



## **Knowledge, attitude, practice, and associated factors of notifiable disease surveillance among public health care workers in Assossa zone, Benishangul Gumuz, west Ethiopia.**

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**Abstract:** In Ethiopia, health professionals' Knowledge attitude and practice on notifiable diseases surveillance notification was not satisfactory. This weakness is evidenced by late outbreak detection and life lost in different manageable disease because of late reporting under reporting and variability of reporting. The same is true for Benishangul Gumuz regional state. The knowledge, attitudes and practices of health care workers on notifiable disease surveillance was not assessed in evidence based manner. **Objective:** To assess the knowledge, attitude, and practice of public health care workers towards notifiable disease surveillance reporting and associated factors in Assossa zone, Benishangul Gumuz regional state. **Method:** Across-sectional institution based study was conducted May to June in 2018, multistage sampling method using proportionate systematic random sample from the health facilities, (n=517) sample size. Data was collected using self-administered questionnaire, Data analysis was performed using binary logistic regression model. **Result:** Among the total respondent 56.1%, 60.2%, 46.9% public health workers had good knowledge, favorable attitude and practice respectively towards notifiable disease surveillance. The BSC Degree Health professionals have good knowledge with (AOR= 2.9; 95% CI, 1.2, 7.1), having surveillance training to knowledge on surveillance (AOR= 5.5; 95% CI, 2.9, 10.6). Having surveillance training to favorable attitude (AOR= 2.5, 95% CI, 1.6, 4). Surveillance material supply 1.7 times more likely to practice disease surveillance reporting AOR=1.7, 95%CI (1.1, 2.6). Having training to practice public health surveillance (AOR=1.5, with 95%CI (1.06, 2.3). Format supply to practice with 95%CI (1.09,2.4). **Conclusion;** The knowledge and attitude of health care workers were good but not much satisfactory as compared to others. Meanwhile practice on surveillance was extremely poor. Knowledge, Attitude and practice of health workers on notifiable disease surveillance are positively influenced by educational status, surveillance material supply and surveillance training.

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**Keywords:** Knowledge, attitude, practice, associated factors; disease; surveillance; west Ethiopia

### **1. Introduction**

#### **1.1. Background**

Surveillance is a French word, meaning watching with attention, suspicion, and authority. It is the close and continuous observation of one or more persons for the purpose of direction, supervision and control. Public health surveillance is ongoing systematic collection, analysis, interpretation and dissemination of health data to help guide public health decision making and action. It is equivalent to monitoring the pulse of the community. [1].

Most often, surveillance relies on simple systems to collect a limited amount of information about each case. Although not every case of disease is reported, health officials regularly review the case reports they do receive and look for patterns among them. These practices have proven invaluable in detecting problems, evaluating programs, and guiding public health action. [2].

A Notifiable disease is a priorityzed diseased that required to be reported to local government health officials when diagnosed, because of infectiousness, severity, or frequency of occurrence[3].The Notifiable Diseases Surveillance system supports case detection and public health interventions, estimates the impact of Notifiable diseases, determines the distribution and spread of Notifiable diseases, generates hypotheses and stimulates research on Notifiable diseases, facilitates planning and evaluation of prevention and control measures [4] International health regulation enforced all member countries including Ethiopia to notify: Smallpox, poliomyelitis, human influenza sub type, and SARS and also events of potential international public health concern like cholera, plague, yellow fever, Heamorregic fever and other diseases that have special national concern and diseases which have unknown cause and source[5]. In Ethiopia there are 20 nationally notifiable diseases. The disease are selected based on

their high epidemic potential such as anthrax, avian human influenza, cholera, measles, meningococcal meningitis, pandemic influenza, smallpox, SARS, viral hemorrhagic fever, and yellow fever required internationally under International health regulation like smallpox, poliomyelitis, human influenza caused by a new subtype, Severe acute respiratory syndrome, diseases targeted for eradication or elimination it includes poliomyelitis, Dracunculiasis, neonatal tetanus and diseases which have a significant public health importance such as rabies, dysentery, malaria, relapsing fever, typhoid fever, Epidemic typhus and severe malnutrition[5].

### 1.2. Statement of the problem

The communicable disease control depends on early response systems and effective response systems rely on strong disease surveillance system, a notifiable disease surveillance is one for which regular, frequent, and timely information regarding individual cases requires for the prevention and control of the disease[6]. The study mentioned the requirement of extra time for reporting and poor knowledge of the list of reportable diseases as a barrier for not reporting and they suggest simplifying the reporting process and shifting the responsibility for notification to another person, such as a secretary or a nurse for improve physician compliance of reporting.[8]. Underreporting For most notifiable diseases, data collection is generally based on passive reporting by physicians and other health care providers. The most obvious result of such underreporting is that effective action is delayed, and cases occur which might have been prevented by prompt reporting and prompt initiation of control measures. It is important that public health agencies recognize these barriers to reporting, since many are within the agencies 'power to address or correct. The reasons provided by physicians and others to explain why many cases are never reported. Lack of knowledge of the reporting requirements, Unaware of responsibility to report Unaware of which diseases to be reported Negative attitude toward reporting of cases: time consuming, lack of feedback ,distrust of government Misconceptions that result from lack of knowledge or negative attitude Compromises patient-physician [27]. In Ethiopia, health professionals' Knowledge attitude and practice of notifiable diseases surveillance and reporting is not satisfactory. This weakness is evidenced by late outbreak detection and life lost in different manageable disease because of late reporting under reporting and variability of reporting and ignorance. The same is true for Benishangul Gumuz regional state

### 1.3. Literature review

Few data was describing the health care workers knowledge attitude and practice on notifiable disease surveillance reporting worldwide.

