Factors that influence acceptance and implementation of Covid-19 Non-Pharmaceutical Interventions among healthcare workers in Western North Region in Ghana

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by
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Abbreviations

CHPS - Community-based health planning services

DDNS - Deputy Director of Nursing Services

FGDs - Focus Group Discussions

GDP Gross Domestic Product

HCs - Health Centres

HCW - Health Care workers

IDI - In depth interviews

IPC - Infection Prevention and Control

KI - Key informants

MoH - Ministry of Health

NPIs - Non pharmaceutical interventions

OPD - Out Patient Department

PA - Physician Assistant

PD - Physical distancing

PPE - Personal protective equipment

RA - Research assistant

REC - Research Ethics Committee

RHD - Regional Health Directorate

RT - Research team

SSI - Semi structured interviews

WHO - World Health Organization

WNR - Western North Region

Definition of terms

Cough etiquette - refers to covering the mouth and nose when coughing and sneezing (e.g. using a paper tissue or cloth handkerchief) with the aim of reducing person-to-person transmission through droplets which are a known mode of transmission for coronaviruses.[1]

Fumigation - the use of special chemicals, smoke or gas to destroy the harmful insects or bacteria in a place.[2]

Hand hygiene – refers to handwashing and sanitizing, respiratory etiquette, avoiding face touching(mouth, eyes and nose with unwashed hands).[3]

Isolation - refers to the isolation of confirmed or probable cases of COVID-19 managed in dedicated isolation facilities or at home for defined period of time.[4]

Non Pharmaceutical Interventions – are public health measures that are aimed at controlling or preventing SARS-COV-2 transmission among people.[4]

Physician Assistant - A physician assistant (PA) is a mid-level medical practitioner who works under the supervision of a licensed doctor.[5]

Self-quarantine – refers to isolation of healthy people who have been in contact with confirmed cases.[4]

Abstract

Introduction

COVID-19 which was declared a pandemic by the WHO in March 2020, has revealed many gaps in the health systems of every country. Some of these gaps are found in implementation of Non Pharmaceutical Interventions. This study which contributes to a bigger research in the Western North Region of Ghana focuses on factors that influence the acceptance and implementation of COVID-19 NPIs among HCWs in the region.

Methodology

This is a qualitative research carried out in 5 government hospitals, 2 Health Centers and 3 CHPS compounds in the region. In depth interviews, focus group discussions and semi structured interviews were used for data collection. Participants included doctors, physician assistants, nurses, cleaners and two key informants. Data was analysed using Quirkos qualitative data analysis software and a conceptual framework developed by researcher.

Results

Personal safety emanated the most important driver for compliance to protocols though other crucial factors such as availability of logistics, facility structures(presence or absence of enclosure), supervision and monitoring, HCWs attitudes, financial incentives, all play key roles in compliance. It was also found that educational background of HCWs made a lot of difference in their understanding of NPIs and consequently their acceptance and implementation.

Discussion

Factors such as perceived danger or benefit, availability of logistics, level of enforcement and supervision and monitoring are responsible for the acceptance and implementation of NPIs. This study confirmed what many other studies have previously established and how important gaps in implementation can be addressed by stakeholders in a multisectoral approach.

Key Words: Non pharmaceutical interventions, healthcare workers, Ghana

Word Count: 11,418

Introduction

I worked as a medical doctor in Ghana for two years before deciding to embark on my journey towards global health. In my line of work spanned from formulation of diagnosis to managing in patients. This included engaging patient's relatives on different levels. Thus from explaining the condition of patients to waiting on them to deliver prescribed drugs which needed to be purchased out of pocket. I worked in both a teaching and regional hospitals and in both cases I experienced shortages of supplies which impeded my ability to properly observing infection prevention control measures. There were a couple of times I had to take blood samples from patients without wearing gloves due to unavailability. Constant availability of water is very common in many health facilities in Ghana.

With the emergence of the novel SARS-COV-2 in the world, I take keen interest in knowing how the Ghana health system can cope with the overwhelming demands that COVID-19 brings. As many countries learn of the weaknesses in their health systems, the question to me as a Ghanaian is what is Ghana going to learn from this pandemic? I therefore found it useful to delve into this study in order to bring out findings to the attention of policy makers.

Through this thesis I seek to unveil the factors that influence the acceptance and implementation of COVID-19 Non pharmaceutical interventions among healthcare workers in western north region of Ghana in order to inform policy makers and facility management on findings for improvement in implementation of NPIs in the health facilities in Ghana. I chose the western north region because there is an ongoing research on COVID-19 and my study will contribute to it.

This thesis has 5 chapters. In chapter 1 I lay out some background information about Ghana. Chapter 2 contains the problem statement and the justification and the need for this research. Chapter 3 deals with the description of the methodology, participants recruitment and conceptual framework. Chapter 4 the results from the research while chapter 5 conveys my discussions, recommendations and conclusion.

Chapter 1. Background information

1.1 Country Profile

Ghana is a lower middle income country located in West Africa with a population of 30.8 million people(2021).[6] It is borders with Togo, Ivory Coast and Mali and the Atlantic ocean on the south with a surface area of 238.500 square km.[7] Until 2018 Ghana was divided into 10 regions. However 6 additional regions were created by the government of which the Western North region where this study was conducted was one. Life expectancy at birth in Ghana is estimated 64.35 years with female life expectancy being 65.48 and male 63.2 years.[8]

1.2 Economy

Its Gross Domestic Product value of US$ 68,338 billion in 2020 according to the world bank.[7] The government of Ghana spent 3.54% of GDP on healthcare in 2018.[9] Before the COVID-19 pandemic Ghana's economy had experienced an average of 7% increase in 2019 but hit a sharp decline in 2020 according to the world bank.[10] This caused an increase in poverty rate from 25% in 2019 to 25.5% in 2020.

1.3 Education

The adult literacy rate in Ghana was 79% in 2018. Literacy rate for adult male and female were 83.5% and 74% respectively.[11] As part of efforts to fulfil the United Nations Sustainable Developmental Goal 4, the government of Ghana in 2017 implemented a free compulsory senior high school program which saw 11% increase in enrolment that year.[12]

1.4 Health system and some challenges facing it

The Ministry of Health (MoH) provides the overall policy direction for all stakeholders in health delivery. The healthcare system in Ghana has five levels of providers: health posts, health centres and clinics, district hospitals, regional hospitals and tertiary hospitals. Health posts are the first level of primary care for rural areas.[13] Medical supplies distribution are centrally controlled thus from ministry of health stock sent to the regional and regional supply to districts and consequently to the facilities.

Patients relatives are indispensable in the care of inpatients. Unlike in high income countries where care of an in-patient is completely provided by the health facility, in Ghana relatives assist in tasks such as bathing, feeding, propping up patients in bed, feeding of patients. During laboratory and radiological investigations, relatives are relied upon to send samples to the laboratories and are involved in transporting patients to radiological departments. Furthermore, with the common situation where some medicines need to be purchased either because it is not covered under the health insurance scheme or there is stock-out problem, HCWs rely on relatives to deliver these medicines to them. Hence patient relatives form an integral part of the healthcare delivery. This makes their presence in the facility necessary. The last challenge worth mentioning for the purpose of this study is the reported incidences of corruption and stealing in the health system. It was reported some hospital staff sold essential PPEs that were meant for HCWs amidst the pandemic for personal gains.[14]

1.4 Sociocultural context

Ghana's population is made up of 70% Christians and 18% Muslims and 5% adheres to other religious beliefs.[15] In a very religious society such as Ghana, the overall health status of the population is influenced by the sociocultural context through care seeking behaviour.[16,17] Being a hierarchical society[18] with strong cultural values it comes with a cost on dynamics between leaders and subordinates in an institution such as in healthcare. It is no wonder some of these practices have fostered corruption and mismanagement as people can watch inappropriate things done by seniors. Leaders are conventionally not accountable to subordinates.

Some cultural practices such as hand shaking depicts reverence to authority in the traditional context. Customs such as funerals, weddings, naming ceremonies are very important in the Ghanaian culture. Such gatherings bring people together as a way of demonstrating love and solidarity among community members.

Chapter 2. Problem statement, justification and objectives

2.1 Problem statement and justification

SARS-COV-2 also known as Corona virus disease(COVID-19) began in Wuhan, China in December 2019 and was declared a pandemic by the World Health Organization(WHO) in March 2020.[19] The pandemic which has currently affected 222 countries with 258,164,425 confirmed cases and claimed 5,166,192 lives worldwide as at November 24 2021, is a major public health threat to the world.[20] Estimates on reported cases around the world are more likely to be understated due to lack of surveillance and diagnostic capacity.[21]

Measures that have been implemented worldwide since the outbreak in order to mitigate the spread of the infection included lockdowns(stay-at-home measures, closure of schools, churches and mosques), travel restrictions, closure of certain services like restaurants, gyms and some healthcare services such as family planning services and Mother and Child services, social distancing, wearing of facemasks in public, frequent washing of hands with soap and water, frequent hand sanitizing with alcohol based gels etc.[3] These measures are known as Non Pharmaceutical Interventions(NPIs). NPIs are public health measures that are aimed at controlling or preventing SARS-COV-2 transmission among people and are the most effective measures in the absence of an effective and safe vaccine.[4] Normally for NPIs to be effective, a cluster of them must be implemented together. Three main categories of NPIs have been identified which are; individual such as hand hygiene, cough etiquette and use of face masks; environmental such as cleaning and ventilation of indoor spaces; and population related such as promoting physical distancing and limiting and restriction of movement and gathering of people.[4]

Ghana recorded its first two imported COVID-19 cases on March 12 2020 and as at 12 December 2021 the country had accumulated a total of 131,911 confirmed cases, with 1,255 deaths.[22] Immediate NPI measures which were instituted by the government to contain and prevent the spread of the disease included a ban on public gatherings, closure of schools, churches, mosques, and other places of worship, travel restrictions and mandatory quarantine for all incoming travellers. There was also a lockdown of three major cities with the most cases. Active case hunt and contact tracing measures were instituted for early detection, isolation and treatment of confirmed cases.[23] The Ministry of Health rolled out different guidelines such as COVID-19 care protocol, Healthcare Worker (HCW) exposure to COVID-19 management, clinical management protocol to streamline the caregiving processes in health facilities across the country. In these guidelines(see Annex 4 for flowcharts) are dispersed NPI measures such as stated in the problem statement. No data is available on the adherence to these recent measures but adherence and implementation is likely to be difficult in the Ghanaian setting as existing pre-COVID-19 era data have shown low compliance by HCWs to standard precautions in health facilities.[24]

With a challenged health system, the country's preparedness against the pandemic has been met with obvious pitfalls.[25] Some of these challenges included insufficient Personal Protective Equipment (PPEs), poor infrastructure, inadequate hospital care equipment, understaffed health workers etc.[26] These might influence on the correct implementation of NPIs against nosocomial spread of the viral disease.[27]

Health workers are undeniably the group at the highest risk of contracting COVID-19 in this pandemic.[28] It was estimated in August 2020 that almost 300,000 healthcare workers in 37 countries had contracted COVID-19 while more than 2500 medical staff had died.[29] Owing to the high risk

facing HCWs in caring for COVID-19 patients the WHO recommended the use of PPEs such as disposable gloves, face masks, face shields, disposable gowns, aprons etc at health facilities where COVID-19 cases are diagnosed and treated.[30]

Limited human resources in healthcare in Ghana, wellbeing of HCWs as exposure to the virus can lead to physical and psychological exhaustion, all makes it imperative for medical staff to be protected as much as possible against the infection.[31,32]

By July 2020 it had been reported that over 2000 healthcare workers in Ghana had contracted the virus.[33] These numbers are naturally expected to increase as the pandemic progresses. The Ministry of Health recommends observation of Infection prevention and control (IPC) practices, social distancing, wearing of appropriate PPEs, self-quarantine by exposed healthcare workers, frequent handwashing or sanitizing. (See Flow charts)

NPIs in health facilities is key to preventing nosocomial infections among HCWs. In order to protect HCWs against the infections within the facilities, not only is it important for appropriate NPI guidelines to be instituted but also assurance of adequate knowledge on how to correctly implement them. A systematic review of 172 studies on known Corona viruses, COVID-19, Severe Acute Respiratory Syndrome(SARS) and Middle Eastern Respiratory Syndrome(MERS) revealed that at least 1 meter physical distancing, wearing of face masks and eye protection provided adequate protection against these viruses which cause severe lower respiratory tract infections.[34,35] In their study on perceived preparedness against COVID-19 in Ghana health facilities Afulani et al found that most HCWs had low perceived preparedness at the health facility level against the pandemic.[36] This low perceived preparedness according to respondents was due to lack of training, PPEs, clear protocols, isolation wards, as well as poor communication from management. These barriers coupled with poor attitude of HCW can undermine COVID-19 preventive measures among HCWs.[37]

Factors that determine the effectiveness of NPIs are well documented in literature. Shin et al identified perceived susceptibility and severity of being afflicted by a life threatening illness as well as perceived benefits as the factors that influenced the likelihood of mask wearing.[38] Another review by Houghton et al on barriers and facilitators to HCWs on adherence to infection prevention and control guidelines for respiratory infectious diseases showed that uncertainty of HCWs on ambiguous and lengthy protocols, constantly changing protocols, lack of isolation rooms for patients and others all contributed to poor adherence.[27] As stated in literature there are several factors that impact acceptance which can only be explored through qualitative study as this one. With the emergence of new variants and concerns of low efficacy of vaccines, there is the need for continuous provision and implementation of NPIs in Ghana and this study is necessary for strengthening the measures.[39]

A number of quantitative researches have been done on implementation of NPIs in different settings but few qualitative researches have been done to explore acceptance by HCWs which in turn influence their adequate implementation. This research will contribute to a bigger research being undertaken by the Regional Health Directorate of the Western North Region on COVID-19.

