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Building a resilient health system to ensure the quality of health care during a public health emergency, July 2022

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A RETROSPECTIVE ASSESSMENT OF MEASLES OUTBREAK RESPONSE ACTIVITIES AND DETERMINANT FACTORS AT NUNUKUMBA DISTRICT, EAST WOLLEGA ZONE, OROMIA REGIONAL STATE, WESTERN ETHIOPIA, MAY 2020

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MPH in Health Service Management

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Outline of Presentation

- Introduction
- Materials and Methods
- Results
- Discussion
- Strength and Limitation of the study
- Conclusion and Recommendation
- Acknowledgement
- Some reference lists

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Introduction

- Measles is one of the most infectious diseases caused by virus.
- Worldwide, more than 140,000 people died from measles in 2018.
- As of 5 November 2019, there have been 440,263 confirmed cases reported to WHO through official monthly reporting by 187 Member States in 2019.
- Measles CFRs among young children in developing countries may reach 3-5%, but could be as high as 10% during epidemics.
- In AFR, 176,785 confirmed measles cases were reported through CBS during 2013–2016.

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Introduction…

- WHO estimated that out of 8.9 million infants in AFR who did not receive MCV1 in 2015, approximately 0.7 million of them was found in Ethiopia.
- 2019 EMDHS showed that only 4 out of 10 children (43%) have received all basic vaccinations.
- It showed that only 59 % of children received MCV1, and 9% of children age 24-35 months received MCV2.
- In Oromia region, it showed that 29.9% received all basic vaccinations and 18.9% of children did not received vaccinations at all. Again in this region, only 48.7% and 5.2% of children received MCV1 and MCV2 respectively.
- The suspected measles outbreak is the occurrence of five or more reported suspected measles cases in one month in a defined geographic area such as a Kebele, Woreda or health facility catchment area.

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Introduction…

- Measles infection can result in serious complications such as blindness, encephalitis, otitis media, diarrhoea, and pneumonia.
- The study conducted to assess the economic burden of concurrent measles and rubella outbreaks in Romania from 2011-2012 revealed that cost per case was US $439 for measles.
- A similar study conducted in Keffa Zone of Ethiopia revealed that the economic cost of the measles outbreak and response was 758,869 United States dollars (US$).
- A literature review suggested that no post-measles outbreak response activities and determinant factors assessment have been conducted in East Wollega Zone.
- Thus, to fill the existing gaps; this study aims to assess the PMORA and its determinant factors at Nunukumba District, EWZ, Oromia Regional state, Western Ethiopia, 2020

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Objective

General Objective

- Assessment of measles outbreak response activities and determinant factors at Nunukumba District, EWZ, ORS, Western Ethiopia, May 2020.

Specific Objectives

- To assess measles outbreak response activities at Nunukumba District, EWZ, ORS, Western Ethiopia, May 2020.
- To identify determinant factors associated with measles outbreak in Nunukumba District, EWZ, ORS, Western Ethiopia, May 2020.

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Materials and Methods

Main sub-topics	Description
Study area and Period	NunuKumba District, Oromia, Ethiopia. From April-24 to May-7, 2020
Study design	Retrospective descriptive cross-sectional survey
Source population	All public HCWs and community members of the district from April-24 to May-7, 2020
Study population	Purposely sampled public HCWs and community members, all individuals affected by the measles and filled on the line list during the study period
Exclusion criteria	HCWs who are on annual and maternity leave and those participants who are not interested to respond were excluded from the assessment.

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Materials and Methods…

Main sub-topics	Description
Sample size and Sampling procedures	All individuals actively engaged in outbreak response were included(1062 participants).All HCs and 7 out of 7 out of 22 Kebeles in the district were included by using purposive sampling technique.
Data collection tools and procedures	Primary data collected by using semi-structured questionnaire, & KIII, FGDs, observation checklist and the secondary data of the surveillance and EPI report. The data were three senior technical experts, under the supervision of EWZHO PHEM case team.

