Assessment of Staffing Need through Workload Analysis at Public Sector Healthcare Facilities in Bangladesh

BRAC SCHOOL OF PUBLIC HEALTH
JAMES P GRANT

World Health Organization
Bangladesh

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Acknowledgements

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- Dr Mithila Faruque, Assistant Professor, Bangladesh University of Health Sciences
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MESSAGE

It is well known that health workforce is the key component of the health system. In fact, health services cannot be delivered without trained, adequate number and right category of health workforce. Now to produce, develop and deploy right category of health workforce, we need proper planning based on evidence. There are not many studies available in the areas of health workforce. I am happy to see that this study on "Assessment of staffing need through workload analysis at public sector health facilities in Bangladesh" has been completed and now ready to publish. I also learnt that the study team applied the WHO's Workload Indicator of Staffing Need (WISN) method to assess the workload of the providers working at their respective health facilities. The results indicate that there is high workload prevailing in the health facilities, which portray high demand of healthcare services. This indicates us to review the staffing pattern and set new staffing norms and standard for the health facilities.

The Government of Bangladesh has achieved many successes over the last decade (2009-2018) through achievement of the Millennium Development Goals (MDGs) and now we are on the journey toward the Sustainable Development Goals. Given the shortage of health workforce against the demand, we are in the process of recruiting additional 10,000 medical doctors and around 40,000 support and non-medical professionals. About 15,000 nurses and midwives have already been recruited to the existing workforce. All those initiatives will certainly and positively impact on improving health service delivery.

I appreciate the initiative taken by the HRD Unit of the Ministry of Health and Family Welfare. I also thank colleagues from DGHS, DGFP, DGNM, WHO Bangladesh and James P Grant School of Public Health, BRAC University, who were involved in carrying out the study. I believe, we should not stop here. We need to do further work on this. We need collective voice and joint effort on a multisectoral agenda like health workforce so that we can ensure the best use of our limited resources.

Wish you all the best,

Professor Dr Abul Kalam Azad
Director General
Directorate General of Health Services
Ministry of Health and Family Welfare
Government of the People's Republic of Bangladesh

MESSAGE

This is a good initiative. Human resources management always remains a complex issue for multidimensional causes. For smooth functioning of an organization, proper person should be placed in the proper positions in proper time to do the proper job. If the things are not harmonious, well-planned and well-managed, the ultimate goal of the organization would never be possible to achieve. In our health sector, we have achieved remarkable successes in many health indicators like reduction of maternal mortality rate, child mortality rate, etc. Not only that, we have been able to build many sophisticated and specialized hospitals like National Institute of Neurosciences (NINS), and National Institute of Traumatology & Orthopaedic Rehabilitaion (NITOR). It is also true that our success in the field of appointment, posting, retention of the health workforce in rural areas is not yet at the satisfactory level. We have to work more. The assessment on health workforce workload is a beautiful initiative. The assessment covers many things but at the same time it left a good number of issues which should have been included. The questionnaire could have been more detailed. However, every study has its shortfall, none is perfect, it is the beginning of the test match. I invite WHO to come forward on this and take bigger initiative covering all dimensions of the health workforce including patients' opinion.

I thank WHO Bangladesh for introducing the WISN tool and its application in Bangladesh. I also thank DGHS, DGFP and DGNM officials to carry out the study in field level. My heartfelt gratitude goes to the steering committee and technical taskforce members and also those who directly and indirectly were involved and contributed to the assessment.

Best wishes

(Sheikh Rafiqul Islam)
Additional Secretary (Admin) and Line Director (HRD)
Health Services Division
Ministry of Health and Family Welfare

World Health Organization
Bangladesh

MESSAGE

Health is a human right and every person everywhere has the right to access quality health services delivered by well-trained healthcare professionals without suffering financial hardship. This is a main pillar of Universal Health Coverage that the Government of Bangladesh has committed to achieving by 2030.

Bangladesh is, historically, a country with shortage of formally trained health workforce, having a density of 8.3 doctor, nurse and midwife per 10,000 populations. The country is also experiencing skill-mix imbalance as this is one of the few countries in the world with more doctors than nurses, with a current doctor to nurse ratio of 1 to 0.6. Consequently, health workforce shortage and skill-mix imbalance have been identified as priority actions in the Global Human Resources for Health Strategy: Workforce 2030 and the Bangladesh Health Workforce Strategy 2015. Sustainable universal health coverage with safe, effective, person-centred health services can be ensured through strategic investment in the health workforce. Therefore, we need careful assessment of the workload of the health workforce in clinical areas so that evidence-based policies and strategies can be developed.

The work that has been carried out in this regard will inform us of the current performance and productivity of the workforce employed in healthcare delivery system, including healthcare providers and support workers. The data collected will facilitate better policy decisions aimed at strengthening health workforce to deliver quality health service.

I would like to thank and appreciate the Human Resources Development Unit, Ministry of Health and Family Welfare for taking the initiative of introducing the Workload Analysis of Staffing Need (WISN) method and its successful application in Bangladesh. I also thank the James P Grant School of Public Health at BRAC University that carried out the study in all 24 health facilities in two selected districts. I am proud that this work was a joint project with our colleagues from Save the Children's MaMoni Health Systems Strengthening team, funded by USAID. With more collaborative work between the Government of Bangladesh, NGO's, academia, and other stakeholders, Bangladesh is on the right track to achieve Universal Health Coverage and Sustainable Development Goals that the country has committed to.

Dr Bardan Jung Rana
WHO Representative to Bangladesh

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Acronyms

ANC	Antenatal Care
BUHS	Bangladesh University of Health Sciences
CC	Community Clinic
CHCP	Community Health Care Provider
DGHS	Directorate General of Health Services
DH	District Hospital
EMO	Emergency Medical Officer
ESP	Essential Service Package
EWG	Expert Working Group
FWA	Family Welfare Assistant
FWV	Family Welfare Visitor
GoB	Government of Bangladesh
IMCI	Integrated Management of Childhood Illness
JPGSPH	BRAC James P Grant School of Public Health
MCWC	Maternal and Child Welfare Centre
MO	Medical Officer
MoHFW	Ministry of Health and Family Welfare
NCD	Non-communicable disease
OPD	Outpatient department
OSD	Officer on Special Duty
PNC	Post-natal care
RMO	Residential Medical Officer
SACMO	Sub Assistant Community Medical Officer
SC	Steering Committee
TT	Technical Taskforce
UHC	Universal Health Coverage
UHFWC	Union Health and Family Welfare Centre
UHFPO	Upazila health and family planning officer
UpHC	Upazila Health Complex
USAID	United States Assistance for International Development
USC	Union Sub-Centre
WHO	World Health Organization
WISN	Workload Indicators of Staffing Need

Executive Summary

Background

Increasing the performance and productivity of health workers is vital to improving health service provision and achieving universal health coverage in Bangladesh. Workload estimation and management is very important for any country or institution to deliver quality services. The World Health Organization developed a method called Workload Indicators of Staffing Need (WISN), which is a simple, useful and rapid approach to estimate the workload in a health facility, and the required health workers to cope with that workload. Supported by the Ministry of Health and Family Welfare of Bangladesh and WHO Bangladesh, a research team from BRAC James P Grant School of Public Health, BRAC University conducted a WISN study in two districts (Jhenaidah and Moulvibazar) of Bangladesh. The study aimed at assessing current staffing needs for delivering optimum health services, and projecting the staffing need to implement the essential service package[1] at the public sector district health system level in Bangladesh. The Bangladesh University of Health Sciences conducted a similar study under the United States Agency for International Development's MaMoni Health System Strengthening Project in two other districts (Brahmanbaria and Kushtia).

Methodology

Implemented during July–November2017, this study followed WISN steps (see below), under the guidance of and collaboration with a steering committee, technical taskforce and expert working groups.

1. Determining priority cadres and health facility types
2. Estimating available working time
3. Defining workload components
4. Setting activity standards
5. Establishing standard workloads
6. Calculating allowance factors
7. Determining staff requirement based on WISN
8. Analysing and interpreting WISN results.

Combining qualitative (i.e. document reviews, key informant interviews, in-depth interviews, observations) and quantitative methods (time–motion survey), this study was conducted in selected health facilities with staff categoriesfrom each of the two districts (Jhenaidah and Moulvibazar) as shown in the table.

[1] An essential health service package consists of a limited list of public health and clinical services, which will be provided at primary and or secondary care level. For further information, please see: Bangladesh essential health service package (ESP). Dhaka: Ministry of Health and Family Welfare, Government of Bangladesh; 2016.

Type of facility	Staff category
District hospital (DH) (n=1)	Consultants (surgery, anaesthesiology, obstetrics and gynaecology, orthopaedics, ear, nose and throat, medicine, paediatrics, cardiology), general physicians (medical officer (MO), emergency medical officer (EMO), residential medical officer (RMO)), nursing staff (senior staff nurse, nursing supervisor)
Maternal and Child Welfare Centre (MCWC) (n=1)	MO, family welfare visitor (FWV)
Upazila Health Complex (UpHC) (n=2)	General physicians (MO, RMO), nursing staff (senior staff nurse, nursing supervisor), sub assistant community medical officer (SACMO)
Union sub centre (USC) (n=2)	SACMO*
Union Health and Family Welfare Centre (UHFWC) (n=2)	SACMO, FWV
Communityclinic (CC)/ Outreach (n=4)	Community health care provider (CHCP), family welfare assistant (FWA)

* MOs were not included because there were none in the selected USCs.

Workload components were defined in light of the essential service package components, based on key informant interviews with the experts (n=5), refined further through in-depth interviews with actual service providers (n=87). Time–motion survey was done by web-based data collection software SurveyCTO, using mobile/tablets. Information on available working time, service and allowance standards, and service statistics were collected through in-depth interviews. WISN differenceand WISN ratio were calculated using WHO WISN software, standard workload, category allowance factor, individual allowance factor and total required number of staff.

Results

For descriptive purposes, workload pressure was categorized as given in the table below.

WISN ratio	Workload pressure
Between 0.10 and 0.29	Extremely high
Between 0.30 and 0.49	Very high
Between 0.50 and 0.69	High
Between 0.70 and 0.89	Moderately high
Between 0.90 and 1.19	Normal
Greater than or equal to 1.20	Low

Based on these criteria, five of the 20 staff categories had extremely high workload pressure, followed by seven staff categories with very high workload pressure, indicating an overall high workload pressure among health service providers. The highest workload was observed among the following staff categories: consultants in medicine (0.16), paediatrics (0.20), anaesthesiology (0.20), obstetrics and gynaecology (0.25), and surgery (0.28).

The average gap between currently available number of nurses and required number of nurses at the studied DHs was estimated at 135.92 for each hospital. The average gap for the number of physicians was 35.10 for DHs, and 18.86 for nurses working in UpHCs. Nurses were predominantly occupied with support activities (60% for DH nurse and 50% for UpHC nurse), instead of providing actual nursing care.

At the district level health sector, the highest number of consultants was required in obstetrics and gynaecology at Jhenaidah District Hospital (16.63), followed by consultants in medicine at Moulvibazar District Hospital (12.94). Almost 15 additional obstetrics and gynaecology consultants were required to tackle the current load in Jhenaidah District Hospital. In the family planning sector, the WISN ratio was higher among FWAs of Moulvibazar MCWC, due to their lower number in this health facility (three, as opposed to six in Jhenaidah MCWC). At the Upazila level health sector, the highest number of staff was required in nursing (19.22 on average in each UpHC). Workload pressure was the highest among general physicians of Kotchandpur UpHC (WISN ratio 0.28) and lowest among SACMOs of Shailkupa (WISN ratio 1.48). Among the SACMOs working at different types of health facilities (i.e. at UpHCs, USCs and UHFWCs), the workload pressure was highest among SACMOs of USCs (WISN ratio 0.49, very high) and lowest among those of UHFWCs (1.29, low). In Prithempasha USC, the WISN ratio for the SACMOs was as high as 0.25 (extremely high).

At the community level, CHCPs in two CCs in Jhenaidah district (Khandakbaria and Kulbaria), and two in Moulvibazar district (Dakkhin Chamatkar and Akbarpur) had normal or even low workload pressure (1.12, 1.37, 1.14 and 1.16, respectively). FWAs in two CCs in Jhenaidah district (Khandakbaria and Korotipara), and two in Moulvibazar district (Sripur and Dakkhin Chamatkar) had normal or even low workload pressure (1.33, 1.18, 1.04 and 1.27, respectively).

Although, most of the staff categories in most of the health facilities experienced very high workload, normal or even low workloadswere found among the UHFWC SACMOs, CC CHCPs and CC FWAs (average WISN ratio 1.29, 0.92 and 1.1, respectively). Excess staff and low workload pressure was observed particularly among CHCPs in four CCs (out of eight): Khandakbaria (WISN difference 0.11 and ratio 1.12), Kulbaria (WISN difference 0.23 and ratio 1.37), Dakkhin Chamatkar(WISN difference 0.12 and ratio 1.14), and Akbarpur (WISN difference 0.14 and ratio 1.16); and FWAs in four CCs (out of five): Khandakbaria (WISN difference 0.25 and ratio 1.33), Korotipara (WISN difference 0.15 and ratio 1.18), Sripur (WISN difference 0.04 and ratio 1.04), and Dakkhin Chamatkar (WISN difference 0.21 and ratio 1.27).

If vacant posts were filled up, understandably, the workload would reduce. However, only filling up vacant posts is not enough for some staff categories, such as consultants, general physicians and nurses at the DH because the staff requirement is much higher than the number of sanctioned posts due to high to extremely high workload.

Time–motion data indicated a discrepancy between activity standard and real practice. For example, providing consultation and counselling, and disbursing non-interventional family planning methods (such as pills, condoms, injections that are done in the outpatient department setting) by an UHFWC FWV should ideally take 25 minutes; but in reality it takes only 4.23 minutes. Interestingly, according to time–motion data, time required for the same activity varied when performed by different staff categories or at different health facilities. For example,

time for outpatient department services ranged from 1.02 minutes (DH general physician) to 4.22 minutes (UHFWC SACMO). Timing for integrated management of childhood illness services ranged from 1.32 minutes (DH general physician) to 6.43 minutes (UHFWC SACMO).

Recommendations

Short term

1. **Reallocate staff from low workload areas to high workload areas:** Despite the fact that most of the staff are already overworked, staff in some health facilities may be more so compared to a neighbouring one. In places where workload of a staff category is 'extremely high', some support from nearby health facilities with lower workload should be sought; or vice versa.
2. **Fill-up existing vacant positions and strengthen supervision and monitoring:** Many posts remained vacant in different health facilities for various reasons during the study period. Even if it were not possible to reach the ideal workforce setup for a health facility, filling-up at least the vacant positions and ensuring regular presence of all staff would reduce the workload.
3. **Change the current scope of work to ensure that nurses deliver clinical care:** In addition to being the most needed, scarcest and one of the most overloaded, nurses are burdened with support activities. If some of their support and additional activities are shifted to other staff, nurses would be able devote their time better in nursing care.
4. **Enable task shifting to reduce consultant workload:** For DH consultants,who have'extremely high' workload pressure, tasks may be shifted to other staff. General physicians, nurses and midwives may be engaged in some of the tasks that consultants currently undertake.
5. **Set national level activity standards (for health services):** Based on the results of the two studies, steps should be undertaken to set or agree upon the list of activity standards for health services. This can be applied at health facilities throughout the country using respective facility data. It would help in assessing workload and recommending staffing norms for designing the respective 'table of organogram and equipment' at various facilities.

Long term

1. **Improve quantity and quality of service providers:** A long-term policy response is needed to increase the intake of nursing students, train them with quality education, and deploy them in large numbers in a secure and gender-friendly work environment. Incentives should be given to increase the number of nurses in both public and private sector educational institutions. Regulations should be developed and implemented so that medical colleges can be established only when a nursing school is established alongside.
2. **Ensure flexible recruitment and human resources for health planning, based on patient load and disease burden:** There should be a gradual policy shift towards flexible recruitment and human resources for health planning, to keep up with local patient load and disease burden.There should also be regular reviews based on new evidence of these decisions, and human resources for health management decisions should be amended from time-to-time, based on the review results.

3. **Create separate staff category for administrative/support activities and medico-legal issues:** Since a large amount of time is spent on activities such as handling medico-legal issues, conflict resolution, signature and attestation, online data entry, there needs to be an additional workforce or staff category to carry out clerical work on behalf of clinical service providers. This would free up valuable yet scarce clinical time of the clinical service providers.
4. **Review staffing norms based on health facility workload:** Although filling up vacant posts can improve the workload situation, sometimes this is not helpful. In DHs, even if all the sanctioned posts were filled up for the consultants, general physicians and nurses, the WISN ratio would not be normal (i.e. between 0.90 and 1.19). Therefore, policy makers should review staffing norms of health facilities based on the facility's workload and make decisions specific to the individual local context.

Conclusion

With a vision of becoming a middle-income country by 2021, Bangladesh needs to strive for optimizing its existing resources, including the health workforce. This type of study can aid such policy decision making in human resources. The study has proposed a quantifiable measure for workload and staff shortage. However, further research is needed to determine the workload of several other health and family planning service providers especially in hard-to-reach areas. WISN should be incorporated as a planning tool for managers at the district level and below. Implementation research should be carried out with regard to how workload-based staffing decisions can be integrated into health systems in the most effective way. This study is expected to pave the way for evidence-based human resources for health decision-making in Bangladesh.

Background

Appropriately trained,motivated and skilled health workforce is essential for achieving universal health coverage (UHC). Since the beginning of the millennium, shortage of human resources for health has been one of the major challenges faced by the health system and an important topic for health system research. Globally, more than 90 countries suffer due to health workforce crisis (1). It is estimated that there are on average 34.5 health workers per 10000 population and about one third of the world's population does not have access to health care because of shortage of health workforce (1). The estimated global shortage of skilled health professionals (midwives, nurses and physicians) will be 12.9 million by 2035 (2). The South-East Asian Region isparticularly experiencinga critical shortage of trained health workers (<23 health workers per 10000 population) which limits access to health services for the population (3).

Increasing health worker performance and productivity is vital to improving health service provision in any country. Problems of poor service provision due to poor performance of health workers have been reported in the literature which results from too few staff, or staff not providing care according to recommended standards (4–6). The magnitude of the shortage can be seen in health worker density rates and workforce vacancy rates, and its impact is reflected in health system performance indicators. Factors that contribute to poor performance of health workers include limited employment opportunities and low salaries; poor working conditions; weak support and supervision; and limited opportunities for professional development (7).

Being a pluralistic health system, Bangladesh's health workforce scenario is characterized by "shortage, inappropriate skill mix and inequitable distribution" (8,9). Equitable access to skilled and motivated health workers in a functional health system is one of the key components to accelerate progress towards UHC and sustainable development goals (10,11). In this regard, the Government of Bangladesh (GoB) approved the Bangladesh Health Workforce Strategyin 2015, which affirms the Government's vision of equitable availability of skilled, motivated and responsive health workforce in adequate numbers across the country. However, there is a lack of comprehensive, national representative data on human resources for health-workload in the formal and informal sectors as well as optimum staff needed in delivering required services in Bangladesh healthcare facilities. A small scale qualitative study found overwhelming workload as one of the critical components that influences retention of doctors and nurses at rural healthcare facilities in Bangladesh (12). A policy analysis on retention of human resources for health (physicians and nurses) also found that deficiency of adequate workforce and consequent high workload acted as a deterrent against rural retention (13). An ethnographic study described how nurses get involvedwith administrative paperwork and thus minimally engage in actual nursing care (14).

Workload management is very important for any country or institution to deliver quality services, retain staff and reduce turnover (15).Even the seminal document on human resources for health, "Global strategy on human resources for health: workforce 2030", laid emphasison developing country-level workforce strategies and drawing on workload analysis studies (11). Such studies can provide detailed insight into the current state of workload in a system, coping strategies of the staff for regular extra work pressure, the causes of excessive workload and ways to deal with it, among others. This study aimed at filling the knowledge gap with respect to workload and optimum staff needs at the district level, including and up to the community

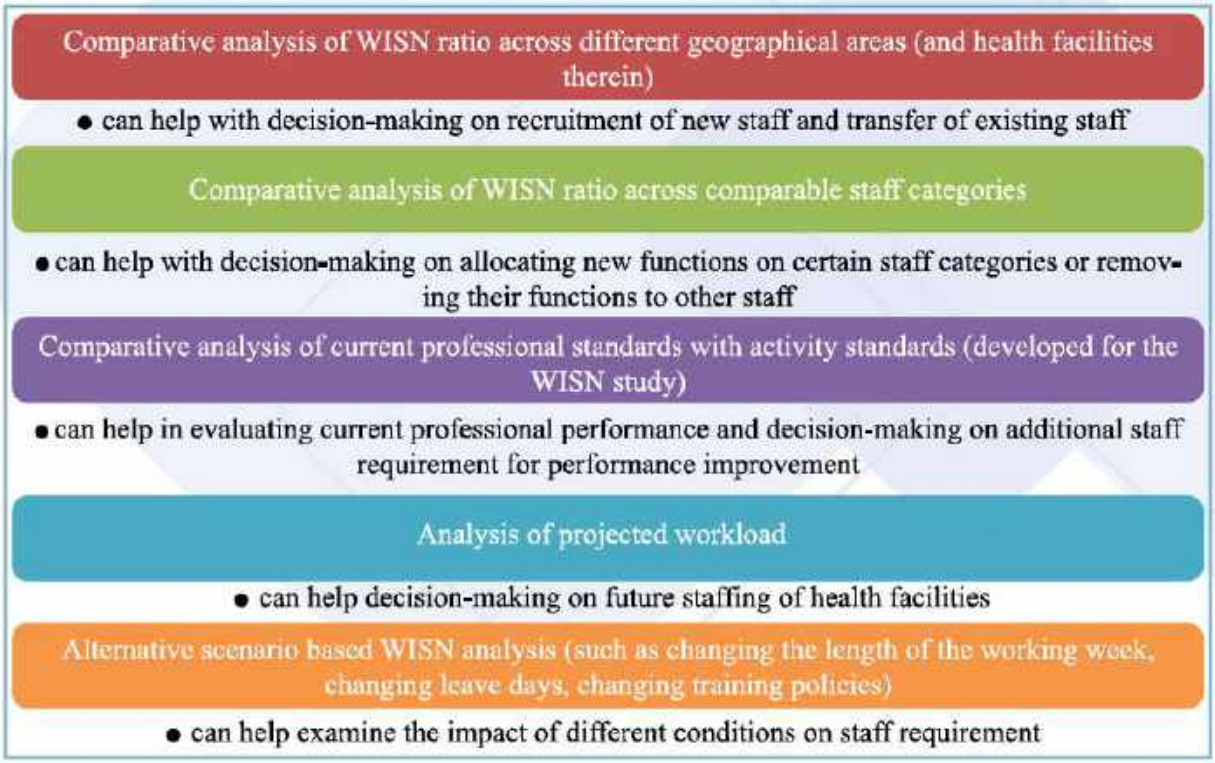
level, and understand why it is happening and how it can be dealt with. It is expected to contribute in ensuring quality and uninterrupted service delivery through efficient management of adequate and motivated staff, and spearhead the current movement of UHC in the country.