#### 1.3.1. Overview Knowledge

The study mentioned that poor knowledge of notifiable diseases as a barrier for not reporting and shifting the responsibility for notification to another person, such as a secretary or a nurse for improve physician compliance of reporting.[8]

The study conducted in Anambra state, Nigeria revealed 89.9% of health care workers were aware of the disease surveillance and notification system and Knowledge of use of the various forms at the facility and local government facility levels [12]. The qualitative study conducted in Georgia indicate majority of health care providers do not have accurate knowledge of notifiable disease and the majority of practioner do not have adequate understanding of what will use the information and for what purpose[13]. The study conducted in Australia shows that the knowledge of health workers was higher when employer-provided refresh training and knowledge among physicians and registered nurses in primary care and emergency department settings indicated only 55% of the physicians and 63% of the registered nurses aware of reporting procedures within in the institution[14]. The study done in Guateng province of South Africa, 59.5% health care workers awareness of notifiable disease are correctly identified condition as notifiable or not[15]. The study conducted in South Africa revealed that knowledge of notifiable disease among hospital doctors was poor and list of notifiable disease is not well[17]. The study conducted in Debremarkose hospital 84.7% of healthcare workers were found to be knowledgeable [26]

#### 1.3.2.. Overview Attitude

The Studies done in est province of Nigeria, 68.5% of respondents felt that disease reporting was necessary and 67.3% of respondent had the perception of reporting is time consuming and cumbersome activity. [4]. The Study conducted in north America, physicians revealed attitude toward reporting: "reporting violated doctor-patient confidentiality, [19]. The quantitative study done on general practitioners' knowledge attitude and practices concerning reporting of notifiable conditions showed most general practioner felt uncomfortable notifying an unconfirmed case, many preferred to leave notification to the laboratory because of concerns about damaging the doctor-patient relationship[20].

The highest percentage 65.2% of the non-reporting doctors considered that a simplified reporting procedure, among all measures, would increase their willingness to report. In addition, a significantly higher proportion of the non-reporting doctors would increase their willingness to report if there has been a good reward for reporting or a penalty for not reporting[22] The studies conducted in United Emirates where no difference on

perception was observed between the educational status of health care providers.[25]

### 1.3.3. Overview Practice

Studies conducted in east state of Nigeria majority of the respondents felt that there was a lack of adequate coordination and communication between staffs in the practice of notifiable disease surveillance reporting.[4] the study conducted in Australia shows that Awareness and practice of healthcare workers was higher when employer-provided training [14].the quantitative study done general practitioners' knowledge and practices concerning reporting of notifiable conditions showed most general practitioner felt uncomfortable notifying an unconfirmed case, many preferred to leave notification to the laboratory because of concerns about damaging the doctor-patient relationship.[20]The study conducted in Mozambique majority of health worker not analyzed data due to lack of skilled personnel, poor understanding of the use of surveillance data and shortages of basic equipment such as calculators, computers and respective software was the reason for limited data analysis[21]. The study conducted in Este Nigeria majority of respondents, their personal reasons for not reporting diseases were due to the lack of appropriate reporting format materials (62.6%) and of non-reporting doctors considered that a simplified reporting procedure, among all measures, would increase their willingness to report. [22]. The study conducted in Nigeria revealed that there were significant association between facilities involved in reporting and facilities that have ever reported occurrence of disease, appropriate authority to report to, means of sending it to the authority, and consistency of sending forms to the authority with Disease Surveillance and Notification. [23].

The study conducted in Ethiopia of Debremarkose hospital 57.3% of respondents had a good practice on communicable disease surveillance [26],

### 1.3.4. Factors associated with knowledge attitude and practice

#### I.Sociodemographics variables

The Studies conducted in Nigeria show that here were significant association between definition of IDSR,age and sex [9].other study conducted at rural health facilities of Kenya revealed that sex and age of the health workers had not significant association with the knowledge of Integrated Disease Surveillance, the study done in Kenya revealed that nurses are significantly more knowledgeable on notifiable disease compared to other teams of health workers[10].The study conducted in United Arab Emirates showing that BSC degree holders were more competent, knowledgeable and practice than non-degree holders [25] The study conducted in Debremarkose hospital age, work experience and higher educational status

were significantly associated with both knowledge and practice workers on communicable disease surveillance notification. [26]

#### II .Surveillance system related variables

Evaluation of the notifiable disease surveillance system in Guateng province South Africa assessed awareness of notifiable disease among health care workers and the study found that 59.5% of respondents are correctly identified condition as notifiable or not[15]. On the study conducted in Germany on physicians indicate the existence of case definitions was unknown to 86.5% of the respondents; 75.2% expressed their desire to have Case definitions available[16].

#### II. Resource related variable

The study conducted in Nigeria Yobe state showed that lack of knowledge of reporting materials was identified as a major factor affecting disease surveillance[18].A literature review conducted in Africa including Ethiopia on challenges with the implementation of an Integrated Disease Surveillance and Response system indicate maintaining adequate reporting forms at all levels was a major challenge for case notification in addition the study showed limited means of communication repeatedly compromised data transmission and processing at all levels in Ethiopia[21].

#### 1.4. Justification of the study

The surveillance system was established in Benishangul Gumuz region as well as in the country level but the knowledge, attitudes and practices of health care workers on notifiable disease surveillance was not assessed in evidence based manner.

The Poor knowledge attitude and practice of health care workers towards notifiable disease surveillance results in difficulty of detect outbreaks early, trends cannot be accurately monitored and prevention and control measure cannot be taken on time why because Health care providers are the main front line source of surveillance information regarding outbreak detection and primary management.

This study was assessed knowledge, attitude and practice of health workers in notifiable disease and to identify the factors affecting knowledge, attitude and practice of health care providers on notifiable disease surveillance in Assosa zone as well as in Benishangul region of Ethiopia. The ultimate goal of this study was to identify factors to improve the national surveillance system.

The finding this study used to improve the notifiable disease surveillance and reporting. In addition, it had an impact on improving detection of unusual occurrence of disease, monitoring trends and generally on utilizing information for action in the region.

This study results were providing basis for understanding how to sustain control efforts over long period to achieve the success in the control of outbreak as a public health, problem, for Assosa zone. It is useful

to evaluate the progress of the health facility towards achieving the regional and national target; this would take immediate actions in planning and implementation of prevention and control efforts of health problem. This study provides valuable information to the refresh training strategy, zone health department, regional health bureau, researchers and other stakeholders. By using this study, the above stakeholders plan their resource for the control program and researchers used as a baseline for future studies.

**2. Objective**

**2.1. General objectives**

To assess the level knowledge, attitude, and practice of public health care workers towards notifiable disease surveillance reporting and associated factors in

**2.2. Specific objective**

To determine knowledge of health workers towards notifiable disease surveillance and reporting

To determine the attitude of health workers towards notifiable disease surveillance notification

To determine the level practice of health care worker towards notifiable disease surveillance reporting

To identify factors affecting knowledge, attitude and practice of health care workers towards surveillance reporting

**3. Method**

**3.1 Study area**

The study was conducted in Assossa zone, Benishangul Gumuz regional state. It is one of the 3 administrative zones of Benishangul Gumuz regional state which located in the Western Ethiopia. It bounded in West by republic of Sudan, in the East by Kamash zone in the North by Metekel zone and in South by Mao-Komo special woreda. It is about 665 KMs away from Addis

Ababa to the west. It has 171 health facilities and 853 health workers.

**3.2. Study design and period**

Institution based cross sectional study design was used to assess knowledge, attitude and practice of the health care workers towards notifiable disease surveillance and reporting. The study was conducted from May to June , 2018

**3.4. Populations**

**3.4.1. Target population:** Health care workers working in Assossa zone Benishangul Gumuz Regional State.

**3.4.2 Sample population:** health workers working in selected government health facilities.

**3.5 inclusion and exclusion criteria:**

**3.5.1. Inclusion criteria:** Health professional who work in government health care facilities.

**3.5.2. Exclusion criteria:** health care workers who work at none government health facilities.

**3.6. Sample size determination**

The minimum sample size for the study was determined using the formula for Confidence interval=1.96, p= proportion of respondents that have knowledge, awareness on disease surveillance and notification 89%, from the previous study = 1-proportion and d= for marginal of error between the sample and the population (0.04). Therefore,  $P=0.89[9]$ . While  $q = 1 -0.89=0.11$   
 $n=Z^2pq/d^2 =1.96*1.96*0.89*0.11/0.04^2 =235$

We got a sample size of with a 10% of non-response rate and multiplied by design effect two then the final sample size was 517.

The double population proportion formula used to assess the factors

$$N=2x (px)(1-px)Z\beta +2\alpha /2)2$$

P1-p2

Table: 1; Shows the factors sample size from the previous study of significant association between facilities involved in reporting, facilities that have ever reported occurrence proportion (20).

| Variable                         |         | Yes (%)  | No (%)   | Total | Proportion | OR(95%CI              | Sample size(n) |
|----------------------------------|---------|----------|----------|-------|------------|-----------------------|----------------|
| Facilities involved in reporting | Public  | 68(85.0) | 12(15.0) | 80    | 0.85       | 8.5(3.978<br>18.164)  | 125****        |
|                                  | Private | 32(40.0) | 48(60.0) | 80    | 0.40       |                       |                |
| Regularity reporting             | Public  | 38(79.2) | 10(20.8) | 48    | 0.79       | 7.6(1.897<br>30.444)  | 97             |
|                                  | Private | 4(33.3)  | 8(66.7)  | 12    | 0.33       |                       |                |
| Ever reported occurrence         | Public  | 48(60.0) | 32(40.0) | 80    | 0.60       | 8.5 (3.978<br>18.164) | 55             |
|                                  | Privet  | 12(15.0) | 68(85.0) | 80    | 0.15       |                       |                |

Sample size from the above significant factors it would be 125 to assess the factors.

Finally we get 517 samples for this study based on prevalence sample size we had calculated for single population proportion formula. It is much larger than the factor sample size we calculated.

**3.7 Sampling procedure**

Multi stage sampling method utilized the study was conducted in the health facility within the districts. The number of respondents included in this study was

distributed proportionally in each of the health centers within the districts in the Assosa zone. Eligible members from each facility were systematic randomly selected until the required sample size was obtained for

that facility. Figure; 2; below shows the Diagrammatic sampling procedure

### 3.8. Study variables

#### 3.8.1. Dependent variable

Knowledge, Attitude and Practice health care workers on Notifiable disease surveillance-reporting

#### 3.8.2. Independent variables

Socio-demographic-variables, like age sex, marital status, religion ethnicity educational level and Income, type of health facility

### 3.9. Operational definition

For purposes of this study, the following terms are defined below.

**Good knowledge:** a respondent's knowledge related score greater than or equal to the median labeled as good knowledge.

**Poor knowledge:** a respondent has poor knowledge level when his or her total knowledge score is below the Median of knowledge related scores.

**Favorable attitude:** Respondents attitude related score greater than or equal the median labeled as favorable attitude.

**Good practice:** a respondents practice related score greater than or equal to the median labeled as good practice.

**Unfavorable attitude:** a respondent's attitude related score less than the median labeled as unfavorable attitude.

**Poor practice:** a respondents practice related score less than or equal to the median labeled as Poor practice.

### 3.10. Data collections

The data was collected using structured questionnaire. The questionnaires were pretested on none a sample of health workers who are comparable to the sample of the respondents but not part of it before applying to the study populations. Participants of the study were questioned on socio demographic questions that were included: age, sex, work experience, level of education as well as on knowledge on the purpose of disease surveillance, disease under notification, reporting route, reporting periodicity, reporting formats, purpose of surveillance reporting and they were asked for their data reporting. The data collections were a self-administered method. Supervisors were recruited for supervising data collection process and 12 data collectors were recruited for data collection. Two data clerk personals were employed.