2.2 Study objectives

2.2.1 Main research objective

To explore the factors that influence the acceptance and implementation of COVID-19 Non Pharmaceutical Interventions among healthcare workers in health facilities within Western North Region in Ghana in order to inform policy makers on strategies to improve COVID-19 implementation protocols.

2.2.2 Specific objectives

1. To identify which NPI measures are in place in the various facilities
2. To assess the competencies on instituted preventive measures from healthcare workers
3. To analyse the perception of health workers on these measures
4. To explore the factors impacting compliance to these preventive measures by health care workers.
5. To inform health policy makers and facility management (National, Regional, District and the local facility levels)on findings for improvement in the implementation of NPI measures.

Chapter 3. Methodology

3.1 Study type

This is an exploratory qualitative research which explored all aspects of the research objectives through observation, in-depth interviews(IDI), focus group discussions and semi structured interviews.

3.2 Study Area

Western North region is a newly created region in Ghana which was carved out of the existing western region of Ghana. It has a population of about 928,000 people. It is bounded by the Ivory Coast on the west, the Central region in the southeast, and the Ashanti, Ahafo, Bono East and Bono regions in the north.[40] The main occupation in the region is farming. There are nine districts in the region with a total of 353 health facilities. There are 6 district hospitals, 26 Health centres(HCs), 39 clinics, 12 hospitals, 21 maternity homes and 250 Community-based Health Planning Services(CHPS) compounds. Data from the Ghana Health Service website shows as at December 2021 there was a cumulative 1005 confirmed cases of COVID-19 recorded in the region.[41] The Western North Region was selected for my study because there is an ongoing bigger research on COVID-19 in the region being conducted by the newly formed Regional Health Directorate and this research will contribute to this.

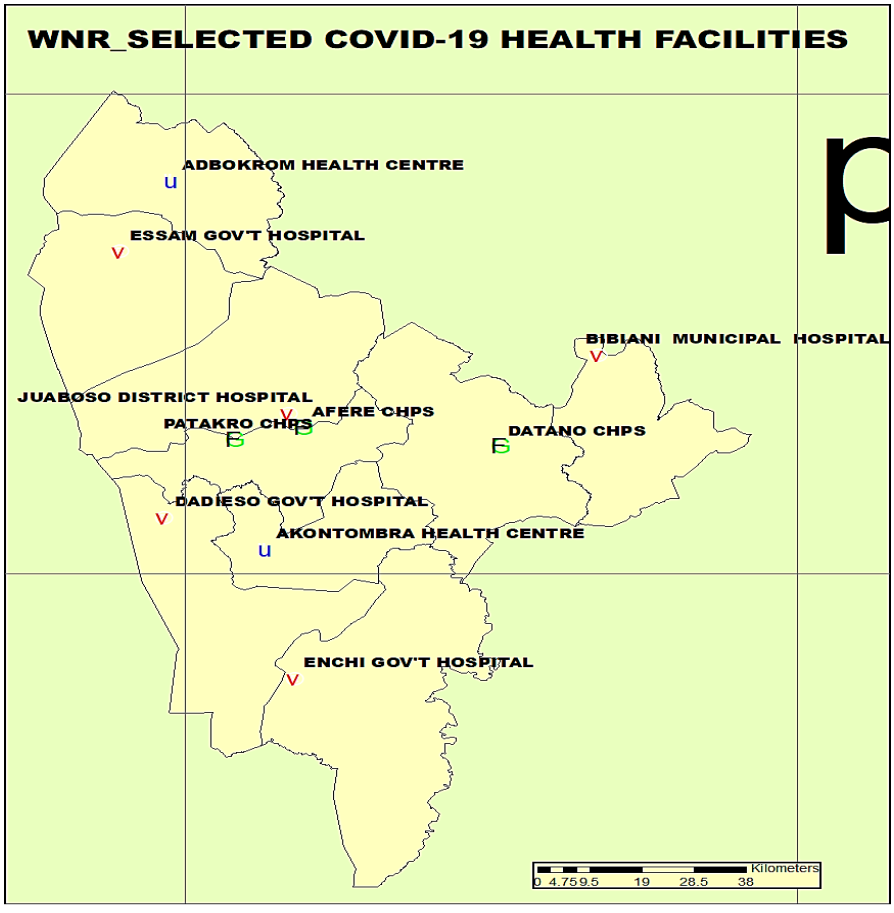

Figure 1. Map of western north regions of Ghana with participating facilities

3.3 Conceptual framework

The conceptual framework (Table 1.0) was developed by the principal investigator from three of the MoH guidelines namely the COVID-19 care pathway, the COVID-19 clinical management protocol and the healthcare worker exposure to COVID- 19 management. In all these three protocols are dispersed the various NPIs which are intended to protect HCWs from COVID-19 nosocomial infection and also provide guidance on what to do in the inevitable event of a HCW infection (See Annex 5 for flowcharts on guidelines). The framework incorporates the three main units(OPD, ward and emergency units) where research was focused with NPI measures classified under the three main categories of NPIs (individual, environmental and the population levels). Population included both healthcare workers and patients though patients were not included as respondents. Patients are included because what they do or fail to do can contribute to HCWs being infected with the virus. From the COVID-19 care pathway protocol(See flow chart 3, Annex 5), HCWs stationed at entrance to the facility screen persons at the entry by checking temperatures, asking COVID-19 standard questions such as if patient has any respiratory symptom, travelled abroad or come into contact with any known COVID-19 case. Triaging of patients is done at two points, the OPD and the emergency units. And it is at this place that patients are sorted based on needs for time-sensitive treatment depending on the severity of their illness. In the COVID-19 clinical management protocol (See flow chart 2 Annex 5), it is required for HCWs to wear appropriate PPEs, and observe infection prevention and control (IPC) measures which are all elaborated in the table below. It is also required by the protocol for a coughing patient if stable to be given a mask if they are not already wearing one before being managed according to its severity. Lastly is the HCW exposure to COVID-19 management protocol (See flow chart 3, annex 5). The protocol categorises the risk of exposure into three levels; high, medium and low risk exposures. When HCW exposure is high or medium risk, it is recommended for the HCW to stop working immediately and undergo self-quarantine for 14 days. HCW should then undergo active monitoring with testing for temperature twice a day while being alert for symptoms consistent with COVID-19. The MoH through the Ghana Health Service and other stakeholders has the responsibility to ensure that HCWs receive regular training on IPC measures. While this puts the HCW in a better position to take the necessary precautions, HCWs will not be fully protected without the active participation of patients and caregivers or family relatives. This therefore makes communication with patients and visitors/caregivers an important part of the process in ensuring that measures are adhered to by this population. And HCWs have the responsibility to carry out this communication tasks.

Table 1. Conceptual framework for COVID-19 Non pharmaceutical interventions among healthcare workers in Ghana.

	Non Pharmaceutical Intervention Measures		
	Individual	Environmental	Population(facility staff + patients)
OPD	-Hand and respiratory hygiene(washing of hands frequently with soap and water, use of hand sanitizers,	-ventilation of OPD waiting rooms and consulting rooms -cleaning of touchable surfaces such as door	-Physical distancing, avoidance of gathering -arrangement of waiting room chairs 1 meter apart)

	cough etiquette) -proper use of appropriate PPEs(face masks, face shields, aprons, gloves, caps)	handles, tables, chairs	-Self quarantine after exposure -Reporting suspected cases for isolation - Prompt testing of staff after exposure -Adequate triaging -Clear communication with patients and visitors/caregivers
Wards	-Hand and respiratory hygiene(washing of hands frequently with soap and water, use of hand sanitizers, cough etiquette) --proper use of appropriate PPEs(face masks, face shields, aprons, gloves, caps)	-Ventilation of wards, -Cleaning of touchable surfaces such as door handles, tables chairs -Frequent cleaning of equipment eg BP checking apparatus, stethoscopes etc	-Physical distancing, avoidance of gathering(arrangement of waiting room chairs 1 meter apart) -Self quarantine after exposure -isolation of suspected cases -Prompt testing of staff after exposure -Clear communication with patients and visitors/caregivers
Emergency	-suspected patients to be given appropriate PPEs -proper use of appropriate PPEs(face masks, face shields, aprons, gloves, caps) -Hand and respiratory hygiene(washing of hands frequently with soap and water, use of hand sanitizers, cough etiquette)	-Ventilation of wards -Cleaning of touchable surfaces such as door handles, tables chairs -Disinfection of equipment	-Physical distancing -Self quarantine after exposure -isolation of suspected cases -Prompt testing of staff after exposure -Adequate triaging

The above framework was developed from the different COVID-19 management protocols from the MOH for health facilities in Ghana. This framework was used as a guide in data collection and analysis.

3.4 Sampling and recruitment of participants

3.4.1 Facility sampling

Selection of facilities was done by purposive and random sampling by the public health department of the Regional Health Directorate (RHD) in a meeting chaired by the regional director. This was done based on the geographical (the various districts) and population distribution. Five government hospitals, 3 CHPS compounds and 2 HCs were selected for the study. Four of the government hospitals were purposively selected while the fifth hospital was selected by balloting which was done by the team at the meeting. The last two hospitals shared similar characteristics so the team balloted for the fifth one.

3.4.2 Participant recruitment

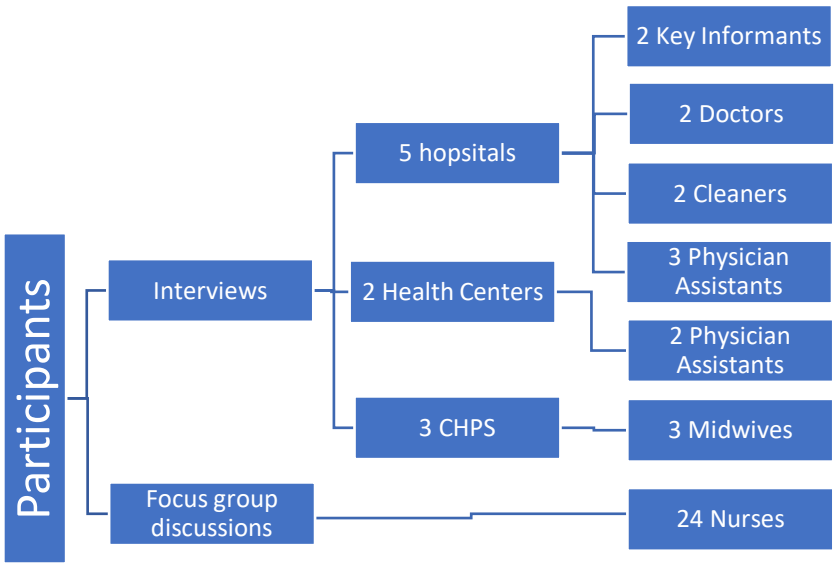

Figure 2. Overview of participating facilities and respondents

Letters were sent from the RHD to the participating facilities prior to the arrival of the researcher. I usually called the facility head a day before my arrival. On arrival I went to administration to meet the authorities, in most cases the medical superintendent and Deputy Director of Nursing Services (DDNS) who usually would be anticipating my arrival. Due to the busy hospital schedules, I ask the authorities to pre inform nurses in the various units and ask for volunteers. In most cases I get many more volunteers than I need from which I choose using the criteria of unit, number of years they have worked in facility, number of male against female. Doctors and Physician Assistants (PAs) were sampled conveniently. It was originally intended for 5 doctors to be interviewed in all 5 government hospitals, however on arrival 2 doctors and 3 (PAs) were interviewed due to busy schedules of doctors. Respondents in this group were made of 4 males and one female. The FGDs were made up of nurses from the various units. In order to eliminate perceived intimidation and generate a more expressive opinions, nurses in charges were not selected to participate in the group discussions. In all the FGD recruitments I politely asked in charges to not participate and gave them the reason above. FGDs were made of 6-7 participants. One of the FGDs had a composition of 4 males, 2 females, while the other two were composed of 4 females and 3 males each.

Participants from the HCs and CHPS compounds were the in-charges of the facilities. I called them the day before arrival on phone and after introducing myself and mission made appointment with them.

Two cleaners were interviewed, a male and female from a high flow hospital and low flow hospital respectively.

Age was not considered as relevant information to the data collection. It was intended to limit selection to HCWs who have been in the facility for 2 years or more however there were instances where a few of the participants had been in the facility for less than 2 years.

Key informants were persons from the administration. One was a female the DDNS from a smaller hospital while the other was a male administrator from a relatively bigger hospital.

3.5 Data collection technique

Data collection was done by researcher over a period of two weeks. Some of the areas were difficult to reach due to poor road access and also the fact that it was rainy season. The RHD supported the research by releasing a sub urban vehicle to facilitate movement to all facilities. The RHD also arranged for my accommodation in the areas that I had to spend a night. All participating facilities were pre-informed about the research by the RHD through an online meeting and letters. On my arrival in the region, I was invited to join the weekly Monday meetings by the RHD among all district directors and facility heads where the Regional Director of health services introduced me to the health authorities and also asked for their support for the research. After this online introduction, letters were sent to all participating facilities prior to my arrival and I arranged with the district directors and facility heads via telephone which date and time I would be present for the data collection.

IDIs, FGDs and SSIs with key informants were all conducted by researcher. One of the participants(a cleaner) was found to be without formal education therefore interview was conducted in the local dialect (Twi). There was no need for a translator because researcher is fluent in Twi.

3.5.1 Observation

Observation of practices was used to assess competencies of HCWs and how functional measures in place were. Practices such as screening of entrants, handwashing, wearing of PPEs, physical distancing, cleaning of touchable surfaces such as door handles, were observed in all participating facilities with a checklist of items. I did the observation for 1 hour in the hospitals and 30 minutes in the HCs and CHPS compounds. Areas in the hospitals that were observed were the OPD, the wards, emergencies, isolation ward and the screening bays. At every unit I informed the in charge about my intent before starting the observation.

3.5.2 In-depth interviews(IDIs)

IDIs was used to gather information concerning all relevant aspects of the specific research objectives that focus on acceptance. Factors influencing acceptance of measures are usually personal and so IDIs was the method of choice in getting opinions that were personal. I used open ended pre-developed topic guided questions for the interviews and interviews lasted an average of one hour Interviews were conducted in English except one which was conducted in Twi, the local dialect. I didn't need an interpreter because I am very fluent in that dialect. All recordings were done by principal investigator, and there was no note taker. Interviews were conducted in doctor's offices.

3.5.3 Focus Group Discussions(FGD)

FGD was used to collect data from nurses. FGDs was ideal for data collection on general opinions that were easier to be discussed in groups. It allowed for participants to build on what others have said. Participants shared their experiences and what they had observed in the facility FGDs were held in conference rooms of all participating facilities and lasted for 1 hour 30 minutes. There were 3 FGDs in three hospitals. FGDs were made of 6-8 participants. Participants comprised of staff from the OPD, the wards and emergencies. Some of them were also screeners and part of the COVID-19 response team.

3.5.4 Semi Structured Interviews(SSIs)

A topic guided semi-structured interviews was used to gather data from key informants from the administration level. This helped in triangulation of data analysis. Interviews lasted a maximum of an hour. There were a total of 2 KIs. Interviews was audio recorded. One KI was an administrator and the other a DDNS. KI were knowledgeable in the institution of the NPIs and the provision of logistics for their implementation. They also shared information about the enforcement and monitoring mechanisms.

3.6 Data processing and analysis

Data was collected solely by principal investigator. Audio recordings were done using one primary recorder and a backup phone recorder to safeguard against data loss.

Transcription was done by researcher. Data was analysed using Quirkos qualitative research analysis software. Themes were formed using the specific objectives of the research, thus measures in place, assessment of competencies, perception on NPIs and factors impacting compliance. Transcripts were coded into these themes, and the topics mentioned in the conceptual framework(eg individual, environmental and population) including new topics that came up during the data collection. Then data was manually analysed according to my conceptual framework taking into account my research objectives.

3.7 Ethical consideration

Ethical approval was sought from the Research Ethical Committee (REC) at KIT Royal Tropical Institute and Ghana Health Service Ethical Review Board. Confidentiality of respondents was maintained and explanation on the purpose, relevance, importance, voluntary participation, possibility of withdrawal and benefits of research was fully provided to participants. WHO consent form template was adapted to this study and was used during signing of consent. Signing of consent was completely voluntary. Participants were given coded names to ensure privacy. And assurance was given to participants that audio recordings will be deleted after 1 year. Due to confidentiality issues, the names of facilities have also been coded in the report.

Data collection was done face to face in accordance to the Ghana Health Service Ethical Review Board COVID-19 guidelines for research. All COVID-19 protocols were strictly observed.

3.8 Quality assurance

Data was collected solely by researcher. Pre testing was done in one facility before commencement of actual data collection the next day. Intelligent verbatim transcription was done by researcher with raw data being securely protected. This removed unintentionally repeated words and sentences, redundant words or sentences saying the same things and translation of some sentences in twi into English. However, off-topic recordings were all transcribed. Transcription was done in

English. Each recording was transcribed within 2-3 hours ensuring that all relevant information had been captured The recording in Twi was translated by researcher during transcription.

3.9 Dissemination of findings

Study findings was sent to the RHD, the various districts in the region and through via email. The study facilities will also receive copies of findings from the RHD. Participants were informed on the dissemination mechanisms.

3.10 Limitations

The research was conducted by the researcher alone as opposed to the idea of a scheduled team work with a research team. The research team at the time of arrival to the field were engaged in a national public health program making them unavailable for the data collection process. They provided logistic support and planned my journey around the region. This eliminated the important role of a note taker. Members of the planned research team were all from the public health department. To protect against losing recordings, a second recorder was used simultaneously so in case the primary device malfunctions I can still have them on the backup device. Also participating facilities were few especially for HCs and CHPS compounds in the region. Compared with the number of HC and CHPS only 2 HCs and 3 CHPS compounds were selected.

Finally some of the health facilities were visited outside the working times which also influenced observation. Due to researcher not being present during active working hours, observation of screening and triaging, handwashing practices, physical distancing could not be done. However items such as availability of veronica buckets soaps and towels, isolation areas, hand gels at vantage points were observed.

3.11 Literature review

A Literature review was performed using Pubmed and Google scholar search engines. Search terms included in the search were mesh terms: “non pharmaceutical interventions”, “healthcare workers”, “health facilities”, “infection and prevention control” with “COVID-19” or “pandemic”. Search terms such as ‘attitudes’ or ‘knowledge’, ‘healthcare workers’, ‘hospital infections’ and ‘Ghana’ also gave relevant literature on research conducted in Ghana. Snowballing technique was also used to get some other referenced relevant literature. Search was directed at effectiveness of NPIs such as social distancing, hand hygiene when properly implemented.

In the discussion section, literature which were relevant to the topics discussed in the findings were cited for comparing and contrasting. Some of these articles were data from other low and middle income countries while others especially the ones touching on ‘HCW attitudes’ from high income countries. Databases and websites such as the world bank, Ghana health service were also searched for supporting data.

Chapter 4. Findings

4.1 Observation

Observation of practices was done in all facilities (See detailed description in table 2 below). At the time of visitation of a few facilities, active work time was over therefore some items on the observation list such as handwashing practices, physical distancing, screening of entrants, couldn't be observed. Observation was done using a checklist with items under the various categories of NPIs. For the individual level NPIs researcher looked for availability of water, soap and towels, hand sanitizers on various units, PPE use and handwashing practice. For the environmental level, attention was paid mainly to the cleaning of touchable surfaces while the population level physical distancing (for patients), presence of isolation ward, and screening of entrants and triaging were observed.

Physical distancing was observed in a few of the facilities. Observation for physical distancing was performed in the most crowded areas of health facilities such as the OPD and pharmacy waiting areas. In most of the facilities these areas had the chairs arranged with 1.5m distance between them. Where benches are used patients are made to sit in every other seat thereby creating a distance of one seat apart. At the time of the observation there weren't too many people at these areas. The HCs and CHPS compounds also implemented the physical distancing according to the MoH requirement. Since the CHPS facilities had a single block their waiting areas were usually outside the building where patients were made to observe the 1.5m physical distancing. Majority of the hospitals did not have a designated ward for isolation of cases, however it was observed in some cases regular wards were converted for isolation purposes. In one instance the X-ray room was used as the isolation ward. Availability of water was observed in all facilities. However proximity of water to HCWs and patients varied. It was observed that some veronica buckets didn't have water and others were observed to be dirty. Some of the veronica buckets with water didn't have soap and almost all hand washing points didn't have towels.

Screening of entrants was also observed in some of the hospitals. Entrants are asked to wear facemasks, do hand washing and sanitize their hands, and have their temperature taken before heading to the nurses station for their vitals to be taken. In most cases there were no hand towels at the screening bays. In some of the facilities visited in the afternoon, the screening bay was seen with veronica bucket but no HCW at post.

Figure 3. Veronica bucket in use[42]

Cleaning of touchable surfaces wasn't seen being done during the time of observation. However it was observed that nurses sanitized equipment such as thermometers, stethoscopes after they were

used on patients. PPEs use(mask wearing) was observed in all facilities and on the average majority of HCWs and patients were wearing masks correctly.

Table 2. Observation done in facilities

Facility	**PD of 1.5m distance(OPD, pharmacy waiting areas)**	**Isolation ward/area**	**Availability of water soap disposable tissues**	**Hand sanitizers on various units**	**Handwashing by HCWs**	**PPE usage(masks)**	**Cleaning of surfaces**	**Screening & Triaging**
Bibiani Hosp	No	Yes	Yes except entrance, no screening	yes	Yes	Yes, few HCW not in mask	Not seen	Yes
Afere CHPS	Yes	No	Water, soap no disposable towels	yes	yes	yes	Not seen	Yes
Patakro CHPS	Yes	No	Water, soap, no towels	Yes	Yes	Yes	Not seen	Yes
Enchi Hospital	Yes	No	Water, soap no towels	Yes	Yes	Most in masks	Not seen	Yes
Akontombra HC	Yes	No	Water soap, no towels	Yes	Not seen	Observed all in masks	Not seen	Station seen, practice not observed
Dadieso hospital	Yes	No	Water, soap no towels	Yes	Observed	All HCWs in masks	Not seen	Yes
Juaboso hospital	Yes	Yes	Water soap no towels	yes	Not seen	HCWs mostly in masks	Not seen	Yes
Datano	Yes	No	Yes	yes	Not seen	HCWs in	Not	Yes

CHPS						masks	seen	
Essam hospital	No	No	yes	For staff	observed	Yes(for both HCW & Patients)	Not seen	Yes
Adabokro HC	-	Yes	Yes	Yes	-	-	-	-

4.2 Non Pharmaceutical Interventions in place as identified by participants

The measures in place in the various facilities that were mentioned by the participants are as follows: concerning individual level NPIs all participants mentioned hand hygiene, mask wearing, while a few added respiratory etiquette(coughing into elbow).

At the environmental level, most participants mentioned improved ventilation through opening of windows, fumigation of wards, use of non-touchable bins, waste segregation, cleaning of touchable surfaces

And at the population level participants stated physical distancing, pre triage(screening) and triaging area, isolation unit, and self-quarantine practice.

4.3 Assessment of competencies

Assessment of competencies was done by eliciting information on knowledge, skills and attitudes. Questions were asked on training provided prior to the institution of the measures, content of training, self-quarantine, perception on practices in the facility and HCWs attitudes.

4.3.1 Knowledge

On knowledge all respondents answered there was training provided by the RHD. Training was provided in series. On the average about three sessions of training were provided prior to data collection. Selected participants from the various districts were trained at the regional level where they in turn provided training at the district level and subsequently the facility level. Content of training was mainly COVID-19 and its IPC measures, COVID-19 management algorithms , HCWs exposure (see Annex 4 for flowcharts). Respondents further mentioned that all staff received some form of training. Type of training was dependent on roles of HCWs. For example, HCWs in charge of isolation wards received intensive training on donning and doffing of PPEs, how to handle patients and the special IPC protocols related to isolation. Even though all HCWs were expected to receive training on the general NPIs whether everyone did participate could not be guaranteed given the possibility of absenteeism. All respondents confirmed they received training.

During the research, attention was focused on certain aspects of the NPIs being practised in the facility which were the PPE usage, self-quarantine measures, screening and triaging , and handling of suspected cases. All respondents said PPEs were required when attending to patients, and self-quarantine was mandatory. Respondents from the 5 hospitals and HCs said that there was a screening bay at the entrances with nurses, where temperature of clients were checked, a standardised questionnaire from the MoH were asked, clients and visitors were made to wash their hands or sanitized them and made to wear face masks before entry. They also ensured that people who had respiratory symptoms were taken through a different route to be seen by clinicians. The

CHPS compounds had something similar but more simple. There is a veronica bucket with water, soap and paper towels where clients are made to do proper hand washing before going for the card. At the CHPS compounds there is no staff designated to check temperature of clients and ask the standardised questions, these were done at the OPD. In all facilities, clients are required to wear facemasks. In case they don't have, they are sold one right at the entrance.

"So when you enter the facility there is a screening area. The nurse is in facemasks, then the vital table nurses also have facemasks. Emergency use the facemask, add on gloves, and other PPEs. At the emergency you cannot take chances especially with patients with respiratory symptoms"(IDI, Health Center 1)

"They(patients) are made to wash their hands, go for screening, temperature taken, questionnaire to be answered. They don't hold their folders this time. Patients are supposed to be in their facemasks."—(Cleaner, Gov't hospital 1)

Prior to COVID-19 patients collected their folders from records before dropping them in in a collection box in front of the consulting rooms. This practice was changed due to the COVID-19 NPIs in order to reduce frequency of touching.

*"there is a veronica bucket at the entrance, so the person will put on the mask and getting closer to the OPD table you will sanitize your hands, then you sit at the OPD, before it gets to your turn we will check the temperature. During the covid era(during the peak) have somebody at the entrance who will check your temperature". (*IDI, CHPS 1)

Expressing their knowledge on self-quarantine measures all respondents said when a HCW tested positive to COVID-19, showed symptoms, or came into contact with a positive case, they were required to self-quarantine until unconfirmed cases are confirmed by lab.

"once you test positive you are required to self-quarantine for 2 weeks" (IDI, Gov't hospital 2)

"All the HCWs who got the covid self-isolated and those who came into contact with positive cases" (FGD, Gov't Hospital 3,)

On self-quarantine measures, one participant shared they had no idea about it and also responded that they hadn't received any education on it. Particular attention was paid to their case and several follow up questions were asked to confirm the knowledge gap. Though they knew about preventive precautions, they admitted not knowing about self-quarantine practices.

"I don't know of such(self-quarantine)…. I can't tell of such(contact tracing) We go home after our work….We have not been educated on such things." (IDI, Hospital 4)

On knowledge on handling of patients, participants mostly responded that suspected patients were separated from the rest of the clients. When patient was triaged and fell into the case definition, they were taken through a different route. They are sent to an isolated place depending on the facility for instance, in hospitals with isolation wards, send such clients are sent to the isolation in the company of HCWs who are dressed in appropriate PPEs. In case the facility does not have isolation, clients are kept somewhere away from other people for clinicians to attend to them for further decisions. In the smaller facilities, they are sent to a distant place which could be under a tree while the COVID-19 task force is informed via telephone. While they are in this isolation the patient is made to wear facemask except where patient has breathing difficulty.

"From triaging, when a suspected case is detected, they notify the clinician. The patient is made to sit somewhere. The lab personnel comes to pick you to the sample taking room, where samples are

taken. If you are stable, you are made to self quarantine at home also because there is no quarantine center here. Your contacts and address is taken. If result is negative you can resume work. If you are positive, we do contact tracing and give treatment accordingly".(IDI, Hospital 5)

4.3.2 Skills/practices and attitudes

Under practices and attitudes attention was focused on PPE usage, self-quarantine measures, screening and triaging, hand hygiene and cleaning of frequently touchable surfaces. On self-quarantine, all participants said it was being practised sufficiently well and once a HCW showed symptoms consistent with COVID-19 they were made to stay away from work for a period of two weeks. During this period samples would be taken and sent for testing and if HCW tested positive, treatment would be initiated while under quarantine. Responding to how long it took for results to come, the majority said initially results took about a month but later testing capacity was scaled up and it took about 3-5 days for results to be ready. Participants from the hospitals said staff attitudes contributed to noncompliance and an example was cited that some staff use unapproved routes to enter the facility thereby skipping screening. Staff is made up of all workers in the health facility; both the clinical and non-clinical. Respondents in the hospitals also complained that screening was mostly done in the mornings and not available mostly in the afternoons and on the weekends. They said screeners refused to show up during these times

"We had a case where a patient results came positive so those HCWs who came into contact with the patient all self-quarantined. They were at post until the result of the patient came positive" (IDI, HC 1)

On hand hygiene practices, almost all participants said it was being practised very well. Though it was admitted that sometimes logistics for proper handwashing was lacking, HCWs still found ways to engage in proper hand hygiene practices even if it meant buying their own soaps, paper towels, hand sanitizers etc. These responses were skewed toward the peak of the pandemic when Ghana recorded a lot of the cases in March 2020 to July 2020. It became clear from respondents that at the time of the data collection practices were compromised.

"it's amazing how people would want to wash their hands and wash it the right way, as for hand hygiene it's being done by almost everybody so many times probably that's why we don't always have soap"—(IDI, Gov't hospital 5)

PPE use also generated various perceptions. The most important PPE in all facilities was the face mask. Most participants said once the PPEs were available they were used correctly. A few also gave contrary opinions on PPE usage. It was said PPE usage fell far below expectation. Staff attitude was cited for underuse of PPEs. A few said some staff abused the PPEs and demanded them unnecessarily.

*"What is being done here is not adequate to me. Using the PPEs as required is not done. You are supposed to be gowned when doing certain procedures, when examining a patient you should wear gloves etc but that is not what is done here. I for instance have examined a patient without gloves before. I know what I am doing is not good but we do it. It's more of staff attitude". (*IDI, Hospital 4)

At the environmental level NPIs, participants said windows were open, waiting areas such as OPDs were in open areas where there is adequate air flow, for the CHPS compounds, waiting areas were moved to the open were some had tents erected in the open space in front of the facility block. One facility had a tree nearby where clients waited for their turn. This was to ensure there is adequate

natural ventilation around people to reduce transmission risk. Respondents also said there had been fumigation exercises in the facilities. Fumigation was done in the various units in the hospitals where patients are cared for such as the wards and emergency units. The smaller facilities usually had the entire facility fumigated. Waste segregation was also mentioned and usage of pedal dustbins were used to avoid touching lids of bins. Most participants found problems with the work of cleaners. Cleaning and disinfection of touchable surfaces were done by both cleaners and nurses. It was said that cleaners did the sweeping and mopping of floors and bathrooms but frequently touchable surfaces like bed rails, tables, door handles etc were done by nurses. Its termed dusting. Some prescribers (doctors and PAs) had issues with the cleaning of their offices. One lamented how he did it himself because no nurse would come to do it. Others said once nurses are prompted they came to clean them. These practices according the majority of respondents were done once per day. The few respondents from some hospitals said once per shift. When asked why cleaners did not do it entirely, all respondents said their numbers were low and they were not permanent workers. One participant was of the view that their salary makes it necessary for them go out to other sources of income after work in the hospital. It was mentioned that at any point in time there was one cleaner on standby who is called to action should the need arise. Respondents also opined that knowledge and skills of cleaners were inadequate as some used the same towels for the bathrooms, consulting rooms, etc. Cleaners are called orderlies in Ghana.

A respondent's comment to their perception of the work of cleaners:

"Well the orderlies I think are helping us to die, they are helping transmit the bacteria or whatever. They are not professionals, they are everyone who can just clean and mop. You can imagine where they are coming from, where they start from, what they are using to clean let's say a consulting room and outside, coming from consulting room to outside, they just put infections together transfer microbes everywhere. You see it and you're like you shouldn't have cleaned, you should have allowed me to use it the way it was." (IDI, Hospital 5)

A few also cited attitudes of staff contributed to the NPI measures not being well implemented. For example a respondent lamented on the fact that some staff didn't wear facemasks, go through the screening process or use unapproved routes to enter the facility. This included some facility authorities which generated concern especially during communication with patients, and other visitors where these entrants point out they don't see any reason to observe the measures if HCWs are not observing the measures themselves.

"Charity begins at home. Some staff go around without masks. So sometimes patients relative refer us to staff who are not in masks. Authorities don't use the approved route to enter the facility so they don't go through the screening. All these make communication with clients difficult." (FGD, Hospital 3)

Another respondent had this to say about screeners:

"At the screening point the nurses instruct the entrants to observe the protocols but when they the nurses are reporting to duty, they walk and by pass the veronica buckets, go and sit down (without them observing the required NPIs) to tell patients and visitors to wash their hands etc" (IDI Hospital 4)

4.4 Factors impacting compliance

Factors impacting compliance was grouped into three categories. The individual, institutional and sociocultural.

4.4.1. Individual factors

4.4.1.1 General perception on NPIs

All participants said NPIs were important, useful and effective in controlling the pandemic but with the condition that if they are well implemented. A few even said they were better than pharmaceutical interventions. The majority was of the view that even apart from COVID-19, NPIs were necessary to prevent other infectious diseases.

"they are very useful even without covid 19 there can be other infections that we need to protect ourselves from other contacts infections that we need to protect ourselves from." (IDI, CHPS 3)

"obviously they are effective, even aside covid, when you wear masks you reduce your chances of getting respiratory infections. They are good". (IDI, HC 1)

"I think all the measures are important especially using one entry and exit points, it helps in tracking people, because you use the route, your details are taken just in case we flag someone as having covid its easy to trace the rest that comes in. And also adhering to the protocols putting on face mask, hand hygiene and all the others, if everyone is to practice it very well, the risk of transferring other infections even not covid to other people is currently reduced". (FGD, Hospital 3)

4.4.1.2 Personal motivation(perceived danger)

All participants cited personal safety as the principal driver for their compliance. They said personal motivation for their compliance was fear of contracting the virus and spreading it to their family. Some said they were afraid they could die from it, others mentioned health reasons which could lead to severe complications. All participants affirmed the reality of the COVID-19 pandemic and the seriousness of the disease. They knew the disease could easily be spread among close contact. It was generally perceived by respondents as a deadly condition.

"To protect myself and my family and the next is not to infect any other person around me."

(IDI, HC 1)

"I know covid is real. I don't know what I will achieve tomorrow, so I will rather protect myself and live to see what I get tomorrow". (FGD, Hospital 5)

All participants also mentioned there was fear at their facilities during the peak of the pandemic and most of them were scared. They however mentioned that no patient was abandoned due to the fear but sometimes HCWs were reluctant to go near suspected cases. Responding to whether HCW abandoned a patient due to fear, a respondent said:

"Yes with our first and second cases. We didn't have enough PPEs."(IDI HC 1)

Another respondent said:

"We all panicked. One staff told me to ask the director to close down the facility because they were afraid. Everyone panicked" (IDI, CHPS 1)

4.4.1.3 Level of interference or enhancement on work

Participants were also asked about the level of interference or enhancement that the NPIs had on their work and whether that influenced their compliance. The average admitted some NPIs like the PPEs and physical distancing measures impacted negatively on their work but were quick to add that that level of interference doesn't prevent them from adhering to the measures. Many of participants said NPIs did not influence their work negatively but rather enhanced it. The reusable masks which were initially provided by the RHD was found by many to be difficult to use. Participants complained

of difficulty in breathing which compelled many HCWs to purchase their own disposable masks. Later the MoH through the RHD supplied the regular disposable masks

"They sort of interfere, one, they are not comfortable. If you are talking to a person behind a screen, how the message is perceived is different form when the person actually sees your face and can see your empathy. You are giving care and so how the person you're saying I am sorry… it just sound like a voice. It doesn't have the human touch to it, so it impairs your communication during work." (IDI, Hospital 2)

"To me they don't interfere with my work, even before the covid pandemic, we as nurses use some of the measures". (FGD, Hospital 3)

4.4.2 Institutional factors

4.4.2.1 Availability of logistics

At the institutional level most of the respondents cited availability of logistics as the main influencing factor for compliance. While respondents admitted that logistics like running water, soaps, hand towels, PPEs, alcohol based sanitiser etc were more readily available during the COVID-19 era compared with pre covid era, they indicated that consistency in the supply was a problem. Key informants also mentioned the supply chain was initially challenged by the demand but later was significantly improved. It was however stated that there were interruptions in supply at times. Supply of logistics is from the national level through the regional and district and down to the facility level. Some facilities also received donations from other sources like community members, churches and other private organizations. Shortage of supplies happens when the regional office also experiences delays in receiving from national. Most of the respondents understand that supply was dependent on different levels, the facility depending on district, and district depending on regional etc. There were complains that sometimes authorities in charge of supplies can put restrictions on supplies due to perceived abuse by HCWs. In charges at the HCs and CHPS compounds were responsible for the supply at the facility level. All respondents at the HCs and CHPS compounds said they ensured supplies were available to their colleagues once they had in stock.

*"Yes. I make PPEs available, sanitizers are available, even chlorine wasn't coming before covid. they are now readily available because of Covid….(Laughs)... I even pray that covid stays so we keep getting the supplies." (*IDI CHPS 2)

Speaking on the challenges facing the facility, a key informant said:

"initially it couldn't support the demand but when supplies were provided we ensured that they were available to HCWs…. Lack of funds ..supplies are limited." (KI Hospital 2)

All participants from the 5 hospitals and two Health Centers said there was constant water supply because they had a mechanised borehole system. Majority of the participants from CHPS facilities said they had constant supply of water while the minority said water was a challenge since the facility depended on the community for water.

Response to the water availability question by respondent from the CHPS was:

"We don't have water in the facility. We beg the community members to fetch us water. There were shortage of water during the peak of the infection. Especially during the barrier exercises, people got frustrated as they were asked to wash their hands and got no water. Staff have their own water for handwashing but that is not available for the clients. We ask the school children to fill our buckets for

us in the morning and so when it get finished during the afternoon that's it. Clients use sanitizer when there is no water." (IDI, CHPS 2)

The most majority explained that though there were significant gaps in the supply chain in all facilities, that did not deter them from observing the protocols (especially at the individual level) as they provide themselves with items such as facemasks, hand sanitizers, and even soaps at their own cost instead of waiting on the facility supply.