Workload Indicators of Staffing Need overview

WHO developed the Workload Indicators of Staffing Need (WISN) method in 1998, which was later updated based on implementation learning from various countries. This method is simple and convenient, and uses a rapid estimation approach.Itwas adapted from the industrial sector to the health sector, by Peter Shipp in 1984.[2] The result is expressed in terms of differences and ratios, the former indicating worker shortage or surplus, and the latter workload pressure on the staff (16).

WISN results help in human resources decision-making in several ways (see Figure 1).

Figure 1: Role of WISN in human resources decision making



Despite obvious advantages, WISN has some limitations as well. Since WISN calculations are contingent upon service statistics, the accuracy of these statistics shapes the accuracy of WISN results. Secondly, since WISN calculations are done based on past years' service statistics, a recent change in services of health facilities may not be reflected in the number of staff recommended through the WISN exercise.

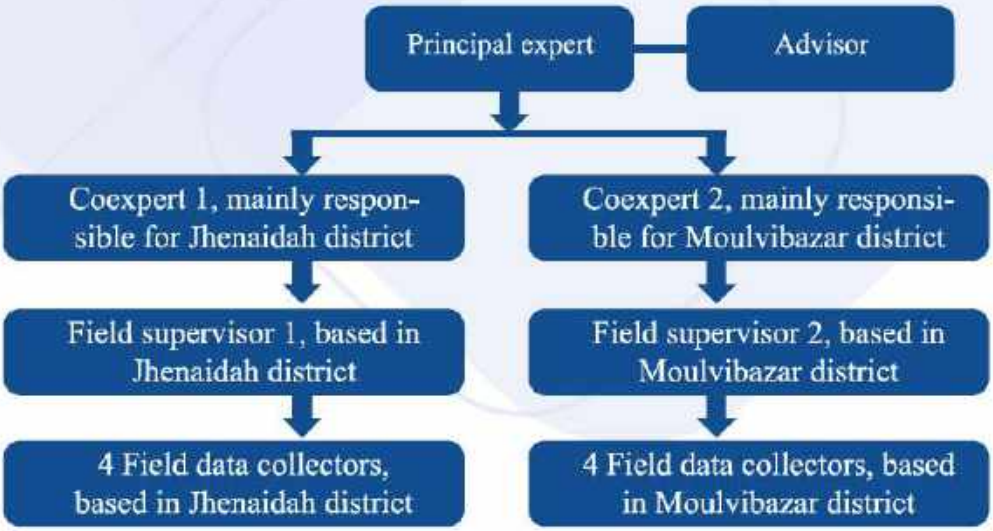
[2] Shipp P. *Workload indicators of staffing need (WISN). A manual for implementation.* Geneva, World Health Organization, 1988 (WHO/HRB/98.2) in Workload Indicators of Staffing Need, User's Manual, World Health Organization. 2010.

Application of the WISN method should not be seen as a single-shot or once-in-a-lifetime activity; but be integrated into the national health human resource management system. The ultimate goal of any WISN study is to incorporate the process and findings into the annual planning and budget cycle of the health system. WISN is easy to implement, and based on existing data once WISN is applied in a system for the first time, it should not be too difficult to replicate in the future by the health sector managers themselves.

Description/scope of the study

The 2010 WISN study (16) was conducted by a research team from BRAC James P Grant School of Public Health (JPGSPH), BRAC University. The team consisted of a principal expert (an assistant professor), two coexperts (senior research associates), two field supervisors (senior research assistants), and eight field data collectors (four quantitative and two qualitative) cum data compilers. An advisor (professor) provided technical guidance as needed (Figure 2). The research team also received support from a statistician, information technology team, and finance/administration team based in JPGSPH. WHO Bangladesh provided technical and financial support to the study including providing WISN software, manual and related trainings. The research team also received all necessary support and guidelines from the human resources branch of the Ministry of Health and Family Welfare (MoHFW), GoB.

Figure 2. Workflow reporting structure of the project



A similar study by Save the Children/Bangladesh University of Health Sciences (BUHS) was conducted recently using the WISN method, which was funded by United States Agency for International Development (USAID). The study sites were Kushtia and Brahmanbaria districts, along with Rajshahi Medical College Hospital. The research teams periodically coordinated with each other. Research members from the USAID funded project were included in the steering committee in the technical taskforce.

Committees

The project was developed based on close collaboration among and mutual insights from three types of committees.

1. **Steering committee (SC)** consisted of 13 members, selected from senior government officials, experts from WHO Bangladesh and relevant academia. The role of the SC was to guide and endorse the overall study based on the WISN strategy and its implementation (see Annex 6 for the full committee).
2. **Technical taskforce (TT)** was responsible for guiding the implementation of the WISN process. Researchers from JPGSPH, BRAC University, and experts from WHO Bangladesh, Save the Children Bangladesh, and BUHS served in the taskforce (see Annex 6 for the full committee).
3. **Expert working groups (EWGs)** were multiple – one for each of the following professional groups: consultants (surgery, medicine, obstetrics and gynaecology, paediatrics, ear, nose and throat, orthopaedics, cardiology, and anaesthesiology), general physicians (medical officer (MO), emergency medical officer(EMO), residential medical officer (RMO)), nursing staff (senior staff nurse, nursing supervisor), family planning (MO, family welfare visitors (FWVs), family welfare assistants (FWAs)), sub assistant community medical officers (SACMOs)/community health care provider (CHCP). The respective EWG defined the workload components and set the activity standard for the specific staff category.

Purpose/objectives of the study

General objective

This study aimed at assessing the current staffing needs in 24 health facilities in two districts (Jhenaidah and Moulvibazar) through application of the WISN method for delivering health services at optimum level and projecting the staffing need to implement the essential service package (ESP) at the district health system level (from district hospital (DH) to community level) in the public sector of Bangladesh (17).

Specific objectives

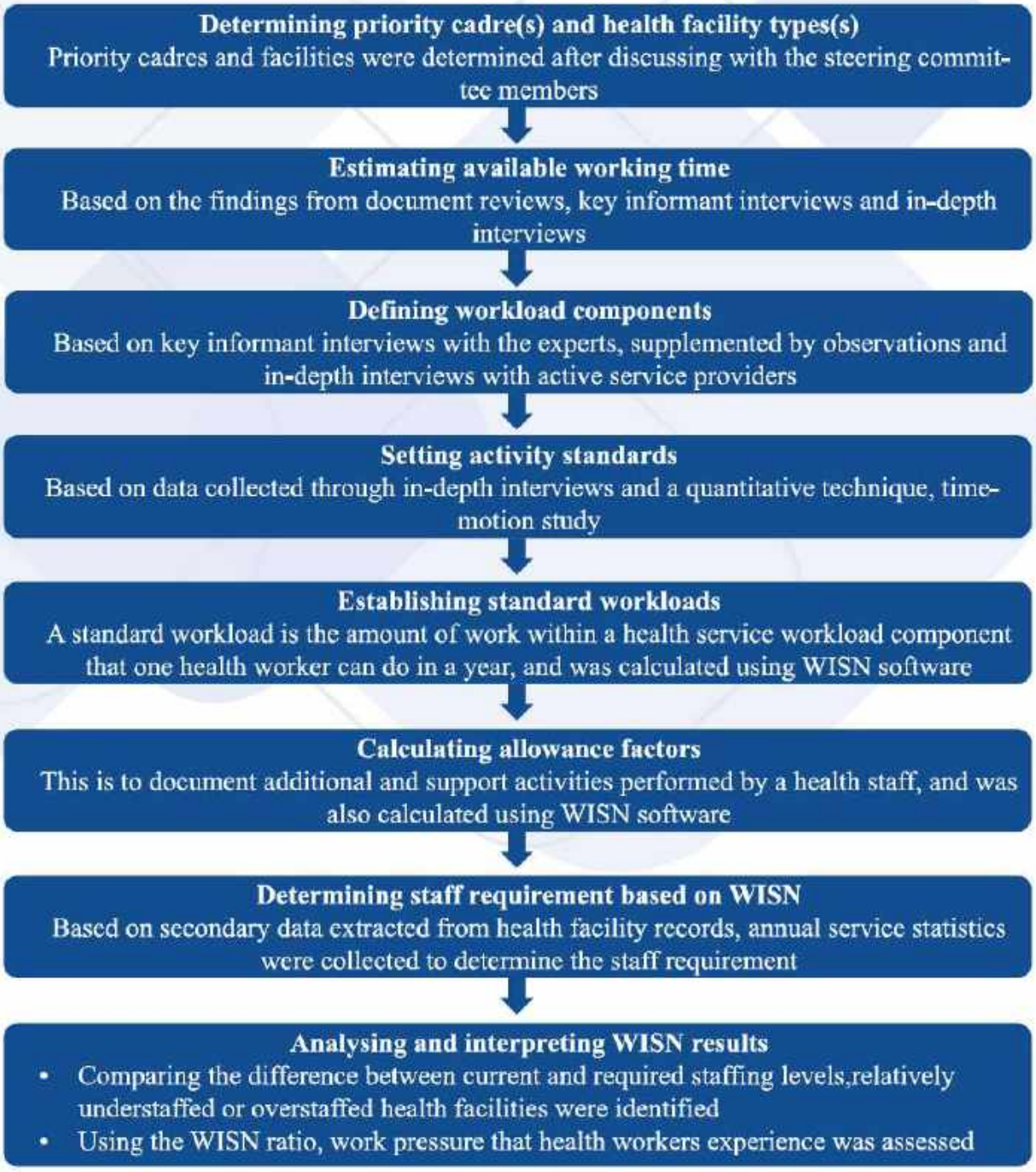
1. To assess the current workload of the existing workforce (of priority cadres) to deliver designated health services (including preventive, promotive and curative) both at community and facility level by using WHO's WISN method.
2. To estimate the required workload to deliver ESP at both facility and community/household level by applying the same method.
3. To ascertain the gaps in distribution between existing and required number of different categories of workforce to implement ESP at the district level and below.
4. To recommend on how to reorganize the health workforce (skill mix, task shifting, number and category of health workforce) to deliver ESP more efficiently in public sector healthcare facilities at district level and below.

Methodology

Study design

The updated WISN manualwas followed, but contextualized for Bangladeshi setting (Figure 3) (16).

Figure 3. Methods applied in each WISN step



The qualitative component involved document reviews and key informant interviews with policy level officials related to human resources for health issues in Bangladesh (mostly from among SC and EWG members), in-depth interviews with individual service providers (such as physicians, nurses, working in health facilities under this study), and observations. The quantitative component involved a time–motion survey (18).

Study duration

The research project started on 2 July and ended on 30 November 2017. Field data collection continued from 1 September to 15 October 2017.

Study setting

The study was carried out in two preselected districts. The selection was made by an advisory committee established by the human resources branch of the MoHFW in 2016–2017 along with the selection of two other districts for the WISN study supported by USAID's MaMoni's Health Systems Strengthening project. Based on high performing districts on some performance indicators (such as bed occupancy rate, patient turnover), the following districts were selected for the study:

- Jhenaidah, located in the south-west part of Bangladesh, under Khulna division.
- Moulvibazar, located in the north-east part of Bangladesh, under Sylhet division.

Figure 4. Map of Jhenaidah and Moulvibazar districts with study Upazilas identified

From each district, based on guidance from SC, one DH, one Maternal and Child Welfare Centre (MCWC), two Upazila health complexes (UpHCs), two Union sub centres (USCs), two Union Health and Family Welfare Centres (UHFWCs), and four community clinics (CCs) were included in this study (Table 1).

Table 1. Types and number of health facilities from each district

Administrative level	health facility	Types of health facility	
		Under Directorate General of Health Services	Under Directo rate General of Family Planning
District	2	DH	MCWC
Upazila	2	UpHC	-
Union	4	USC	UHFWC
Community	4	CC/outreach	

For selecting UpHCs from each district, a list of all Upazilas under each district was first prepared (Figure 5).

Figure 5. List of Upazilas under each district

Then performance indicators (such as the number of beds, number of total delivery, number of live births, bed occupancy rates and number of outpatient visits for each Upazila) were collected from the Health Bulletin of the Directorate General of Health Services (DGHS) (Figures 6 and 7) (19).

Figure 6. Performance of UpHCs under Jhenaidah district (January to June 2017)

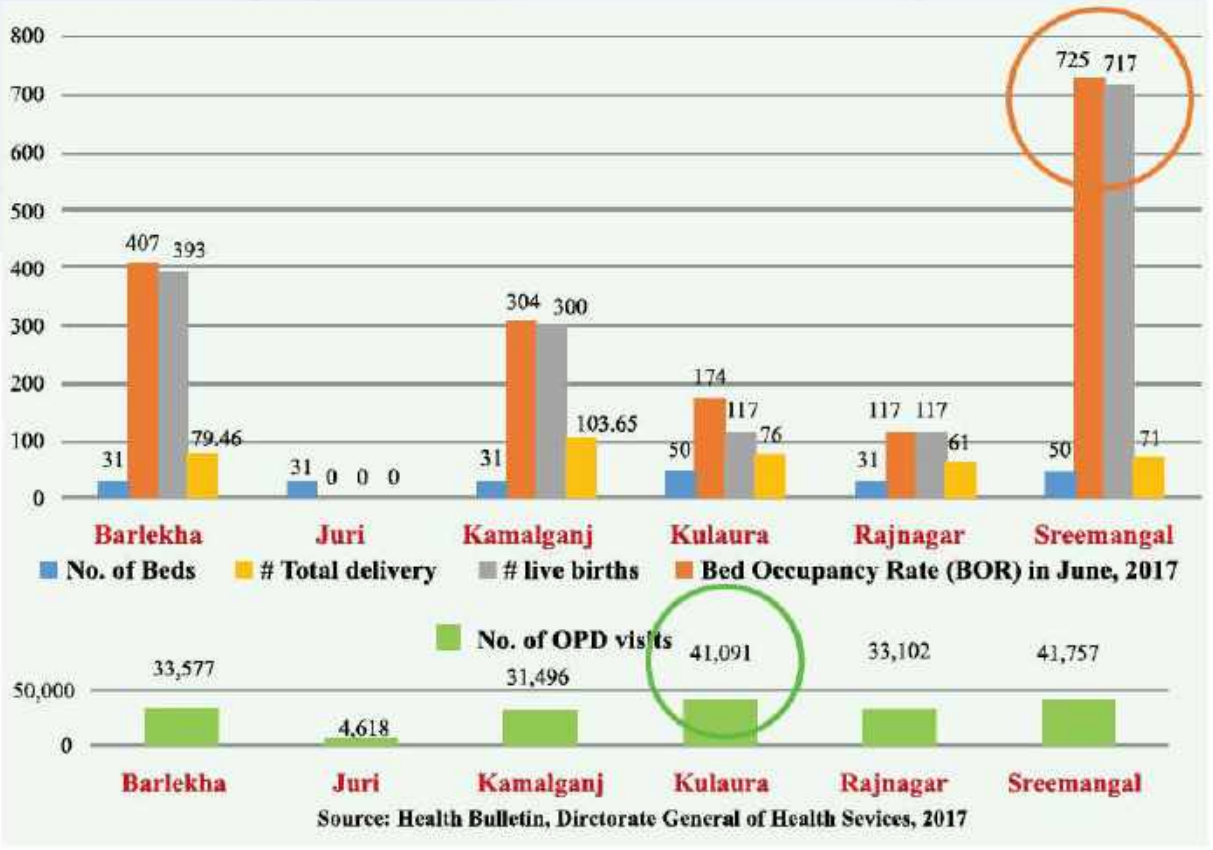
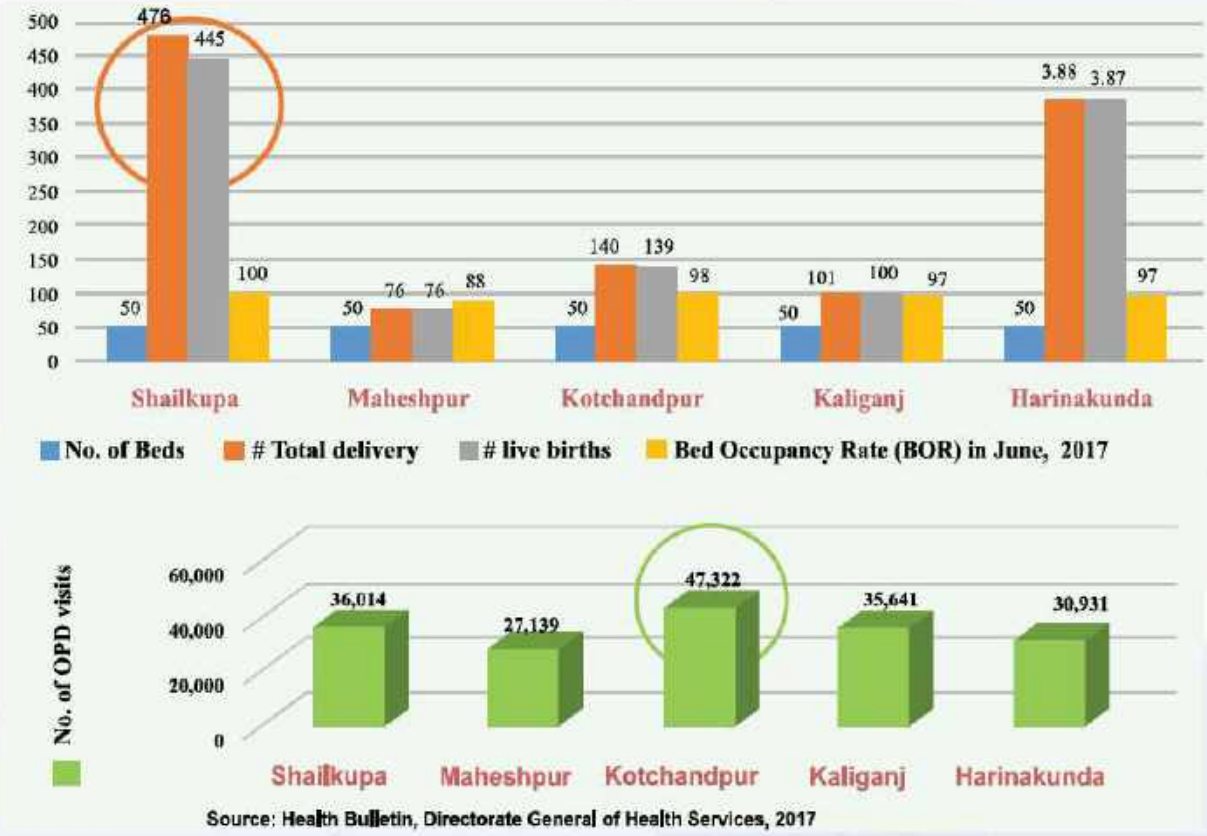


Figure 7. Performance of UpHCs under Moulvibazar district (January to June 2017)



Source: Health Bulletin, Directorate General of Health Services, 2017

Based on the analysis of these indicators, the SC identified the highest performing UpHCs and suggested conducting the study at Shailkupa and Kotchandpur UpHCs in the Jhenaidah district and Kulaura and Sreemangal UpHCs in the Moulvibazar district (Figure 4).

Other health facilities were selected in consultation with local health administrators (such as civil surgeons, Deputy Director-Family Planning, and Upazila health and family planning officers. Based on their suggestions, the following health facilities were finalized for the study (Table 2).

Table 2. List of health facilities selected for the study

DH	UpHC	USC	UHFWC	CC
1. Jhenaidah	1. Shailkupa 2. Kotchandpur	1. Kacherkol 2. Sabdalpur	1. Moharajpur 2. Dudhsammata	1. Khandakbariya 2. Kagmari 3. Kulbaria 4. Korotipara
2. Moulvibazar	1. Kulaura 2. Sreemangal	1. Prithempasha 2. Bhunabir	1. Chandnighat 2. Ashidron	1. Sripur 2. Igragaon 3. Dakkhin Chamatkar 4. Akbarpur

Study population

The study population (i.e.the staff category) was finalized based on the discussion between SC and TT. The 20 selected categories of service providers from different health facilities are shown in Table 3.

Table 3. Facility types and staff categories for the WISN study

Type of facility	Staff category
DH (n=2)	Consultants (surgery, anaesthesiology, obstetrics and gynaecology, ear, nose and throat, medicine, paediatrics, cardiology), general physicians (MO, EMO, RMO), nursing staff (senior staff nurse, nursing supervisor)
MCWC (n=2)	MO, FWV
UpHC (n=4)	General physicians (MO, RMO), nursing staff (senior staff nurse, nursing supervisor), SACMO
USC (n=4)	SACMO
UHFWC (n=4)	SACMO, FWV
CC/outreach (n=8)	CHCP, FWA

Sampling strategy

Qualitative

Documents for the review were selected based on suggestions from experts (members of SC, TTand EWG), supplemented by reference tracking of government reports and published literature on human resources for health of Bangladesh. Key informant interview respondents were selected on the principles of purposive sampling (20), supplemented by snow ball sampling (i.e. based on reference or suggestion from key informants). In-depth interview respondents were selected through purposive sampling, based on the respondent's seniority (assuming better knowledge of activity standards) and designation (such as RMO, nursing supervisors). Where only one member of a staff category was providing servicesata health facility (such as SACMOs in USC, UHFWC; FWVs in UHFWCs; CHCPs in CC; and FWAs in CC), one from each health facility was interviewed.

