

ORIGINAL RESEARCH ARTICLE

Staffing Needs for Quality Perinatal Care in Tanzania

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ABSTRACT

In Tanzania maternal and perinatal mortalities and morbidities are problems of public health importance, and have been linked to the shortage of skilled staff. We quantified the available workforce and the required nursing staff for perinatal care in 16 health institutions in Dar es Salaam. WHO safe motherhood needs assessment instruments were used to assess the availability of human resources, WHO designed Workload Indicators for Staffing Need (WISN) and Tanzanian standard activities and components of the workload for labour ward nursing were used to calculate nurse staffing requirements and WISN ratios. There was a severe shortage of essential categories of health staff for perinatal care in all institutions. The ranges of WISN ratios for nursing staff working in the municipal hospitals' labour wards were; nurse officers 0.5 – 1, trained nurses/midwives 0.2 - 0.4 and nurse assistants 0.1. These findings reflect extremely huge perinatal care workload pressure and suggest the urgent need for more staff in order to achieve the global millennium development goals set for maternal and infant survival (*Afr J Reprod Health* 2008; 12[3]:113-124).

RÉSUMÉ

L'importance des dotations en personnel de soin périnatal en Tanzanie En Tanzanie, les mortalités maternelles et périnatales et les morbidités sont des problèmes de santé publique importants qui sont liées au manque de personnel qualifié. Nous avons quantifié la main d'œuvre disponible et les infirmiers requis pour les soins périnataux dans 16 établissements sanitaires à Dar es Salam. Les instruments de d'évaluation de la maternité sans danger de l'OMS ont été utilisés pour évaluer la disponibilité des ressources humaines. Les indicateurs de la répartition du travail pour la dotation en personnel (IRDP) conçus par l'OMS et les activités standards tanzaniennes et des composants de la répartition des infirmiers des salles d'accouchement ont été utilisés pour calculer les besoins d'infirmiers requis et la proportion de l'IRDP. Il y avait un manque sévère des catégories du personnel sanitaire pour des soins périnataux dans tous les établissements. Les gammes des proportions de l'IRDP pour des personnels infirmiers travaillant dans les salles d'accouchement des hôpitaux municipaux étaient : des officiers infirmiers 0,5 – 1, infirmiers/sages femmes qualifiées 0,2 – 0,4 et les aides - infirmiers 0,1. Ces résultats reflètent extrêmement la pression énorme de la répartition du travail et suggèrent le besoin urgent de la dotation en personnel afin de réaliser le but du développement mondial millénial mis pour la survivance maternelle et infantile (*Afr J Reprod Health* 2008; 12[3]:113-124).

KEY WORDS: Perinatal care, Standard workload, Activity standard, WISN ratio

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Introduction

The tragedies of maternal and perinatal mortalities and morbidities in Tanzania are problems of public health importance. Statistics show that in Tanzania maternal mortality ratio is 578/100,000 live births and perinatal mortality rate ranges “between” 42 - 125/1000 births¹⁻². Although the magnitude of maternal morbidity in Tanzania is not well known, the presence of such high mortality predicts high incidences of maternal and perinatal morbidity in the country. The health workforce is one of the key determinants of the efficiency and effectiveness in the delivery of perinatal care and its outcome. Attendance at delivery by skilled personnel equipped with appropriate supplies and equipments has been found to be strongly associated with reduction of maternal mortality than many other interventions, hence a priority strategy³. The association between shortage of trained attendants during childbirth and obstetric outcome has been clearly established in countries with varied economic resources⁴⁻⁶. Countries in Africa, Asia and Latin America where less than 50% of births are attended by skilled staff have high maternal and perinatal mortality figures⁷.

In Tanzania, like many other low income countries, the shortage of skilled staff for perinatal care has been associated with limited national budgets for training adequate number of personnel. Deaths of personnel due to diseases like HIV, migration from rural areas to cities and to high-income countries (brain drain) have contributed

also to the shortage. Health workers' attitudes, lack of morale, absenteeism, and passivity in attending life-threatening obstetric emergencies have also been associated with poor obstetric care and outcome⁸. Based on the recognition of the role of skilled staff for quality perinatal care, some experts have doubted the achievement of Millennium Development Goals set for maternal and child health by 2015, if purposive investments are not made to the recruitment and retention of health professionals⁹.