"Also we buy our own masks, sometimes the alcohol hand sanitizers, liquid soaps all run out. I now have soap in my bag" (FGD Hospital 5)

4.4.2.2 Level of enforcement, monitoring and supervision of practices

All participants from the hospitals said supervision and enforcement of practices was mainly done by colleagues who were in charges on the various units. Some of the hospitals had a COVID-19 policing team which was set up by the local authorities. Members of this team were staff of the facility and their role was to conduct surveillance within the facility to ensure NPI measures were in place and being properly observed. However at the time of data collection researcher did not get a glimpse of the team. Respondents from facilities with such system affirmed the system was no more functioning. A few from the hospitals said there was no supervision in their facilities. Respondents from the HCs and the CHPS compounds said supervision and enforcement was done by them(in charges of the facilities) and indicated they did so periodically. Once they notice a worker not in mask, they are prompted to put it on. They also check to ensure there is water in veronica buckets, soap and towels were available. They also stated that due to the fact that they were also usually busy, the adequacy of the monitoring mechanisms was questionable.

"…Each unit has an in charge, nurses have in charge who all ensure that the right thing is done". (IDI, HC 1)

"There was a covid police system where a team goes round and ensured staff observed the protocols however it is no more as we speak." (FGD, Hospital 3)

"I rarely see any enshrined body around doing supervision. Unit heads are mandated to ensure protocols are observed" (IDI, Hospital 2)

Supervision of cleaners in response to COVID-19 was noted by some respondents to be inexistent. Majority of respondents opined that they had inadequate skill and received little or no supervision. While a key informant said some nurses were mandated to supervise cleaners, a cleaner asked who supervised their work said it was administrator and sometimes the DDNS.

On supervision of the cleaners a respondent in a hospital said:

"So it looks like after receiving the training, nobody checks on them(cleaners). Occasionally they get the training but the thing is they are not practicing it. I haven't seen any supervision going on so far."(IDI, Hospital 5)

4.4.2.3 Level of trust in health authorities

Half the respondents said they trusted health authorities to provide the necessary logistics for their safety while the other average said they didn't trust them enough when it came to their safety issues. Those who trusted had their trust grounded in the fact that authorities did their best to ensure logistics were available. Some respondents lamented on the fact that some health authorities were not observing the protocols and that they used unapproved routes to enter the facility thereby skipping screening. Issues of authorities not responding promptly to calls from HCWs were also

raised. As part of the measures, when a nurse suspects a patient on their ward may have developed COVID-19, they were supposed to inform authorities and sometimes such reporting are not treated with the required urgency by the authorities.

"Since the outbreak they gave us a lot of things that will protect us, they also advise us to be careful and take the measures seriously. I think they love us" (IDI, Hospital 4)

This is what a participant from a focus group discussion say

"During the initial stages where there was no isolation ward, sometimes you saw a patient on the ward with signs and symptoms of covid but when you inform the authorities they just say its not a covid case when patient has not been tested….This attitude from authorities puts fear in the staff and other patients which makes some HCW unwilling to care for these patients." (FGD Hospital 5)

Another participant in FGD said:

"Some of the authorities don't even observe the protocols." (FGD Hospital 3)

4.4.2.3 Communication with clients

All respondents lamented that getting patients, patient attendants and other visitors to comply with measures was difficult as some of these people didn't believe in the existence of the COVID-19. Others also did not understand the reason behind these measures. Participants from the hospitals without enclosure said there were times patients relatives could enter the wards evading the attention of the nurses. The CHPS compounds and HCs didn't have this problem because patients are not admitted. Furthermore these facilities were usually a one block facility so all entrants used the same entry points. It is difficult for an intruder to get in the building without being noticed. The main problem with communication with clients was the disbelief and misunderstanding of the condition.

"we do our part as health workers to inform them about the realities on the ground and what can happen to any of us as a result of covid. Sometimes the patients are not really our challenge but the challenge is the relatives who won't understand" (IDI, Hospital 3)

"Another man told me covid is an NPP disease". (FGD Hospital 5) NPP stands for the New Patriotic party which is the political party in power in Ghana currently.

4.4.2.4 Facility motivation

Most respondents said provision of logistics was the most important motivation for them under the institutional factors. What was meant by this is when logistics were provided in a timely manner compliance was likely to go up. However, during the discussion an important influencer emerged from among respondents. It was a government incentive promise of 50% increase in salaries for COVID-19 frontline workers. This was a motivation package from the Government of Ghana to all frontline health workers for the period of three months from April 2020. It was later extended till the end of 2020. The few majority said there was discrimination in defining who a frontliner was. Some said they were initially promised that allowance only for them to work so hard and later realise they didn't qualify to receive it.

"Also there was a promise from government to frontline workers that there will be 50% increase in salary for them but there screeners were not given that 50%. It created a feeling that they were being cheated since they saw themselves as frontliners as well. Those at the isolation were given that bonus while screeners weren't given." (FGD, Hospital 5)

4.4.3 Sociocultural factors

Many of the respondents said the COVID-19 NPI measures had affected handshaking practice for them. A few mentioned that encountering some traditional rulers without handshakes didn't augur well for them. A large minority said they broke their commitment not to shake hands a few times. Majority said they were comfortable with not shaking hands.

Just as it was mentioned under staff attitude and trust in health authorities, some authorities who were not observing the measures could be due to the hierarchal perception in the Ghanaian culture. For example an administrator may walk past screeners without being screened and they may not be asked anything.

On how the NPI measures have affected their relationships, these respondents said:

"You forget (not to shake hands) sometimes since we are Ghanaians and its part of our culture"(IDI, CHPS 3)

"Negative, because there was a time I visited my parents and my daddy wanted to shake hands with me and immediately I said eh covid! no handshaking, his comment was in (twi, local dialect) 'did I send you to nursing school to come and do this?'" (FGD, Hospital 3)

Chapter 5. Discussion, conclusion and recommendations

5.1 Discussion

Though hand hygiene for example is a key measure which is very common in all the facilities, both the observation and interviews revealed that not all items needed for proper hand hygiene practice was available. Participants confirmed significant gaps in the supply chain. This finding is consistent with studies conducted in other low and middle income countries which shows only 2% of healthcare facilities are able to adequately provide the needed infrastructure.[43] Facility architecture also played a key role in the proper implementation of screening of entrants. Most of the hospitals were not able to institute a well-defined entry and exit points because of lack of enclosure structures such as a fence. Only a few had an enclosed premises which supported an effective screening process. The majority that had several entry points into the facility experiences challenges with the screening of entrants. A similar finding was seen in a study by Ogbaini et al conducted in Liberia during the Ebola where entrants evaded screening due to the existence of multiple entry points to the facility.[44]

Participants showed they had sufficient knowledge on the NPIs that were instituted by the MoH in response to COVID-19. This was demonstrated in their responses to practices like hand hygiene, self-quarantine, screening and handling of suspected cases. This finding is consistent with what Ocran et al found where majority of HCWs had the requisite knowledge on how to prevent hospital acquired infections, but contradicts another study conducted in Ghana where knowledge in standard precautions was low among participants.[24,37] In spite of this, an important knowledge gap was identified in a minority on self-quarantine practices among respondents with background as cleaners. Though the likelihood of this finding is high due to the fact that respondents were without formal education,[45] it could suggest that either some respondents did not receive all relevant content of training or the training was not understood

Staff attitudes was found to be of concern by respondents as it was revealed that some staff entered the facility through unapproved routes thereby skipping going through screening. These personnel include both clinical and non-clinical staff. Several determinants are responsible for attitudes. These includes internal factors such as perceived threat, where a patient feels threatened by the severity of disease, and perceived benefits where a patient feels the benefit gained by observing the protocols far outweighs the risks of not observing them, as well as external factors like enforcement mechanisms. When there is stringency in enforcement and HCWs know there are consequences involved when standards are violated, the tendency to observe them increases. In a hierarchical society like Ghana, some authorities may just skip protocols as was noted in this study. At that level there is a possible perception of being ‘above the law’.

Lackadaisical attitudes of HCWs can also be directly related to enforcement measures. This study revealed that at the time of data collection, respondents including key informants were not happy with the level of enforcement. Screening had stopped in some facilities, COVID-19 policing system was no more functioning in the hospitals that implemented this measure, and HCWs were generally relaxed in adherence. Supervision of cleaners was also a major problem as according to a key informant cleaners were being supervised by nurses. This is likely to experience an implementation gap due to the pandemic-induced work overload because these nurses still have to discharge their usual duties. Though it was said nurses supervised cleaners, respondents found a lot of problems

with the work of cleaners. This suggests there is little or no supervision provided by these nurses. There is also lack of clarity on whose shoulders the responsibility lied.

Acceptance and implementation of the NPIs was gravely influenced by perceived danger and all participants confirmed that their personal safety was the most important reason for compliance. This finding is consistent with many studies which have been conducted on the subject.[46–48] During the Ebola outbreak in Sierra Leone, PPE usage was found to be very high and generally the fear of contracting the virus became the main driver of adherence to IPC measures.[49] Another study by Mahmoud Al-Hussami et al in a hospital in Amman Jordan showed that HCWs were more compliant to handwashing due to the perceived threat of coming into contact of patients' secretions but were less complaint when it came to patient's safety.[50] This phenomena could induce 'careless behaviour' should HCWs feel less threatened as can happen after being vaccinated, which could put some vulnerable population at risk. This is true especially with COVID-19 where asymptomatic carriers can still transmit the virus to another person.

Financial incentives also influenced compliance in this study which is similar to what was found in a study in Japan where a large number of HCWs cited financial incentive as an important motivation to their willingness to continue in COVID-19 related work.[51] HCWs lamented on the segregation in who receives the benefit of 50% salary increase from the government. They believed every HCW who risks coming into contact with a COVID-19 patient qualified to be named a frontliner. This is especially important as it influenced the actions of some members in the screening team.

The overall decline of national statistics on COVID-19 coupled with the emergence of the vaccine also had a toll on the implementation of the measures. Screening of entrants had stopped in some facilities at the time of data collection. Key informants and respondents noted that there was laxity in the implementation and it was due to the fact that everyone assumed COVID-19 was over or fading out. Perceived danger at the corporate level had lessened.

5.2 Conclusion

This study is aimed at identifying the factors which influence the acceptance and implementation of COVID-19 NPIs from the standpoints of HCWs at the individual, environmental and population levels of NPIs. It was clear from this study that compliance at the individual level was the strongest as it was closely bound to individual safety. The environmental level had significant weaknesses due to low numbers of cleaners , their competencies, availability of logistics, and supervision and monitoring. These issues can be addressed at the Regional, district and facility management levels. Gaps in compliance at the population level NPIs was found to be mainly linked to availability of logistics and motivation of HCWs especially when the focus is on patient safety.

HCWs attitude was tied to several factors including the assumption that the pandemic was over or almost over therefore they relaxed their compliance.
It is crucial for regular periodic assessment to be conducted by the RHD across health facilities in the region to identify the gaps and address them in a timely manner.
This study and the many others conducted around the world reveal a complex cascade of factors associated with compliance to NPIs by HCWs. It is therefore paramount for authorities to adopt a multisectoral approach to ensuring maximum compliance.

5.3. Recommendations

5.3.1 Recommendations to the RHD:

1. Isolation areas or wards are very important in containing infectious diseases especially in an outbreak therefore it is strongly recommended that the Regional Director of health services in the western north region will find ways in helping all facilities in the region to secure an appropriate area for isolation. This can be a long or short term isolation depending on the facility's function. Smaller facilities can be provided with makeshifts tents where suspected cases can be kept before being transferred to the referral centres.
2. The RHD is encouraged to collaborate with other regional directorates in conducting further research on the gaps in supply chain and consequently forwarding findings to MoH for solutions.
3. It is recommended that the Director through her office will identify all facilities without reliable source of water within the region and call on stakeholders to help provide simple mechanised borehole systems for them. This recommendation is based on the finding that some CHPS compounds did not have a reliable source of water supply and were dependent on school children to bring in water.
4. The RHD through the district health assemblies, medical directors, and superintendents, and ICs of smaller facilities should ensure continuous provision of logistics.
5. In order to increase the level of trust HCWs have in health authorities, the regional director is urged to set up a monitoring system that will monitor and ensure compliance of protocols by health authorities. This can elicit behavioural change among HCWs and build a stronger organizational culture in terms of compliance to NPI protocols. Furthermore the Director through the RHD, District health assemblies and facilities should establish additional motivation for staff as and when positive cases are recorded.

5.3.2 Recommendations to facility heads

1. Facility heads are urged to provide training in the local dialect for HCWs without formal education which should also include a feedback mechanism to confirm understanding of content. Attention should be given to ensuring all HCWs receive all relevant training.
2. Facility heads in the hospitals should also ensure teams such as COVID-19 policing system are revived and functional in enforcing the protocols in facilities which instituted this system. Those without such can learn and adapt a similar system in their respective facilities.
3. Facility heads are encouraged to clearly define who takes up supervision of cleaners as their work is indispensable as far as NPIs are concern.

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ANNEXES

1 Research table

Specific objective	Issues	Method	respondents
To identify measures in place in facility according to MoH protocol	1. Measures in place at OPD(staff at entrance checking temperature and asking preliminary questions, arrangement of chairs in waiting rooms, availability of hand sanitizers) at triage, wards, 2. Isolation ward or center 3. What is missing?	In-depth interviews Observation FGD*	Doctors Nurses Cleaners KI (facility administrator)
Assess competencies on NPIs in the facility	1. General knowledge, skills and approach on NPIs 2. Training/workshops on NPIs – level of training, effectiveness 3. Self quarantine(conditions for self quarantine, how long, factors determining return to post) 4. How duties are carried out with regards to NPIs 5. SD guidelines 6. Use of PPEs 7. Triage of patients	In depth interviews Observation FGD	Same as above
Analyse perception of HCW about measures	1. Effectiveness 2. Efficiency at work 3. Perceived benefits of measures 4. Perceived consequences 5. Quality of products 6. Consistency with health literacy – conspiracy theories 7. Level of trust in health authorities	IDI FGDs	Same as above
To explore factors impacting compliance	1. Sociocultural factors – Individual factors - facility factors Social factors	Same as above	Same as above + facility administrator

	2. Availability 3. Accessibility 4. Efficiency at work -Level of interference with duties, time consuming,		
To inform health management policy			

2 Informed Consent Forms (Source: WHO 2018, ICF template for qualitative studies.[52])

2.1 Informed Consent Form for In-depth Interviews

Informed Consent Form for Healthcare workers in Western North Region (Interviews)

This informed consent form is for healthcare workers in western north region of Ghana who we are inviting to participate in a qualitative research titled "Factors influencing the acceptance and implementation of COVID-19 non pharmaceutical interventions in western north region of Ghana..

Name of Principle Investigator: Dr Emmanuel Ardiabah
Name of Institution: KIT Royal Tropical Institute

This Informed Consent Form has two parts:

- Information Sheet (to share information about the study with you)
- Certificate of Consent (for signatures if you choose to participate)

You will be given a copy of the full Informed Consent Form

Part I: Information Sheet

Introduction
I am Dr Emmanuel Ardiabah a student of KIT Royal Tropical Institute and I am undertaking a research study to know the factors that influence the acceptance and implementation of COVID-19 Non Pharmaceutical Interventions among healthcare workers in the western north region of Ghana. I am going to give you information and invite you to be part of this research. You are not obliged to decide today whether to part take in the research or not. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me or of another researcher.

Purpose of the research
One of the most vulnerable groups to COVID-19 is the healthcare worker community since they are constantly exposed. Since this pandemic, approximately 3700 healthcare workers in Ghana have been infected with 14 losing their lives by the end of 2020. It is in view of this that the WHO and MoH of Ghana outlined guidelines for COVID-19 Non Pharmaceutical Interventions in health facilities across the country. NPIs are the public health preventive measures that help to prevent the spread of the virus and in turn keep the population safe from contracting the disease in the absence of a safe and effective vaccine. For healthcare workers a variety of them including the PPEs usage, social distancing, handwashing, protocol in triaging suspected cases and others are recommended. In this study we will like to find out the factors that influence the acceptance and their implementation in the facilities within the Western North Region. We want to learn about the different ways that healthcare workers cope with the protocols of NPIs.

Type of Research Intervention
This research will involve your participation in interview that will take about one hour.

Participant Selection
This study will involve your participation in an interview that will take about a one-hour. You are being invited to take part in this research because we feel that your experience as a healthcare worker in the western north region can contribute much to our understanding and knowledge of NPI practices among healthcare workers in the region.
Your views and opinions are also very important. Participation in this research is entirely voluntary. It is your decision to participate or not. If you choose not to participate, it is within your right. You are also free to change your mind later and stop participating even if you agreed earlier. There are no consequences to do so.

Procedures of Interview and Confidentiality: During the interview, another interviewer or I and a

note taker will sit down with you in a comfortable place. No one else but the interviewer will be present unless you would like someone else to be there. The information recorded is confidential, and no one else except the research team involved in this study will have access to the information documented. The entire interview will be noted and tape-recorded if you permit it, and no one will be identified by name during recording or in the notes afterwards..

Risks and Benefits: We are asking you to share some personal views and opinions with us, and you may feel uncomfortable talking about some of the topics. You do not have to answer any question in the interview if you feel the question(s) are too personal or if talking about it makes you uncomfortable. You do not have to give us any reason for not responding to any question. There will be no direct benefit to you, but your participation helps us find out more about factors that contribute to adherence to NPI protocols and make recommendations.

Results sharing: After the study is completed, we will share the results with Ministry of Health, Regional Health Directorate, Hospital management, healthcare workers, through workshop, conference and media. We will also publish the results so that other interested people may learn from the study. No information through which individuals can be identified will be included. If you would like to receive a copy of the report, please let us know and we will send it to you.

Contact: If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact any of the following: Dr Emmanuel Ardiabah/Tel: +31658841362/Email:ardibee@yahoo.com

This study has been reviewed and approved by Ghana Health Service Ethical Review Board. This is the board that ensures that research participants are protected from harm. If you wish to find about the committee, please contact Nana Abena Apatu, +233(0)503539896, ethics.reseach@ghsmail.org .

Part II: Certificate of Consent

I have been invited to participate in a study about the "Factors influencing acceptance and implementation of Covid-19 Non Pharmaceutical interventions among healthcare workers in Western North Region of Ghana."

The purpose of the interview and all details mentioned were explained to me and I consent voluntarily to be a participant in this study.

Name of Participant……. Signature of Participant ……..Date……..

Statement by the researcher/person taking consent: I have accurately read out the information sheet to the invited participant, and to the best of my ability made sure that the participant understands all information above mentioned. I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant.

Name of Researcher:……. Signature of Researcher …… Date ……

2.2 Informed Consent Form for Focus Group Discussion

Informed Consent Form for Healthcare workers in Western North Region

This informed consent form is for healthcare workers in western north region of Ghana who we are inviting to participate in a qualitative research titled "Factors influencing the acceptance and implementation of COVID-19 non pharmaceutical interventions in western north region of Ghana..

Name of Principle Investigator: Dr Emmanuel Ardiabah
Name of Institution: KIT Royal Tropical Institute

This Informed Consent Form has two parts:

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- Certificate of Consent (for signatures if you choose to participate)

You will be given a copy of the full Informed Consent Form

Part I: Information Sheet

Introduction

I am Dr Emmanuel Ardiabah a student of KIT Royal Tropical Institute and I am undertaking a research study to know the factors that influence the acceptance and implementation of COVID-19 Non Pharmaceutical Interventions among healthcare workers in the western north region of Ghana. I am going to give you information and invite you to be part of this research. You are not obliged to decide today whether to part take in the research or not. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me or of another researcher.

Purpose of the research

One of the most vulnerable groups to COVID-19 is the healthcare worker community since they are constantly exposed. Since this pandemic, approximately 3700 healthcare workers in Ghana have been infected with 14 losing their lives by the end of 2020. It is in view of this that the WHO and MoH of Ghana outlined guidelines for COVID-19 Non Pharmaceutical Interventions in health facilities across the country. NPIs are the public health preventive measures that help to prevent the spread of the virus and in turn keep the population safe from contracting the disease in the absence of a safe and effective vaccine. For healthcare workers a variety of them including the PPEs usage, social distancing, handwashing, protocol in triaging suspected cases and others are recommended. In this study we will like to find out the factors that influence the acceptance and their implementation in the facilities within the Western North Region. We want to learn about the different ways that healthcare workers cope with the protocols of NPIs.

Type of Research Intervention

This research will involve your participation in group discussion that will take about one hour.

Participant Selection

This study will involve your participation in an interview that will take about a one-hour. You are being invited to take part in this research because we feel that your experience as a healthcare worker in the western north region can contribute much to our understanding and knowledge of NPI practices among healthcare workers in the region.

Your views and opinions are also very important. Participation in this research is entirely voluntary. It is your decision to participate or not. If you choose not to participate, it is within your right. You are also free to change your mind later and stop participating even if you agreed earlier. There are no consequences to do so.

Procedures of Interview and Confidentiality: During the group discussion, we will ask you and

others in the group not to talk to people outside the group about what was said in the group. We will, in other words, ask each of you to keep what was said in the group confidential. You should know, however, that we cannot stop or prevent participants who were in the group from sharing things that should be confidential

Risks and Benefits: We are asking you to share some personal views and opinions with us, and you may feel uncomfortable talking about some of the topics. You do not have to answer any question in the interview if you feel the question(s) are too personal or if talking about it makes you uncomfortable. You do not have to give us any reason for not responding to any question. There will be no direct benefit to you, but your participation helps us find out more about factors that contribute to adherence to NPI protocols and make recommendations.

Results sharing: After the study is completed, we will share the results with Ministry of Health, Regional Health Directorate, Hospital management, healthcare workers, through workshop, conference and media. We will also publish the results so that other interested people may learn from the study. No information through which individuals can be identified will be included. If you would like to receive a copy of the report, please let us know and we will send it to you.

Contact: If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact any of the following: Dr Emmanuel Ardiabah/Tel: +31658841362/Email:ardibee@yahoo.com

This study has been reviewed and approved by Ghana Health Service Ethical Review Board. This is the board that ensures that research participants are protected from harm. If you wish to find about the committee, please contact: ……..[address/telephone number/e-mail].

Part II: Certificate of Consent

I have been invited to participate in a study about the "Factors influencing acceptance and implementation of Covid-19 Non Pharmaceutical interventions among healthcare workers in Western North Region of Ghana."

The purpose of the interview and all details mentioned were explained to me and I consent voluntarily to be a participant in this study.

Name of Participant……. Signature of Participant ……..Date……..

Statement by the researcher/person taking consent: I have accurately read out the information sheet to the invited participant, and to the best of my ability made sure that the participant understands all information above mentioned. I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant.

Name of Researcher:……. Signature of Researcher …… Date ……

2.3 Informed Consent Form for Semi-structured Interviews (SSI)

This informed consent form is for healthcare workers in western north region of Ghana who we are inviting to participate in a qualitative research titled "Factors influencing the acceptance and implementation of COVID-19 non pharmaceutical interventions in western north region of Ghana.

Name of Principle Investigator: Dr Emmanuel Ardiabah
Name of Institution: KIT Royal Tropical Institute

This Informed Consent Form has two parts:

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- Certificate of Consent (for signatures if you choose to participate)

You will be given a copy of the full Informed Consent Form

Part I: Information Sheet

Introduction

I am Dr Emmanuel Ardiabah a student of KIT Royal Tropical Institute and I am undertaking a research study to know the factors that influence the acceptance and implementation of COVID-19 Non Pharmaceutical Interventions among healthcare workers in the western north region of Ghana. I am going to give you information and invite you to be part of this research. You are not obliged to decide today whether to part take in the research or not. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me or of another researcher.

Purpose of the research

One of the most vulnerable groups to COVID-19 is the healthcare worker community since they are constantly exposed. Since this pandemic, approximately 3700 healthcare workers in Ghana have been infected with 14 losing their lives by the end of 2020. It is in view of this that the WHO and MoH of Ghana outlined guidelines for COVID-19 Non Pharmaceutical Interventions in health facilities across the country. NPIs are the public health preventive measures that help to prevent the spread of the virus and in turn keep the population safe from contracting the disease in the absence of a safe and effective vaccine. For healthcare workers a variety of them including the PPEs usage, physical distancing, handwashing, protocol in triaging suspected cases and others are recommended. In this study we will like to find out the factors that influence the acceptance and their implementation in the facilities within the Western North Region. We want to learn about the different ways that healthcare workers cope with the protocols of NPIs.

Type of Research Intervention

This research will involve your participation in interview that will take about one hour.

Participant Selection

This study will involve your participation in an interview that will take about a one-hour. You are being invited to take part in this research because we feel that your experience as a healthcare administrator in the Western North Region can contribute much to our understanding and knowledge of NPI practices among healthcare workers in the region. We believe you have solid understanding of the dynamics between the MoH and the healthcare delivery on the ground which will help us to make some informed recommendations. Your perspective will also guide us to get a clearer picture from the entire study.

Participation in this research is entirely voluntary. It is your decision to participate or not. If you choose not to participate, it is within your right. You are also free to change your mind later and stop participating even if you agreed earlier. There are no consequences to do so.

Procedures of Interview and Confidentiality: During the interview, I and a note taker will sit down with you in a comfortable place. No one else but the interviewer will be present unless you would like someone else to be there. The information recorded is confidential, and no one else except the

research team involved in this study will have access to the information documented. The entire interview will be noted and tape-recorded if you permit it, and no one will be identified by name during recording or in the notes afterwards..

Risks and Benefits: We are asking you to share some personal views and opinions with us, and you may feel uncomfortable talking about some of the topics. You do not have to answer any question in the interview if you feel the question(s) are too personal or if talking about it makes you uncomfortable. You do not have to give us any reason for not responding to any question. There will be no direct benefit to you, but your participation helps us find out more about factors that contribute to adherence to NPI protocols and make recommendations.

Results sharing: After the study is completed, we will share the results with Ministry of Health, Regional Health Directorate, Hospital management, healthcare workers, through workshop, conference and media. We will also publish the results so that other interested people may learn from the study. No information through which individuals can be identified will be included in this document. If you would like to receive a copy of the report, please let us know and we will send it to you.

Contact: If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact any of the following: Dr Emmanuel Ardiabah/Tel: +31658841362/Email:ardibee@yahoo.com

This study has been reviewed and approved by Ghana Health Service Ethical Review Board. This is the board that ensures that research participants are protected from harm. If you wish to find about the committee, please contact: .

Part II: Certificate of Consent

I have been invited to participate in a study about the "Factors influencing acceptance and implementation of Covid-19 Non Pharmaceutical interventions among healthcare workers in Western North Region of Ghana."

The purpose of the interview and all details mentioned were explained to me and I consent voluntarily to be a participant in this study.

Name of Participant……. Signature of Participant ……..Date……..

Statement by the researcher/person taking consent: I have accurately read out the information sheet to the invited participant, and to the best of my ability made sure that the participant understands all information above mentioned. I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant.

Name of Researcher:……. Signature of Researcher …… Date ……

Informed Consent Form for Healthcare workers in Western North Region(Observation)

This informed consent form is for healthcare workers in western north region of Ghana who we are inviting to participate in a qualitative research titled "Factors influencing the acceptance and implementation of COVID-19 non pharmaceutical interventions in western north region of Ghana..

Name of Principle Investigator: Dr Emmanuel Ardiabah
Name of Institution: KIT Royal Tropical Institute

This Informed Consent Form has two parts:

- Information Sheet (to share information about the study with you)
- Certificate of Consent (for signatures if you choose to participate)

You will be given a copy of the full Informed Consent Form

Part I: Information Sheet

Introduction

I am Dr Emmanuel Ardiabah a student of KIT Royal Tropical Institute and I am undertaking a research study to know the factors that influence the acceptance and implementation of COVID-19 Non Pharmaceutical Interventions among healthcare workers in the western north region of Ghana. I am going to give you information and invite you to be part of this research. You are not obliged to decide today whether to part take in the research or not. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me or of another researcher.

Purpose of the research

One of the most vulnerable groups to COVID-19 is the healthcare worker community since they are constantly exposed. Since this pandemic, approximately 3700 healthcare workers in Ghana have been infected with 14 losing their lives by the end of 2020. It is in view of this that the WHO and MoH of Ghana outlined guidelines for COVID-19 Non Pharmaceutical Interventions in health facilities across the country. NPIs are the public health preventive measures that help to prevent the spread of the virus and in turn keep the population safe from contracting the disease in the absence of a safe and effective vaccine. For healthcare workers a variety of them including the PPEs usage, social distancing, handwashing, protocol in triaging suspected cases and others are recommended. In this study we will like to find out the factors that influence the acceptance and their implementation in the facilities within the Western North Region. We want to learn about the different ways that healthcare workers cope with the protocols of NPIs.

Type of Research Intervention

This research will involve your cooperation in agreeing that observation be made at your unit.

Participant Selection

This study will involve your participation in the capacity as the in charge of the unit/ senior nurse of this facility to consent for observation to be made in your unit/facility. We believe this part of the research will contribute to our understanding of NPI practices among healthcare workers in the region. a group discussion that will take about a one-hour. You are being invited to take part in this research because we feel that your experience as a healthcare worker in the western north region can contribute much to our understanding and knowledge of NPI practices among healthcare workers in the region.

Consent is entirely voluntary. It is your decision to grant consent or not. If you or any of your staff disagrees, it is within your right. You are also free to change your mind later and stop the observation even if you agreed earlier. There are no consequences to do so.

Procedures of Observation: During the observation I will be present on your ward to observe how Covid -19 protocols are observed by your staff. No communication will be involved, there will be no audio or video recordings as well. I will use an observation check list which will guide me in order not to forget some items. Observation will be done for 30 minutes.

Risks and Benefits: During the observation a patient on the ward or a staff may feel awkward or uncomfortable being observed. It is not compulsory and they can notify you for the procedure to stop. We are ready to stop the observation as soon as such a concern is raised. There will be no direct benefit to you, but your participation helps us find out more about factors that contribute to adherence

to NPI protocols and make recommendations.

Results sharing: After the study is completed, we will share the results with Ministry of Health, Regional Health Directorate, Hospital management, healthcare workers, through workshop, conference and media. We will also publish the results so that other interested people may learn from the study. No information through which individuals can be identified will be included in this document If you would like to receive a copy of the report, please let us know and we will send it to you.

Contact: If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact any of the following: Dr Emmanuel Ardiabah/Tel: +31658841362/Email:ardibee@yahoo.com

This study has been reviewed and approved by Ghana Health Service Ethical Review Board. This is the board that ensures that research participants are protected from harm. If you wish to find about the committee, please contact: Nana Abena Apatu, +233(0)503539896, ethics.reseach@ghsmail.org.

Part II: Certificate of Consent

I have been invited to give my consent as the in-charge of the unit for observation in a study about the "Factors influencing acceptance and implementation of Covid-19 Non Pharmaceutical interventions among healthcare workers in Western North Region of Ghana."

The purpose of the observation interview and all details mentioned were explained to me and I consent voluntarily for my unit to be observed in this study.

Name of Participant……. Signature of Participant ……..Date……...

Statement by the researcher/person taking consent: I have accurately read out the information sheet to the invited participant, and to the best of my ability made sure that the participant understands all information above mentioned. I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant.

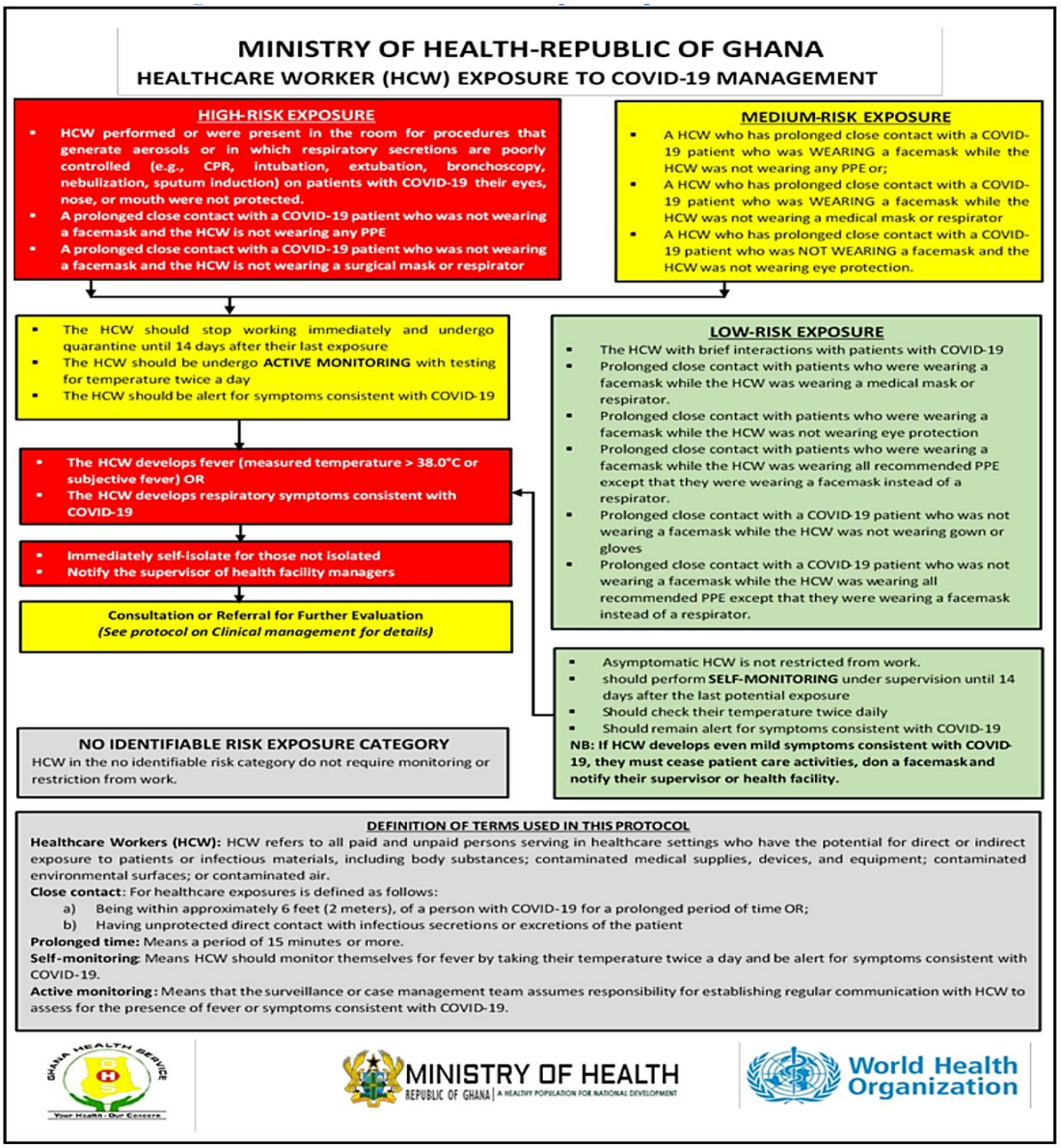
Name of Researcher:……. Signature of Researcher …… Date ……

3 NPI measures adapted from MOH guidelines.

Unit	**NPI Measures**		
	Individual	**Environmental**	**Population(Hospital staff)**
Triage (OPD& Emergency unit)	-Entrance checks by hospital staff(checking of temperature, asking of standardized questions) -Hand and respiratory hygiene(washing of hands frequently with soap and water, use of hand sanitizers, cough etiquette) -proper use of appropriate PPEs(face masks, face shields, aprons, gloves, caps)	-cleaning of touchable surfaces such as door handles, tables, chairs, -Periodic fumigation of facility	-Physical distancing, avoidance of gathering(arrangement of waiting room chairs 1 meter apart) -Self quarantine and testing after exposure -isolation of suspected cases
OPD	-Hand and respiratory hygiene(washing of hands frequently with soap and water, use of hand sanitizers, cough etiquette) -proper use of appropriate PPEs(face masks, face shields, aprons, gloves, caps)	-ventilation of OPD waiting rooms and consulting rooms -cleaning of touchable surfaces such as door handles, tables, chairs	-Physical distancing, avoidance of gathering -arrangement of waiting room chairs 1 meter apart) -Self quarantine after exposure -Reporting suspected cases for isolation - Prompt testing of staff after exposure
Wards	-Hand and respiratory hygiene(washing of hands frequently with soap and water, use of hand sanitizers, cough etiquette) --proper use of appropriate PPEs(face masks, face shields, aprons, gloves, caps)	-Ventilation of wards, -Cleaning of touchable surfaces such as door handles, tables chairs -Frequent cleaning of equipment eg BP checking apparatus, stethoscopes etc	-Physical distancing, avoidance of gathering(arrangement of waiting room chairs 1 meter apart) -Self quarantine after exposure -isolation of suspected cases -Prompt testing of staff after exposure
Emergency	-suspected patients to be given appropriate PPEs -proper use of appropriate PPEs(face masks, face shields, aprons, gloves, caps) -Hand and respiratory hygiene(washing of hands frequently with soap and water, use of hand sanitizers, cough etiquette)	-Ventilation of wards -Cleaning of touchable surfaces such as door handles, tables chairs -Disinfection of equipment	-Physical distancing -Self quarantine after exposure -isolation of suspected cases -Prompt testing of staff after exposure