Quantitative

For the time–motion study, time sampling was done for each consenting staff available during the data collection period. Field data collectors observed each staff twice for a 45-minute duration; once during the first half of their service duration and again during the second half. This was done to minimize any bias in time data due to patient load (assuming higher patient load in the first half and lower in the second). In DHs, however, due to the higher number of staff, a different sampling strategy was adopted. Each service location in the hospital was observed for awhole working day. The locations included: outpatient department (OPD), antenatal/postnatal care (ANC/PNC) room, integrated management of childhood illness (IMCI) corner, emergency room, indoor wards, operation theatre and labor room. In the last two places, direct observation was not possible on ethical grounds; therefore, the field data collectors stood outside the room and recorded the time taken for each procedure with the help a staff serving inside.

Tool development, pretesting, training of data collectors, agreement testing

For qualitative data collection, semi-structured guidelines, including that for document reviews, key informant interviews, in-depth interviewsand observations, were developed. For the time–motion study, a structured observation tool was designed. The structured observation tools contained three sections (see also Annex 3).

1. Background information on observation setting and the person under observation.
2. Time–motion data sheet (containing columns on type of activity, time spent in minutes and remarks).
3. Example of the activities (health service activities, support activities and additional activities).

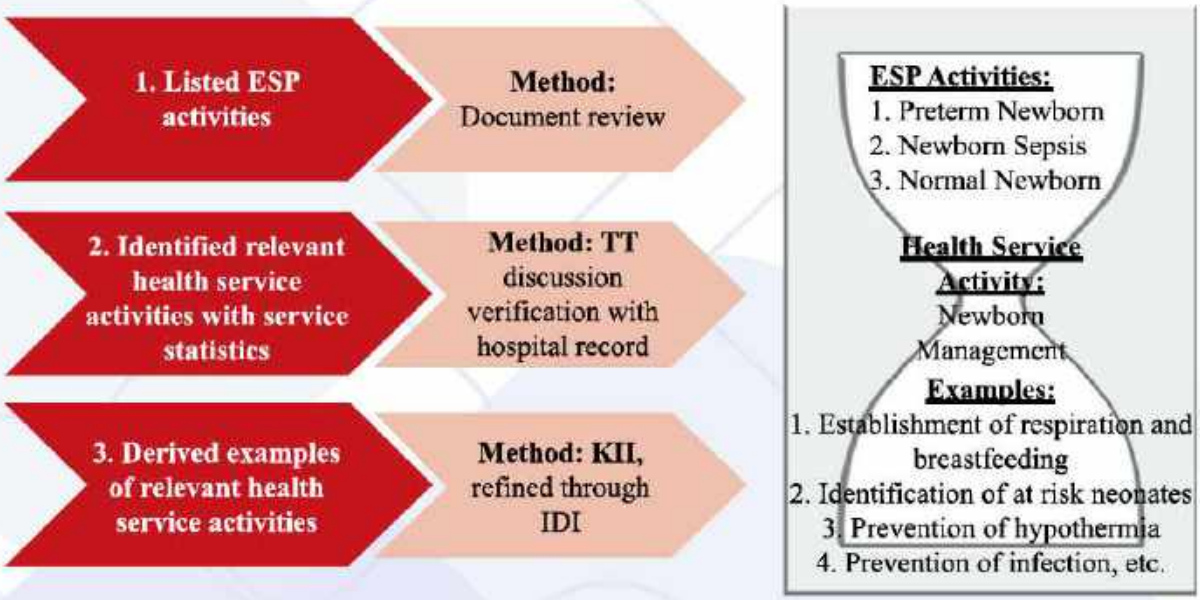
All staff categories performed health service activities (according to the WISN manual) and regular service statistics were available. While all members of the staff category also performed support activities, regular service statistics were not available. Additional activities were performed only by certain members of the staff category (such as the supervisor or a senior member), but regular service statistics were not available (16).

Examples of health service activities were primarily drawn from the list of activities mentioned in the ESP for the respective health facility type (Annex 8) (17). Since service statistics were not available according to the ESP activity list,these were adjusted for the local context with inputs from the respondents (through key informant interviews followed by in-depth interviews), in alignment with the availability of service statistics. An 'hourglass' approach was adopted for defining workload components based on the ESP (Figure 8).

Tools were pretested in Manikganj District Hospital, Manikganj MCWC, and Dhamrai UpHC before actual data collection. Qualitative tools were also pretested through mock in-depth interviews and key informant interviews. Data collectors were trained following the pretesting exercise.

Field supervisors and field data collectors were selected through a competitive process, and only the highest performers were recruited. Field supervisors had completed a master's degree (one in anthropology and the other in linguistics) from reputed universities of Bangladesh, and had experience in health systems research in Bangladesh. Field data collectors were also all highly experienced and had at least a bachelor's degree (most had a master's degree) in various disciplines (such as sociology, statistics, mathematics). They underwent a five-day intensive training, which included WISN methodology, ethical issues, general principles of data collection, specific training on the tools used in this study, and a hands-on training on mobile-based data collection using the SurveyCTO software.

Figure 8. Approach for integration of ESP components in defining workload components of health service activity



KII: key informant interview; IDI: in-depth interview

After the training, the data collectors did a mock data collection. Finally, an agreement test was done, where the two coexperts served as the gold standard. No data collector was allowed to collect data from the field until demonstrating at least 90% agreement with the gold standard.

Data collection and quality control

At first, field supervisors were sent to the respective districts to orient personnel on the project, seek support and assess the availability of service statistics. The field supervisors spent one week in each district, visited the DH and MCWC, as well as the other facilities below the district level (i.e.UpHC, USC, UHFWCand CC). They also conducted qualitative observation of service provision at all health facility levels, to gain a firsthand understanding of the context. They reported back to the principal expert and contributed in the decision process regarding the selection of priority staff categories and health facilities. At the same time, available documents were reviewed and performance indicators (number of beds, number of total delivery, number of live births, bed occupancy rates, and number of outpatient visits) were compiled. These were presented before the SC, which then finalized the priority staff category and health facilities.

In the second step, five key informant interviews were conducted to define workload components, in light of ESP standard of services at the facility level (17) (Annex 8). The workload components were further refined based on in-depth interviews with the service providers at the health facility level (Table 4).

Table 4. Total number of in-depth interviews from both the districts

Health facility	Type of respondent	Number
DH	MO/EMO/RMO	6
	Consultants	16
	Nursing supervisor, senior staff nurse	10
MCWC	MO	2
	FWV	4
UpHC	MO/RMO	8
	Nursing supervisor, senior staff nurse	8
	SACMO	8
USC	SACMO	4
UHFWC	SACMO	4
	FWV	4
CCoutreach	CHCP	8
	FWA	5
	Total	87

In the third step, field data collectors,under the supervision of field supervisors, conducted the time–motion study using a mobile device installed with SurveyCTO software.The time–motion study is a work measurement technique for recording the times and rates of working for the elements of a specific job byobserving a subject continuously or in a certain period of time (18). Field data collectorswere given a package containing the necessary guidelines and tools for data collection. This included an internet-enabled mobile phone/tablet, a time–motion tool, a route guide for their travel to the assigned health facility, a document enumerating steps of data collection, pencil, eraser, sharpener and a notebook. Their mobile was preinstalled with Survey CTO data collection application with the time–motion tool loaded; Google Map application to guide them to their destination; global positioning system application to record the location of data collection; internet connection to upload the data and geo-and time-tagged photos (only for data quality assurance purposes) from health facilities; a built-in camera to take geo- and time-tagged photo of the setting; Drop Box application folder to access updated instructions and daily assignments, if any. After each day's data collection, all field data collectors attended a daily debriefing session individually with the field supervisor. They had to submit consent forms, give an update about the field, and resolve any problems or confusions in data collection and entry. They also attended weekly debriefing sessions with the field supervisors, together with all the field data collectors.

While field data collectors were collecting time–motion data, the field supervisors, in addition to supervising field data collectors, conducted additional in-depth interviews and collected data on available working time; time required for health service, support and additional activities; and service statistics.

The next step was data validation and setting activity standards. Primary data validation was done through phone calls made by the coexperts to the service providers and health facility statisticians. Secondly, these were shared with SC and TT members. Finally, interviews were conducted with EWG membersto finalize activity standards (Table 5). Initially the plan was to use time–motion findings for activity standards. This decision was later revised based on inputs from SC and TT meetings, as well as from key informants. They argued that time–motion data does not reflect the standard scenario, and instead reflects service providers coping with their high workload. Therefore, experts from SC and TT endorsed using information obtained

through in-depth interviews with service providers and key informant interviews, with validation from EWGs. However, time–motion findings were presented to the EWG members with arequest to be as realistic as possible in suggesting activity standards. Finally, through multiple meetings, debates and deliberations, the activity standard was finalized, taking into account information from in-depth interviews and key informant interviews, and inputs from EWG members. Time–motion data served as a guide (i.e. showing the actual time taken for each workload component) only.

Table 5. Number of interviewees representing EWG of staff categories

EWG representing staff category	Number
MO/EMO/RMO	2
Consultants	8
Nursing supervisor, senior staff nurse	7
SACMO, CHCP	1
Family planning (MO, SACMO, FWV, FWA)	2
Total	20

To ensure the quality of data, the principal expert, coexperts, WHO team consisting of national and international technical experts, and representatives from the human resources branch of MoHFW conducted field visits to each study district and the health facilities therein. During the time–motion data collection period, coexperts monitored data and their geographic location in real-time. They also regularly checked the consistency of data. The field-based data collection team saved contact information of all respondents so that coexperts could contact them over the phone later if there was any confusion or need for clarification.

Data management and analysis

The first analytical step was to estimate available working time of the staff. This is the time a health worker has available in one year to do his or her work, taking into account authorized and unauthorized absences (16). For all categories of staff, a uniform number of weeks per year (52 weeks), working days in one week (six days), and possible working days in one year (52 * 6 = 312 days) were estimated. Next, absent days, such as public holidays (20 days), earned leave (average for each staff category, based on Health Management Information System data), and casual leave (20 days) were deducted to obtain the annual working time in days. Multiplying this with daily working hours (six hours per day), the annual working time in hours was obtained (Annex 1).

Workload components were defined through inputs from key informants; activity standards were also set through interviews with EWG members. An activity standard is the time necessary for a well-trained, skilled and motivated worker to perform an activity to professional standards in local circumstances (16). Service standards (for health service activities), category allowance standards (for support activities), and individual allowance standards (for additional activities) were determined in the same way (Annex 1).

The next analytic step was to establish standard workload, which was done by dividing the annual working time by unit time of health service activities. A standard workload is the amount of work within a health services workload component that one health worker can do in a year hypothetically (16). The category allowance factor and individual allowance factor were calculated using the following formulas:

Category allowance factor = 1 / {1 – (total category allowance standard / 100)}

Individual allowance factor = total individual allowance standard / available working time in hours

Next, the exact number of required staff was calculated:

Total required number of staff = (staff needed for health service activity * category allowance factor) + individual allowance factor

The fractional results were rounded up or down, following the guideline provided in the WISN manual (16):

- 1.0 – 1.1 is rounded down to 1 and >1.1 – 1.9 is rounded up to 2
- 2.0 – 2.2 is rounded down to 2 and >2.2 – 2.9 is rounded up to 3
- 3.0 – 3.3 is rounded down to 3 and >3.3 – 3.9 is rounded up to 4
- 4.0 – 4.4 is rounded down to 4 and >4.4 – 4.9 is rounded up to 5
- 5.0 – 5.5 is rounded down to 5 and >5.5 – 5.9 is rounded up to 6

Finally, based on the existing number of staff in the respective health facilities, both the difference (current number of staff – required number of staff by WISN), and the ratio (current number of staff / required number of staff by WISN) were calculated. The WISN difference indicates whether the health facilities are relatively under staffed (i.e. when the WISN difference is negative), overstaffed (i.e. when the WISN difference is positive), or balanced (i.e. when the WISN difference is zero). The WISN ratio indicates whether the staff are experiencing high workload (i.e. when the WISN ratio is lower than one), low workload (i.e. when the WISN ratio is higher than one), or normal workload (i.e. when the WISN ratio is equal to one). For this calculation, the de-facto number of current staff (i.e. the number of staff actually found working in the health facilities during the data collection period; and not the number shown in the office records or statistics) was used.

Ethical considerations

Ethical approval for this study was obtained from the Ethical Review Committee (ERC) of JPGSPH, BRAC University (Annex 5). All ethical principles, such as autonomy, beneficence and justice were strictly adhered to. Appropriate consent process was followed before collecting any research data. Consent was taken from each respondent before conducting the interview and they were informed that the process would take around one hour. Identity of respondents (such as EWG members) was kept confidential.

Results

General WISN findings across levels

For descriptive purposes, workload pressure was categorized as given in Table 6.

Table 6. WISN ratio and workload pressure

WISN ratio	Workload pressure
Between 0.10 and 0.29	Extremely high
Between 0.30 and 0.49	Very high
Between 0.50 and 0.69	High
Between 0.70 and 0.89	Moder ately high
Between 0.90 and 1.19	Normal
Greater than or equal to 1.20	Low

Based on this categorization, at an aggregate level (i.e. considering the average required number and WISN ratio across the same type of health facilities), most of the staff categories were found to have a workload pressure of 'very high' (seven of 20 staff categories), followed by 'extremely high' (five staff categories). Two staff categories had 'high', three had 'moderately high', two had 'normal', and one had 'low' workload. The highest workload was observed among the following staff categories: consultants in medicine (WISN ratio 0.16), paediatrics (WISN ratio 0.20), anaesthesiology (WISN ratio 0.20), obstetrics and gynaecology (WISN ratio 0.25), and surgery (WISN ratio 0.28) (Table 6). Most staff categories in health facilities were found to have 'very high' (17 out of 61 categories in health facilities), followed by 'extremely high' and 'high' (11 out of 61 categories in health facilities, each) workload pressures. These indicated an overall high workload pressure among health service providers (Tables 9–15).

The average gap between currently available number of nurses and required number of nurses at the studied DHs was estimated at 135.92 for each hospital. The gap for the number of physicians was 35.10 for each hospital, and 18.86 for nurses working in UpHCs.

Table 7. Analysis of WISN results at aggregate level (average required number and WISN ratio across same types of health facilities)

Staff category	Required staff to cope with the demand	Average number of existing staff	Deficit of staff	Average WISN ratio	Workload pressure
Consultant (surgery)	7.42	2.00	5.42	0.28	Extremely high
Consultant (anaesthesiology)	4.98	1.00	3.98	0.20	Extremely high
Consultant (obstetrics and gynaecology)	11.00	2.00	9.00	0.25	Extremely high
Consultant (orthopedics)	5.04	2.00	3.04	0.41	Very high
Consultant (ear, nose and throat)	2.82	1.50	1.32	0.67	High
Consultant (medicine)	12.00	2.00	10.00	0.16	Extremely high
Consultant (paediatrics)	7.64	1.50	6.14	0.20	Extremely high
Consultant (cardiology)	4.21	1.50	2.71	0.35	Very high
DH general physician	35.10	11.00	24.1	0.32	Very high
DH nurse	135.92	66.00	69.92	0.49	Very high
MCWC general physician	4.22	2.00	2.22	0.48	Very high
MCWC FWV	5.80	4.50	1.30	0.81	Moderately high
UpHC general physician	10.59	4.50	6.09	0.43	Very high
UpHC nurse	18.86	12.75	6.11	0.69	High
UpHC SACMO	10.43	7.75	2.68	0.75	Moderately high
USC SACMO	2.33	1.00	1.33	0.49	Very high
UHFWC SACMO	1.04	1.00	0.04	1.29	Low
UHFWC FWV	1.18	1.00	0.18	0.85	Moderately high
CC CHCP	1.34	1.00	0.34	0.92	Normal
CC FWA	0.96	1.00	-0.04	1.10	Normal

Tabulating the total percentage of time spent on all support activities (i.e. category allowance standards) by different staff categories, it was found that, nurses in general were the most occupied with support activities (60% in case of DH nurse and 50% for UpHC nurse). Time occupied by support activities were 56% for CC/outreach level FWAs, and 27% for CHCPs. Percentage of support activities was relatively low among consultants, except for obstetrics and gynaecology consultants (24%). Other staff performed moderate level of support activities, ranging from 21% (MCWC general physician and UpHC SACMO) to 39% (UHFWC FWV) (Table 8).

Table 8. Comparison of support activities across staff categories

Staff category	Total % of support activities	Staff category	Total % of support activities
Consultant (surgery)	20%	MCWC general physician	21%
Consultant (anaesthesiology)	15%	MCWC FWV	38%
Consultant (obstetrics and gynaecology)	24%	UpHC general physician	24%
Consultant (orthop aedics)	17%	UpHC nurse	50%
Consultant (ear, nose and throat)	15%	UpHC SACMO	21%
Consultant (medicine)	19%	USC SACMO	25%
Consultant (paediatrics)	17%	UHFWC SACMO	33%
Consultant (cardiology)	17%	UHFWC FWV	39%
DH general physician	28%	CC CHCP	27%
DH nurse	60%	CC FWA	56%

The greatest shortage (i.e. deducting the required number from current number of staff) was observed among consultant category (obstetrics and gynaecology) of Jhenaidah District Hospital (difference -14.63), followed by consultant (medicine) in both DHs (difference -9.07 in Jhenaidah; -10.94 in Moulvibazar). Although workload pressure was very high, it was relatively lower compared to other categories (WISN ratio 0.49 and 0.48 in Jhenaidah and Moulvibazar, respectively); shortage of nursing staff (i.e. senior staff nurse and nursing supervisor) was the highest (WISN difference -64.86 and -74.98 in Jhenaidah and Moulvibazar, respectively) among all staff categories followed by general physicians (MO/EMO/RMO) in DHs (WISN difference -23.29 and -24.90 in Jhenaidah and Moulvibazar, respectively) (Table 9).

Excess staff and normal or low workloads were very uncommon to find, except among UHFWC SACMOs, CC CHCPs and CC FWAs (average WISN ratio 1.29, 0.92, and 1.1, respectively). Excess staff and low workload pressure was observed particularly among CHCPs in four CCs (out of eight): Khandakbaria (WISN difference 0.11; ratio 1.12), Kulbaria (WISN difference 0.23; ratio 1.37), Dakkhin Chamatkar (WISN difference 0.12; ratio 1.14), and Akbarpur (WISN difference 0.14; ratio 1.16) as seen in Table 14; and FWAs in four CCs (out of five): Khandakbaria (WISN difference 0.25; ratio 1.33), Korotipara (WISN difference 0.15; ratio 1.18), Sripur (WISN difference 0.04; ratio 1.04), and Dakkhin Chamatkar (WISN difference 0.21; ratio 1.27) as seen in Table 15.

WISN results from district level

The required number of staff in all categories was consistent across both DHs. The highest number of consultants was required in obstetrics and gynaecology at Jhenaidah District Hospital

(16.63), followed by medicine in Moulvibazar District Hospital (12.94). Highest shortage was observed for nurses (-69.92 on average in each hospital), followed by general physicians (-24.10 on average in each hospital). Almost 15 additional obstetrics and gynaecology consultants were required to tackle the current load in Jhenaidah District Hospital. The highest workload pressure was observed among them as well (WISN ratio 0.12) (Table 9).

Table 9. Analysis of WISN results of district level health staff

Health facility	Current number of staff	Required number, based on WISN	Shortage or excess	WISN ratio	Workload pressure
Staff category: consultant (surgery)					
Jhenaidah District Hospital	2	6.23	-4.23	0.32	Very high
Moulvibazar District Hospital	2	8.6	-6.6	0.23	Extremely High
Staff category: consultant (anaesthesiology)					
Jhenaidah District Hospital	1	5.08	-4.08	0.20	Extremely high
Moulvibazar District Hospital	1	4.89	-3.89	0.20	Extremely high
Staff category: consultant (obstetrics and gynaecology)					
Jhenaidah District Hospital	2	16.63	-14.63	0.12	Extremely high
Moulvibazar District Hospital	2	5.37	-3.37	0.37	Very high
Staff category: consultant (orthopaedics)					
Jhenaidah District Hospital	2	4.2	-2.2	0.48	Very high
Moulvibazar District Hospital	2	5.98	-3.98	0.34	Very high
Staff category: consultant (ear, nose and throat)					
Jhenaidah District Hospital	2	1.87	-0.13	1.07	Normal
Moulvibazar District Hospital	1	3.76	-2.76	0.27	Extremely high
Staff category: consultant (medicine)					
Jhenaidah District Hospital	2	11.07	-9.07	0.18	Extremely high
Moulvibazar District Hospital	2	12.94	-10.94	0.15	Extremely high
Staff category: consultant (paediatrics)					
Jhenaidah District Hospital	1	7.86	-6.86	0.13	Extremely high
Moulvibazar District Hospital	2	7.42	-5.42	0.27	Extremely high
Staff category: consultant (cardiology)					
Jhenaidah District Hospital	1	3.23	-2.23	0.31	Very high
Moulvibazar District Hospital	2	5.19	-3.19	0.39	Very high
Staff category: medical officer/emergency medical officer/residential medical officer					
Jhenaidah District Hospital	11	34.29	-23.29	0.32	Very high
Moulvibazar District Hospital	11	35.90	-24.90	0.31	Very high
Staff category: senior staff nurse/nursing supervisor					
Jhenaidah District Hospital	62	126.86	-64.86	0.49	Very high
Moulvibazar District Hospital	70	144.98	-74.98	0.48	Very high

For family planning too, the required number of staff was consistent across both the DHs. However, the WISN ratio was higher among FWVs of Moulvibazar MCWC, due to their lower numbers in this health facility (three, as opposed to six in Jhenaidah MCWC). 'Very high' workload pressure was observed among all staff categories, except for FWVs in Jhenaidah MCWC (Table 10).