In order to achieve the main objective of reducing newborn and maternal mortality, one of the fundamental strategies of the National Health Policy of Tanzania is to ensure that a sufficient number of adequately trained personnel are available, motivated and productive. In the past four decades the government of Tanzania has been training various sub-cadres of health professionals including assistant medical officers (AMOs), clinical officers (COs), maternal and child health aide (MCHA) and Public Health Nurse grade B (PHNB). These cadres are employed in the regional and district hospitals, health centers and dispensaries. AMOs are holders of an advanced diploma in clinical medicine and are expected to provide the general care up to the level of regional hospital. The MCHA and PHNB are regarded as enrolled nurses because they have less training than the nurse midwives. The national regulations allow enrolled nurse to assist deliveries under supervision. Since the establishment of training courses for these cadres, they

have been quite instrumental in the Tanzanian health care delivery system such that they occupy the large proportions of care providers from the district hospital way down to the dispensaries levels.

This article presents results of the Dar es Salaam perinatal care study which was conducted in 2004 to assess the structural, process and systemic needs in the domain of perinatal care. The article also attempts to quantify the available workforce in providing perinatal care and the required nursing staff in the municipal hospitals using the “*Workload Indicators of Staffing Need (WISN)*” developed for the World Health Organization. This manual outlines the activity standards, standard workload and components of the workload for different categories of health care providers at different levels of health care in some countries in Africa, Asia and Europe. The manual also provides a formula used to determine the required staffing based on these standards¹⁰.

Methods

Study Area: The study was performed in Dar es Salaam, one of the densely populated regions in Tanzania. In 2002, the region had a population of 2,497,940 people with an annual growth rate of 4.3%¹¹. The majority of women in this region receive reproductive and child health services from public health institutions¹².

Sampling Design and Size: A list of public health institutions that provide perinatal care services with their levels of

care was obtained from the Dar es Salaam city medical officer. A purposive sampling method was employed to select all four public hospitals (Muhimbili National Hospital and all three municipal hospitals), one private hospital, and all five public health centres available in the region. A simple random sampling technique was used to select six dispensaries from a list of all public dispensaries that provided perinatal care services. The focus on public health institutions was justified because problems in the most reputable institutions were likely to occur throughout the system. A total of 16 health facilities were involved in the analysis, fulfilling WHO recommendation to cover at least 25-30% of the health facilities in the area when assessing quality of care¹³⁻¹⁴. A simple random sampling technique was also employed to select five midwives working in the labour wards/maternity units for interview from each health institution. Where the available number was less than five, all midwives working in the maternity units were recruited for interview to make a total of 48 from all health institutions.

Data Collection: Data collection was done by the local authors with assistance from four trained field assistants. Ethical clearance was obtained from Muhimbili University College of Health Sciences as part of a bigger study on perinatal care needs assessment. Permission to conduct the assessment was obtained from the respective authorities of the institutions. WHO safe motherhood needs assessment

instruments¹⁵ were utilised to assess the availability of human resources, to interview the in charge of the surveyed institutions to explore the existing strategies for staff motivation. The midwives working in the perinatal care units were interviewed about their previous midwifery training and the level of immediate recall of the symptoms and dangers signs of pregnancy which would prompt them to refer the patient to the hospital. Quantitative data was entered and analysed using Epi-Info 6.

Definitions, Standards and WISN Method

We assessed the available workforce in all health institutions, by type of institution and type of provider. Secondly, we assessed the institutional staff motivation strategies and training of the health providers. We determined the required nurse staffing and WISN ratio in the municipal hospitals using the WISN method¹⁰.

Registered nurses were those who according to the National Board of Nurses of Tanzania are recognized as nursing officers or nurse midwives, while enrolled nurses

were those who had less training than nurse midwives (e.g. MCHA, and PHNB). Standard workload was defined as the amount of work which could be done by a health care provider in a year during the time available for work after due adjustment. Activity standard was defined as the average unit time required by each staff category for a specific activity while allowance factor referred to the set unit time that the staff would spend doing other related official activities like documentation, report writing, etc within the same shift. Staff requirement was defined as the number of staff required in the facility in order to meet the workload according to the professional standards which have been set. WISN ratio was calculated as the ratio of the available number of staff to the required in the health facility. A ratio less than one indicates the work pressure is high and hence urgent need of action to adjust the staffing levels.