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Materials and Methods…

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Materials and Methods…

Main sub-topics	Description
Dependent variable	Post-measles outbreak response activities
Independent variables	General information and socio-demographic characteristics of measles affected individuals, PHEM related activities, & EPI related activities.
Ethical consideration	Letter of approval to conduct the assessment was obtained respective units, & informed verbal consent was taken from each participant

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Materials and Methods…

Main sub-topics	Description
Data processing and analysis procedures	The quantitative data obtained were entered and analyzed using Microsoft Excel 2010 pivot table and epidemiological-curve (Epi-curve). The qualitative data was themed; analyzed and triangulated with quantitative result.
Data quality control	Two days brief orientation & detail discussion was provided to the data collectors for two days.

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Results:- outbreak profile & characteristics

- Starting from 30/09/2019 to 02/04/2020 **976-suspected measles cases** with **one community and three facility deaths** reported from NunuKumba district of EWZ, Western Ethiopia; 8 cases were from adjacent LimuSeka district of Jimma Zone, Western Ethiopia, & 968 cases from NunuKumba district were reported with the overall AR and CFR of 1.05% and 0.41% respectively.
- Of the 976-suspected cases reported on the line list; four specimens collected and sent to EPHI and tested IgM positive; while the others 972 were confirmed by epidemiologically linked and clinically compatible cases fulfilling suspected the measles case.

Results…

- Three (3) facility and one (1) community deaths with a CFR of 0.3% and 0.10% respectively.
- The Age of cases range from 1 month to 38years with median age of 5.9 years.
- Majority of the cases were those age group ranging from 1 to 4 years (456, 46.7%), followed by 5 to 14years (321, 32.9%).
- <5years constituted (558, 57.2%) and <15years constituted (879, 90.1%) of the total measles cases.

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Results…socio-demographic characteristics

Table. 1. Distribution of measles cases by age group and sex disaggregated in NunuKumba District, EWZ, ORS, Western Ethiopia, May 2020(n=976).

Variables	Number of cases(N=976)	Percentage (%)
Age Group		
< 9 months	71	7.3
9 to 11 month	31	3.2
1 to 4 years	456	46.7
5 to 14 years	321	32.9
>15years	97	9.9
Total	**976**	**100.0**
Sex		
Male	492	50.4
Female	484	49.6
Total	**976**	**100**

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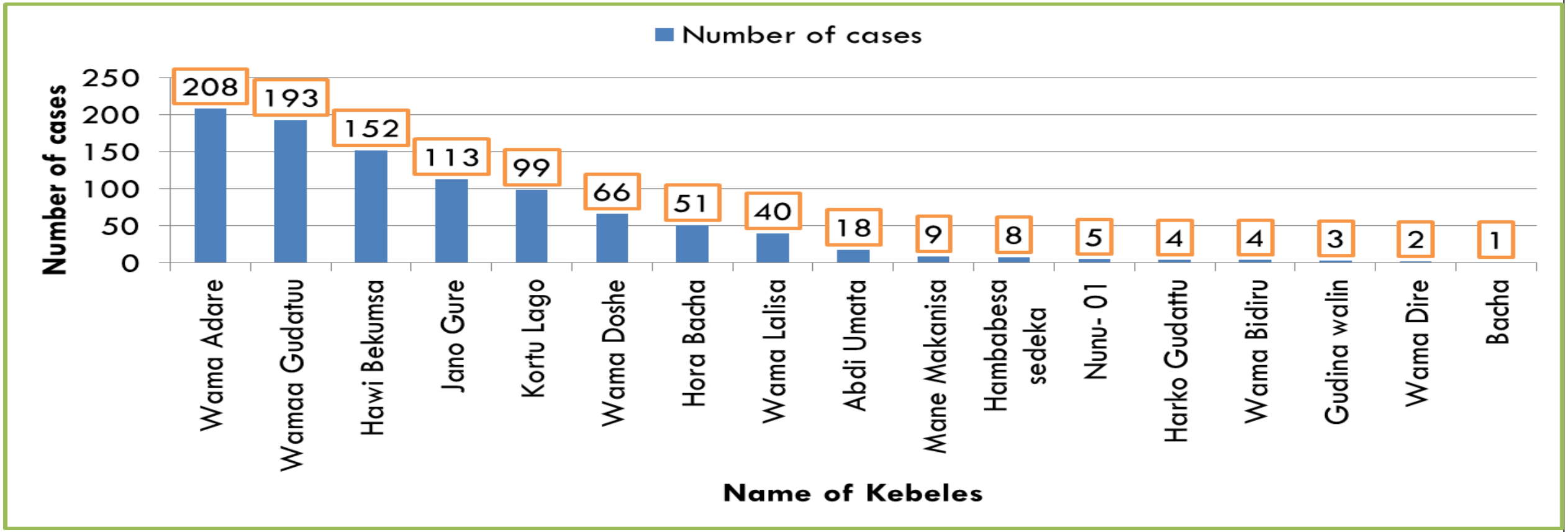
Results…

- From 22 kebeles in the district sixteen (73%) of them were reported the cases with varying magnitudes.