Table 10. Analysis of WISN results of district level family planning staff

Health facility	Current number of staff	Required number, based on WISN	Shortage or excess	WISN ratio	Workload pressure
Staff category: medical officer (clinic)/ medical officer (maternal and child health)					
Jhenaidah Maternal and Child Welfare Centre	2	4.17	-2.17	0.48	Very high
Moulvibazar Maternal and Child Welfare Centre	2	4.26	2.26	0.47	Very high
Staff category: family welfare visitor					
Jhenaidah Maternal and Child Welfare Centre	6	5.61	0.39	1.07	Normal
Moulvibazar Maternal and Child Welfare Centre	3	6.71	-3.71	0.45	Very high

WISN results from Upazila level

The required number of staff ranged from eight to 12 among general physicians, 16 to 23 among nurses, and nine to 14 among SACMOs. Highest numbers of staff were required in nursing (19.22 on average in each UpHC). Highest shortage was observed for nursing personnel of Sreemangal UpHC (-8.46), followed by general physicians of Kulaura UpHC (-8.28). Workload pressure was the highest among general physicians of Kotchandpur UpHC (WISN ratio 0.28) and lowest among SACMOs of Shailkupa (WISN ratio 1.48) (Table 11).

Table 11. Analysis of WISN results of Upazila level health staff

Health facility	Current number of staff	Required number, based on WISN	Shortage or excess	WISN ratio	Workload pressure
Staff category: medical officer/residential medical officer					
Shailkupa Upazila Health Complex	4	8.14	-4.14	0.49	Very high
Kotchandpur Upazila Health Complex	3	10.71	-7.71	0.28	Extremely high
Kulaura Upazila Health Complex	4	12.28	-8.28	0.33	Very high
Sreemangal Upazila Health Complex	7	11.23	-4.23	0.62	High
Staff category: senior staff nurse/nursing supervisor					
Shailkupa Upazila Health Complex	14	16.08	-2.08	0.87	Moderately high
Kotchandpur Upazila Health Complex	15	22.80	-7.8	0.66	High
Kulaura Upazila Health Complex	10	16.08	-6.08	0.62	High
Sreemangal Upazila Health Complex	12	20.46	-8.46	0.59	High
Staff category: sub assistant community medical officer					
Shailkupa Upazila Health Complex	15	10.15	4.85	1.48	Low
Kotchandpur Upazila Health Complex	7	13.81	-6.81	0.51	High
Kulaura Upazila Health Complex	3	9.16	-6.16	0.33	Very high
Sreemangal Upazila Health Complex	6	8.59	-2.59	0.70	Moderately high

WISN results from Union level

The required number of SACMOs was consistent in all USCs (1.52–1.95) except Prithempasha (3.97). Both staff shortage and workload pressure were the highest in the same USC (WISN difference -2.97 and ratio 0.25) (Table 12).

Table 12. Analysis of WISN results of Union level health staff

Health facility	Current number of staff	Required number, based on WISN	Shortage or excess	WISN ratio	Workload pressure
Staff category: sub assistant community medical officer					
Kacherkol Union sub centre	1	1.95	-0.95	0.51	High
Sabdalpur Union sub centre	1	1.52	-0.52	0.66	High
Prithempasha Union sub centre	1	3.97	-2.97	0.25	Extremely high
Bhunabir Union sub centre	1	1.88	-0.88	0.53	High

For family planning, the required number of staff was consistent across all UHFWCs. There was no shortage of SACMOs in Dudhshammata UHFWC in Jhenaidah district. Workload pressure was 'moderately high' in most places, and even 'low' among SACMOs of Dudhshammata UHFWC of Jhenaidah, and Ashindron UHFWC of Moulvibazar (Table 13).

Table 13. Analysis of WISN results of Union level family planning staff

Health facility	Current number of staff	Required number, based on WISN	Shortage or excess	WISN ratio	Workload pressure
Staff category: sub assistant community medical officer					
Moharajpur Union Health and Family Welfare Centre	1	1.64	-0.64	0.61	High
Dudhshammata Union Health and Family Welfare Centre	1	0.45	0.55	2.22	Low
Chandnighat Union Health and Family Welfare Centre	1	1.16	-0.16	0.86	Moderately high
Ashidron Union Health and Family Welfare Centre	1	0.61	0.39	1.64	Low
Staff category: family welfare visitor					
Moharajpur Union Health and Family Welfare Centre	2	1.21	-0.21	0.83	Moderately high
Dudhshammata Union Health and Family Welfare Centre	1	1.21	-0.21	0.83	Moderately high
Chandnighat Union Health and Family Welfare Centre	1	1.46	-0.46	0.68	High
Ashidron Union Health and Family Welfare Centre	1	1.13	-0.13	0.88	Moderately high

WISN results from community/outreach level

At CCs, the required number of CHCPs was consistent (0.73–1.88), except in Igragaon (3.14). CHCPs in two CCs in Jhenaidah district (Khandakbaria and Kulbaria), and two in Moulvibazar district (Dakkhin Chamatkar and Akbarpur) had 'normal' or even 'low' workload pressure (1.12, 1.37, 1.14 and 1.16, respectively) (Table 14).

Table 14. Analysis of WISN results of community level health staff

Health facility	Current number of staff	Required number, based on WISN	Shortage or excess	WISN ratio	Workload pressure
Staff category: community health care provider					
Khandakbaria Community Clinic	1	0.89	0.11	1.12	Normal
Kagmari Community Clinic	1	1.15	-0.15	0.87	Moderately high
Kulbaria Community Clinic	1	0.73	0.23	1.37	Low
Korotipara Community Clinic	1	1.88	-0.88	0.53	High
Sripur Community Clinic	1	1.19	-0.19	0.84	Moderately high
Igragaon Community Clinic	1	3.14	-2.14	0.32	Very high
Dakkhin Chamatkar Community Clinic	1	0.88	0.12	1.14	Normal
Akbarpur Community Clinic	1	0.86	0.14	1.16	Normal

For family planning, the required number of FWAs was consistent across all five CCs. FWAs in two CCs in Jhenaidah district (Khandakbaria and Korotipara), and two in Moulvibazar district (Sripur and Dakkhin Chamatkar) had'normal'or even 'low'workload pressure (1.33, 1.18, 1.04 and 1.27, respectively) (Table 15).

Table 15. Analysis of WISN results of community/outreach level family planning staff

Health facility	Current number of staff	Required number, based on WISN	Shortage or excess	WISN ratio	Workload pressure
Staff category: family welfare assistant					
Khandakbaria Community Clinic	1	0.75	0.25	1.33	Low
Kagmari Community Clinic	No FWA				
Kulbaria Community Clinic	No FWA				
Korotipara Community Clinic	1	0.85	0.15	1.18	Normal
Sripur Community Clinic	1	0.96	0.04	1.04	Normal
Igragaon Community Clinic	1	1.43	-0.43	0.70	Moderately high
Dakkhin Chamatkar Community Clinic	1	0.79	0.21	1.27	Low
Akbarpur Community Clinic	No FWA				

Change of workload if vacancies are filled

During the study period, many posts were found vacant in various health facilities. Some staff were not present at their service location for various reasons. For example, according to the standard setup document of the Ministry of Public Administration, 18 physician posts (10 junior consultants, one residential MO, seven assistant surgeons) were proposed for a 50-bed hospital (21). On average 4.5 general physicians (MO/RMO) were found in each UpHC (Table 11), even though the average required number was 11 (Table 7). Traditionally, if vacant posts are filled up, understandably, the workload would reduce. However, only filling up vacant posts is not enough for some staff categories, such as the consultants (not shown in the table), general physicians and nurses at the DH because the WISN ratio still remains significant against the number of sanctioned posts (Table 16).

Table 16. Change of workload if vacancies in physician and nursing posts are filled

Health facility	Staff category	Current number of staff	Required number, based on WISN	WISN ratio	Sanctioned number of staff	WISNratio as per sanctioned number of staff
Jhenaidah District Hospital	General physician	11	34.29	0.32	16	0.47
	Nursing staff	62	126.86	0.49	80	0.63
Moulvibazar District Hospital	General physician	11	35.90	0.31	16	0.44
	Nursing staff	70	144.98	0.48	80	0.55
Shailkupa Upazila Health Complex	General physician	4	8.14	0.49	10	1.25
	Nursing staff	14	16.08	0.87	21	1.31
Kotchandpur Upazila Health Complex	General physician	3	10.71	0.28	20	1.82
	Nursing staff	15	22.80	0.66	20	0.87
Kulaura Upazila Health Complex	General physician	4	12.28	0.33	20	1.67
	Nursing staff	10	16.08	0.62	26	1.62
Sreemangal Upazila Health Complex	General physician	7	11.23	0.62	10	0.91
	Nursing staff	12	20.46	0.59	22	1.10

Time–motion study results

Time–motion data clearly indicates that there was a discrepancy between activity standard and real practice. For example, activity standard for major surgical management for a consultant (surgery) in a DH was 150 minutes, but in reality, it took only 84 minutes on average. Activity standard for cesarean section by a MO working in a MCWC was 60 minutes, but in reality, it took less than half of the standard time, on an average. Providing consultation and counselling, and disbursing non-interventional family planning methods (such as pills, condoms, injections, which are done in OPD setting) by an FWV working at an UHFWC should ideally take 25 minutes. In reality though, this took even less than a fifth of the standard time.

Interestingly, according to time–motion data, time required for the same activity varied when performed by different staff categories or at different health facilities. For example, time for OPD services ranged from 1.02 minutes (DH general physician) to 4.22 minutes (UHFWC SACMO). There was a large variation in ANC and PNC times as well, without any predictable pattern across different professional groups, levels (such as at district, Upazila), or sectors (such as health and family planning). IMCI was provided by 12 different staff categories. Timings ranged from 1.32 minutes (DH general physician) to 6.43 minutes (UHFWC SACMO). For family planning, non-interventional family planning services (such as distribution of pills, condoms, injections) at the OPD took 3.08 minutes (MCWC FWV) to 8.73 minutes (CC FWA) per patient (Annex 4).

Discussion and conclusion

Discussion

This WISN study clearly indicated that public sector health care providers at the district level and below in Bangladesh, in general, were experiencing very high workload pressure (seven out of 20 staff categories under study had WISN ratio between 0.30 and 0.49). The most overworked staff were DH consultants (most notably in medicine, paediatrics, anaesthesiology, obstetrics and gynaecology, and surgery). This study also indicates that the highest number of staff required were nurses at both DH and UpHC, and general physicians at the DH. Nurses were predominantly occupied with support activities rather than actual nursing care. The time–motion study revealed a large discrepancy between the activity standard and the actual time spent per interaction with patients. Interestingly, the time spent also varied across the different staff categories (such as consultant, general physician and nurse), while delivering the same services (such as OPD service, IMCI or ANC/PNC).

Workload and varying time for an activity

High workload pressure may arise from absolute or relative shortage of health workforce. Absolute shortage appears when there is inadequate number of a particular staff category. For example, in Bangladesh there were only 4.90 registered physicians and 2.90 registered nurses per 10 000 population (19), rendering the country to be one of the 57 critical workforce shortage countries in the world (6). Relative shortage appears, when the health workforce is not distributed evenly between urban and rural areas throughout the country for various reasons. In addition to absolute shortage, Bangladesh also experiences relative shortage, as evidenced from the fact that the physician to population ratio in urban areas is 1:1500, but in rural areas it is 1:15 000 (22). Workload pressure has some serious consequences as well, such as fatigue and burnout of service providers, lack of motivation and compromised quality of care (23,24). High workload is, however, not unique to Bangladesh. WISN studies in low- and middle-income countries, such as Burkina Faso (25), Iran (26), Kenya (27), Namibia (28) and Uganda (29) have also identified high workload pressure.

This study also found that the same service was delivered at varying times across different levels. Plausibly, the time required to deliver the same service may legitimately vary across the context of service provision. However, some services have standard times, established through numerous studies. For example, a well-done IMCI service typically takes about eight minutes in a low- and middle-income country setting (30). ANC and PNC services also have similar standards of 15–20 minutes (31). The standard for a first family planning visit was 15 minutes and revisit was 10 minutes per patient in a study conducted in Namibia (28). Unfortunately,

none of the staff categories in this study succeeded in meeting those standards. The varying times for these standard types of services may be due to varying degree of training and/or motivation. It is important to note that no standard time has been formally specified for any staff category to carry out any workload component by the GoB. Therefore, in the current scenario, service providers cannot be singled out for not meeting the standard, since no standard has yet been defined. Nevertheless, the determinants of this timing variability warrant further exploration.

Recommendations

Based on the findings and discussion, a few short-term and long-term recommendations are proposed. Short-term recommendations require administrative or management decisions, which are relatively easier to implement totackle the immediate crisis. Long-term recommendations however demand more substantive policy amendments following careful examination.

Short-term recommendations

1. **Reallocate staff from low workload areas to high workload areas:** While most of the staff is overworked, staff in some health facilities may be more so compared to a neighbouring one. In places where workload of a staff category is 'extremely high', some support from nearby health facilities with lower workload should be sought. Or, in places where workload of a staff category is 'normal' or 'low', some support may be transferred to health facilities with higher workload. For example, in Shailkupa UpHC, there are 15 SACMOs, with an excess supply of almost five. Workload is 'low'with a WISN ratio of 1.48. Conversely, in nearby Kotchandpur UpHC, there are seven SACMOs, with a shortage of -6.81. Workload is 'high'with WISN ratio of 0.51 (Table 10). At least five SACMOs from Shailkupa can be reallocated to Kotchandpur to tackle the high workload.
2. **Fill-up existing vacant positions and strengthen supervision and monitoring:** Many posts remained vacant in different health facilities. Some staff were not present at their service location for various reasons. If the existing posts were filled-up, a large portion of the workload would be curbed. It is proposed that, even if it were not possible to reach the ideal workforce setup for a health facility, filling-up at least the vacant positions, and ensuring regular presence of all staff would reduce some workload. This may be assisted by supportive supervision and monitoring to ensure the presence of posted staff.
3. **Change the current scope of work to ensure that nurses deliver clinical care:** As evidenced from WISN results, nurses are the most needed staff, one of the most overloaded, and short in supply. They are also burdened with support activities. If some of their support and additional activities can be shifted to other staff, nurses can devote their time better toactual nursing as well as clinical care (see long-term recommendation #3).
4. **Enable task shifting to reduce consultant workload:** Consultants, especially those in medicine, paediatrics, anaesthesiology, obstetrics and gynaecology, and surgery undergo 'extremely high' workload pressure; and their tasks may be shifted to other staff based on proper review of the workload. General physicians, nurses and midwives may be engaged in some of the tasks that consultants currently undertake. Since the GoB is currently developing a midwifery cadre and recruiting them in larger numbers, they may be engaged to execute some of the current functions performed by obstetrics and gynaecology consultants.

5. **Set up national level activity standards (for health services):** Agreeing to national activity standards was found to be an urgent need while conducting this study because the WISN ratio is calculated based on the difference between actual time spent and the standard time supposed to be spent for accomplishment of a particular activity. Therefore, a national level activity standard would be helpful to determine WISN ratio acceptable to all concerned. Based on the results of the study, steps can be taken to establish an agreed list of activity standards. This will help assess workload and recommend staffing norms while designing the respective 'table of organogram and equipment' of various facilities.

Long-term recommendations

1. **Improve quantity and quality of service providers:** As discussed, nurses are in short supply and the quality of their work is also compromised due to high workload. Therefore, a long-term policy response is needed to increase the intake of nursing students, train them with quality education, and deploy them in large numbers in a secure and gender-friendly work environment across the country as per need. Incentives should be given to increase the number of nurses in both public and private sector educational institutions. Regulations should be developed and implemented so that medical colleges can be established only when a nursing school is established alongside. Otherwise, the skill-mix imbalance between physicians and nurses will jeopardize the quality of care in Bangladesh.
2. **Ensure flexible recruitment and human resources for health planning, based on patient load and disease burden:** Bangladesh inherited a rigid administrative and public financing structure from the colonial era. This structure has contributed to human resources based on a 'one-size-fits-all' decision-making approach. However, decisions in the health sector should be very much contingent to the local context, especially patient load, demographic drivers (such as age structure of the population, gender ratio), and epidemiological profile. Therefore, there should be a gradual policy shift towards flexible human resources for health planning and recruitment in keeping with local needs. There should be routine review of these decisions and human resources for health management decisions should be amended regularly, based on review results which are informed by new evidence.
3. **Create separate staff category for administrative/support activities and medico-legal issues:** Apparently, a large amount of staff workload especially that of nurses, is due to administrative paperwork and support activities. This calls for the development of additional workforce to carry out administrative work on behalf of clinical service providers. A large amount of time is spent in handling medico-legal issues, conflict resolution, signature and attestation, online data entry, among others. Therefore, a group of clerical or support staff should be developed to carry out only these activities, freeing up valuable yet scarce clinical time of service providers.
4. **Train district officers on WISN for evidence-based decision making:** District officers are strongly recommended to be trained in WISN methodology and application so that data can be used for making better management decisions based on workload and staffing needs.

5. **Review staffing norms based on health facility workload:** Although filling up vacant posts can improve the workload situation, in many cases this is not helpful. In DHs, even if all sanctioned posts for consultants, general physicians and nurses, were to be filled up, the WISN ratio would not be 'normal'(i.e.between 0.90 and 1.19). Therefore, policy makers should review staffing norms of health facilities based on that facility's workload and other criteria (such as socio-economics, disease burden and demography), and make decisions specific to the individual local context. The culture of bottom-up decision-making should be adopted eventually.

Strengths and limitations

Despite careful planning and diligent implementation of the research, there were challenges during various stages of the WISN process. Firstly, some service statistics data, which were essential for establishing standard workloads, were unavailable (such as OPD visit data for DH consultants, separate follow-up ANC data below the Upazila level). Secondly, the official number of existing staff often did not match with the number of staff observed providing services (such as SACMOs, despite being posted at USCs, provide service at the UpHC for three days a week). Thirdly, some staff did not provide services according to their designation or post (such as male nurses provide service as SACMOs and even do not often admit that they are nurses). This often caused confusion among data collectors and appropriate strategies were needed to deal with these issues during data collection and analysis.

This study had some strengths: firstly, it was conducted as a time–motion study, which helped the research team gain a better understanding of the service context of the staff; secondly, when the key informants or experts suggested an unrealistic activity standard, time–motion findings were presented which helped them suggest more context-sensitive standards. This study benefitted from multiple field visits by national and international technical experts of WHO, the research team (principal expert and coexperts), and high-ranking officials of the MoHFW. This enormously helped in data acquisition and improved ownership of stakeholders over the study and data quality.

Conclusion

Human resource management is a significant challenge, especially in a resource-poor setting like Bangladesh. With a vision of becoming a middle-income country by 2021, Bangladesh needs to strive for optimizing its existing resources, including human resources for the health sector. The current study would aid policy decision-making in this direction, because it did not limit itself by remarking that the staff were overloaded, but rather pin-pointed which staff categories were affected the most and in which health facilities. Quantifiable measures of workload and staff shortage were also proposed. However, further research is needed for determining the workload of several other health and family planning service providers, especially in hard-to-reach areas. WISN should be incorporated as a planning tool for managers at the district level. Implementation research should be carried out with regard to how workload-based staffing decisions can be integrated into health systems in the most effective way. These types of studies are expected to pave the way for evidence-based human resources for health decision-making in the context of Bangladesh.

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Annexes

Annex 1: Institution full reports

[Sample only, all such reports are submitted separately as PDF files]

KacherkolUnion sub centre (USC)

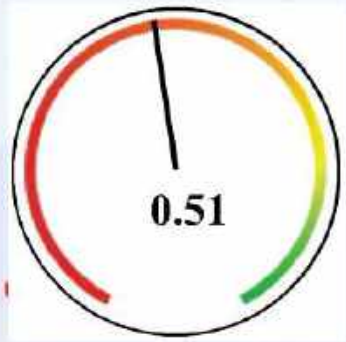
Institution type:	Primary care institution	**Country:**	Bangladesh
Institution description:	USC	**Region/Province:**	Khulna
Property	Public	**District:**	Jhenaidah

MEDICAL PRACTITIONERS

SACMO

Available working time	
Working days per week	6.00
Working hours per day	6.00
Annual leave	0
Public holidays	20.00
Sick leave	20.00
Special no notice leave	0
Training days per year	0
Nonworking days	40.00
Nonworking weeks	6.67
Working days	271.98
Working weeks	45.33
No. of hours	1631.88

WISN ratio



Existing staff	Annual salary	Total staff requirement	Difference in staff
1	433800	1.95	-0.95

Total salary cost	"True" cost	Difference
433800	845910	-412110

Activities related with service statistics

Activity name	No.per year	Service standard	Unit	Standard workload	Calculated requirement
IMCI/nutritional service	310	15	minutes/patient	6527.52	0.05
OPD service (including noncommunicable disease (NCD) management)	13043	10	minutes/outpatient	9791.28	1.33
ANC	408	15	minutes/patient	6527.52	0.06
PNC	102	15	minutes/patient	6527.52	0.02

Activities not related with service statistics
Category allowance standard

Activity	Workload	Unit	Service Standard
Additional duties outside health sector (such as examination duty, mobile court, games, election.)	4.41	days/year	0.02
Bring medicine from Upazila	5.25	hours/month	0.04
Maintain/manage the store	0.75	hours/week	0.02
Monthly meeting at Upazila	3.25	hours/month	0.02
National day celebration	1.33	days/year	0.00
Online data entry of monthly reports	3.88	hours/month	0.03
Participate in training/seminar/workshop/conference	2	days/year	0.01
Record keeping (daily)	30	minutes/day	0.08
Social and behaviour change communication	1	hours/week	0.03
	Total category allowance		0.25
	Category allowance factor		1.34

Individual allowance standard

Activity	No. of staff	Workload	Unit	Service standard
	Total individual allowance			
	Individual allowance factor			0.00

Annex 2: Summary institutions report

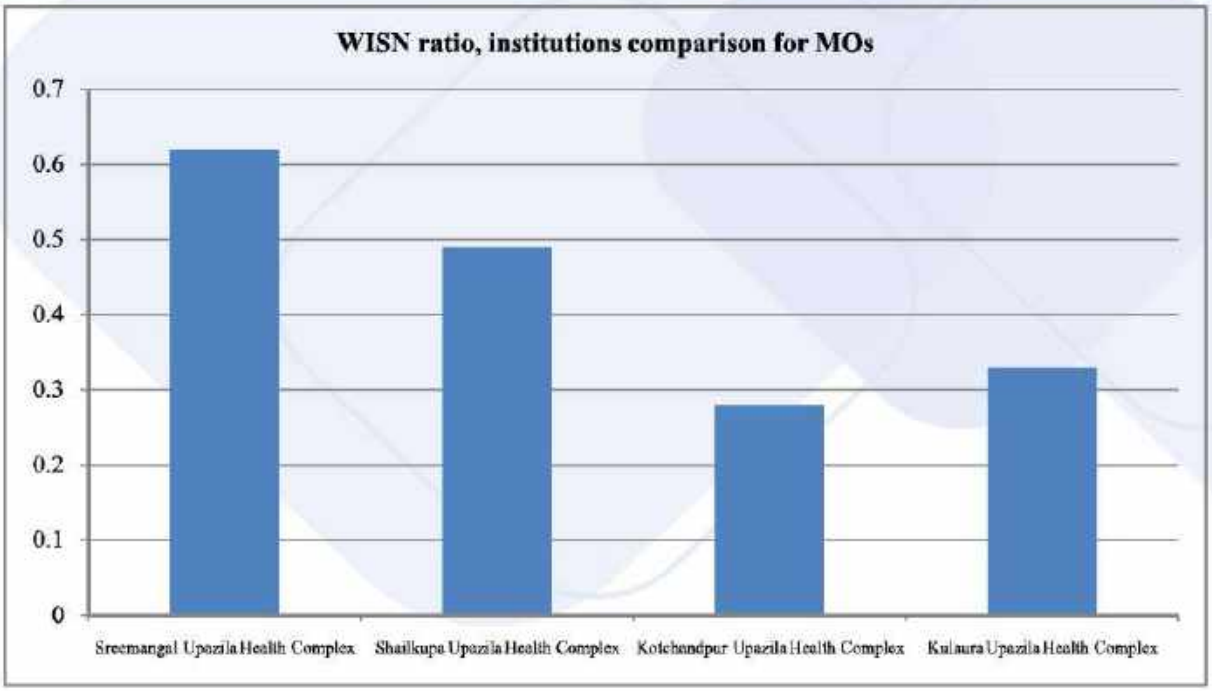
[Sample only, all such reports are submitted separately as PDF files]

Summary institutions report of four Upazila health complexes

MEDICAL PRACTITIONERS

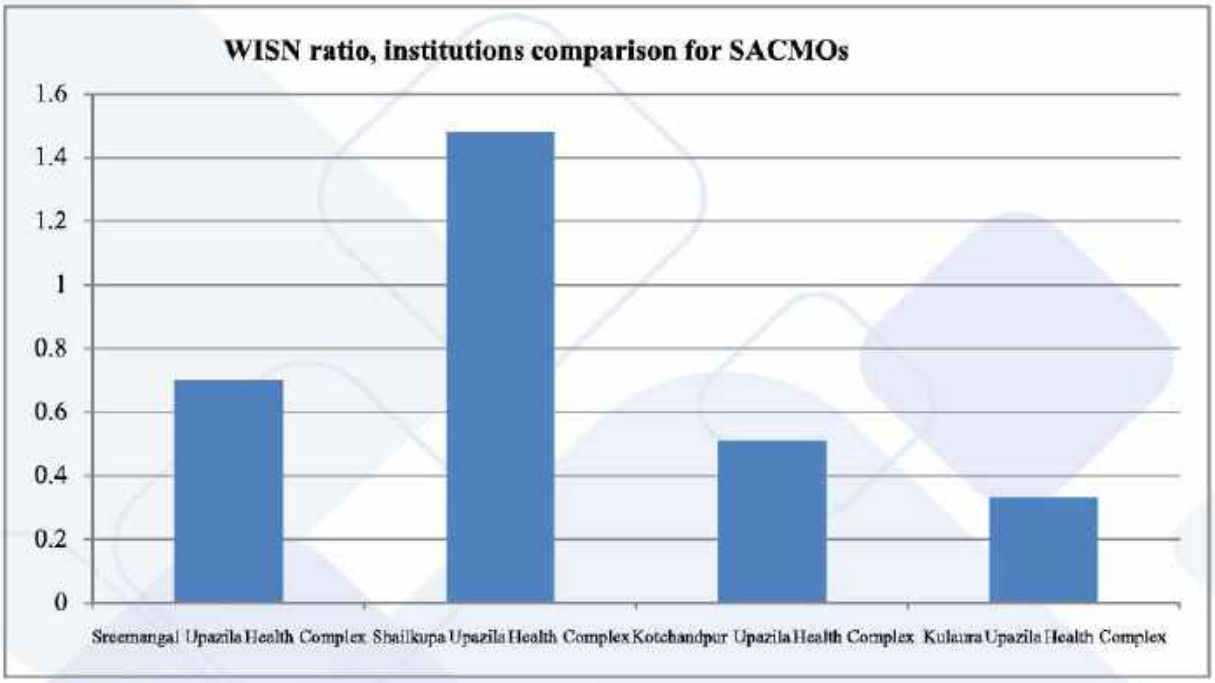
MO

Institution name	Existing staff	Calculated requirement	WISN ratio
Sreemangal Upazila Health Complex	7.0	11.23	0.62
Shailkupa Upazila Health Complex	4.0	8.14	0.49
Kotchandpur Upazila Health Complex	3.0	10.71	0.28
Kulaura Upazila Health Complex	4.0	12.28	0.33
Average	**4.5**	**10.59**	**0.43**



SACMO

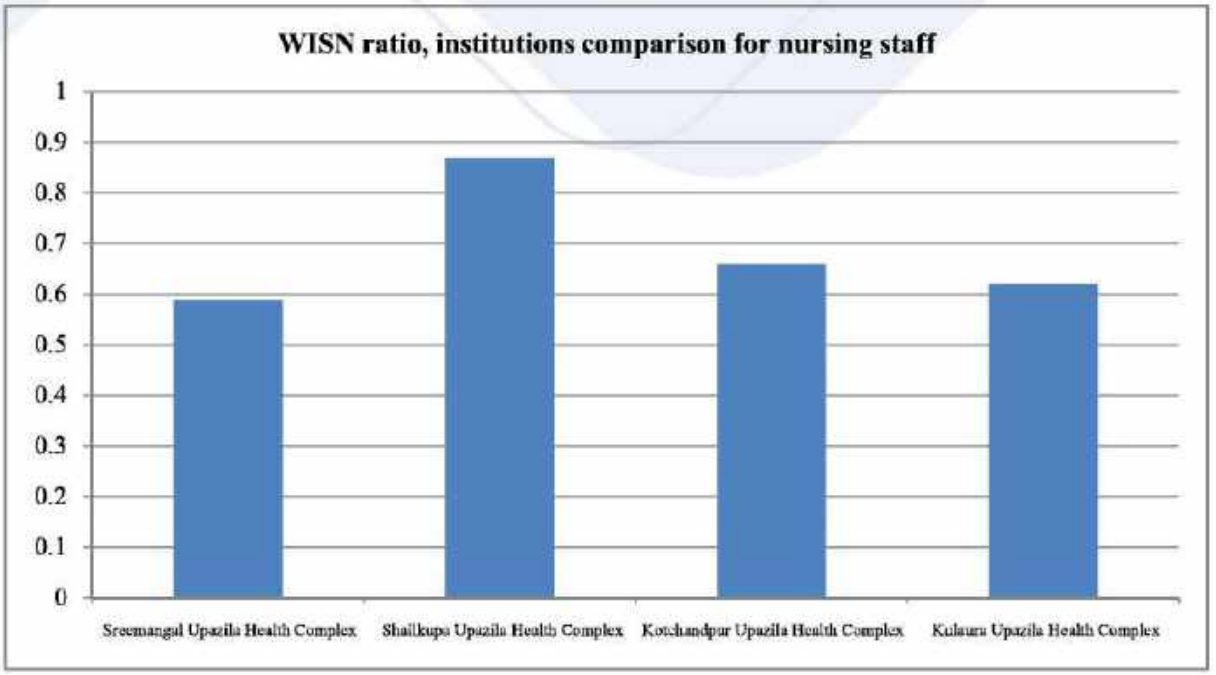
Institution name	Existing staff	Calculated requirement	WISN ratio
Sreemangal Upazila Health Complex	6.0	8.59	0.70
Shailkupa Upazila Health Complex	15.0	10.15	1.48
Kotchandpur Upazila Health Complex	7.0	13.81	0.51
Kulaura Upazila Health Complex	3.0	9.16	0.33
Average	**7.75**	**10.43**	**0.75**



NURSES

Nursing staff

Institution name	Existing staff	Calculated requirement	WISN ratio
Sreemangal Upazila Health Complex	12.0	20.46	0.59
Shailkupa Upazila Health Complex	14.0	16.08	0.87
Kotchandpur Upazila Health Complex	15.0	22.8	0.66
Kulaura Upazila Health Complex	10.0	16.08	0.62
Average	**12.75**	**18.86**	**0.69**



Annex 3: Tools and consent forms

Qualitative tools

Guideline for key informant interviews

Study title: **Assessment of staffing need through workload analysis in two selected districts (Jhenaidah and Moulvibazar) in Bangladesh**

Name of respondent/data source:	
Present designation:	Department:
Facility/programme:	
Contact detail:	
Mobile number:	Email ID:
Age:	Sex:
Date of interview:	
Name of interviewer:	

A. Available working time
(It is mandatory to mention a specific year/duration for each question)

1. Number of possible working days in a calendar year of a health service provider (physician/nurse/ SACMOs/CHCP/FWV/FWA)
2. Number of days off for public holidays in a year
3. Number of days off for annual leave in a year
4. Possible number of days off due to sick leave in a year
5. Number of days off due to other leave, such as training, in a year
6. Average working hours in a day
7. Available working days in a week
8. Available working weeks in a year.

B. Workload components (including essential service package (ESP))
(Do not go into detail on this while interviewing policy level key informants)

1. Health service activities (including ESP) for a health service provider (physician/nurse/SACMOs/CHCP/FWV/FWA) (such as attending patients at OPD, managing emergency patients, managing patients in in-patient department; with details and duration, if possible).
2. Support activities of a health service provider (physician/nurse/ SACMOs/CHCP/ FWV/FWA) (such as filling out patient records, log-books, signing/attesting certificates).
3. Additional activities of a health service provider (physician/nurse/SACMOs/ CHCP/FWV/FWA) (such as supervising other staff, attending meetings).
4. Any other services that they may provide, in addition to those mentioned above.

C. Data source/availability of recoded documents
(Do not go into detail on this while interviewing policy level key informants)

1. How can we get the information of a provider's attendance? Is there any register book where attendance is recorded?

2. Could you please help us to get the information regarding available working days of a provider?
3. Is there any documentation of provider's leave days?
4. Is there any official document of training days (leave) of a service provider? Are those days counted as available working days?
5. Is there any register book for any service activities? (If yes, then have to ask if there is a document for a specific service and also for the respective department)
6. Is there any computer database (regarding service activities and attendance)? (It is mandatory to ask for each type of health facility from district level to CC)
7. Is there any other source of data of health service activities? (Please specify)
8. Could you please tell us how we can know the details of each type of activity?

D. Opinion regarding the health workforce's workload

(More emphasis on this section for policy level respondents)

1. What is your opinion regarding the workload of a provider? Are they over-loaded? (If yes, how?) (for each type of facility and provider)
2. Are they under-loaded (If yes, how?) (for each type of facility and provider)
3. How can the issue be solved?
4. How to distribute the workforce in a health facility to get better health services? (for each type of health facility; DH/MCWC/UpHC/USC/UHFWC/CC)
5. How to distribute the workload (for each type of provider) in a health facility (for each type of health facility; DH/MCWC/UpHC/USC/UHFWC/CC) to get better health services?

E. Suggestions/recommendations

1. What would be your suggestion regarding reorganizing of the health workforce (such as skill mix, task shifting, number and category of health workforce) to deliver ESP more efficiently at public sector healthcare facilities? (for each type of health facility; DH/MCWC/UpHC/USC/UHFWC/CC)
2. Do you have any questions?

Thank you for your time!

Guideline for in-depth interviews with physician/nurse/SACMOs/CHCP/FWV/FWA

Study title: **Assessment of staffing need through workload analysis in two selected districts (Jhenaidah and Moulvibazar) in Bangladesh**

Name of respondent/data source:	
Present designation:	Department:
Facility/programme:	
Contact detail:	
Mobile number:	Email ID:
Age:	Sex:
ID of service provider:	
Degrees/highest level of education:	Medical college:
Year of graduation:	
Date of interview:	
Name of interviewer:	

A. Available working time
(It is mandatory to mention a specific year/duration for each question)

1. Number of possible working days in a year of a health service provider (physician/nurse/ SACMOs/CHCP/FWV/FWA)
2. Number of days off for public holidays in a year
3. Number of days off for annual leave/earned leave in a year
4. Possible number of days off due to sick leave/casual leave in a year
5. Number of days off due to other leave, such as training, in a year
6. Average working hours in a day
7. Available working days in a week
8. Available working weeks in a year.

B. Salary cost calculations
1. Annual salary of each staff category
2. Existing staff in that category
3. Total salary (annual salary x existing staff).

C. Workload components (including essential service package (ESP))
1. Health service activities (including ESP) for a health service provider (physician/nurse/ SACMOs/CHCP/FWV/FWA) (such as attending patients at OPD, managing emergency patients, managing patients in in-patient departments; with details and duration, if possible)
2. Support activities of a health service provider (physician/nurse/SACMOs/CHCP/FWV/FWA) (such as filling out patient records, log-books, signing/attesting certificates; with details and duration, if possible)
3. Additional activities of a health service provider (physician/nurse/SACMOs/CHCP/FWV/FWA) (such as supervising other staff, attending meetings; with details and duration, if possible)
4. Any other services that they may provide, in addition to those mentioned above
5. How many patients does the provider attend on an average in a typical day? (provider should give an estimate of patients attended per day)

D. Data source/availability of recoded documents
1. How can we get information of a provider's attendance? Is there any register book where attendance is recorded? If yes, then could you please arrange for us to access it?
2. Could you please help us get information regarding the available working days of a provider?
3. Is there any documentation of provider's leave days? If yes, could you please arrange for us to access it?
4. Is there any official document of training days (leave) of a service provider? Are those days counted as available working days? If yes, then could you please arrange for us to access it?
5. Is there any register book for any service activities (including ESP)? (If yes, then have to ask if there is document for a specific service and also for respective department?) Could you please arrange for us to access it?
6. Is there any computer database (regarding service activities and attendance)?
7. Is there any other source of data of health service activities (including ESP)? Please specify and if yes, then could you please arrange for us to access it?
8. Could you please tell us that how we can know the details of each type of activity?

E. Opinion regarding the health workforce's workload

1. What is your opinion regarding the workload of a provider (physician/nurse/SACMOs/CHCP/ FWV/FWA)? Are they over-loaded? (If yes, how?)
2. Are they under-loaded (If yes, how?)
3. How can the issue be solved?

F. Suggestions/recommendations

1. Do you have any suggestions/recommendations that could help fulfill the study objective (how to deliver ESP more efficiently at public sector healthcare facilities)?
2. Do you have any questions?

Thank you for your time!

Checklist for document review of physician/nurse/SACMOs/CHCP/FWV/FWA

Study title: **Assessment of staffing need through workload analysis in two selected districts (Jhenaidah and Moulvibazar) in Bangladesh**

Name of document:	
Originator/owner/publisher of the document (such as MoHFW):	
Source person from whom it is collected:	
Mobile number:	Email ID:
Name of data collector:	

Review items:

A. Available working time (day/year, hour/day, day/week)
B. Any information on leave of employees
C. Job description
D. Any other information on workload

Observation guideline for physician/nurse/SACMOs/CHCP/FWV/FWA

Study title: **Assessment of staffing need through workload analysis in two selected districts (Jhenaidah and Moulvibazar) in Bangladesh**

Name of respondent/ data source:	
Present designation:	Department:
Facility/ program me:	
Contact detail:	
Mobile number:	Email ID:
Age:	Sex:
ID of provider:	
Date of observation:	
Name of observer:	

A. Basic observation topics

1. Location and surrounding areas of the health facility (DH/MCWC/UpHC/USC/UHFWC/CC)
2. Type of people visiting the facility (service providers, clients, others)
3. General interactions between people at the health facility (between service providers and clients, between different service providers, between patients)
4. Basic operations of health facilities (such as how patients enroll for treatment, where do they wait, how they are called in, where they are sent for diagnostic tests).

B. Service delivery related observation

1. **Health service activities (ESP)** (such as attending patients at OPD, managing emergency patients, managing patients in in-patient department; with details and duration, if possible)
2. **Support activities** (such as filling out patient records, log-books, signing/attesting certificates)
3. **Additional activities** (such as supervising other staff, attending meetings) (these are performed only by certain (not all) members of the cadre).

Quantitative tools

Time–Motion Study Tool

Study title: **Assessment of staffing need through workload analysis in two selected districts (Jhenaidah and Moulvibazar) in Bangladesh**

Type of provider: consultant (surgery)
Facility: DH

1. Date:	2. Geographic information system, location:
3. Observation ID:	4. Observer ID:
5. Start time of observation:	6. End time of observation:
7. Timing of observation: i. First half; ii. Second half	
8. Facility location:	
9. Setting of observation:	
10. Name/ID of the observed staff:	
11. Age:	12. Sex: i. Male; ii. Female
13. Present designation:	
14. Contact details (with mobile number and email):	

Time–motion data sheet

Type of activity	Time spent (minutes)	Remarks

Type of provider: consultant (surgery)
Facility: DH
Type of activity

<table>
<tr><th colspan="3">Health service activities of all cadre members</th></tr>
<tr><th>ESP components (categories)</th><th>Health service activities</th><th>Examples</th></tr>
<tr><td rowspan="2">Trauma care
General surgery</td><td>Surgical management (major) (mention the type of surgery)</td><td rowspan="2">Performing general surgical management
Providing conservative treatment in operation theatre (OT)
Counselling patient in OT
Giving prescription in OT
Removing cataract of aging person
Changing lenses of cornea (if necessary)</td></tr>
<tr><td>Surgical management (minor) (mention the type of surgery)</td></tr>
<tr><td>NCD management
Limited curative care
NCD screening</td><td>OPD service</td><td>Providing conservative treatment (giving medicine)
Providing diet chart
Counselling
Providing antibiotics for bacterial infections
Performing any intervention, if needed</td></tr>
<tr><td></td><td>Indoor services (mention the type of service, such as morning round, evening round, giving medicine, performing minor bedside procedure)</td><td>Taking rounds of beds of admitted patients
Checking up their health condition
Counselling
Prescribing or changing-medicine</td></tr>
<tr><td colspan="3">Support activities of all members:</td></tr>
<tr><td colspan="3">1. Attend monthly meetings with internal staff
2. Celebrate national day
3. Provide emergency/on-call service
4. Conduct teaching and training
5. Participate in training/seminar/workshop/conference
6. Resolve conflict between hospital and patient
7. Supervise cleanliness and hospital amenities
8. Undertake social and behaviour change communication</td></tr>
<tr><td colspan="3">Additional activities of certain cadre members: Not applicable</td></tr>
</table>

Type of provider: consultant (anaesthesiology)
Facility: DH
Type of activity

<table>
<tr><th colspan="3">Health service activities of all cadre members:</th></tr>
<tr><th>ESP components (categories)</th><th>Health service activities</th><th>Examples</th></tr>
<tr><td rowspan="4">Trauma care
Ophthalmic surgery
General surgery
Obstetric fistula</td><td>Anaesthetic management (major surgery)</td><td rowspan="4">Performing general surgical management
Providing conservative treatment in OT
Counselling patient in OT
Giving prescription in OT
Removing cataract of aging person
Changing lenses of cornea (if necessary)</td></tr>
<tr><td>Anaesthetic management (caesarean section)</td></tr>
<tr><td>Preoperative check-up and management</td></tr>
<tr><td>Postoperative clinical monitoring</td></tr>
<tr><td colspan="3">Support activities of all members:
1. Attend monthly meetings with internal staff
2. Celebrate national day
3. Provide emergency/on-call service
4. Conduct teaching and training
5. Participate in training/seminar/workshop/conference
6. Resolve conflict between hospital and patient
7. Supervise cleanliness and hospital amenities
8. Undertake social and behaviour change communication</td></tr>
<tr><td colspan="3">Additional activities of certain cadre members: Not applicable</td></tr>
</table>

Type of provider: consultant (obstetrics and gynaecology)
Facility: DH
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
Comprehensive emergency obstetric and newborn care (CEmONC)	Obstetrical service (caesarean section)	Performing caesarean section Giving medications (intravenous/intramuscular (IV/IM) antibiotics, oxytocin, anticonvulsants) Giving blood transfusion, if needed Removing placenta manually Conducting or assisting in vaginal delivery
Trauma care Obstetric fistula	Surgical management (major) Surgical management (minor)	Performing general surgical management Providing conservative treatment in OT Counselling patient in OT Giving prescription in OT Removing cataract of aging person Changing lenses of cornea (if necessary)
ANC/PNC	First ANC Follow-up ANC PNC	Providing antenatal check-up Providing intermittent preventive treatment Counselling with the mother about healthy diet and lifestyle during pregnancy Monitoring the progress of pregnancy and detecting and managing if any complications arise
NCD management Limited curative care NCD screening	OPD service	Providing conservative treatment (giving medicine) Providing diet chart Counselling Providing antibiotics for bacterial infections Performing any intervention, if needed
	Indoor services (rounds, including minor bedside procedures)	Taking rounds of beds of admitted patients Checking up their health condition Counselling Prescribing or changing medicine
Support activities of all members:		
1. Attend monthly meetings with internal staff 2. Celebrate national day 3. Provide emergency/on-call service 4. Conduct teaching and training 5. Participate in training/seminar/workshop/conference 6. Resolve conflict between hospital and patient 7. Supervise cleanliness and hospital amenities 8. Undertake social and behaviour change communication		
Additional activities of certain cadre members: Not applicable		

Study title: **Assessment of staffing need through workload analysis in two selected districts (Jhenaidah and Moulvibazar) in Bangladesh**

Type of provider: consultant (orthopaedics)
Facility: DH
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
Trauma care General surgery	Surgical management (major)	Performing general surgical management Providing conservative treatment in OT Counselling patient in OT Giving prescription in OT Removing cataract of aging person Changing lenses of cornea (if necessary)
	Surgical management (minor)	
NCD management Limited curative care NCD screening	OPD service	Providing conservative treatment (giving medicine) Providing diet chart Counselling Providing antibiotics for bacterial infections Performing any intervention if needed
	Indoor services (rounds, including minor bedside procedures)	Taking rounds of beds of admitted patients Checking up their health condition Counselling Prescribing or changing medicine
Support activities of all members:		
1. Attend monthly meetings with internal staff 2. Celebrate national day 3. Provide emergency/on-call service 4. Conduct teaching and training 5. Participate in training/seminar/workshop/conference 6. Resolve conflict between hospital and patient 7. Supervise cleanliness and hospital amenities 8. Undertake social and behaviour change communication		
Additional activities of certain cadre members: Not applicable		

Type of provider: consultant (ear, nose and throat)
Facility: DH
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
Trauma care General surgery	Surgical management (major)	Performing general surgical management Providing conservative treatment in OT Counselling patient in OT Giving prescription in OT Removing cataract of aging person Changing lenses of cornea (if necessary)
	Surgical management (minor)	
NCD management Limited curative care NCD screening	OPD service	Providing conservative treatment (giving medicine) Providing diet chart Counselling Providing antibiotics for bacterial infections Performing any intervention if needed
	Indoor services (rounds, including minor bedside procedures)	Taking rounds of beds of admitted patients Checking up their health condition Counselling Prescribing or changing medicine
Support activities of all members:		
1. Attend monthly meetings with internal staff 2. Celebrate national day 3. Provide emergency/on-call service 4. Conduct teaching and training 5. Participate in training/seminar/workshop/conference 6. Resolve conflict between hospital and patient 7. Supervise cleanliness and hospital amenities 8. Undertake social and behaviour change communication		
Additional activities of certain cadre members: Not applicable		

Type of provider: consultant (medicine)
Facility: DH
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
NCD management Limited curative care NCD screenings	OPD service (including NCD management)	Providing conservative treatment (giving medicine) Providing diet chart Counselling Providing antibiotics for bacterial infections Performing any intervention if needed
	Indoor services (rounds, including minor bedside procedures)	Taking rounds of beds of admitted patients Checking up their health condition Counselling Prescribing or changing medicine
Support activities of all members:		
1. Attend monthly meetings with internal staff 2. Celebrate national day 3. Provide emergency/on-call service 4. Conduct teaching and training 5. Participate in training/seminar/workshop/conference 6. Resolve conflict between hospital and patient 7. Supervise cleanliness and hospital amenities 8. Undertake social and behaviour change communication		
Additional activities of certain cadre members: Not applicable		

Type of provider: consultant (paediatrics)
Facility: DH
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
IMCI	IMCI/nutritional service	Providing routine immunization and growth monitoring services Counselling for exclusive breast-feeding and complementary feeding Counselling for child's health Providing vaccines Managing a cute respiratory infections Providing oral rehydration therapy Monitoring the growth and height of newborn Providing counselling or medicine for developing growth and height Advising to follow a balanced diet chart
NCD management Limited curative care NCD screenings	OPD service (including NCD management)	Providing conservative treatment (giving medicine) Providing diet chart Counselling Providing antibiotics for bacterial infections Performing any intervention if needed
	Indoor services (rounds, including minor bedside procedures)	Taking rounds of beds of admit-ted patients Checking up their health condi-tion Counselling Prescribing or changing medicine
Support activities of all members:		
1. Attend monthly meetings with internal staff 2. Celebrate national day 3. Provide emergency/on-call service 4. Conduct teaching and training 5. Participate in training/seminar/workshop/conference 6. Resolve conflict between hospital and patient 7. Supervise cleanliness and hospital amenities 8. Undertake social and behaviour change communication		
Additional activities of certain cadre members: Not applicable		

Type of provider: consultant (cardiology)
Facility: DH
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
NCD management Limited curative care NCD screening	OPD service (including NCD management)	Providing conservative treatment (giving medicine) Providing diet chart Counselling Providing antibiotics for bacterial infections Performing any intervention if needed
	Indoor services (rounds, including minor bedside procedures)	Taking rounds of beds of admitted patients Checking up their health condition Counselling Prescribing or changing medicine
Support activities of all members:		
1. Attend monthly meetings with internal staff 2. Celebrate national day 3. Provide emergency/on-call service 4. Conduct teaching and training 5. Participate in training/seminar/workshop/conference 6. Resolve conflict between hospital and patient 7. Supervise cleanliness and hospital amenities 8. Undertake social and behaviour change communication		
Additional activities of certain cadre members: Not applicable		

Type of provider: medical officer (MO)
Facility: DH
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
CEmONC	Obstetrical service (caesarean section)	Performing caesarean section Giving medications (IV/IM)
Normal vaginal deliveries Basic emergency obstetric and newborn care (BEmONC)	Obstetrical service (normal delivery)	Prescribing antibiotics, oxytocin, anticonvulsants Giving blood transfusion, if needed Removing placenta manually Conducting or assisting in vaginal delivery
Preterm newborn babies Newborn sepsis ONC Normal newborn	Newborn management	Establishing respiration and breast-feeding, Identifying at-risk neonates Preventing hypothermia (wrapping with cloth) Preventing infection Performing clinical evaluation and monitoring of low birth weight Checking and recording heart rate and breathing rate Recording temperature Providing counselling to parents Screening for neonatal sepsis (DLC, ESR, cerebrospinal fluid) Providing IV antibiotics, Performing operation in septicaemia
Severe cases	Emergency service	Emergency surgical management at Emergency room (minor surgery) Prescribing medicine in emergency Giving stomach wash (guiding)
IMCI, growth monitoring	IMCI/nutritional service	Providing routine immunization and growth monitoring services Counselling for exclusive breast-feeding and complementary feeding Counselling for child's health Providing vaccines Managing acute respiratory infec-tions Providing oral rehydration therapy Monitoring the growth and height of the newborn Providing counselling or medicine for developing growth and height Advising to follow a balanced diet chart

NCD management Limited curative care NCD screening	OPD service (including NCD management)	Providing conservative treatment (giving medicine) Providing diet chart Counselling Providing antibiotics for bacterial infections Performing any intervention if needed
ANC/PNC	First ANC	Providing antenatal check-up Providing intermittent preventive treatment Counselling the mother about healthy diet and lifestyle during pregnancy Monitoring the progress of pregnancy and detecting and managing if any complication arise
	Follow-up ANC	
	PNC	
	Indoor services (rounds, including minor bedside procedures)	Taking rounds of beds of admitted patients Checking up their health condition Counselling Prescribing or changing medicine
	Death certification and associated arrangements	

Support activities of all members:

1. Attend monthly meetings with internal staff
2. Sign and attest
3. Celebrate national day
4. Provide emergency/on-call service
5. Handle medico-legal cases
6. Participate in training/seminar/workshop/conference
7. Resolve conflict between hospital and patient
8. Perform additional duties outside the health sector (such as examination duty, mobile court, games, election)
9. Undertake social and behaviour change communication

Additional activities of certain cadre members:

1. Supervise clinical staff and other physicians
2. Supervise cleanliness and hospital amenities
3. Attend any other meetings (such as with community, local authority)
4. Prepare duty roster
5. Arrange meetings

Type of provider: nurse
Facility: DH
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
Trauma care Ophthalmic surgery General surgery Obstetric fistula	Assist surgical management (major)	Performing general surgical management Providing conservative treatment in OT Counselling patient in OT Giving prescription in OT Removing cataract of aging person Changing lenses of cornea (if necessary)
	Assist surgical management (minor)	
CEmONC	Assist obstetrical service (caesarean section)	Assisting in caesarean section Giving medications (IV/IM antibiotics, oxytocin, anticonvulsants) Giving blood transfusion,if needed Removing placenta manually Conducting or assisting in vaginal delivery
Normal vaginal deliveries BEmONC	Obstetrical service (normal delivery)	
Preterm newborn babies Newborn sepsis ONC Normal newborn	Newborn management	Establishing respiration and breast-feeding Identifying at-risk neonates Preventing hypothermia (wrapping with cloth) Preventing infection Performing clinical evaluation and monitoring of low birth weight Checking and recording heart rate and breathing rate Recording temperature Providing counselling to parents Screening for neonatal sepsis (DLC, ESR, cerebrospinal fluid) Providing IV antibiotics. Performing operation in septicaemia
IMCI, growth monitoring	IMCI/nutritional service	Providing routine immunization and growth monitoring services Counselling for exclusive breast-feeding and complementary feeding Counselling for child's health Providing vaccines Managing acute respiratory infections Providing oral rehydration therapy Monitoring the growth and height of newborn Providing counselling or medicine for developing growth and height Advising to follow a balanced diet chart

ANC/PNC	First ANC	Providing antenatal check-up Providing intermittent preventive treatment Counselling the mother about healthy diet and lifestyle during pregnancy Monitoring the progress of pregnancy and detecting and managingif any complication arise
	Follow-up ANC	
	PNC Bedside patient care	
	Indoor services (rounds, including minor bedside procedures)	Taking rounds of beds of admitted patients Checking up their health condition Counselling Prescribing or changing medicine
	Patient admission and discharge	
	Preoperative preparation of patients	
	Death certification and associated arrangements	
Support activities of all members:		
1. Attend meetings with nursing staff 2. Ensure record keeping (daily) 3. Celebrate national day 4. Prepare and distribute diet 5. Ensure instrument sterilization 6. Handle medico-legal cases 7. Participate in training/seminar/workshop/conference 8. Maintain the accounting of linen 9. Monitor handover shifts 10. Supervise bed making 11. Undertake social and behaviour change communication		
Additional activities of certain cadre members:		
1. Meet with nursing or hospital superiors 2. Supervise senior staff nurse 3. Supervise cleanliness and hospital amenities 4. Prepare duty roster 5. Arrange meetings with nursing staff 6. Maintain/manage the store 7. Prepare the staff evaluation report 8. Perform online data entry of monthly reports		

Type of provider: physician
Facility: MCWC
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
CEmONC	Obstetrical service (caesarean section)	Giving blood transfusion if needed Removing placenta manually Giving medicine for protein, energy malnutrition Monitoring and supervising during delivery as needed
Normal vaginal deliveries BEmONC	Obstetrical service (normal delivery)	Giving blood transfusion if needed Removing placenta manually Giving medicine for protein, energy malnutrition Monitoring and supervising during delivery as needed
Preterm newborn babies Newborn sepsis ONC Normal newborn	Newborn management	Referring complicated cases to DH Establishing respiration and breast-feeding Identifying at-risk neonates Preventing infection
IMCI, growth monitoring	IMCI/nutritional service	Providing services to children, 2 months to 5 years of age Treating children for very severe disease, pneumonia, cough and cold (no pneumonia), diarrhoeal disease, fever
ANC/PNC	First ANC	Providing antenatal check-up Counselling with the mother about healthy diet and lifestyle during pregnancy Checking heartbeat of baby on mother's womb Monitoring the progress of pregnancy and detecting and managingif any complication arises Providing intermittent preventive treatment (such as for malaria infection during pregnancy)
	Follow-up ANC	
	PNC	
Family planning, all methods	Counselling on non-interventional family planning methods (such as pill, condom, injections, which are done in OPD setting)	Consulting about the advantages and disadvantages of methods
	Counselling on interventional family planning methods (long-acting methods such asimplant, intrauterine device (IUD), copper T, which are done in OT setting)	

	Interventional family planning methods (permanent methods such as tubectomy, vasectomy, which are done in OT setting)	Providing OT based services (for implant, vasectomy, tubectomy, IUD)
	Indoor services (rounds, including minor bedside procedures)	Taking rounds of beds of admitted patients Checking up their health condition Counselling Prescribing or changing medicine
NCD management Limited curative care	OPD service (including NCD management)	Providing services to general patients
NCD screening		

Support activities of all members:

1. Attend monthly meeting with internal staff
2. Attend monthly meeting at DG-Family Planning office
3. Ensure record keeping (daily) (such as ANC/PNC, general patient register)
4. Sign and attest
5. Celebrate national day
6. Provide emergency/on-call service
7. Participate in training/seminar/workshop/conference
8. Resolve conflict between hospital and patient
9. Undertake social and behaviour change communication

Additional activities of certain cadre members:

1. Supervise FWVs
2. Supervise cleanliness and MCWC amenities
3. Attend any other meeting (such as with community, local authority)
4. Prepare duty roster
5. Arrange meetings
6. Maintain/manage the store
7. Visit UHFWC
8. Conduct teaching and training
9. Make yearly work plan
10. Provide salary to staff

Type of provider: FWV
Facility: MCWC
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
CEmONC	Obstetrical service (caesarean section)	Measuring pulse and blood pressure Keeping trolley and instruments ready Registering births
Normal vaginal deliveries BEmONC	Obstetrical service (normal delivery)	Measuring pulse and blood pressure Keeping trolley and instruments ready Registering births
Preterm newborn babies Newborn sepsis ONC Normal newborn	Newborn management	Drying up the newborn baby Checking respiration of newborn baby Counselling about how to give breastfeeding
IMCI, growth monitoring	IMCI/nutritional service	Providing iron tablet Providing medicine to kill worms
ANC/PNC	First ANC Follow-up ANC PNC	Providing ANC/PNC card Taking history Measuring pulse and blood pressure Measuring height and weight Counselling to have iron tablets
Family planning, all methods Family planning, short acting	Non-interventional family planning methods (such as pill, condom, injections, which are done in OPD setting) Interventional family planning methods (long-acting methods, such as implant, IUD, copper T, which are done in OT setting) Assist in interventional family planning methods (permanent methods, such as tubectomy, vasectomy, which are done in OT setting)	Taking history Giving injection Counselling about the advantage and disadvantage of methods Providing copper-T Counselling onnon-interventional family planning, such asusing pill, condom
	Indoor services (roundswith MO)	Measuring pulse and blood pressure Checking the quantity of bleeding of admitted patient Giving medicine Counselling

	Bedside patient care	
	Patient admission and discharge	
NCD management Limited curative care NCD screening	OPD services (including NCD management)	Providing services to general patients
Support activities of all members:		
1. Attend monthly meeting with internal staff 2. Ensure record keeping (daily) (such as ANC/PNC, general patient register) 3. Celebrate national day 4. Participate in training/seminar/workshop/conference 5. Undertake social and behaviour change communication 6. Prepare duty roster 7. Maintain cleanliness of MCWC 8. Maintain/manage the store 9. Assist in giving vaccines on certain dates (as per Expanded Programme on Immunization)		
Additional activities of certain cadre members:		
1. Perform online data entry of monthly reports		

Type of provider: physician
Facility: UpHC
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
CEmONC	Obstetrical service (caesarean section)	Conduct or assist for caesarean delivery Giving medications (IV/IM antibiotics, oxytocin, anticonvulsants) Giving blood transfusion if needed Removing placenta manually
Normal vaginal deliveries BEmONC	Obstetrical service (normal delivery)	Conducting or assisting in vaginal delivery
Preterm newborn babies Newborn sepsis Normal newborn	Newborn management	Establishing respiration and breast-feeding Identifying at-risk neonates Preventing hypothermia (wrapping with cloth) Preventing infection Performing clinical evaluation and monitoring of low birth weight Checking and recording heart rate and breathing rate Recording temperature Providing counselling to parents Screening for neonatal sepsis screening (DLC, ESR, cerebrospinal fluid) Providing IV antibiotics, Performing operation in septicaemia
Severe cases	Emergency service	Performing emergency surgical management in emergency room (minor surgery) Prescribing medicine in emergency room Giving stomach wash (guiding)
IMCI, growth monitoring	IMCI/nutritional service	Providing routine immunization and growth monitoring services Counselling for exclusive breastfeeding and complementary feeding Counselling for child's health Providing vaccines Managing acute respiratory infections Providing oral rehydration therapy Monitoring the growth and height of the newborn Providing counselling or medicine for developing growth and height Advising to follow a balanced diet chart

NCD management Limited curative care NCD screening	OPD service (including NCD management)	Providing conservative treatment (giving medicine) Providing diet chart Counselling Providing antibiotics for bacterial infections Performing any intervention if needed
ANC/PNC	First ANC	Providing antenatal check-up Providing intermittent preventive treatment Counselling with the mother about healthy diet and lifestyle during pregnancy Monitoring the progress of pregnancy and detecting and managing if any complication arise
	Follow-up ANC	
	PNC	
	Indoor services (rounds, including minor bedside procedures)	Taking round of beds of admitted patients Checking up their health condition Counselling Prescribing or changing medicine
	Death certification and associated arrangements	

Support activities of all members:

1. Attend monthly meeting with internal staff
2. Sign and attest
3. Celebrate national day
4. Provide emergency/on-call services
5. Handle medico-legal cases
6. Participate in training/seminar/workshop/conference
7. Resolve conflict between hospital and patient
8. Perform additional duties outside health sector (such as examination duty, mobile court, games, election)
9. Conduct trainings
10. Undertake social and behaviour change communication

Additional activities of certain cadre members:

1. Supervise clinical staff and other physicians
2. Supervise cleanliness and hospital amenities
3. Attend any other meetings (such as with community, local authority)
4. Prepare duty roster
5. Arrange meetings
6. Maintain/manage the store

Type of provider: nurse
Facility: UpHC
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
CEmONC	Assist obstetrical service (caesarean section)	Assisting in caesarean delivery Assisting in manual removal of placenta Providing counselling to mothers Taking history from mother Taking consent from mother
Normal vaginal deliveries BEmONC	Obstetrical service (normal delivery)	Assisting in vaginal delivery Executing normal vaginal delivery Providing counselling to mothers Taking history from mother Taking consent from mother
Preterm newborn babies Newborn sepsis Normal newborn	Newborn management	Monitoring low birth weight Checking and recording heart rate Recording temperature Providing counselling to mothers Assisting in check-up Establishing respiration and breast-feeding Preventing infection Assisting physicians
IMCI, growth monitoring	IMCI/nutritional service	Monitoring growth and height Administering vaccination Keeping records
ANC/PNC	First ANC	Providing counselling to mothers Providing ANC schedule Measuring weight
	Follow-up ANC	
	PNC	
	Bedside patient care	
	Indoor services (rounds with MO)	Providing medicine, saline Staying with the physician during the rounds of beds Taking rounds of beds of admitted patients Checking up their health condition Providing counselling to patients Inserting cannula and giving injection
	Patient admission and discharge	
	Death certification and associated arrangements	

Support activities of all members:
1. Attend meetings within nursing staff 2. Keeping daily records 3. Celebrate national day 4. Prepare and distribute diet 5. Sterilize instruments 6. Handle medico-legal cases 7. Participate in training/seminar/workshop/conference 8. Maintain the accounting of linen 9. Supervise handover shifts 10. Make bed 11. Undertake social and behavioural change communication
Additional activities of certain cadre members:
1. Attend any other external meetings (such as with community, local authority) 2. Meet with hospital superiors 3. Supervise senior staff nurse 4. Supervise cleanliness and hospitalamenities 5. Prepare duty roster 6. Arrange meetings with nursing staff 7. Maintain/manage the store 8. Prepare the staff evaluation 9. Perform online data entry of monthly reports 10. Maintain/manage the store

Type of provider: SACMO
Facility: UpHC
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
Severe cases	Emergency service	Providing treatment for hypertension, asthma, chronic obstructive pulmonary disease Providing treatment to road traffic accident patients Performing minor surgery Performing any type of emergency case management
IMCI, growth monitoring	IMCI/nutritional services	Providing treatment for severe diseases Providing pneumonia treatment Providing cough and cold (no pneumonia) treatment Providing treatment for diarrhoeal disease Providing treatment for malarial fever Providing treatment for measles, ear problems, drowning, child injury, pus draining from umbilicus, other diseases, anaemia (0–5 years), low birth weight (within 72 hours of birth) Counselling mothers to breast feed within one hour of birth (0–2 years)
ANC/PNC	First ANC Follow-up ANC PNC	Measuring blood pressure Measuring weight Measuring height Checking heartbeat of baby on mother's womb Suggesting/counselling regarding urine test and diabetes test
NCD management Limited curative care NCD screening	OPD service (including NCD management)	Suggesting/counselling regarding blood glucose measurement/diabetic test Providing management of fever, cough, common cold, headache and other aches, irritation on skin, abdominal pain Providing arthritis treatment Providing general patient service
Support activities of all members:		
1. Attend monthly meeting with internal staff 2. Ensure reporting (monthly) 3. Keep records (daily) 4. Celebrate national day 5. Participate in training/seminar/workshop/conference 6. Undertake social and behavioural change communication 7. Prepare duty roster 8. Maintain/manage the store 9. Perform additional duties outside the health sector (such as examination duty, mobile court, games, election)		
Additional activities of certain cadre members:		
Not applicable		

Type of provider: SACMO
Facility: USC
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
IMCI, growth monitoring	IMCI/nutritional services	Providing treatment for severe disease Providing treatment for pneumonia Providing treatment for cough and cold (no pneumonia) Providing treatment for diarrhoeal disease Providing treatment for malarial fever Provide treatment for measles, ear problems, drowning, child injury, pus draining from umbilicus, other disease, anaemia (0–5 years), low birth weight (within 72 hours of birth) Counselling mothers to breastfeed within one hour of birth (0–2 years)
NCD management Limited curative care NCD screening	OPD service (including NCD management)	Suggesting/counselling regarding blood glucose measurement/diabetic test Providing treatment for fever, cough, common cold, headache and other aches, irritation on skin, abdominal pain Providing arthritis treatment Providing general patient service
ANC/PNC	ANC PNC	Measuring blood pressure Measuring weight Measuring height Checking the heartbeat of the baby on mother's womb Suggesting/counselling regarding urine test and diabetes test
Support activities of all members:		
1. Attend monthly meeting at Upazila 2. Obtain medicine from Upazila 3. Keep records (daily) 4. Celebrate national day 5. Participate in training/seminar/workshop/conference 6. Undertake social and behavioural change communication 7. Maintain/manage the store 8. Perform additional duties outside the health sector (such as examination duty, mobile court, games, election) 9. Perform online data entry of monthly reports		
Additional activities of certain cadre members:		
Not applicable		

Type of provider: SACMO
Facility: UHFWC
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
IMCI, growth monitoring	IMCI/nutritional services	Providing services for children 2 months to 5 years of age Providing treatment to severe cases among children Providing treatment for pneumonia Providing treatment for cough and cold (no pneumonia) Providing treatment for diarrhoeal disease Providing treatment for malarial fever, fever that is not malaria, and fever that is likely malaria
NCD management Limited curative care NCD screening	OPD service (including NCD management)	Suggesting/counselling regarding blood glucose measurement/diabetic test Providing treatment for fever, cough, common cold, headache and other aches, irritation on skin, abdominal pain Providing treatment for arthritis Providing general patient services
ANC/PNC	ANC	Measuring blood pressure Measuring weight Measuring height Checking the heartbeat of the baby on mother's womb Suggesting/counselling regarding urine test and diabetes test
	PNC	
Support activities of all members:		
1. Attend monthly meetings with internal staff 2. Attend monthly meetings at district office 3. Keep records (daily) 4. Report monthly 5. Celebrate national day 6. Participate in vitamin A campaign 7. Participate in training/seminar/workshop/conference 8. Maintain/manage the store 9. Obtain medicine from Upazila 10. Assist in obstetrical services 11. Assist in newborn management 12. Undertake social and behavioural change communication in outreach		
Additional activities of certain cadre members:		
Not applicable		

Type of provider: FWV
Facility: UHFWC
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
Normal vaginal deliveries	Obstetrical service (normal delivery, only in facility)	Conducting normal delivery in facility Conducting normal delivery in household
Preterm newborn babies Newborn sepsis Normal newborn	Newborn management (only in facility)	Providing services for preterm newborn babies Managing newborn sepsis Providing services for low birth weight baby
IMCI, growth monitoring	IMCI/nutritional service (both in facility and satellite clinics)	Providing treatment to children 2 months to 5 years of age Providing treatment for severe diseases among children Providing pneumonia treatment Providing treatment for cough and cold (no pneumonia) Providing treatment for diarrhoeal disease Providing treatment for malarial fever, fever that is not malaria, and fever that is likely malaria
ANC/PNC	ANC (both in facility and satellite clinics)	Measuring blood pressure Measuring weight Measuring height Checking the heartbeat of the baby on mother's womb Suggesting/counselling regarding urine test and diabetes test
	PNC (both in facility and satellite clinics)	
Family planning, short acting	Non-interventional family planning methods (such as pill, condom, injections, which are done in OPD setting)	Providing pills, condoms, injections Counselling for family planning
Family planning, all methods	Interventional family planning methods (long-acting methods, such as implant, IUD, copper T, which are done in OT setting)	

NCD management Limited curative care NCD Screening	OPD service (both in facility and satellite clinics, including NCD management)	Suggesting/counselling regarding blood glucose measurement/diabetic test Providing treatment for fever, cough, common cold, headache and other aches, irritation on skin, abdominal pain Providing treatment for arthritis Providing general patient services
Support activities of all members:		
1. Attend monthly meetings with internal staff 2. Attend monthly meetings at district office 3. Keep records in facility (daily) (such as ANC/PNC, general patient register) 4. Perform reporting (monthly) in facility 5. Celebrate national day 6. Participate in training/seminar/workshop/conference 7. Maintain cleanliness of UHFWC 8. Maintain/manage the store 9. Assist in giving vaccines on certain dates (Expanded Programme on Immunization) 10. Participate in vitamin A campaign 11. Obtain medicine from Upazila 12. Undertake social and behaviour change communication (only in satellite clinic sessions)		
Additional activities of certain cadre members:		
Not applicable		

Type of provider: CHCP
Facility: CC (outreach)
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
IMCI, growth monitoring	Service to under 5 children	Growth monitoring General medical service to children
ANC/PNC	ANC PNC	Measuring blood pressure Measuring weight Measuring height Checking the heartbeat of the baby on mother's womb
NCD management Limited curative care NCD screening	OPD service (including NCD management)	Suggesting/counselling regarding blood glucose measurement/diabetic test Providing treatment for fever, cough, common cold, headache and other aches, irritation on skin, abdominal pain Providing treatment for arthritis
Support activities of all members:		
1. Attend monthly meetings at UpHC 2. Keep records (daily) 3. Perform online data entry (monthly reporting) 4. Attend committee meeting at CC 5. Obtain medicine from Upazila 6. Celebrate national day 7. Participate in training/seminar/workshop/conference 8. Maintain/manage the store 9. Undertake social and behavioural change communication 10. Maintain cleanliness of CC		
Additional activities of certain cadre members:		
Not applicable		

Type of provider: FWA
Facility: CC (outreach)
Type of activity

Health service activities of all cadre members:		
ESP components (categories)	**Health service activities**	**Examples**
Family planning methods Family planning, short acting	Non-interventional family planning methods (such as pill, condom, injections) in CC and outreach	Distributing pills and condoms to the couples visiting CCs or in the community/outreach
	Couple counselling (in CC and outreach) old acceptors Couple counselling (in CC and outreach) new acceptors	Counselling eligible couples regarding long term methods, and motivating them regarding the permanent method (no scalpel vasectomy for male, tubectomy for female)
	Counselling and referral for permanent and long acting family planning methods (in CC and outreach)	Taking eligible couples to MCWC for offering the long term method (IUD, implant)
Support activities of all members:		
1. Make couple registrations (in CC and outreach) 2. Attend meeting with internal staff 3. Attend meeting at UHFWC 4. Keep records (such as ANC/PNC, general patient register) 5. Report monthly 6. Celebrate national day 7. Participate in training/seminar/workshop/conference 8. Maintain cleanliness of CC 9. Undertake social and behaviour change communication 10. Maintain/manage the store 11. Assist in giving vaccines on certain dates (Expanded Programme on Immunization) 12. Participate in vitamin A campaign 13. Obtain medicine from Upazila 14. Observe the time taken to visit from one household to another 15. Organize field trips for satellite clinic sessions (with FWV) 16. Accompany FWV and health assistants during satellite clinic sessions (with FWV)		
Additional activities of certain cadre members:		
Not applicable		

Consent forms

CONSENT FORM FOR KEY INFORMANT INTERVIEWS

Protocol no.		Version no. 0.00	Date:

Protocol/study title: **Assessment of staffing need through workload analysis in two selected districts (Jhenaidah and Moulvibazar) in Bangladesh**

Purpose of the research

Background *(brief introduction of the issue and the need for/ importance of the research)*
Hello/Assalamualaikum! My name is _____ and I work with JPGSPH, BRAC University at Mohakhali, Dhaka. We are conducting a research to assess current staffing needs through application of Workload Indicators and Staffing Need (WISN) method for delivery of health services in the public sector in Bangladesh. Workload management is very important for any country or institution to deliver quality health services, retain staff and reduce turnover. We want to know details about the workload components (health service activities, support activities and additional activities) and activity standards (service standards and allowance standards) of the health workforce. This will help identify the way to project staffing needs to implement the essential service package (ESP) at the district health system (from district to community level) in the public sector in Bangladesh. This study, funded by World Health Organization, Bangladesh Country Office and the Ministry of Health and Family Welfare, Government of Bangladesh, is endorsing and providing guidance and support to this work.

Why are we inviting you to participate in the study?
Since you are responsible for public health system management/leadership, we would like to invite you to participate in the study.

What is expected from the participants of the research study?
We would like to ask questions that explore your views regarding healthcare providers/workforce job responsibilities and workload components. If you agree, it will take a maximum of one hour forthe interview.

Risk and benefits
There is no risk from being in the study. We will only collect information. Staying engaged in an interview for one hour may be uncomfortable. However, we do not expect any harm to come to you or your staff or your health facility because of the study.

While there is no immediate benefit to you for participating in this study, the information you provide will help us better understand conditions in Bangladesh. This information may help to improve conditions in the future.

There is no cost to you for being in this study. You will not receive anything for being in the study.

Privacy, anonymity and confidentiality
We will keep all information that we collect strictly confidential. Only persons working on this study will have access. Your name will not be used in reporting the findings.

Future use of information
In case of future use of the information collected from the study, we may supply data to other researchers. However, in such a case (if any) we will maintain confidentiality, for example, we will remove the identity of the participants so that the investigator does not have a chance to identify anyone.

Right not to participate and withdraw
You are free to decide whether or not to be in the study. If you start participating in the study, you can stop at any time. If you decide not to be in the study, you will not lose any benefits.

Principle of compensation
Since participation is limited – up to one hour – we are not considering any compensation for this.

Answering your questions/contact persons
If you have any questions about this research study you may contact Dr Taufique Joarder (Assistant Professor, JPGSPH, BRAC University). If you have questions about your right in the study, you may call Kuhel Faizul Islam, Committee Coordinator, +88 (02) 9827501-4 at Extension 6008. His office is located at 68, Shaheed Tajuddin Ahmed Sarani, JPGSPH, BRAC University, icddr,b building, 5th floor, Level-6, Mohakhali, Dhaka 1212.

If you agree to our proposal of enrolling you in our study, please indicate that by putting your signature or your left thumb impression at the specified space below.

Thank you for your cooperation.

_____ _____
Signature of participant Date

_____ _____
Signature of the witness Date

_____ _____
Signature of the principal investigatoror his/her representative Date

CONSENT FORM FOR IN-DEPTH INTERVIEWS

Protocol no.	Version no.	Date:

Protocol/study title: **Assessment of staffing need through workload analysis in two selected districts (Jhenaidah and Moulvibazar) in Bangladesh**

Purpose of the research

Background *(brief introduction of the issue and the need for/ importance of the research)*
Hello/Assalamualaikum! My name is _____ and I work with JPGSPH, BRAC University at Mohakhali, Dhaka. We are conducting a research to assess current staffing needs through application of Workload Indicators and Staffing Need (WISN) method for delivery of health services in the public sector in Bangladesh. Workload management is very important for any country or institution to deliver quality health services, retain staff and reduce turnover. We want to know details about the workload components (health service activities, support activities and additional activities) and activity standards (service standards and allowance standards) of the health workforce. This will help identify the way to project staffing needs to implement the essential service package (ESP) at the district health system (from district to community level) in the public sector in Bangladesh. This study, funded by World Health Organization, Bangladesh Country Office and the Ministry of Health and Family Welfare, Government of Bangladesh, is endorsing and providing guidance and support to this work.

Why invited to participate in the study?
Since you are a public health care service provider, we would like to invite you to participate in the study.

What is expected from the participants of the research study?
We will ask questions about the healthcare services that you provide and the activity standard of your workload. If you agree, it will take a maximum of one hour for the interview.

Risk and benefits
There is no risk from being in the study. We will only collect information. Staying engaged in an interview for one hour may be uncomfortable. However, we do not expect any harm to come to you or your staff or your health facility because of the study.

While there is no immediate benefit to you for participating in this study, the information you provide will help us better understand conditions in Bangladesh. This information may help to improve conditions in the future.

There is no cost to you for being in this study. You will not receive anything for being in the study.

Privacy, anonymity and confidentiality
We will keep all information that we collect strictly confidential. Only persons working on this study will have access. Your name will not be used in reporting the findings.

Future use of information

In case of future use of the information collected from the study, we may supply data to other researchers. However, in such case (if any) we will maintain confidentiality, for example, we will remove the identity of the participants so that the investigator does not have a chance to identify anyone.

Right not to participate and withdraw

You are free to decide whether or not to be in the study. If you start participating in the study, you can stop at any time. If you decide not to be in the study, you will not lose any benefits.

Principle of compensation

Since the participation is limited up to one hour, we are not considering any compensation for this.

Answering your questions/contact persons

If you have any question about this research study you may contact Dr Taufique Joarder (Assistant Professor, JPGSPH, BRAC University). If you have questions about your right in the study, you may call Kuhel Faizul Islam, Committee Coordinator, +88 (02) 9827501-4 at Extension 6008. His office is located at 68, Shaheed Tajuddin Ahmed Sarani, JPGSPH, BRAC University, icddr,b building, 5th floor, Level-6, Mohakhali, Dhaka 1212.

If you agree to our proposal of enrolling you in our study, please indicate that by putting your signature or your left thumb impression at the specified space below.

Thank you for your cooperation.

_____ _____

Signature of participant Date

_____ _____

Signature of the witness Date

_____ _____

Signature of the principal investigatoror his/her representative Date

CONSENT FORM FOR TIME–MOTION STUDY

Protocol no.	Version no.	Date:

Protocol/study title: **Assessment of staffing need through workload analysis in two selected districts (Jhenaidah and Moulvibazar) in Bangladesh**

Purpose of the research

Background *(brief introduction of the issue and the need for/ importance of the research)*
Hello/Assalamualaikum! My name is _____ and I work with JPGSPH, BRAC University at Mohakhali, Dhaka. We are conducting a research to assess current staffing needs through application of Workload Indicators and Staffing Need (WISN) method for delivery of health services in the public sector in Bangladesh. Workload management is very important for any country or institution to deliver quality health services, retain staff and reduce turnover. We want to know details about the workload components (health service activities, support activities and additional activities) and activity standards (service standards and allowance standards) of the health workforce. This will help identify the way to project staffing needs to implement the essential service package (ESP) at the district health system (from district to community level) in the public sector in Bangladesh. This study, funded by World Health Organization, Bangladesh Country Office and the Ministry of Health and Family Welfare, Government of Bangladesh, is endorsing and providing guidance and support to this work.

Why invited to participate in the study?
Since you are a public health care service provider, we would like to invite you to participate in the study.

What is expected from the participants of the research study?
We will observe you to know about the healthcare services that you provide and the activity standard of your workload. If you agree, it will take a maximum of one hour for the interview.

Risk and benefits
There is no risk from being in the study. We will only collect information. Staying engaged in an interview for one hour may be uncomfortable. However, we do not expect any harm to come to you or your staff or your health facility because of the study.

While there is no immediate benefit to you for participating in this study, the information you provide will help us better understand conditions in Bangladesh. This information may help to improve conditions in the future.

There is no cost to you for being in this study. You will not receive anything for being in the study.

Privacy, anonymity and confidentiality
We will keep all information that we collect strictly confidential. Only persons working on this study will have access. Your name will not be used in reporting the findings.

Future use of information

In case of future use of the information collected from the study, we may supply data to other researchers. However, in such a case (if any) we will maintain confidentiality, for example, we will remove the identity of the participants so that the investigator does not have a chance to identify anyone.

Right not to participate and withdraw

You are free to decide whether or not to be in the study. If you start participating in the study, you can stop at any time. If you decide not to be in the study, you will not lose any benefits.

Principle of compensation

Since the participation is limited up to one hour, we are not considering any compensation for this.

Answering your questions/contact persons

If you have any question about this research study you may contact Dr Taufique Joarder (Assistant Professor, JPGSPH, BRAC University). If you have questions about your right in the study, you may call Kuhel Faizul Islam, Committee Coordinator, +88 (02) 9827501-4 at Extension 6008. His office is located at 68, Shaheed Tajuddin Ahmed Sarani, JPGSPH, BRAC University, icddr,b building, 5th floor, Level-6, Mohakhali, Dhaka 1212.

If you agree to our proposal of enrolling you in our study, please indicate that by putting your signature or your left thumb impression at the specified space below.

Thank you for your cooperation.

_____ _____

Signature of participant Date

_____ _____

Signature of the witness Date

_____ _____

Signature of the principal investigatoror his/her representative Date

Annex 4: Selected time–motion tables

Table 4.1. Comparison of time–motion study findings of OPD service time across different staff categories

Staff category	Activity standard	Time–motion findings
Consultant (surgery)	10 minutes	1.97 minutes
Consultant (obstetrics and gynaecology)	10 minutes	2.04 minutes
Consultant (orthopedics)	10 minutes	1.03 minutes
Consultant (ear, nose and throat)	10 minutes	1.59 minutes
Consultant (medicine)	15 minutes	1.17 minutes
Consultant (cardiology)	15 minutes	4.06 minutes
Consultant (paediatrics)	10 minutes	2.40 minutes
DH general physician	10 minutes	1.02 minutes
MCWC general physician	10 minutes	1.66 minutes
MCWC FWV	10 minutes	2.07 minutes
UpHC general physician	10 minutes	2.45 minutes
UpHC SACMO	10 minutes	2.06 minutes
USC SACMO	10 minutes	2.16 minutes
UHFWC SACMO	10 minutes	4.22 minutes
UHFWC FWV	10 minutes	3.03 minutes
CC CHCP	10 minutes	2.88 minutes

Table 4.2. Comparison of time–motion study findings of IMCI/nutritional services time across different staff categories

Staff category	Activity standard	Time–motion findings
Consultant (paediatrics)	15 minutes	2.42 minutes
DH general physician	15 minutes	1.32 minutes
DH nurse	15 minutes	2.99 minutes
MCWC general physician	15 minutes	1.39 minutes
MCWC FWV	15 minutes	2.64 minutes
UpHC general physician	15 minutes	2.05 minutes
UpHC nurse	15 minutes	2.04 minutes
UpHC SACMO	15 minutes	2.62 minutes
USC SACMO	15 minutes	3.25 minutes
UHFWC SACMO	15 minutes	6.43 minutes
UHFWC FWV	15 minutes	4.92 minutes
CC CHCP	15 minutes	5.60 minutes

Table 4.3. Comparison of time–motion study findings of non-interventional family planning methods time across different staff categories

Staff category	Activity standard	Time–motion findings
MCWC FWV	25 minutes	3.08 minutes
UHFWC FWV	25 minutes	4.23 minutes
CC FWA	25 minutes	8.73 minutes

Annex 5: Ethical approval

BRAC UNIVERSITY

JPG SCHOOL OF PUBLIC HEALTH

KNOWLEDGE AND KNOW-HOW FOR HEALTH EQUITY

Date: September 5, 2017

IRB Reference No: *Please quote this ref on all correspondence*	**2017-009**
Project Title:	**Assessment of staffing need through workload analysis in two selected districts in Bangladesh**
Principal Investigator:	**Dr. Taufique Joarder**

Thank you for submitting your application which was considered by the BRAC James P Grant School of Public Health (BRAC JPGSPH), BRAC University Institutional Review Board (IRB). The following documents were reviewed:

1. IRB form
2. Research Proposal
3. Informed Consent Forms
4. Data Collection Tools

The IRB approves this study from an ethical point of view upon the addressing by the researchers of the concerns as raised by the IRB affiliates.

Approval is given for one year. Projects, which have not commenced within one year of original approval, must be re-submitted to IRB. You must inform IRB when the research has been completed.

Any serious adverse events or significant change which occurs in connection with this study and/or which may alter its ethical considerations must be reported immediately to the IRB.

Approval is given on the understanding that the 'Guidelines of IRB' are adhered to.

Yours sincerely,

Dr. Malay Kanti Mridha
Chairperson, IRB
BRAC James P Grant School of Public Health (BRAC JPGSPH)
BRAC University

Annex 6: Committees

Steering Committee

Government of the People's Republic of Bangladesh
Ministry of Health and Family Welfare
Health Sevices Division
Human Resource Branch
Bangladesh Secretariat, Dhaka
Email: mohfwhrm.gov.bd@gmail.com

Memo no: MOHFW/HRM/WHO Biennium/413/2016/480 Date: 29-11-2017

Notice

The undersigned is directed to inform you that the following steering committee (SC) is hereby constituted for guiding a study entitled 'Assessment of staffing need through workload analysis in two selected districts in Bangladesh'. The composition and Terms of References (ToR) of the committee are as follows:

Composition of the steering committee

1.	Sheikh Rafiqul Islam, Additional Secretary (Admin) & LD of HRD, HSD, MoHFW	Chairperson
2.	Dr. A.M Pervez Rahim, Deputy Secretary, HR, HSD, MoHFW	Member
3.	Md. Jasim Uddin, Deputy Secretary, HRD, MoHFW, Dhaka	Member
4.	Minakshi Barman, Deputy Secretary, HRD, HSD, MoHFW, Dhaka	Member
5.	Dr. Samir Kanti Sarkar, Director (Admin), DGHS	Member
6.	Mariam Begum, Deputy Director (Admin), DGNM	Member
7.	Prof. Liaquat Ali, Vice Chancellor, BUHS	Member
8.	Mr. Md. Nuruzzaman, National Professional Officer-HRH, WHO, Dhaka	Member
9.	Prof. Syed Masud Ahmed, Director, Centre of Excellence for Universal Health Coverage, James P Grant School of Public Health, BRAC University	Member
10.	Dr. Taufique Joarder, PI of the project, Assistant Professor, JPGSPH, BRAC University	Member
11.	Prof. Md. Humayun KabirT alukder, Professor (Curriculum development & Evaluation), Centre for Medical Education (CME)	Member
12.	Dr. Jamaluddin Chowdhury, Vice President, Bangladesh Medical Association (BMA)	Member
13.	Md. Shamim Iqbal, Director (Admin), DGFP	Member

Terms of References:

- Review the background documents and provide overall guidance on the WISN study including finalizing the study sites (health facilities) and the study participants (health workforces).
- Assess the WISN tools (qualitative and quantitative) and provide inputs on the tools.
- Review the WISN study findings and assist in interpretation.
- The Chairperson, in consultation with other Members, can propose changes in the committee, ifnecessary.

Memo no: MOHFW/HRM/WHO Biennium/413/2016/ ৭৪৩ Date: 29-11-2017

Distribution for necessary action (not according to seniority):

1.	Sheikh Rafiqul Islam, Additional Secretary (Admin) & LD of HRD, HSD, MoHFW	Chairperson
2.	Dr. A.M Pervez Rahim, Deputy Secretary, HR, HSD, MoHFW	Member
3.	Md. Jasim Uddin, Deputy Secretary, HRD, MoHFW, Dhaka	Member
4.	Minakshi Barman, Deputy Secretary, HRD, HSD, MoHFW, Dhaka	Member
5.	Dr. Samir Kanti Sarkar, Director (Admin), DGHS	Member
6.	Mariam Begum, Deputy Director (Admin), DGNM	Member
7.	Prof. Liaquat Ali, Vice Chancellor, BUHS	Member
8.	Mr. Md. Nuruzzaman, National Professional Officer-HRH, WHO, Dhaka	Member
9.	Prof. Syed Masud Ahmed, Director, Centre of Excellence for Universal Health Coverage, James P Grant School of Public Health, BRAC University	Member
10.	Dr. Taufique Joarder, PI of the project, Assistant Professor, JPGSPH, BRAC University	Member
11.	Prof. Md. Humayun KabirT alukder, Professor (Curriculum development & Evaluation), Centre for Medical Education (CME)	Member
12.	Dr. Jamaluddin Chowdhury, Vice President, Bangladesh Medical Association (BMA)	Member
13.	Md. Shamim Iqbal, Director (Admin), DGFP	Member

Distribution for kind information:

1. PO to the Additional Secretary (Admin), HSD, Ministry of Health and Family Welfare, Dhaka.

29.11.2017

(Minakshi Barman)
Deputy Secretary
Phone: 9540324

Technical taskforce

BRAC SCHOOL OF PUBLIC HEALTH
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TO BE THE LEADING GLOBAL PUBLIC HEALTH INSTITUTE FOR THE WORLD'S CRITICAL HEALTH CHALLENGES AFFECTING DISADVANTAGED COMMUNITIES

James P Grant School of Public Health (JPGSPH), BRAC University
Study Title: Assessment of staffing need through workload analysis in two selected districts in Bangladesh
Date: 29 October, 2017

Notice

Technical Taskforce (TT) will be responsible for guiding the implementation of the WISN process. The composition and Terms of References (ToR) of the TT is as follows:
Composition/ Distribution (Not according to seniority):

1.	Prof. Syed Masud Ahmed, Director, Centre of Excellence for Universal Health Coverage, JPGSPH, BRAC University	**Advisor of the project**
2.	Dr. Taufique Joarder, Assistant Professor, JPGSPH, BRAC University	**PI of the project and Coordinator**
3.	Dr. Israt Nayer, Deputy Director-Health Systems, Save the Children	Member
4.	Mr. Md. Nuruzzaman, National Professional Officer -HRH, WHO	Member
5.	Masuma Mannan Lina, Health System Advisor, Administrative Department, Bangladesh University of Health Sciences (BUHS)	Member
6.	Dr. Mithila Faruque, Assistant Professor & Head of the Department, Noncommunicable Diseases, BUHS	Member
7.	Samiun Nazrin Bente Kamal Tune, Senior Research Associate, JPGSPH, BRAC University	Member

Terms of References for Technical Taskforce (TT):

- Provide technical inputs for implementation of the project as per the agreed work plan
- Meet at least twice in a month and according to the technical needs of the project, at an agreed time, place, and frequency
- Discuss and finalize the overall and specific principles and strategies adopted for the completion of work
- Review and monitor progress of the work and report to the Steering Committee (SC)
- Submit relevant documents to the SC and incorporate their inputs as and when necessary
- In case of any unexpected events/ non-performance on any issue, carry out necessary exploration and provide recommendation to resolve this; any unresolved issue will be referred to the SC
- Support the SC as and when necessary
- Co-opt any member when necessary.

Prof. Syed Masud Ahmed
Director, Centre of Excellence for Universal Health Coverage, JPGSPH, BRAC University

Dr. Taufique Joarder
Assistant Professor, JPGSPH, BRAC University

Expert working group

EWG of consultants
1. Director, DGHS and specialist in anaesthesiology
2. Retired gynaecologist, former consultant at medical college and DH
3. Associate professor of medicine, BIRDEM, former consultant at medical college and DH
4. Professor of surgery, BIRDEM, former consultant at medical college and DH
5. Associate professor of orthopaedics, Kumudini Medical College, former consultant at DH and medical college
6. Ear, nose and throat specialist at SAHIC, former consultant at DH6.
7. Principal of a medical college, paediatric specialist, former consultant at DH
8. Consultant of cardiology, Islamia Eye Hospital, former consultant at DH
EWG of general physicians (medical officer/emergency medical officer/residential medical officer)
1. Former MO at UpHC and DH level, currently Lecturer at NIPSOM
2. Former MO at UpHC and DH, experienced in working at Civil Surgeon office, currently OSD at National Institute of Preventive and Social Medicine
EWG of nursing staff (senior staff nurse/ nursing supervisor)
Author: please expand abbreviation1. Additional Director, DGNM
2. Director, DGNM
3. Lecturer, College of Nursing, Mohakhali
4. Assistant professor, College of Nursing, Mohakhali
5. Senior staff nurse (at DH), currently MPH student at NIPSOM
6. Senior staff nurse (at DH), currently MPH student at NIPSOM
7. Senior staff nurse (at UpHC and DH), currently MPH student at NIPSOM
EWG of SACMO/CHCP
1. Relevant Deputy Director at DGHS, representing both SACMOs and CHCPs
EWG of family planning
1. Additional Director, Directorate General of Family Planning
2. Deputy Director of Family Planning of a district, Directorate General of Family Planning

Note: Since EWG members were also key informants, they have been de-identified intentionally on ethical grounds.

Annex 7: Photographs

Top Left: Structured observation of a nurse in Jhenaidah District Hospital; Top centre: Document review in Shailkupa Upazila Health Complex; Top right: Field visit to Moulvibazar District Hospital

Middle left: Structured observation of a physician in Kotchandpur Upazila Health Complex; Middle centre: Steering committee meeting at MoHFW; Middle right: Final debriefing of field data collectors

Bottom left: Structured observation of indoor ward in Jhenaidah District Hospital; Bottom middle: Interview with a physician at Moulvibazar District Hospital; Bottom right: Interview with a nurse at Kulaura Upazila Health Complex

Annex 8: List of ESP components

ESP components provided by the available staff at each level (Minimum standards and extra services by facility level) (17)

DH	MCWC	UpHC	USC/FWC	CC
Trauma care				
Ophthalmic surgery				
General surgery		General surgery		
Obstetric fistula		Obstetric fistula		
CEmONC		CEmONC		
Severe cases		Severe cases		
BEmONC		BEmONC	BEmONC	
Preterm newborn babies		Preterm newborn babies	Preterm newborn babies	
Newborn sepsis ONC	CEmONC	Newborn sepsis	Newborn sepsis	
NCD management	BEmONC	NCD management	NCD management	
Normal newborn	Preterm newborn	Normal newborn	Normal newborn	Normal newborn
Normal vaginal deliveries	Newborn sepsis	Normal vaginal deliveries	Normal vaginal deliveries	Normal vaginal deliveries
NCD screening	Normal newborn	NCD screening	NCD screening	NCD screening
Social and behaviour change communication	Normal vaginal deliveries	Social and behaviour change communication	Social and behaviour change communication	Social and behaviour change communication
EPI/IMCI	Social and behaviour change communication	EPI/IMCI	EPI/IMCI	EPI/IMCI
Family planning, short acting	EPI/IMCI	Family planning, short acting	Family planning, short acting	Family planning, short acting
Growth monitoring, severe acute malnutrition management	Growth monitoring, severe acute malnutrition management	Growth monitoring, severe acute malnutrition management	Growth monitoring, severe acute malnutrition management	Growth monitoring
ANC/PNC	Family planning,all methods	ANC/PNC	ANC/PNC	ANC/PNC
Limited curative care	ANC/PNC	Limited curative care	Limited curative care	Limited curative care

Annex 9: Detailed activities completed under terms of reference from the signing of the contract until the end of agreement

1. Finalizing the methodology

- Study methodology including study design, study setting and study populations, were finalized at the beginning of the study, and is described in the methodology section of this report.

2. Staff recruitment

- Coexperts (senior research associates) and field supervisors (senior research assistant) were recruited from July 2017 for this WISN study. Coexperts were responsible for overall study activities and field supervisors were responsible for supervising the field team and for collecting qualitative data.
- Eight field data collectors were recruited from 11 September 2017 to 15 October 2017. They were responsible for qualitative and quantitative data collection.

3. Meetings

3.1 Inception meeting with WHO

- Introductory meeting with WHO personnel was held on 2 July 2017 at WHO Bangladesh Country Office, Dhaka.
- The purpose of the meeting was to discuss the names of potential SC members, timeline of the study, detailed methodology, and overall activities of the WHO workload analysis study.

3.2 Meeting of Technical Advisory Group of Save the Children WISN Study at MoHFW

- One coexpert joined the meeting and got overall ideas regarding the WISN study, conducted by BUHS and Save the Children, Bangladesh.

3.3 TT meetings

- TT meetings were held on different dates from July to November 2017.
- TT members shared their project updates (tool development, field plan, data collection procedure data analysis plan) and other members provided proper guidance to the WISN team in every step of this study period during several TT meetings.

3.4 Meeting with human resources branch at MoHFW

- Meeting with the human resources branch of MoHFW was held on 19 July 2017 and 24 August 2017.
- Formation of SC was decided in the meeting and priority health categories and facilities were selected by suggestions from high government officials during that introductory meeting at MoHFW.
- A government reference letter was received from the MoHFW for data collection from field sites on 6 September 2017. The updated version of the reference letter from MoHFW was sent on 7 September 2017.

3.5 Meeting with WHO at DGHS

- A meeting with WHO regarding the WISN study progress was held on 25 September 2017 at DGHS.
- Discussions regarding the field visit were the main agenda of that meeting.

3.6 Meeting with SC

- Meeting with SC members was held on 4 October 2017 at MoHFW. The principal expert presented an overview of this WISN study.
- Main agenda of the meeting was to discuss conducting interviews with expert individuals as suggested by EWG and the SC members, who also provided overall guidance.

4. Tool and consent form development

- All tools (qualitative and quantitative) and individual consent forms for key informant interviews, in-depth interviews and time-motion study tools were developed by coexperts and reviewed by the principal expert of this WISN study.
- Coexperts also transcribed tools and consent forms were transcribed into Bangla.

5. IRB submission, receiving feedback and ERC approval

- All the tools (both English and Bangla versions) were submitted to the Ethical Review Committee (ERC) for institutional review for ethical approval on 8 August 2017.
- Based on reviewers' feedback, the revised version of the International Review Board form and updated tools were submitted; defending for ethical approval was successfully completed.
- Expedited review was applied for and the ERC approval letter was received on 5 September 2017.

6. Trainings

6.1 Training of coexperts and field supervisors

- The principal expert of the WISN study conducted a two-day training on the 'WHO WISN Manual' for coexperts and field supervisors during 5-6 September 2017.
- During the training session, the principal expert decided to send field supervisors to their respective fields on 7 September 2017.

6.2 Training for field data collectors and field supervisors

- JPGSPH, BRAC University facilitated a five-day training for field data collectors and field supervisors.
- The principal expert and coexperts conducted the training, and other TT members from WHO and Save the Children were also involved in conducting the training.
- The training covered an overview of this WISN study (including the objectives, methodologies and field planning), general research methodology, WISN method, research ethics, overview of Bangladesh health systems and overall qualitative methods (specifically, in-depth interview and observation). An overview of the time–motion study was also discussed and training and tools were shared with the training participants.
- Field data collectors received training on mobile-based data collection using SurveyCTO software as well.

7. Field visit

7.1 Sending field supervisors to field sites

- Field supervisors visited Moulvibazar and Jhenaidah districts on 10 and 17 July 2017, respectively.
- They collected the list of government health facilities and the entire health workforce (from district to community level) of that district, which helped in finalizing the study sites and priority cadres.

7.2 Field visit by principal expert

- The principal expert of the study visited Jhenaidah on 30 and 31 August 2017; and also visited the field sites on 4 September 2017.
- The purpose of the field visit was to identify health facilities, which was communicated to the Civil Surgeon, Deputy Director of Family Planning and the responsible staff of respective facilities.

7.3 Field visit by coexperts and field supervisors

- One of the coexperts visited Moulvibazar district from 8 to 10 August 2017 and identified the facilities for data collection.
- At the same time, both the field supervisors also visited their respective field sites, communicated with the authorities (Civil Surgeon and Deputy Director of Family Planning), and collected the contact number of some important staff who could help in the annual statistics of the respective facilities.

7.4 Field visit by WHO authority, principal expert and coexperts

- WHO personnel visited one of the study sites (Moulvibazar district) on 26 September 2017.
- At the same time, the study principal expert and coexperts also visited the same field site.

7.5 Field visit by the principal expert with government officials

- The principal expert with government officials did a field visit on 5 October 2017 at the Jhenaidah site.

8. Field pretesting

8.1 Field pretesting in Manikganj district and Dhamrai UpHC

- A day-long pretest session was conducted on 14 September 2017 at Manikganj District Hospital and MCWC.
- The purpose of the pretesting was to test if the tools would be appropriate in the real field.

9. Field data collection

- Field data collection ended on 15 October 2017.

9.1 Field data management and quality control

- JPGSPH WISN research team had access to check field data and monitor data in real-time.
- They regularly checked data for consistency.

10. Submission of progress report to WHO

- The progress report was submitted to WHO on 25 September 2017, where 50% of completed activities and the plan for upcoming days were explained.
- The WISN study team received feedback from WHO, and submitted the revised version of the progress report on 5 October 2017.

11. Data analysis

- Quantitative data analysis was done using WHO's WISN software and manually on MS Excel.
- Data analysis was completed on 15 November 2017.

12. Report writing

- Draft report of the WISN study was submitted to the SC on 29 November 2017.
- Feedback received from the SC was integrated into the final report.
- The final report was submitted on 30 November 2017.

Annex 10: Activity standard

Activity name	Service standard	Unit
DH: consultant (surgery)		
1. Surgical management (major)	150	minutes/patient
2. Surgical management (minor)	60	minutes/patient
3. OPD service	10	minutes/patient
4. Indoor services (rounds, including minor bedside procedures)	23.5	minutes/patient
DH: consultant (anaesthesiology)		
1. Anesthetic management (major surgery)	120	minutes/patient
2. Anesthetic management (caesarean section)	40	minutes/patient
3. Preoperative check-up and management	15	minutes/patient
4. Postoperative clinical monitoring	47	minutes/patient
DH: consultant (obstetrics and gynaecology)		
1. Obstetrical service (caesarean section)	50	minutes/patient
2. Surgical management (major)	120	minutes/patient
3. Surgical management (minor)	40	minutes/patient
4. First ANC	20	minutes/patient
5. Follow-up ANC	10	minutes/patient
6. PNC	15	minutes/patient
7. OPD service	10	minutes/patient
8. Indoor services (rounds, including minor bedside procedures)	23.5	minutes/patient
DH: consultant (orthopaedics)		
1. Surgical management (major)	180	minutes/patient
2. Surgical management (minor)	70	minutes/patient
3. OPD service	10	minutes/patient
4. Indoor services (rounds, including minor bedside procedures)	35.25	minutes/patient
DH: consultant (ear, nose and throat)		
1. Surgical management (major)	120	minutes/patient
2. Surgical management (minor)	50	minutes/patient
3. OPD service	10	minutes/patient
4. Indoor services (rounds, including minor bedside procedures)	35.25	minutes/patient

DH: consultant (medicine)		
1. OPD Service (including NCD management)	15	minutes/patient
2. Indoor services (rounds, including minor bedside procedures)	35.25	minutes/patient
DH: consultant (paediatrics)		
1. IMCI/nutritional service	15	minutes/patient
2. OPD service (including NCD management)	10	minutes/patient
3. Indoor services (rounds, including minor bedside procedures)	23.5	minutes/patient
DH: consultant (cardiology)		
1. OPD service (including NCD management)	15	minutes/patient
2. Indoor services (rounds, including minor bedside procedures)	35.25	minutes/patient
DH: medical officer/emergency medical officer/residential medical officer		
1. Obstetrical service (caesarean section)	90	minutes/patient
2. Obstetrical service (normal delivery)	120	minutes/patient
3. Newborn management	15	minutes/patient
4. Emergency service	15	minutes/patient
5. IMCI/nutritional service	15	minutes/patient
6. OPD service (including NCD management)	10	minutes/patient
7. First ANC	20	minutes/patient
8. Follow-up ANC	10	minutes/patient
9. PNC	15	minutes/patient
10. Indoor services (rounds, including minor bedside procedures)	23.5	minutes/patient
11. Death certification and associated arrangements	20	minutes/patient
DH: senior staff nurse/nursing supervisor		
1. Assist surgical management (major)	150	minutes/patient
2. Assist surgical management (minor)	90	minutes/patient
3. Assist obstetrical service (caesarean section)	85	minutes/patient
4. Obstetrical service (normal delivery)	120	minutes/patient
5. Newborn management	20	minutes/patient
6. IMCI/nutritional service	15	minutes/patient
7. First ANC	20	minutes/patient
8. Follow-up ANC	10	minutes/patient
9. PNC	15	minutes/patient
10. Bedside patient care	23.5	minutes/patient

11. Indoor services (rounds with physician)	47	minutes/patient
12. Patient admission and discharge	20	minutes/patient
13. Preoperative preparation of patients	20	minutes/patient
14. Death certification and associated arrangements	30	minutes/patient
MCWC: medical officer (clinic)/medical officer (maternal and child health)		
1. Obstetrical service (caesarean section)	60	minutes/patient
2. Obstetrical service (normal delivery)	60	minutes/patient
3. Newborn management	20	minutes/patient
4. IMCI/nutritional service	15	minutes/patient
5. First ANC	20	minutes/patient
6. Follow-up ANC	10	minutes/patient
7. PNC	15	minutes/patient
8. Counselling on non-interventional family planning methods (such as pill, condom, injections, which are done in OPD setting)	15	minutes/patient
9. Counselling on interventional family planning methods (long-acting methods, such as implant, IUD, copper T, which are done in OT setting	60	minutes/patient
10. Interventional family planning methods (permanent methods, such as tubectomy, vasectomy, which are done in OT setting)	30	minutes/patient
11. Indoor services (rounds, including minor bedside procedures)	37.5	minutes/patient
12. OPD service (including NCD management)	10	minutes/patient
MCWC: family welfare visitor		
1. Obstetrical service (caesarean section)	90	minutes/patient
2. Obstetrical service (normal delivery)	120	minutes/patient
3. Newborn management	30	minutes/patient
4. IMCI/nutritional service	15	minutes/patient
5. First ANC	20	minutes/patient
6. Follow-up ANC	10	minutes/patient
7. PNC	15	minutes/patient
8. Non interventional family planning methods (such as pill, condom, injections, which are done in OPD setting)	25	minutes/patient
9. Interventional family planning methods (long-acting methods, such as implant, IUD, copper T, which are done in OT setting)	30	minutes/patient
10. Assist in interventional family planning methods (permanent methods, such as tubectomy and vasectomy, which are done in OT setting)	45	minutes/patient

11. Indoor services (rounds with MO)	50	minutes/patient
12. Bedside patient care	25	minutes/patient
13. Patient admission and discharge	20	minutes/patient
14. OPD services (including NCD management)	10	minutes/patient
UpHC: medical officer/residential medical officer		
1. Obstetrical service (caesarean section)	90	minutes/patient
2. Obstetrical service (normal delivery)	60	minutes/patient
3. Newborn management	15	minutes/patient
4. Emergency service	15	minutes/patient
5. IMCI/nutritional service	15	minutes/patient
6. OPD service (including NCD management)	10	minutes/patient
7. First ANC	20	minutes/patient
8. Follow-up ANC	10	minutes/patient
9. PNC	15	minutes/patient
10. Indoor services (rounds, including minor bedside procedures)	25.65	minutes/patient
11. Death certification and associated arrangements	20	minutes/patient
UpHC: senior staff nurse/nursing supervisor		
1. Assist Obstetrical service (caesarean section)	90	minutes/patient
2. Obstetrical service (normal delivery)	120	minutes/patient
3. Newborn management	15	minutes/patient
4. IMCI/nutritional service	15	minutes/patient
5. First ANC	20	minutes/patient
6. Follow-up ANC	10	minutes/patient
7. PNC	15	minutes/patient
8. Bedside patient care	17	minutes/patient
9. Indoor services (round with MO)	34	minutes/patient
10. Patient admission and discharge	20	minutes/patient
11. Death certification and associated arrangements	30	minutes/patient
UpHC: sub assistant community medical officer		
1. Emergency service	15	minutes/patient
2. IMCI/nutritional services	15	minutes/patient
3. First ANC	20	minutes/patient
4. Follow-up ANC	10	minutes/patient
5. PNC	15	minutes/patient
6. OPD service (including NCD management)	10	minutes/patient

USC: sub assistant community medical officer		
1. IMCI/nutritional services	15	minutes/patient
2. OPD service (including NCD management)	10	minutes/patient
3. ANC	15	minutes/patient
4. PNC	15	minutes/patient
UHFWC: sub assistant community medical officer		
1. IMCI/nutritional services	15	minutes/patient
2. OPD service (including NCD management)	10	minutes/patient
3. ANC	15	minutes/patient
4. PNC	15	minutes/patient
UHFWC: family welfare visitor		
1. Obstetrical service (normal delivery, only in facility)	120	minutes/patient
2. Newborn management (only in facility)	15	minutes/patient
3. IMCI/nutritional service (both in facility and satellite)	15	minutes/patient
4. ANC (both in facility and satellite clinics)	15	minutes/patient
5. PNC (both in facility and satellite clinics)	15	minutes/patient
6. Non interventional family planning methods (such as pill, condom, injections, which are done in OPD setting)	25	minutes/patient
7. Interventional family planning methods (long-acting methods, such asimplant, IUD, copper T, which are done in an OT setting)	45	minutes/patient
8. OPD service (both in facility and satellite clinics, including NCD management)	10	minutes/patient
CC: community health care provider		
1. Service to children under five years of age	15	minutes/patient
2. ANC	15	minutes/patient
3. PNC	15	minutes/patient
4. OPD service (including NCD management)	10	minutes/patient
CC/outreach: family welfare visitor		
1. Non-interventional family planning methods (such as pills, condoms, injections) (in CC and outreach)	20	minutes/patient
2. Couple counselling (in CC and outreach) old acceptors	10	minutes/patient
3. Couple counselling (in CC and outreach) new acceptors	30	minutes/patient
4. Counselling and referral for permanent and long-acting family planning methods (in CC and outreach)	60	minutes/patient

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