In Tanzanian public service the statutory working week is 5 days and the number of working hours per day is 8. The staff requirement in the studied hospitals was calculated based on the national statutory standards and standard workload. The standard activities and components of the workload for the nursing categories working in the labour

Table 1: Components of workload and standard activities for the nurses in the labour wards at the district and regional hospitals in Tanzania

Staff category	Components of the workload	Standard activities
1 Nursing officer	Supervision, assessment of labour, assist delivery, documentation	One nurse in charge plus one more for every 10 deliveries/day
2 Nurse midwives/ trained nurses	Assessment of labour, assist delivery, documentation	4 hours per delivery plus 2 hours per shift
3 Nurse assistant	Assessment of labour, assist delivery under supervision	3 hours per each delivery

wards at the district and regional hospitals in Tanzania are as shown in Table 1¹⁰.

In our study the scope of the calculation for staff requirement was confined to the nursing staff working in the labour wards. This is because only the nursing staff had consistently data available for components of the workload performed in the previous year, necessary for determination of staff requirement. It was not possible to collect all data for all components of the workload performed by other categories of staff in the previous year.

The available working time per year (in days) was calculated using the following method¹⁰;

Annual leave (4 weeks x 5 days/week)	= 20
Public holidays per year	= 17
Off-the-job (sickness and all other absences) days per year	= 21
Total unavailable days per year	= 58
Unavailable weeks per year (58 ÷ 5)	= 11.6
Available weeks per year (52 – 11.6)	= 40.4
Available days per year (40.4 x 5)	= 202
Available hours per year (202 x 8)	= 1616
Allowance factors (2 ÷ 8)	= 25%

The following formula was used to calculate the staffing requirement[10];

Total staff requirement = Allowance multiplier x (volume of activity in a year/standard workload for the activity)

Where:

Standard workload = Available time in the year/ activity standard

Allowance multiplier = 1 / (1 - total allowance factor).

It should be noted that individual allowance factor for nursing staffing is not indicated. Supervision and administrative activities are parts of the nursing officer's responsibilities.

Limitations of WISN method:

1. The accuracy of the method depends on the accuracy of the record keeping at the health institutions. As for this study, the chances of errors were minimized by ensuring that the number of deliveries collected from the health institutions was collected as accurately as possible by trained midwives directly from delivery registries and not from the compiled maternity reports.
2. The method utilizes statistics from the past year and gives the estimates of what the staffing levels should have been.

Results

The Workforce and Workload Indicators: The distribution of health providers in all health institutions is presented in Table 2. More than three quarters (81%) of the 27 obstetricians were allocated to the national hospital.

There were 28 anaesthetists of which only four were allocated in the three municipal hospitals, and only two neonatologists. One of the neonatologists spent most of his working time doing administrative work at Muhimbili University College of Health Sciences. The total number of nursing officers working at the labour wards in the municipal hospitals ranged from 2 -5, trained nurses/midwives ranged from 9 to 14 and nurse assistants from 2 - 3. The institutional nurse staffing requirements and WISN ratios for nursing officers in these hospitals are presented in Table 3. The WISN ratios for trained

nurses/midwives working in the labour wards in Dar es Salaam municipal hospitals ranged from 0.2 to 0.4 and that for nurse assistants was 0.1.

Previous Training and Level of Recall for Danger Signs: The majority of the interviewed midwives (87%) from all the health institutions reported that they had previously received practical training in midwifery (Table 4). Half of the midwives (50%) had had their last midwifery training more than 5 years before the study. More than three quarters (77%) reported that they had special training on the use of the

Table 2: Number of health care providers in 16 health institutions in Dar es Salaam during the study period 2005

Personnel	MNH [†]	MH n = 3	H M	HC n = 5	Disp n = 6	Total n = 16
Specialists (obstetricians)	22	4	1	0	0	27
General practitioners	17	8	1	2	0	28
Anaesthetists/anaesthetic nurse/assistants	24 [§]	4	1	0	0	28
Pharmacists/assistants	3	6	5	4	0	18
Neonatologists	2	0	0	0	0	2
Assistant medical officers	0	63	0	8	0	71
Clinical officers/assistants	0	65	0	33	21	119

Key: MNH = Muhimbili National Hospital, MN = Municipal hospitals, HM = Hindu Mandal hospital, HC = health centres, Disp = dispensaries,

† As opposed to other institutions where the numbers represent institutional figures, at MNH only those who were allocated to the maternity wards (antenatal, labour and postnatal wards) were included except for anaesthetists

§ MNH had 24 anaesthetists of different kinds and included; 5 anaesthetists, 6 Assistant medical officer anaesthetists, 11 anaesthetic nurses, and 2 resident anaesthetists. They work on a rotational basis and at any time one of them is allocated to obstetric theatre according to their duty roster.

Table 3: The workload indicators for nurses working in the labour wards in Dar es Salaam municipal hospitals based to the 2004 delivery statistics

Deliveries/Staff category	Amana	Mwananyamala	Temeke
<i>Total annual deliveries</i>	12,432	12,465	15,347
<i>Delivery rate (per day)</i>	34	34	42
<i>Nursing officers</i>			
Requirement	4.4	4.4	5.2
In position	4	2	5
WISN ratio	0.91	0.45	0.96
<i>Nurse midwives(trained)</i>			
Requirement	40	40.1	49.4
In position	8	14	9
WISN ratio	0.20	0.35	0.2
<i>Nurse assistants</i>			
Requirement	23.1	23.1	28.5
In position	2	2	3
WISN ratio	0.09	0.09	0.1

partogram to monitor progress of labour; however the percentage was lowest (37%) among nurses from dispensaries. Although most health workers (81%) indicated to have been trained on how to take care of neonates and premature babies during their pre-service training, most of them (87%) had never seen neonatal care guidelines.

The level of recall of 48 midwives was assessed for danger signs of the complications of pregnancy. Of all the groups only danger signs directed to the group of eclampsia were spontaneously recalled by over half (72%) of the interviewed midwives (Table 5). The groups of danger signs that were least recalled were those directed to sepsis

(6%), intrauterine fetal death (10%) and obstructed / prolonged labour 27%.

Workforce Motivation Strategies: There was a diversity of motivation strategies in place reported in health institutions. The most reported incentives included paying overtime and timely promotion in 69% and 56% of the institutions respectively. Other strategies reported by less than 50% of the institutions included plans to increase the salaries, in-service training, seminars and workshop, and provision of mid morning tea for staff. Hindu Mandal hospital, the only private hospital in the survey, was the only health institution that had no established strategies for staff motivation.

Table 4 Proportions of midwives who had attended training in midwifery, neonatal care and use of partogram in Dar es Salaam health institutions

Training category	Dispensaries n (no. of midwives) =16	Health centers n = 12	Hindu Mandal n = 5	Municipal hospitals n = 15	Muhimbili National Hospital n = 5	Total n = 48 n %
Midwifery						
< 5 years	6	6	0	8	4	2 (45) 4
≥5 years	10	6	5	7	1	2 (55) 9
Practical midwifery training	13	11	5	13	4	4 (87) 6
Neonatal care						
Never	5	0	1	1	0	7 (13)
< 5 years	4	10	2	11	5	32 (60)
≥5 years	7	2	2	2	0	13 (25)
Partogram	6	11	4	15	5	41 (77)
Neonatal care practicals	11	12	5	13	3	44 (83)
Care for premature baby	11	9	5	14	4	43 (81)
Guideline for neonatal care	1	0	4	2	3	10 (19)

Discussion

Our findings indicated severe shortage of health care providers in almost all health institutions in Dar es Salaam region. The workload pressure at the municipal hospitals, which function as first referral facilities in the region, was very huge and exceeded the available human resources. The findings of low WISN ratios for trained nurses and nurse assistants as low as 0.2 and 0.09 respectively indicate

severe shortage of these staff in these hospitals. These findings suggest that the staff are under an extremely huge work pressure and reflect what extent the desired professional standards can be met by the available staff. During the period of study there were only four assistant anaesthetists in all three municipal hospitals, two neonatologists in all facilities and no nurse specialized in neonatal care.

Table 5 Number and proportions of midwives from Dar es Salaam health institutions who could spontaneously mention at least one the symptoms/signs of a group of danger signs for pregnancy complication

Group of danger signs	Dispensaries (midwives) N = 16	Health centers n = 12	Municipal hospitals n = 15	Muhimbili National Hospital n = 5	Total N = 48 N	%
	Previous bad obstetric history / abdominal scar/ previous still birth	7	7	4	2	20
Hypertension / headache / swelling / fits	10	7	12	5	34	71
Anaemia / pallor/ fatigue/ breathlessness	7	3	8	2	20	42
Cessation of fetal movement / baby does not move	3	0	2	0	5	10
Abnormal lie/ position of fetus	5	4	2	0	11	23
Sepsis / foul smelling discharge / postpartum abdominal pain	1	0	2	0	3	6
Light bleeding / spotting	3	1	4	1	9	19
Haemorrhage / heavy bleeding	8	4	9	4	25	52
Multiple pregnancy / large abdomen	6	5	4	1	16	33
Obstructed / prolonged labour	5	4	1	3	13	27
Other specify	8	6	6	1	21	44

Shortage of staff for perinatal care has been reported in Tanzania and many other countries including high income ones¹⁶⁻¹⁸. The impact of low coverage of skilled staff on women and foetuses in the context of perinatal care is critical and includes the high rates of failure to rescue from complications of pregnancy leading to maternal and perinatal morbidity and mortality^{5,6,19,20}. The shortage of staff leads to high workload pressure which in turn leads to staff spending much less time on each activity than is set by the activity standards in the

country. This indicates that the quality of service being delivered is even below the locally accepted standards¹⁰.

Such low coverage of essential staff for perinatal care in Dar es Salaam public health institutions can partly explain poor quality of perinatal care and outcome. With only four assistant anaesthetists among the three Municipal hospitals, it was impossible to provide anaesthesiology services for 24 hours per day, a requirement for first referral hospitals.

A problem of lack of 24 hour availability of key staff has been reported

to be endemic in low income countries [21]. Quite often district hospitals and health centres function for only a fraction of the day (often morning) and are virtually inactive the rest of the day and all the night as were found in this study²¹. However, this may be true even when there is an adequate number of health personnel. Based on the concept of brain drain of staff from rural to urban areas we can conclude that the picture of low coverage of skilled health providers seen in Dar es Salaam region likely reflects an even more serious shortage of the health providers all over the country. While this study has revealed a severe shortage of workforce, it has been also reported that the current trend of staff productivity in the country is too slow to meet the increasing staffing requirements²². These findings suggest that the Millennium Development Goals set for maternal and newborn survival are unlikely to be achieved in Tanzania unless focused strategic interventions for human resource are implemented.

The levels of recall for danger signs of the complications of pregnancy among the midwives were critically low. The fact that recall is the lowest level in the hierarchy of cognitive domain such a poor recall of the danger signs of complications of pregnancy suggests that these health care providers also lacked the higher levels of the domain. The higher levels of cognitive domain are of great value in management of diseases and include: comprehension defined as the ability to interpret, translate and make use of an idea; extrapolation, defined as predicting effects and consequences;

application, defined as the ability to utilise knowledge and apply facts; synthesis defined as the ability to bring together separate components of knowledge to form a complete thing; and evaluation that refers to the ability to make judgments based on knowledge²³. Poor knowledge of the health workers in the context of complications of pregnancy has also been reported in other parts of this country⁸. Such poor knowledge could be a reflection of the existing gaps in the teaching and learning processes in the training institutions as well as lack of regular on-the job training in the domain of perinatal care. The gaps of knowledge could have contributed to poor perinatal care and outcomes in this region. These findings suggest the need of on the job competency-based training in order to improve the levels of knowledge and skills. As it has been learned in other intervention programs such training should also be complemented by innovative incentives, management protocols and employment of adequate numbers of health providers in order to improve the quality of care and have sustainable provision of essential obstetric care services in health institutions²⁴.

Conclusion and Recommendation

The shortage of human resource in the domain of perinatal care is great and is associated with poor performance and outcomes in Dar es Salaam health institutions. We recommend for more staff, innovative incentives to motivate and retain trained staff, on the job competency-based training and

introduction of management protocols to standardize practice in order to achieve the global millennium development goals set for maternal and newborn survival.

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