- Figure.1. Distribution of measles cases by areas of residence in NunuKumba District, EWZ, Oromia Regional State, Western Ethiopia, May 2020(n=976).

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Results…

- During this outbreak, the vaccination coverage among cases was **41.3% for single doses (MCV1) and only 1.1% of them took two doses (MCV2); while 389(40%) of the cases were not vaccinated**.
- CFR was higher among female than male with **0.60% and 0.20%** respectively.
- With regard to the distribution of cases by admission status; the majority 712(73%) of the cases managed at OPD, and the remaining was managed at IPD.

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Results…

Table-3: Distribution of measles cases by their immunization status at PHCUs of NunuKumba district, East Wollega Zone, Oromia Regional state, Western Ethiopia, May 2020 (n=976).

Name of PHCUs	Vaccination Status(n=976)								Total measles cases	
	0 dose		MC1		MC2		99(unknown)			
	N	%	N	%	N	%	N	%	N	%
Adare PHCUs	202	21	174	18	0	0	121	12	497	51
Birinkas PHCUs	101	10	151	15	11	1	37	4	300	31
Dalati PHCUs	80	8	73	7	0	0	14	1	167	17
Nunu PHCUs	6	1	5	1	0	0	1	0	12	1
Total	389	40	403	41	11	1	173	18	976	100

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Results…

Table-4: Distribution of measles cases by its AR, CFR and Sex disaggregated at NunuKumba district of EWZ, Oromia Regional state, Western Ethiopia, May 2020 (n=968).

Variable	Population at risk	#of cases	# of deaths	AR/100	CFR/100
Age group					
< 1year	3,006	100	0	3.3	-
1 to 4 Year	12,194	452	3	3.7	0.7
5 to 14 year	20,573	320	0	-	-
>15 Years	14,280	96	1	0.7	1.04
Total	**50,053**	**968**	**4**	**1.9**	**0.41**
Sex					
Male	45,033	492	1	1.09	0.20
Female	47,481	484	3	1.02	0.60
Total	**92,514**	**968**	**4**	**1.05**	**0.41**

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Results…Distribution of cases by time

- From the line list result, we have seen that the day difference between **the date they saw sign and symptom of the diseases and the date they visited HFs took 0 to 16 days**.
- The majority of them seek health care services within the 3rd and 4th days. The mean date difference was 3.1 days.
- The outbreak reached climax at middle of January and declining by the middle of February 2020.
- Measles vaccination campaign was initiated after the declining of an outbreak.

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Results…

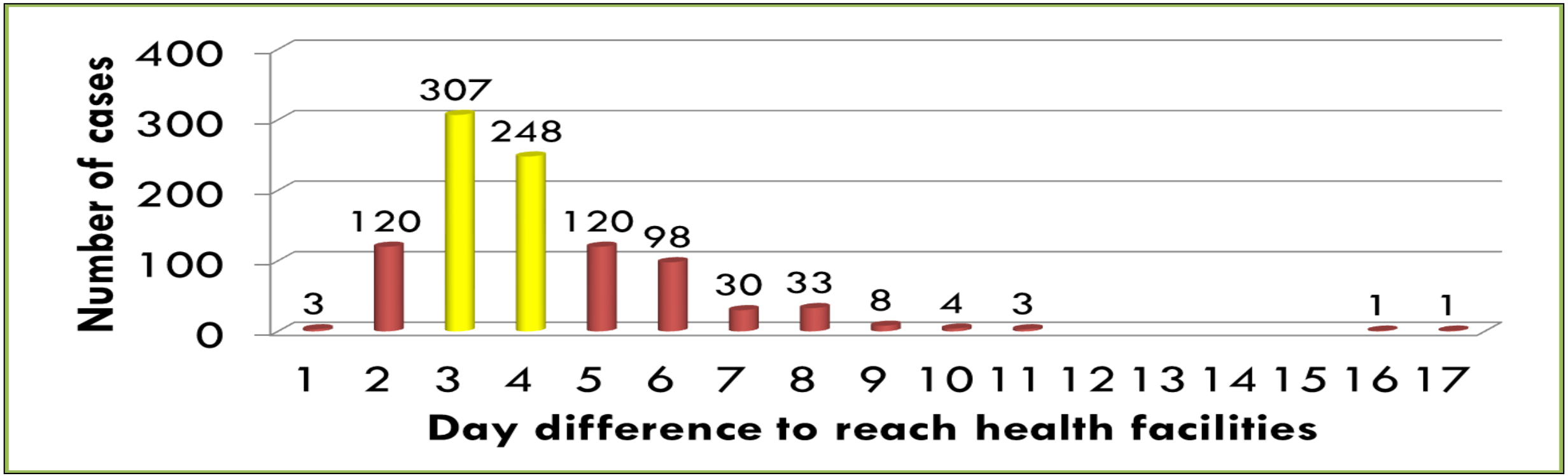

Figure. 3. The day difference between the date the measles cases saw sign and symptom and the date they visited HFs in NunuKumba district, EWZ, Oromia Regional state, Western Ethiopia, May 2020(n=976).

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Results…

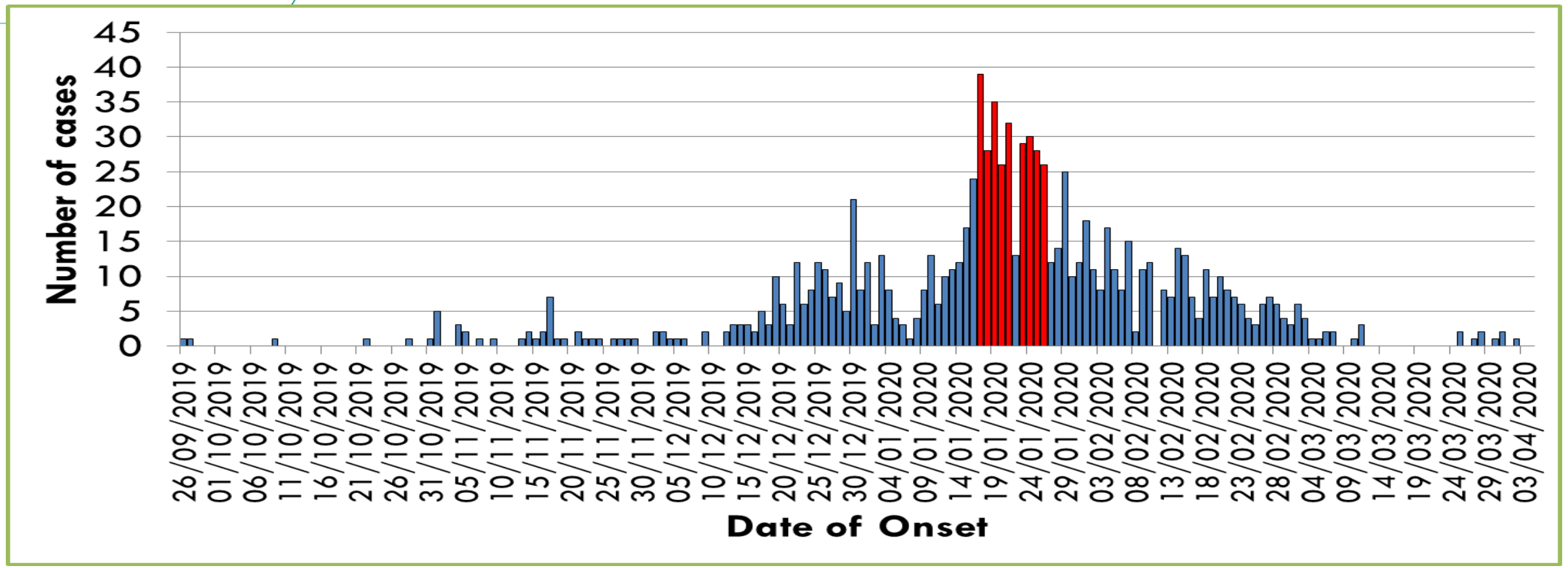

Fig.4: The Epicurve shows the distribution of measles cases by date of onset of signs and symptoms at NunuKumba District, EWZ, Western Ethiopia, May 2020 (n=976).

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Results…

- The Epi week shows us that due to lack of immediate response; the outbreak covered majority of district kebeles.
- In Epi week 4 the outbreak reached climax and down over the past four weeks. Deaths were reported in week 50 of 2019, week 2 and week 3 of 2020.

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Results…

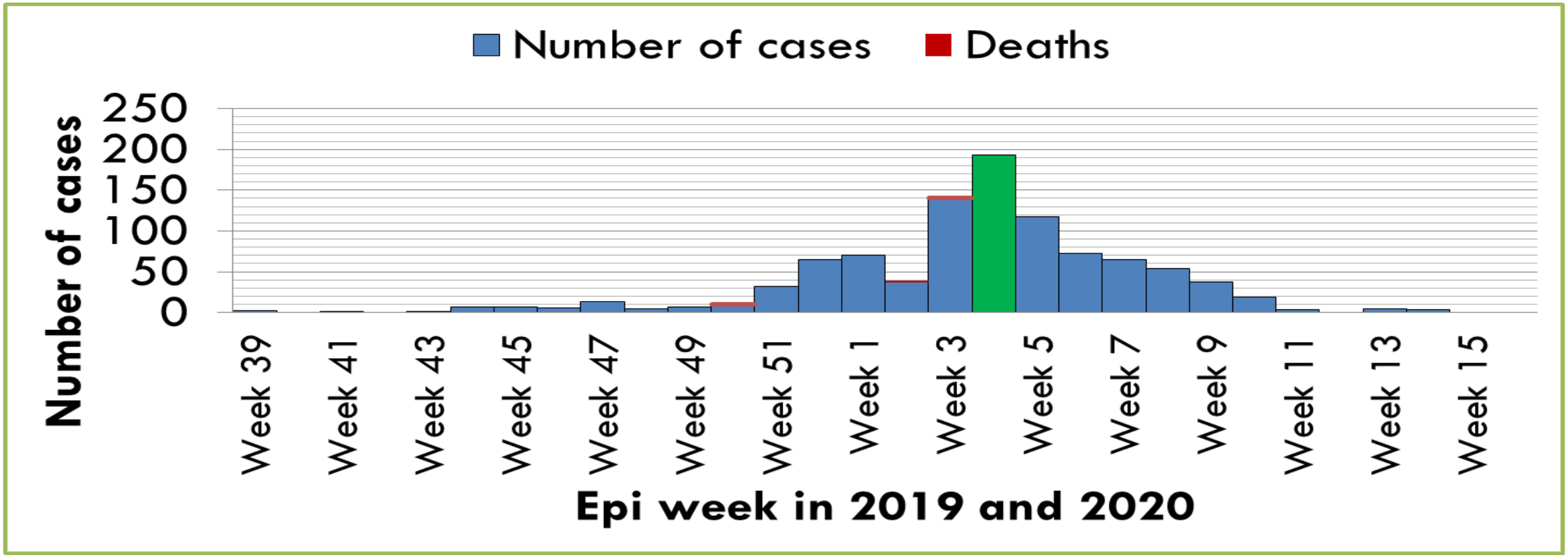

Fig.5: The Epi week shows the distribution of measles cases in 2019 and 2020 at NunuKumba District, EWZ, Western Ethiopia, May 2020 (n=976).

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Results…Measles outbreak response

- EZHO responded to an outbreak in different ways,
- These were- deployed physicians and pediatricians from NSH and APHs and managed the cases; mobilized supplies for cases management and conducted capacity building for HWs and HEWs.
- With regard to logistic and resources mobilization; the ZHO mobilized supplies from adjacent districts and partners for the support.
- SM was conducted at school, Churches and Mosques after preparing key messages on measles prevention and control measures.

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Results…

- Besides; ZHO strengthened surveillance:-activated Zonal epidemic preparedness and response plan and team; Zonal PHEM assigned surveillance officer to support the district, alert letter disseminated for all districts in the Zone, active case searches and weekly incidence monitoring were conducted in the district.
- Moreover, following the current outbreak, measles vaccination campaign and jointly nutritional mass screening campaign has been conducted for whole districts in the Zone.
- The age groups targeted during the campaign for both vaccination and nutritional mass screening was those under five years children, accordingly a total of 13,639 children were targeted.

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Results…

- The overall measles vaccination and nutritional mass screening campaign coverage for the under-five was 102.3% and 102% respectively.
- The coverage is various among the PHCUs and all of them have achieved above expected recommended coverage of 95%.
- The nutritional mass screening conducted during the outbreak response showed that among the children 6-59months screened for malnutrition about 3.8% and 1.4% of them had moderate and severe acute malnutrition respectively with a global acute malnutrition (GAM) of 5.1%

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Results…

Table-5: The distribution of measles vaccination campaign done during the outbreak at primary health care units of NunuKumba District, East Wollega Zone, Western Ethiopia, May 2020 (n=13,957).

Name of PHCUs	Total Population	# of Kebeles	Target 6-59 months	Total Vaccinated	Coverage (%)
Nunu PHCUs	35,176	9	5,276	5,269	99.9
Adare PHCUs	33,066	7	4,960	5,033	101.5
Birinkas PHCUs	8,071	2	1,211	1,445	119.3
Dalati PHCUs	14,610	3	2,192	2,210	100.8
Total	**90,923**	**21**	**13,639**	**13,957**	**102.3**

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Results…

Table-6: The distribution of nutritional screening results at NunuKumba district, East Wollega, Western Ethiopia, May 2020 (n=2192+2982=5174).

S.no	Name of PHCUs	Screening 6-59 months					Screening pregnant and lactating women(PLW)				
		Plan	Achievement	%	MAM	SAM	Plan	Achievement	%	MAM	SAM
1	Nunu PHCUs	5276	5269	99.9	172	64	7758	7493	97	145	6
2	Adare PHCUs	4960	5033	101	150	49	6864	6441	94	97	8
3	Birinkas PHCUs	1211	1445	117	104	23	1650	1575	95	27	0
4	Dalati PHCUs	2,192	2210	101	98	56	2,982	2798	94	111	15
Total		13638	13957	102	524	192	19254	18307	95	380	29

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Results…PHEM activities assessment finding

- The main activities undertaken on **PHEM events** were thoroughly assessed;
- At the district there is epidemic preparedness plan of the year 2019/2020.
- However, there was no separated and written epidemic preparedness plan at HCs level.
- There is no regional or national PHEM written guidelines.
- The PHEM focal person of Dalati health center did not take basic training on PHEM.
- The district PHEM experts were not providing technical support to the HCs service providers for the last one year.
- Likewise, the HCs PHEM experts were not supporting their catchment HPs by using the standard checklist.

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Results…

- There was no written feedback from DHO to HCs ; and HPs to catchment HPs on PHEM activities.
- In the year 2018/2019 and the first eight months of 2019/2020 the PHEM report completeness of HCs was 81% and 91% respectively.
- Likewise HPs level PHEM report completeness during the same period was 70% and 93% respectively.
- Besides, we found that at both district and PHCU's levels; there is no PHEM report timelines tracking system at all.

Results…EPI related activities

- The result from this assessment indicated that a district and most HCs EPI focal persons were not trained on vaccine and CC management.
- There was no up to date EPI guideline at both district and PHCUs; which was provided during the outbreak.
- The EPI schedule was not available in the written form and posted on the wall chart at all visited health facilities during the assessment.
- A total EPI sites in the district were 67 (static-25 and outreach-42).
- Immunization services were not being provided on daily basis at all HCs and at the HPs with functional refrigerator.

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Results…

- At the district level there is no EPI dedicated functional refrigerator and sharing with Nunu HC.
- Among four the HCs in the district; three of them (75%) have functional refrigerator; while one HC(25%) have not during the assessment.
- All refrigerators at the HCs level have fridge tag to monitor the temperature continuously.
- However, it was not monitored on daily basis at all visited HFs. One HC(25%) has no EPI monitoring chart.
- Among ten refrigerators found at the HP levels; nine solar type refrigerators (90%) were functional and one kerosene type (10%) was not functional during the assessment.

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Results…

- It was identified that all HCs refrigerators were overload with different drugs and antigens.
- CCE inventory was not conducted at both the district and all PHCUs for the last one year and 8 months before the assessment.
- The strategies like RED/REC (reach every district and reach every child) categorization to monitor the EPI performance was not available at both the district and PHCUs.
- They also did not use defaulter tracing mechanism to address unvaccinated children in their catchment defaulted from routine immunization program.
- Besides, the district and all HCs did not use the ledger book for EPI supplies stock management.

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Results…

- At one HC (25%) there was EPI supplies stock out for about two months in the year 2019/2020 and this catchment was the primary epicenter of the outbreak.
- They also did not use defaulter tracing mechanism to address unvaccinated children in their catchment defaulted from RIP.
- Besides, the district and all HCs did not use the ledger book for EPI supplies stock management.
- At one HC (25%) there was EPI supplies stock out for about two months in the year 2019/2020 and this catchment was the primary epicenter of the outbreak.

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Results…outbreak related activities

- In the district the two suspected measles cases were reported from Bacu and HarkoGudetu Kebeles of Nunu PHCU on 30/09/2019 and date of illness onset were 28/09/2019.
- The samples were collected from these suspected cases and sent to EPHI.
- The lab result feedback was not received and the cases were treated by antibiotics and vitamin A and they get relieved.
- There was no search done for contact history and the probable epidemiologically linked cases.
- The first index case for the current outbreak was reported from HoraBaca Kebele of Dalati PHCUs. This case was a vaccinated 2.6years old female.

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Results…

- The date of illness onset was **28/10/2019** and the date examined at Dalati HC was **30/10/2019**. This case was reported to DHO within 24 hours and treated by antibiotic and Vitamin A and get relieved.
- However, the district delayed for about two weeks and they started to respond after the cases surge and spread to Adare PHCUs and reported to the district.
- About ten suspected cases from Adare HC were referred to APH on 19/12/2019.
- After the suspected cases referred to the hospital and measles suspected cases happened at different sites; the DHO collected the samples of four measles suspected cases and sent it to EPHI on **24/12/2019**.

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Results…

- **The lab result written feedback was not given to the DHO** and they were informed by telephone call notices from ZHO PHEM FP that all of the samples were found to be IgM positive.
- ***Then the DHO RRT come together and declared the occurrence of the measles outbreak on 19/12/2019***.
- The difference between **date of illness onset** and health care facilities visit was **8 days, 9days, and 10 days** with an **average of 9 days.**
- According the data reported on the line list the first measles suspected case was reported from Nunu-01 Kebele and visited the health facilities on 30/09/2019.

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Results…

- In the district **the last measles** suspected case was reported from AbdiUmata Kebele of Adare PHCUs on **02/04/2020.**
- **The total duration of the outbreak** after being declared by the district RRT lasted for **three solid months and thirteen days** (**19/12/2019** to **02/04/2020**).
- Despite of having the line list data of cases; it was not analyzed by place, person and time at both the district and PHCUs levels.

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Results…

Table-7: The characteristics of index cases in NunuKumba district, East Wollega Zone, Western Ethiopia, May 2020.

Codes of index cases	Sex	Age (in years)	Address	Vaccination status	Date of onset of disease	Date seen at health facility	Date health facility notified the district	Date sent to lab	IgM result
01	F	4	WamaDoshe	Vaccinated	13/12/19	22/12/19	22/12/19	24/12/19	Positive
02	M	4	WamaDoshe	Vaccinated	12/12/19	22/12/19	22/12/19	24/12/19	Positive
03	M	4	WamaDoshe	Vaccinated	13/12/19	22/12/19	22/12/19	24/12/19	Positive
04	F	6	WamaDoshe	Vaccinated	14/12/19	22/12/19	22/12/19	24/12/19	Positive

Discussion

- In this study, we assessed the measles outbreak response activities and its determinant factors at NunuKumba district, Western Ethiopia.
- The overall AR from the total of the district was 1.05 % (976/92,514*100). This is higher than the study conducted in Kabridahar District, Ethiopia, which revealed the overall AR of 0.4/1000.The possible explanation for these differences was early diagnosis and management of cases at Kabridahar district.
- The overall CFR of this outbreak was 0.41%. This is lower than the study conducted in both Artuma Fursi Woreda and Simada district of Amhara region, Ethiopia and Indonesia which revealed the CFR of 2.6%, 13.4% and 14.1%, respectively.

Discussion…

- