17 nurses resulted in a modest absolute increase in nursing time during 6-week assessment periods, from an average of only 34 minutes per baby per 12-hour shift to 43 minutes.

2. Measures of nursing care provided to babies after adding the three nurses increased only slightly, with indications that additional time was focused on more clinical tasks.

3. Nurses on the NBUs appeared to experience other benefits of adding additional nurses including better teamwork and wellbeing.

4. Introducing three WAs with a clear job description and specific one-week training did not affect nurses' performance of measured bedside nursing tasks; however, reassuringly, there was little evidence that WAs started taking on skilled nursing tasks.

5. Positive effects of introducing WAs included improved work efficiency among nurses, a sense of support amongst some nurses, more substantial support for mothers, and better hygiene and infection control.

6. An unintended effect of adding nurses was that many existing nurses, previously unable to take leave due to shortages, used the opportunity to take overdue leave – sometimes for more than a year. This reduced workforce availability and limited the intervention's impact, but was highly beneficial to nurses' wellbeing.

HIGH-Q intervention

The intervention aimed to improve nurse staffing and the quality of neonatal care by introducing additional nurses and WAs to NBUs at public hospitals in Kenya (Figure 1). Three additional nurses with intensive one-week training in neonatal care were introduced to four NBUs each for 15 months. These NBUs had 10–17 nurses before the intervention (so nurse staffing increased by 17.6% to 37.5% across the four units). This level of increase was considered something that policymakers in resource-limited settings might realistically achieve, even though it meant overall nurse staffing was still low.

After eight months, three WAs per unit were introduced for seven months. They were expected to take on non-clinical duties and provide general ward support, allowing nurses to focus on skilled patient care. The job description and linked one-week training for WAs were co-designed with senior nurses and hospital managers, ensuring an agreed scope of practice and aiming to ensure their implementation did not disrupt workflows. The study was pragmatic, meaning that senior hospital nurses managed and allocated new nurses to shifts and directed the WAs' work locally to minimise disruptions to hospital operations.
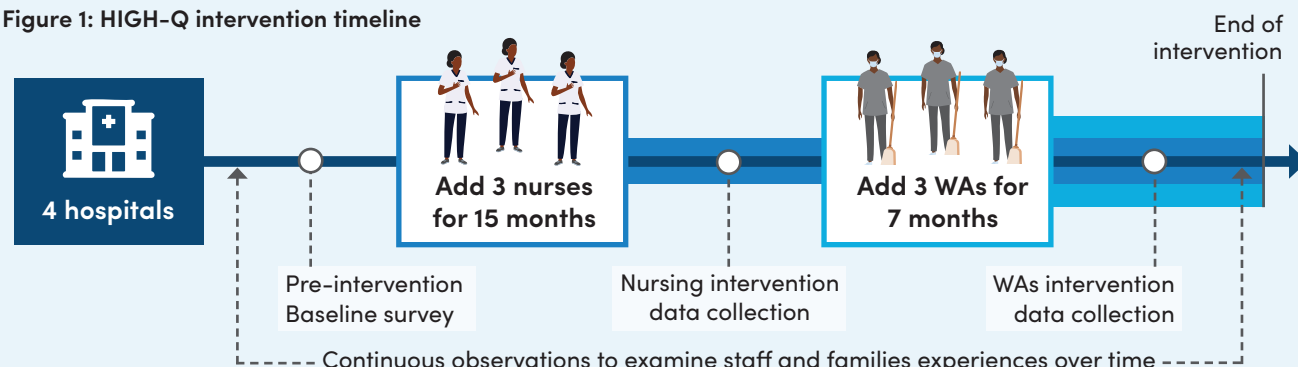
Evaluation approach

The evaluation used a combination of direct observations that measured the delivery of bedside nursing care and work on NBUs, interviews, and routine hospital data to assess the impact of increased nurse staffing. The primary measure was the Nursing Care Index (NCI), which quantified the proportion of expected bedside nursing tasks completed per baby. Each task was scored as performed or missed, providing a clear metric of nurse-delivered care (expressed as the % of expected care completed).

Total care provision, including contributions from nurses, student nurses, and mothers/carers, was also measured to capture the broader picture. Nursing workload was assessed by calculating the nursing hours available during a 12-hour shift per baby.

Data collection occurred at three points: before the intervention, after six months of added nurses, and after introducing WAs. Observations covered 1,190 babies across 13,357 hours to track changes in care delivery. Additionally, 47 in-depth interviews were conducted with staff to explore intervention effects beyond those captured by the NCI.