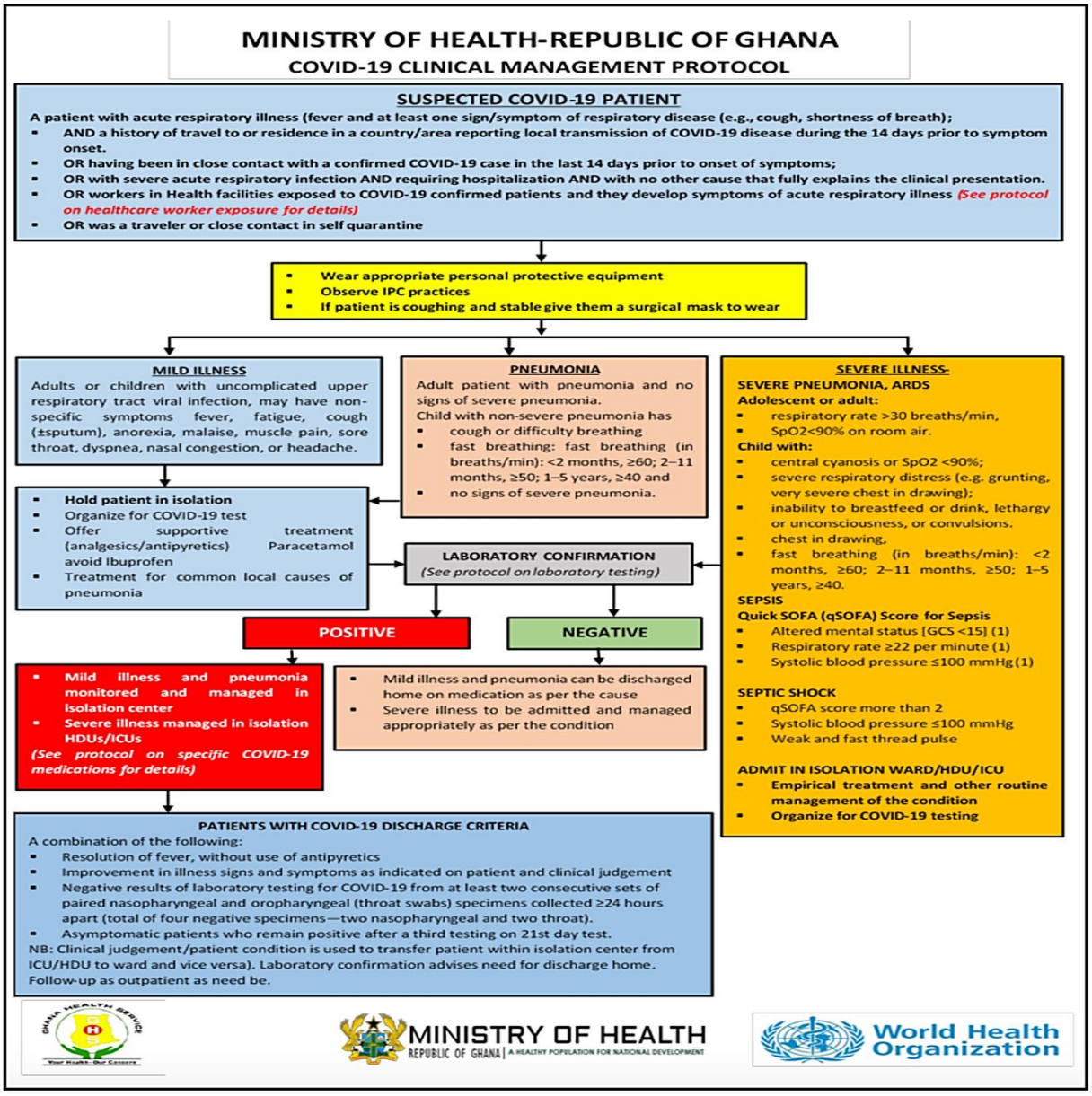
4 Flow charts

Flow charts 1 – HCW exposure to COVID 19 management

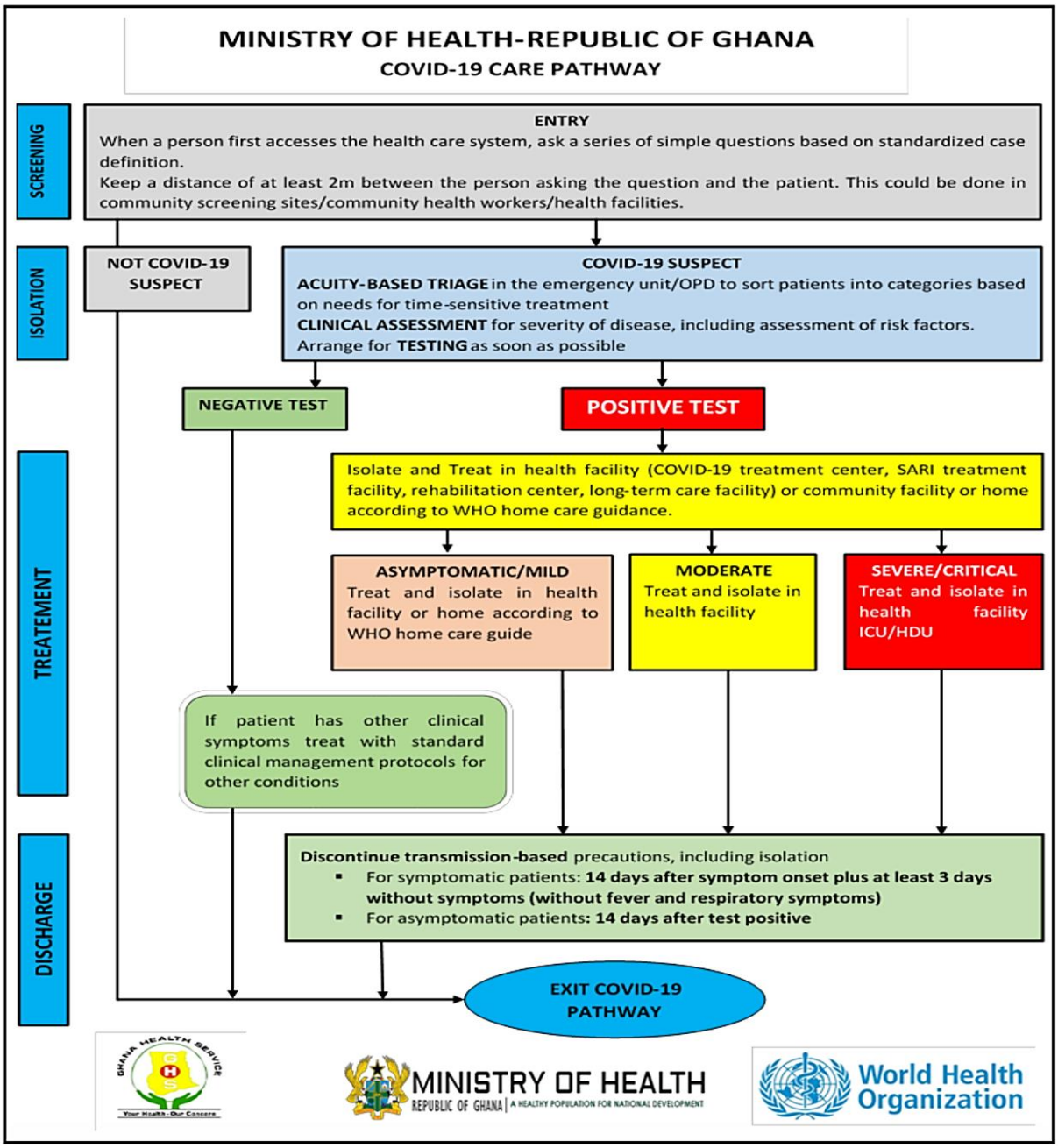


Source: Ministry of Health/Ghana Health Service Case Management Protocol

Flow chart 2 – Covid 19 clinical management protocol



Flow chart 3 - MOH/GHS– COVID-19 care protocol



5 Interviews biodata

Part code	I -01	I – 02	I – 03	I 04	I -05	I – 06	I-07	I08	I09	I-10	I-11	I-12
Sex	M	M	M	F	M	M	M	F	M	F	F	F
No of yrs	2	8	8	2yrs	7	7	3	3	1	8	3	8
Education	University	Secondary	Tertiary	Tertiary	Tertiary	Tertiary	Tertiary	Tertiary	University	Tertiary	Tertiary	No
Prof background	MD	Cleaner	PA	Midwife	PA	PA	PA	Midwife	MD	PA	Midwife	Cleaner
spouse	No	No	Yes	Yes	No	yes	yes	yes	yes	No	No	Yes
Children	No	yes	yes	yes	yes	yes	yes	yes	yes	Yes	No	Yes
Date/ Time	16/08 @12:43	17/08 @12:12	19/08 @13:16	18/08 @12:33	18/08 @18:14	24/08 @13:51	24/08 @10:41	26/08 @08:46	23/08 @14:17	20/08 @13:04	24/08 @16:32	24/08 @08:52

6 FGDs biodata

Participant code	FG01	FG02	FG03	FG04	FG05	FG06	FG07
Gender	M	M	F	F	M	F	F
No. of years in facility	4	2	2	6	2	2	7
Education	Tertiary	Tertiary	Tertiary	Tertiary	Tertiary	Tertiary	Tertiary
Professional background	Nurse	Nurse(Community)	Nurse	Nurse	Nurse	Midwife	Midwife
Spouse	No	Yes	No	Yes	No	Yes	Yes
Children	No	Yes	No	Yes	No	Yes	Yes
Date/Time/Place	19/08/21 @10:20am, Essam Gov't hospital						

Participant code	FG01	FG02	FG03	FG04	FG05	FG06	FG07
Gender	M	M	F	F	F	M	F
No. of years in facility	2	9	9	6	11	4	10
Education	Master	Tertiary	Tertiary	Tertiary	Tertiary	Tertiary	Tertiary
Professional background	Nurse	Nurse	Nurse	Nurse	Nurse	Nurse	Midwife
Spouse	Yes	No	Yes	No	Yes	No	Yes
Children	No	No	Yes	Yes	Yes	No	Yes
Date/Time/Place	20/08/21 @10:30am, Bibiani government hospital						

Participant code	FG01	FG02	FG03	FG04	FG05	FG06
Gender	F	M	M	M	F	M
No. years in facility	10	9	6	9	7	4
Education	Tertiary	Tertiary	Tertiary	Tertiary	Tertiary	Tertiary
Professional background	Nurse	Nurse	Nurse	Nurse	Nurse	Nurse
Spouse	No	Yes	No	No	Yes	No
Children	No	Yes	No	No	Yes	No
Date/Time/Place	23/08/21 @11:35, Enchi government Hospital					

7 Interview Questions

Introduction

Hello.
I am Dr Emmanuel Ardiabah a student of KIT Royal Tropical Institute and I am undertaking a research study to know the factors that influence the acceptance and implementation of COVID-19 Non Pharmaceutical Interventions among healthcare workers in the western north region of Ghana.

The aim of the study is to explore the factors that influence the acceptance and their implementation in the facilities within the Western North Region

Since you are a health care worker and staff of this facility , I would like to invite you to be a part of this study.

Participant code	
Gender	Female | Male| Other
Education	
Professional background	Health provider | programme management | other
Spouse	Yes | No
Children	Yes | No
Date/Time/Place	

Measures in Place

What are some of the NPIs in your facility? – regular supply of water, soap and disinfectants

At the environmental level which involves regular periodic cleaning of touchable surfaces, using non touchable dustbins, ensuring adequate ventilation, which ones are being practised strictly and which ones are not? Why ?

Is there a functional isolation ward? Is self-quarantine mandatory?

Assessment of perceived competencies

How do you perceive hand hygiene practice in this facility during covid 19 compared with pre pandemic practice? Are there any

In your opinion do you think that PPEs are being used as is required by the MOH protocol by HCWs in this facility? Who is required to wear which PPE type? For example who wears goggles, face shields, aprons, full gowns etc.

How is self-quarantine observed in your facility? Who is required to self-quarantine? Are you satisfied with the level of enforcement and compliance?

What is your opinion on triaging in this facility during Covid 19 pandemic? How are suspected cases triaged?

How are suspected cases handled? What are the protocols?

Perception of HCW on NPIs

Can you comment on the usefulness of these measures?

Do you think usage of PPEs enhances your work or can you elaborate on the level of interference it has on your work.

Which of the measures do you find of less benefit or unnecessary?

During the peak of Covid cases what was the atmosphere here like? How were HCWs reacting generally and also towards suspected cases? Levels of anxiety, fear or panic? Did HCWs trust health authorities to provide adequate protection?

Factors impacting compliance

What was your personal motivation for compliance to NPIs? It is common practice in the Ghanaian context to greet by shaking hands. How has the pandemic affected this practice for you? Have you felt compelled to shake hands with someone because of their relation with you or their status? How often if any have you compromised?

Do you think the facility is doing enough to motivate HCWs to adhere to these protocols? How?

How has the supply chain been since this pandemic? Constant availability of running water, soaps, hand gels PPEs etc.

How is the supervision here? What is used to monitor compliance?

8 Questions for FGDs

Measures in place

Brainstorm the measures in place.

Assessment of competencies

What training were provided prior to the institution of the measures? How was it provided? How many HCW were covered? What was learned?

Do you think HCWs in this facility are adhering to the protocols as is expected? PPEs are being worn correctly and adequately, physical distancing being observed…

Orderlies take care of the environmental measures cleaning of frequently touchable surfaces, door handles, bed rails etc, how do you perceive the work of the orderlies in terms of these measures during the pandemic?

Practices at the isolation ward, self-quarantine measures, triaging of suspected cases?

HCWs cannot protect themselves without the cooperation of the patients and relatives. How do you ensure that patients are also involved in the process?

Perception of HCWs on NPIs

What is your perception about these measures ? How useful are they? How much do they help or interfere with your duties?

What is the general perception on Covid-19? What do you think of the quality of products being used ? for example gloves, disinfectants, hand gels etc?

Factors impacting compliance

Which of the measures do you find was to comply with and why? Which is difficult or doo you find unnecessary ?

What motivates you to comply with the measures.? How does the facility motivate your compliance?

It is a common practice in the Ghanaian context to greet by shaking hands. How has the pandemic affected this practice for you? Have you felt compelled to shake hands with someone because of their relation with you or their status? How often if any have you compromised?

How has the supply chain impacted your compliance? Are there gaps in the supply chain?

How does the facility ensure compliance?