#### Reliability:

The data collection method is self-administered structured questioners were used. Data collectors were trained on the objective of the study and about the questionnaire. To keep the reliability and accuracy of data collection regular supervision were made during data collection process. Data were cleaned and checked for inconsistencies and missing values.

### 3.11. Data analysis and processing

All the collected data was once checked for consistence; missing value and completeness were coded and analyzed using the SPSS software. Proportion along with the corresponding confidence interval and frequency were done for analysis. Composite knowledge indicator was constructed from all the knowledge questions. A total knowledge score were computed by coding correct responses by 0 and wrong response by 1. Depending on the asymmetric distribution of the total score across different professionals the median considered as a cut of point. Health workers score below the mean will be classified as having poor knowledge and those score above the mean were classified as having Good knowledge the same is true for attitude and practice as knowledge operation.

The Bivariate logistic regression analysis was done to determine the presence of statistical association between independent variables and the outcome variable and its strength with direction. Variables with P value  $\leq 0.2$  in Bivariate analysis were considered as candidates to be entered into multivariable logistic regression model. The final model was fitted using stepwise selection methods (backward logistic regression). Goodness of fitness of the model will checked by Hosmer–Lemeshow test.

### 3.12. Ethical consideration

Ethical clearances were obtained from review board of the University of Gondar College of Health Sciences and Institute of Public Health. Permission was sought from Benishangul Gumuz regional state and from district health offices. An informed verbal consent was obtained.

## 4. Results

The total five hundred and seventeen health care providers were recruited in the study and 503 respondent completed with a response rate of 97.4%.

The mean age of the participants were 33 years, ranges (20-58) years with the standard deviation (SD 6.6). The 232(46.1%) participants were between the ages of 20 and 30 years and 201(39.9%) were between 31 and 40 years.

The sex distribution of the participants was male 311(61.8%). Regarding the marital status participants 376(74.8%) was married. The religious composition of participants were orthodox 214(42.5%) and Muslim. 204(40.6%)

The ethnicity compositions of the participants were 179(35.6%) Amhara and 165(32.8%) Oromo ethnic groups. The place residencies of the participants were 62% from urban and the remainder 38% of was from rural areas area of health institution. The educational status of the participants were diploma 48.1%) Among participants there were 47.3% from health centers and 31.8% from health posts.

The profession compositions of respondents were nurse were predominantly accounted 67.6%, the mean number of years of experience by the respondents was 6.4 (SD  $\pm$ 3.5) years. Most of respondents had between

1-4 years of experience, 221 (43.9%). Those with 5-8 years were 147 (29.2%). The socio-demographic characteristics of the study participants are summarized in Table: 3 below

Table: 2: Socio demographic variables of health professionals in Assossa zone west part of Ethiopia 2018

| Variables          |                | Frequency N=503 | Percentage (%) |
|--------------------|----------------|-----------------|----------------|
| Place of residency | Urban          | 315             | 62.6           |
|                    | Rural          | 188             | 37.4           |
| Age                | 20-30year      | 232             | 46.1           |
|                    | 31-40 years    | 196             | 39.9           |
|                    | $\geq$ 41years | 75              | 14.9           |
| Sex                | Male           | 311             | 61.8           |
|                    | Female         | 192             | 38.2           |
| Marital status     | Single         | 127             | 25.2           |
|                    | Married        | 376             | 74.8           |
| Ethnicity          | Amhara         | 179             | 35.6           |
|                    | Oromo          | 165             | 32.8           |
|                    | Berta          | 132             | 26.2           |
|                    | Others         | 27              | 5.4            |
| Religion           | Muslim         | 204             | 40.6           |
|                    | Orthodox       | 114             | 42.5           |
|                    | Protestant     | 85              | 16.9           |
| Education status   | Degree         | 125             | 24.9           |
|                    | Advanced       | 133             | 26.4           |
|                    | Diploma        | 245             | 48.7           |
| Work experience    | 1-4 years      | 198             | 39.4           |
|                    | 5-8 years      | 150             | 29.8           |
|                    | $>$ 9 years    | 155             | 30.8           |
| Professions        | Nurse          | 340             | 67.6.          |
|                    | HO             | 32              | 6.4            |
|                    | Laboratory     | 86              | 17.1           |
|                    | Physician      | 20              | 4.0            |
|                    | Others         | 25              | 5.0            |

#### 4.1. Knowledge of public health care workers on notifiable disease surveillance notification

There were 427(84.9%) of the participants heard about integrated disease surveillance notification. The 366(72.8%) of the respondents knew the disease reporting periodicity of weekly reportable disease from health facility to the next higher level. The 334(66.4%)

of the participants had the awareness of the purpose of notifiable disease surveillance. The 359(74.8%) of the respondent were aware the chaine flow of surveillance system and 281(55.9%) of the respondents were correctly listed the notifiable disease of the country more than have of the notification.

Table: 3. Knowledge of health care workers on notifiable disease surveillance in Assosa zone west part of Ethiopia, 2018

| Variables   | Respon | frequency | percent % |
|---|--------|-----------|-----------|
| know the number of notifiable disease in Ethiopia                               | Yes    | 355       | 70.6      |
|   | No     | 148       | 29.4      |
| know the reporting periodicity of notifiable diseases in Ethiopia               | Yes    | 366       | 72.7      |
|   | No     | 137       | 27.2      |
| Ever heard about IDSR surveillance  | Yes    | 427       | 84.8      |
|   | No     | 76        | 15.1      |
| know immediately and weekly reportable disease in Ethiopia with case definition | Yes    | 370       | 73.6      |
|   | No     | 133       | 26.4      |
| know the purpose of notifiable disease surveillance and reporting               | Yes    | 334       | 66.4      |
|   | No     | 169       | 33.6      |
| know chaine flow of the surveillance system                                     | Yes    | 359       | 71.3      |
|   | No     | 144       | 28.6      |
| Recall listing of national and regional notifiable disease                      | Yes    | 281       | 55.9      |
|   | No     | 222       | 44.1      |

Each correct response was assigned a score of 0 and each incorrect response was allocated a score of 1 then the overall score was calculated for all the knowledge responses for each individual. Since knowledge was not normally distributed across different profession, the median used as a cut-off for those with good knowledge (values  $\geq$  median) and those with poor knowledge (values  $<$  median).

Thus, 56.1% had good knowledge with 95% CI (51.9, 60)

#### 4.2. Attitude of health care workers on notifiable disease surveillance

The 433(85.9%) of the respondent perceived that disease surveillance notification is the responsibility of health care providers. The 376(74.6%) respondents felt that disease reporting was necessary activity. There were 333(66.2%) of them were the opinion that it was a time consuming. The 340(67.6%) of the respondents felt that there was a good coordination of surveillance system and communication between the higher to lower. The 332(66%) of the participants had the opinion that reporting treatment less case negatively affects patient health care workers relation. Furthermore (Table: 6)

Table: 4. Health care workers Attitude assessment result on notifiable disease surveillance reporting in Assosa zone west part of Ethiopia, 2018

| Variables   | Opinion  | Frequency % |
|---|----------|-------------|
| Registering reporting surveillance is responsibility of Health care workers.                      | Agree    | 432(85.9%)  |
|   | Disagree | 71(14.1%)   |
| surveillance reporting is easily as way manage public health system                               | Agree    | 403(80.1%)  |
|   | Disagree | 100(19.9%)  |
| Detecting reporting communicable disease is necessary activity                                    | Agree    | 375(74.6%)  |
|   | Disagree | 128(25.4%)  |
| Reporting communicable disease is harm pt health care confidentiality and relation                | Agree    | 332(66%)    |
|   | Disagree | 171(34%)    |
| Reporting is time consuming other than routine work   | Agree    | 333(66.2%)  |
|   | Disagree | 169(33.6%)  |
| Adequate coordination between regional health beau and facility in surveillance system important. | Agree    | 338(67.2%)  |
|   | Disagree | 165(32.8%)  |
| Selecting and reporting notifiable disease more necessary for resource limit country              | Agree    | 386(76.7%)  |
|   | Disagree | 117(23.3%)  |

Attitude towards notifiable disease surveillance notification was assessed using different statements on a point on Likert Scale Agree, Disagree (strongly agree, strongly disagree). The median score on attitude was calculated and those who scored above the median were deemed to have good attitude whereas those with scores below the median were deemed to have poor attitude towards surveillance notification. The mean was therefore as the cut-off for good (values  $\geq$  mean) and poor (values  $<$  median). Thus, 303 (60.2) of the respondents had good attitude with 95% CI (56, 64). Figure 4; below shows.

#### 4.3. The Practice of health care workers on surveillance

The 383 (76.1%) of the respondents had ever reported a disease occurrence disease. There was about 305 (60.6%) of the respondent reported with hard copy of reporting sheet as the primary method of reporting. There were 342 (68.2%) of the respondents had reported surveillance data with back up. There were 326 (65%) of the respondents detected notifiable disease at facility level.

The practice towards notifiable disease surveillance reporting was assessed using standard questions. Median was therefore used as the cut-off for good (values  $\geq$  median) and poor (values  $<$  median) practice towards surveillance reporting. Thus, 236 (46.9%) of the respondents had good practice and 267 (53.1%) of the respondents had poor practice.

#### 4.4. Factors of Disease Surveillance Reporting Practice

The 287 (57.1%) respondents got training on surveillance notification and Availability of standard Reporting format 314 (62.4%), while 263 (52.3%) of the health facilities were with poor laboratory services, 332 (66%) of respondents lack of feedback from the higher level for their surveillance notification activity. The 272 (54.1%) of the respondents or health facilities

had poor staff collaboration in surveillance notification. The one third (1/3) of respondents, their personal reasons for not reporting diseases were due to the lack of appropriate standard surveillance reporting materials (30.2%).

#### 4.5. Factors associated with knowledge of public health care workers

Variables that were significant in the Chi-square test analyses were entered into binary logistic regression. There were some factors not full fill entrance criteria such as Age, work experience and income. The factors which meet the multivariate entrance criteria were entered in multivariate logistic regression analysis which was significantly associated with knowledge of health care workers on notifiable disease surveillance notification. The socio demographic variable sex was statistically significant among males more knowledgeable than female health professional with AOR=3.7 and 95% CI (1.9, 7.2) In this study knowledge of disease surveillance reporting is statistically significant association with educational status of health professional AOR=2.9 times more likely higher in degree holder health professional than diploma holder public health care workers with 95% confidence interval=(1.19,4.5) and advanced diploma 3.4 times more knowledgeable than diploma holders with 95% CI(1.5,7.8) The knowledge of the health workers about the notifiable disease was also associated with residency of health workers working in urban area more knowledgeable than rural area with AOR of 2.3 times higher with 95% CI (1.19, 4.5). The health workers who ever got surveillance training were AOR= 5.5 times more likely knowledgeable than who did not get it, with 95% CI (2.9, 10.6).

The health workers who worked with poor laboratory services were AOR= 0.4 times less likely knowledgeable than who worked with adequate laboratory services with 95% CI (0.2, 0.8).



Table: 7. Bivariate and multi variant analysis of outcome variables on knowledge of health care workers on notifiable disease surveillance reporting in Assosa zone west part of Ethiopia 2018

| Variables                    |         | Yes | No  | COR(95%)CI      | p       | AOR (95%)CI           | P       |
|------------------------------|---------|-----|-----|-----------------|---------|-----------------------|---------|
| Sex                          | M       | 210 | 101 | 3.4(2.3,5)      | < 0.001 | 3.7(1.9,7.2)          | <0.001  |
|                              | F       | 72  | 120 | 1               |         | 1                     |         |
| Residency                    | Urban   | 226 | 88  | 6(4.9)          | < 0.001 | <b>2.3(1.19,4.5)</b>  | 0.013   |
|                              | Rural   | 56  | 133 | 1               |         | 1                     |         |
| Educational Status           | Degree  | 103 | 29  | 4.2(2.5,7.3)    | < 0.001 | <b>2.9(1.2,7.1)</b>   | 0.016   |
|                              | Advance | 58  | 70  | 3.5(2.2,5.8)    | < 0.001 | <b>3.4(1.57,8)</b>    | 0.03    |
|                              | Diploma | 121 | 122 | 1               |         | 1                     |         |
| Marital Status               | single  | 99  | 28  | 3.7(2.3,5.9)    | < 0.001 | <b>3.7(1.9,7.2)</b>   | < 0.001 |
|                              | Married | 183 | 193 | 1               |         | 1                     |         |
| Feedback                     | Yes     | 114 | 54  | 2(1.4,3)        | < 0.001 | 1.8(0.9,3.5)          | 0.074   |
|                              | no      | 168 | 167 | 1               |         | 1                     |         |
| Training                     | Yes     | 211 | 75  | 5.7(3.9,8.5)    | < 0.001 | <b>5.5(2.9,10.6)</b>  | < 0.001 |
|                              | No      | 71  | 146 | 1               |         | 1                     |         |
| Staff Coronation             | Yes     | 249 | 115 | 6.9(4.4,10.8)   | <0.001  | 7.3(3.5,15.2)         | <0.001  |
|                              | No      | 33  | 106 | 1               |         | 1                     |         |
| Poor lab Capacity            | Yes     | 100 | 163 | 0.19(0.13,0.28) | <0.001  | 0.4(0.2,0.8)          | 0.016   |
|                              | No      | 182 | 58  | 1               |         | 1                     |         |
| Medication Supply            | Yes     | 194 | 104 | 2.4(1.7,3.5)    | <0.001  | 1.7(0.9,3.3)          | 0.081   |
|                              | No      | 88  | 117 | 1               |         | 1                     |         |
| Type of health institution   | Hospit. | 86  | 20  | 3.4(1.9,5.9)    | < 0.001 | 0.8(0.3,2)            | 0.7     |
|                              | HC      | 132 | 105 | 6.4,3.6,11.5)   | < 0.001 | 0.9,2.7)              | 0.9     |
|                              | HP      | 64  | 96  | 1               |         | 1                     |         |
| Surveillance material supply | Yes     | 239 | 54  | 17(10.9,26.8)   | <0.001  | <b>18.4(9.2,36.8)</b> | <0.001  |
|                              | No      | 43  | 167 | 1               |         | 1                     |         |

#### 4.6. The factors associated with attitude of the health workers

Variables that were significant in the Chi-square test analyses were entered into binary logistic regression. The Respondents with degree education status were 2.4 times more likely to be good attitude on notifiable disease surveillance the Diploma holders, with 95% CI (1.09, 2.9). The respondents with previous surveillance training were AOR =2.5 times more likely to be attitude

towards disease surveillance reporting with, 95% CI (1.6,4).

The respondents who working with surveillance material supply were AOR 5.2 times more likely to have good attitude 95% CI (3.3, 8.4). Furthermore, respondents with urban residency were 1.7 times more likely good attitude to disease surveillance reporting than rural resident public health workers with (AOR, 1.7, 95% CI, 1.01, 2.9). Table 11 below.

Table: 8- Bivariate and multi variant analysis of independent factors against outcome variables Attitude of health care workers on notifiable disease surveillance reporting in Assosa zone west part of Ethiopia

| Variable                      |         | Yes | No  | COR(95%CI)   | P     | AOR(95%CI)          | P     |
|-------------------------------|---------|-----|-----|--------------|-------|---------------------|-------|
| Sex                           | Male    | 215 | 96  | 2.6(1.8,3.8) | 0.001 | <b>1.7(1.1,2.8)</b> | 0.001 |
|                               | Female  | 88  | 104 | 1            |       | 1                   |       |
| Marital status                | Single  | 99  | 28  | 2.9(1.8,4.7) | 0.001 | <b>2.3(1.3,4.2)</b> | 0.003 |
|                               | Married | 204 | 172 | 1            |       | 1                   |       |
| Educational status            | Degree  | 132 | 262 | 2.9,1.7,5    | 0.001 | 2.4(1.09,5.2)       | 0.029 |
|                               | Advance | 128 | 254 | 2,1,2,3,2    | 0.002 | 1.9(0.9,4)          | 0.053 |
|                               | Diploma | 243 | 483 | 1            |       | 1                   |       |
| Residency                     | Urban   | 223 | 91  | 3.3,2.2,4.8  | 0.001 | <b>1.7(1.9,4.1)</b> | 0.002 |
|                               | Rural   | 80  | 109 | 1            |       | 1                   |       |
| Poor laboratory capacity      | Yes     | 133 | 130 | 0.4,0.29,0.6 | 0.001 | 1.3(0.1,1.7)        | 0.09  |
|                               | No      | 170 | 70  | 1            |       | 1                   |       |
| Medication supply             | Yes     | 193 | 105 | 1.5(1.1,2.2) | 0.05  | 0.9(0.6,1.5)        | 0.07  |
|                               | No      | 110 | 95  | 1            |       | 1                   |       |
| Feed back                     | Yes     | 113 | 55  | 1.5,1.06,2.3 | 0.02  | 1.04(0.6,1.6)       | 0.8   |
|                               | No      | 190 | 145 | 1            |       | 1                   |       |
| material supply               | Yes     | 222 | 60  | 7.7,5.1,11   | 0.001 | <b>5.2(3.2,8.4)</b> | 0.001 |
|                               | No      | 70  | 140 | 1            |       | 1                   |       |
| Reporting format              | Yes     | 214 | 100 | 2.4,1.6,3.4  | 0.001 | 1.3(0.8,2.2)        | 0.2   |
|                               | No      | 89  | 100 | 1            |       | 1                   |       |
| Training                      | Yes     | 211 | 75  | 3.8,2.6,5.5  | 0.001 | <b>2.5(1.6,4)</b>   | 0.001 |
|                               | No      | 92  | 125 | 1            |       | 1                   |       |
| Work environment satisfaction | Yes     | 199 | 141 | 0.7,0.4,1.02 | 0.001 | 1.3(0.8,2.2)        | 0.2   |
|                               | No      | 104 | 59  | 1            |       | 1                   |       |

#### 4.7. The factors associated with practice of health workers

The result of analysis of independent factors in relation of practice showed that: The public health care workers those who get surveillance training are (AOR= 1.5) times more likely to practice public health surveillance than who did not get the chance of training with 95%CI (1.06, 2.3). The health care workers who are working in the health facility with adequate surveillance format supply are 1.6 times more likely to practice the public health surveillance than the health facility with 95%CI (1.09, 2.4).

The health care workers who are working with surveillance material or equipment supply 1.7 times more likely practice notifiable diseases surveillance notification with 95%CI (1.18, 2.6).

The health care workers in the facilities with good staff coordination 1.8 times more likely practice disease surveillance notification with 95% CI (1.18, 2.6) The health care providers who works in urbane health institution COR =1.8 TIMES more likely practice notifiable disease surveillance notification with 95%CI (1.2, 2.6)

Table: 9; below the analytic results of factors affecting the surveillance notification

Table: 9; Bivariate and multivariate analysis of independent factors against outcome variable of practice of public health care workers notifiable disease surveillance reporting in Assosa zone, west part of Ethiopia 2018

| Variable                  |         | Yes | No  | COR (95%CI)      | P     | AOR (95%CI)          | P            |
|---------------------------|---------|-----|-----|------------------|-------|----------------------|--------------|
| <b>Residency</b>          | Urban   | 165 | 149 | 1.8(1.2,2.6)     | 0.001 | 1.4(0.9,2.2)         | 0.1          |
|                           | Rural   | 71  | 118 | 1                |       | 1                    |              |
| <b>Educational status</b> | Degree  | 67  | 65  | 1.4(0.8,2.3)     | 0.2   | 0.9(0.5,1.59)        | 0.26         |
|                           | advance | 54  | 74  | 1.1(0.7,1.7)     | 0.5   | 0.7(0.4,1.2)         | 0.6          |
|                           | Diploma | 115 | 128 | 1                |       | 1                    |              |
| <b>Material supply</b>    | Yes     | 164 | 129 | 2.4(1.6(3.5)     | 0.04  | <b>1.7(1.1,2.6)</b>  | <b>0.006</b> |
|                           | No      | 72  | 138 | 1                |       | <b>1</b>             |              |
| <b>Format supply</b>      | Yes     | 171 | 143 | 2.2(1.5,3.3)     | 0.01  | <b>1.6(1.09,2.4)</b> | <b>0.02</b>  |
|                           | No      | 65  | 124 | 1                |       | <b>1</b>             |              |
| <b>Staff coordination</b> | Yes     | 190 | 174 | 2.2(1.4,3)       | 0.02  | 1.8(1.2,2.8)         | 0.04         |
|                           | No      | 46  | 93  | 1                |       | 1                    |              |
| <b>Work load</b>          | Yes     | 136 | 174 | 0.7(0.5,1.04)    | 0.03  | 0.8(0.5,1.18)        | 0.2          |
|                           | No      | 100 | 93  | 1                |       | 1                    |              |
| <b>Feedback</b>           | yes     | 77  | 91  | 0.9(0.61,3)      | 0.2   | 0.7,0.4,1.09)        | 0.1          |
|                           | No      | 159 | 176 | 1                |       | 1                    |              |
| <b>Training</b>           | Yes     | 159 | 127 | 2.2(1.6,1.5,3.2) | 0.01  | <b>1.5(1.06,2.3)</b> | <b>0.02</b>  |
|                           | No      | 77  | 140 | 1                |       | 1                    |              |

## 5. Discussion

Little is known about knowledge attitude and practice of health care workers on notifiable disease surveillance reporting in Benishangul region. The result of this may provide clue on the knowledge, attitudes and practices of public health care workers on notifiable disease surveillance reporting since they are front line for disease detection. In this study, the majority the participants were nurses. This result was more likely with the knowledge; attitude and practice study conducted in the South East of Nigeria Most of the Participants were nurses. (13) This might be due to that at primary health care level and in remote area of the country nurses were major health service providers due to the difficulty of recruiting and retaining physician and health officers in the rural areas.

This study shows that there was significant association between knowledge of notifiable disease surveillance notification with sex of health care workers. This finding differ from study conducted in Kenya, revealed that sex of the health workers had not significant association with the knowledge of Disease Surveillance notification [10]. This variation might due to that in the study region sex composition health care providers and none uniform training provision among male and female and gender based work load among female.

This study finding revealed that 56.1% of public health care workers had good knowledge about notifiable disease surveillance notification. This study is less likely with the study conducted in Anambra state, Nigeria revealed 89.9% of health care workers had good knowledge of the disease surveillance and notification ([12] This variation might be high turnover of qualified

health personnel to the adjacent region of Oromia and Amhara in the reason of miss human resource management like priority given only and only for local indigenous health care workers in every aspects of an opportunity and security problem.

This finding shows that knowledge influenced by Academic qualifications on notifiable disease surveillance with degree holders being more knowledgeable than the diploma holders. This finding is supported by previous studies showing that degree holders health workers were more competent, knowledgeable and practice than non-degree holders in United Arab Emirates.[25] This differences in educational status mainly due to that scope of training of degree with in depth understanding of the basic sciences including basic Epidemiology and other related public courses. The current study identified that public health workers' knowledge and attitude about the disease surveillance reporting is significantly associated with their urbane residency. Health workers living in 'urbane' area were significantly more knowledgeable, favorable attitude about the disease surveillance notification. This association might be competent experienced workers prefer urbane area and professional placement by itself with computation and inequitable distribution of equipment, disease reporting instruments, logistic support.

The current studies revealed that majority of the respondent had the perception of notifiable disease reporting is necessary and more than half of the respondent perceived that reporting cases is time consuming other than routine works. This finding is similar with Studies conducted in est state of Nigeria, majority of respondents felt that disease

reporting was necessary and more than half of respondent had the opinion reporting is time consuming activity. [4].

This study result revealed that majority of the participants had the perception that reporting cases not good patient health care workers relation. This finding is consistent with the Study conducted in America physicians revealed attitude toward reporting: "reporting violated doctor-patient confidentiality," "patient refused permission to report," [19].

The result of this study showed a strong association between perception and previous training in disease surveillance. Since training is important in nurturing good attitude the ultimate outcome would be larger proportion of health workers who are knowledgeable with positive perception towards surveillance notification.

The finding of this study shows that there is no significant association educational status with good attitude. This finding is consistent with the studies conducted in United Emirates where no difference on perception was observed between nurses with degree and diploma [25]. This study shows that more than half of the respondents lack staff integration in notifiable disease surveillance reporting, this finding is more likely with Studies conducted in east state of Nigeria majority of the respondents felt that there was a lack of adequate coordination and communication between staffs in the practice of notifiable disease surveillance reporting. [4], this lacking staff coordination might be due to that in every department of the institution has single assigned focal person and rewarded of incentive for reporting given only of the assigned focal this none inclusive rewarded might disappointed the other important staffs disease surveillance notification in general. The current study shows that majority of the health care workers did not analyze data at facility level. This study finding was more likely with, The study conducted in Mozambique majority of health worker not analyzed data due to lack of skilled personnel, poor understanding of the use of surveillance data and shortages of basic surveillance materials equipment [21]. This reporting without analyzing and evaluating might be due lack of knowledge, work over load and lack of surveillance material /equipment/. This study identified that inadequate/poor/ laboratory service is negatively associated with the practice of health care providers on disease surveillance confirmation. This finding is more likely with the quantitative study done general practitioners' knowledge and practices concerning reporting of notifiable conditions showed most general practitioner felt uncomfortable notifying an unconfirmed case, many preferred to leave notification [20]

The current study identified that knowledge attitude and practice of health workers were significantly associated with training. This finding was more likely with the study conducted in Australia shows Awareness and practice of healthcare workers was higher when employer-provided training [14]. The current study revealed that surveillance reporting format and surveillance materials supply had significant association with practice of public health workers on surveillance notification. This finding was more likely with the study conducted in Este Nigeria majority of respondents, their personal reasons for not reporting diseases were due to the lack of appropriate reporting format and of non-reporting doctors interested that reporting should be simple to increase their willingness of reporting [22]. This might due to those health workers who were working at the facility with adequate material supply might get adequate information which updates their knowledge as well as the practice of surveillance notification of disease.

The current study revealed that the overall practice health care workers less than fifty percent, this finding less likely with the study conducted in Debremarkose hospital more than fifty percent of respondents had a good practice on communicable disease controlling [26], This variation might be due to educational status and availability of communication access between urban and rural area as well as developmental variation between the two region may be the reason of inconsistency between the two region.

## 6. Limitation and challenge

1. Participants of this study were mainly selected from the public health facilities
2. Scarcity of reference materials in Ethiopia as well as in the continent

## 7. Conclusions

The knowledge level of health care workers on notifiable disease surveillance was not sufficient when we compared to the previous study.

The overall attitude level on notifiable disease surveillance among respondents was relatively favorable

The majority of the health care workers perceived that disease surveillance reporting is their responsibility. The overall practice of participants' on notifiable disease surveillance was poor as compared to the previous study the study. Knowledge and perception of health workers on notifiable disease surveillance are influenced positively by their educational status, urban residency; surveillance material supply and having surveillance refresh training.

This study highlights the need to put in place strategies that will ensure health care providers have

good knowledge and good perception in order to enhance surveillance reporting practice.

## 8. Recommendations

Taking in to account the results following recommendations are forwarded: The Regional health bureau better providing training and adequately surveillance materials supply for all health facilities timely.

The regional health bureau should strengthening laboratory services for case confirmation. The Regional health bureau and partners should improve public health surveillance reporting by availing adequate material for every corners of the region, to achieve elimination and eradication target the country.

The regional and zonal health department should give tight feedback to fill the gaps of surveillance activity.

The health provider's Knowledge attitude and practice on public health surveillance reporting services should be improved, which is low when we compare with other African countries.

The MOH and RHB should fill the knowledge gap between rural and urban health care workers by giving special attention for rural one. We also hope this thesis might be the beginning of a future research on the subject matter, especially at the national level, The Ministry of Health better to conduct further researches on the subject matter RHB should give educational opportunity to the diploma health workers The department heads of health facility should encourage the staff integration to strengthen surveillance notification of notifiable disease.

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