Figure 1: HIGH-Q intervention timeline

4 hospitals

Add 3 nurses for 15 months

Add 3 WAs for 7 months

End of intervention

Pre-intervention Baseline survey

Nursing intervention data collection

WAs intervention data collection

- - - - - Continuous observations to examine staff and families experiences over time - - - - - -

Effects of adding nurses

The intervention led to a modest increase in nursing time per baby per shift, from 34 to 43 minutes—a 25% absolute rise (Figure 2). However, 43 minutes spread over 12 hours for each baby is still a very limited amount of time. In a typical week comprising seven 12-hour day shifts and seven 12-hour night shifts, adding three new nurses would mean adding only one nurse to eight of these 14 weekly shifts. After adding nurses, some shifts – especially at night – still had only one qualified nurse to care for all patients.

Figure 2: Nursing time per baby per shift

34 minutes
Pre-intervention

43 minutes
Post-intervention
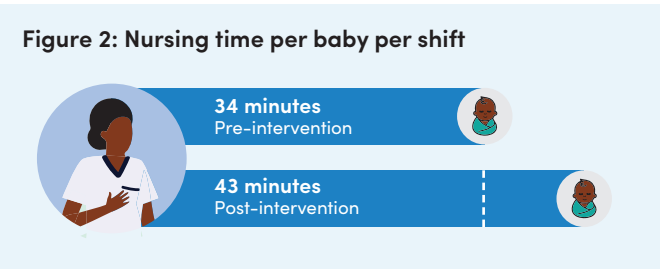
Although the intervention added new staff, existing nurses who had not previously been able to take leave due to staffing shortages took accumulated leave. This improved nurse well-being but reduced the expected increase in patient care. At the same time, extreme workforce pressures in hospitals sometimes led to nurses' redeployment to other departments. As a result, average nurse-to-patient ratios saw only small improvements, limiting the potential for impact on patient care.

Utilising the NCI revealed that only 33% of the expected care was delivered by nurses at baseline (Figure 3). Minimal improvements were noted after adding three nurses, as the NCI score increased from 33% to 35%, representing a relative increase of 4.2%. Further analyses suggested that an increase in nursing time resulted in a larger increase in a subset of critical and clinical care tasks performed by nurses, indicating they utilised additional time on higher-priority tasks. In contrast, lower-priority tasks, such as feeding, cord care, and patient monitoring, remained unchanged (Figure 4).
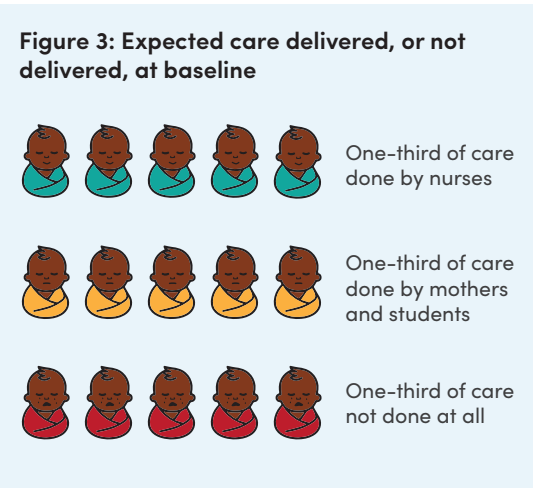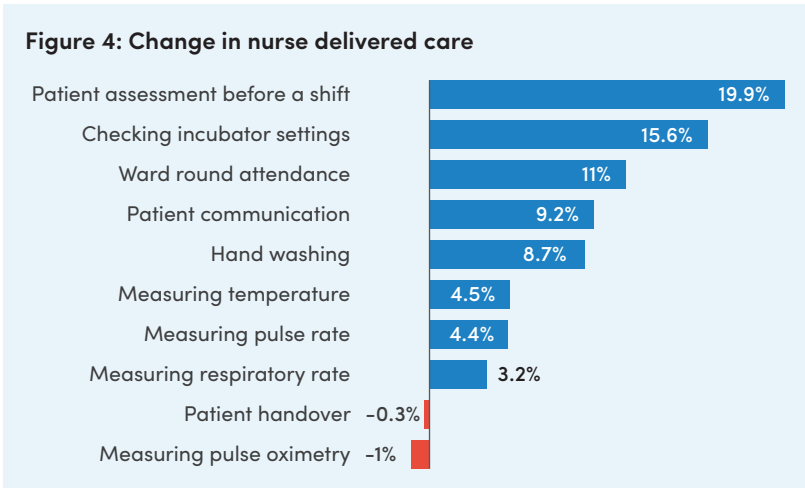
While the overall increase in the NCI indicates that the intervention effect was statistically significant, the findings suggest that meaningful increases in nursing care will require much more significant increases in nurse staffing.

Despite the slight increase in nurse-delivered bedside care, qualitative findings indicated that the addition of three new nurses resulted in several positive effects:

- **Improved work efficiency:** The mix of resident and intervention nurses broadened the overall skillset within neonatal units and enabled nurses to deliver care professionally.

- **Stronger teamwork and collaboration:** Increased staffing on a shift allowed nurses to divide tasks more effectively, enhancing teamwork.

- **Enhanced nurse wellbeing:** More opportunities to take rest breaks and annual leave reduced nurses' work-induced stress and burnout and improved their wellbeing.

- **Greater peer support:** Intervention nurses who had received training mentored resident staff, boosting their confidence in using some technologies such as CPAP.

- **Expanded learning opportunities:** Nurses played a more active role in training junior doctors and students, for example, in nasogastric (NG) tube placements.

- **Faster adoption of some technologies:** Devices like BiliDx (a jaundice screening tool) and syringe pumps were integrated more quickly into routine practice.

"Sometimes even the calculation of these doses. We help each other. Personally, I appreciate it. The workload like you used to go in a shift alone [before the intervention], now she [new nurse] has come, you see the workload now is shared." (Nurse)

Figure 3: Expected care delivered, or not delivered, at baseline

One-third of care done by nurses

One-third of care done by mothers and students

One-third of care not done at all

Figure 4: Change in nurse delivered care

Task	Change
Patient assessment before a shift	19.9%
Checking incubator settings	15.6%
Ward round attendance	11%
Patient communication	9.2%
Hand washing	8.7%
Measuring temperature	4.5%
Measuring pulse rate	4.4%
Measuring respiratory rate	3.2%
Patient handover	–0.3%
Measuring pulse oximetry	–1%

Effects of adding ward assistants

WAs were introduced to reduce nurses' non-clinical workload by taking on routine newborn care tasks such as linen and diaper changes, supporting mothers, cleaning medical equipment, and managing waste. The evaluation showed that WAs primarily performed these non-clinical tasks, which was consistent with their job description (Figure 5). They rarely performed the bedside nursing tasks measured in the NCI. As a result, across the whole study, typically, 19% of expected bedside care was not delivered by anyone.

Although WAs did not contribute to the delivery of bedside nursing tasks, introducing them led to noticeable improvements in overall ward cleanliness and waste disposal, highlighting the potential for enhanced infection control. Interestingly, their contribution and engagement varied across hospitals: in several sites, they were active and helpful, while in another, they were disengaged or distracted (Box 1).

The introduction of WAs had several positive effects:

- **Workload relief for nurses:** By handling non-nursing tasks, WAs enabled nurses to focus on technical tasks such as conducting patient assessments before ward rounds, checking incubators more frequently and attending ward rounds.

- **Better support for mothers:** WAs played an important role in assisting mothers, orienting them to the neonatal unit, demonstrating feeding techniques, and offering emotional support (Brief 4).

- **Enhanced ward cleanliness and hygiene:** Overall hygiene in the units improved, with noticeable improvements in ward cleanliness and waste disposal practices.

- **Mothers' hand hygiene practices improved,** driven by targeted sensitisation efforts by the WAs, although hand hygiene adherence among healthcare providers remained inconsistent.

Box 1: Case Study – Ward assistant challenges in a newborn unit

While WAs generally supported work and hygiene improvements, one hospital experienced significant integration challenges. Two WAs frequently failed to complete tasks, absconded from duty, and delegated responsibilities to student nurses. Nurses viewed this as insubordination, leading to strained relationships and nurses' eventual reclaiming of tasks—reversing anticipated workload relief.

These problems likely stemmed from a lack of local clinical team involvement in recruitment, which was handled instead at an administrative level. This undermined accountability, leaving the WAs feeling little obligation to the neonatal unit team, which may have enabled problematic behaviours. At times, perceived preferential treatment of intervention WAs—such as receiving new uniforms—also created tension.
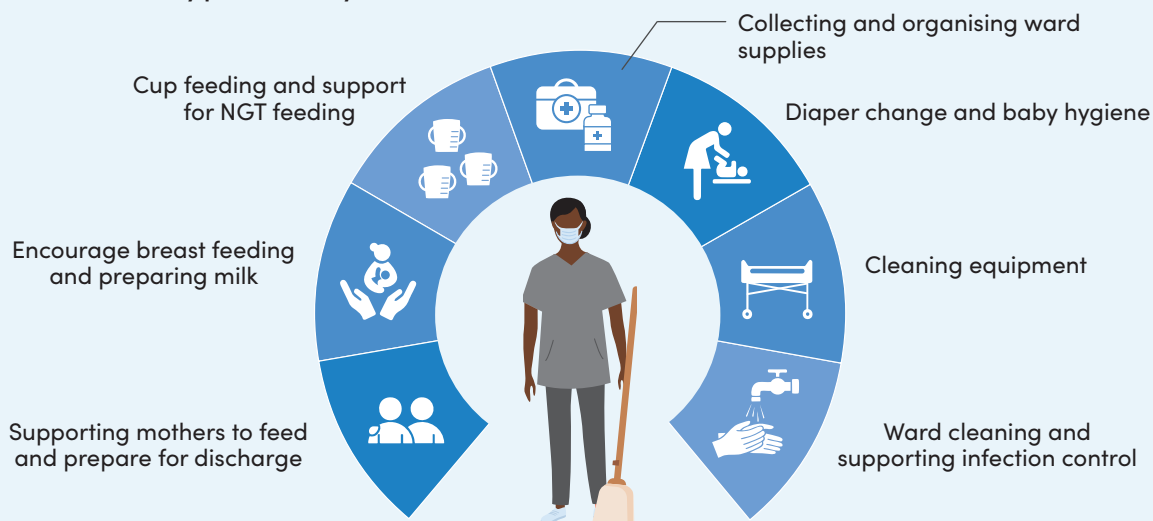
- **Improved feeding practices:** WAs prepared and cleaned feeding equipment and ensured timely feeding, particularly for abandoned babies or babies whose mothers were unavailable.

"I have seen a big change because initially, we were so overloaded with work, sometimes we could not attend the ward rounds, but now, with the addition of the support staff, we are able to allocate them some duties so that we can be able to go for the ward rounds, and most importantly the stores. Because before, we were the ones who could go to the stores, so we were missing on the ward round." (Nurse)

Figure 5: Tasks commonly performed by ward assistants

Collecting and organising ward supplies

Cup feeding and support for NGT feeding

Diaper change and baby hygiene

Encourage breast feeding and preparing milk

Cleaning equipment

Supporting mothers to feed and prepare for discharge

Ward cleaning and supporting infection control

Conclusion

The HIGH-Q intervention provides valuable insights into the effects of increasing nurse staffing and introducing WAs in neonatal care. While there were positive effects, the nursing intervention shows that major improvements in nurse-delivered care will require large increases in the number of nurses. The aim should be to achieve nurse-to-patient ratios that are much better than the current levels of 1 to 15 or more and come closer to ratios of 1 to 4, which might be the minimum for NBUs in high-income countries.

These findings suggest that small staffing increases are beneficial but not enough. Achieving high-quality newborn care requires considerable investment in nurse staffing alongside broader health workforce strategies and essential equipment. WAs can play a valuable support role but should complement—not replace—nurses.

Sustainability planning should be integral to any workforce intervention research. Despite repeated discussions, some hospitals were unprepared for the exit of HIGH-Q nurses. In several cases, staffing gaps had to be filled within 24 hours, causing last-minute disruptions to patient care.

The findings raise concerns about whether improved access to technology and training alone can reduce persistently high neonatal mortality. Without substantial increases in nurse staffing, the additional workload created by new technologies and advanced interventions could have unintended consequences. As neonatal care expands, increasing nurse staffing is not optional – it is a necessity.

Sources

This brief draws on both published and unpublished research, as well as presentations delivered at conferences and workshops. Key sources include:

1. Imam A, Gathara D, Aluvaala J, Maina M, English M, Were F, Karumba K, Onyango O, Kagonya V, Fuller S. Evaluating the effects of supplementing ward nurses on quality of newborn care in Kenyan neonatal units: protocol for a prospective workforce intervention study. *BMC Health Serv Res.* 2022;22:1230. https://doi.org/10.1186/s12913-022-08597-9

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3. Imam A, English M, Aluvaala J, Kagonya V, Onyango O, Were F, Fuller S, Karumba K, Gathara D, Maina M. Evaluating the effects of increasing nursing numbers on quality of newborn care in understaffed Level 2 neonatal units: a prospective workforce intervention study. Draft manuscript.

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7. Odinga N, Waithira C, Maluni J, Ngaiza G, Kagonya V, Onyango O, Imam A, Gathara D, Maina M, Karumba K, Were F, Fuller S, English M, Mutua E, Molyneux S, Jones C, Oluoch D; on behalf of the HIGH-Q Hospital Group. Effects of an intervention enhancing skill-mix in Kenyan neonatal units with severe workforce deficits on nurses' experiences. Draft manuscript.

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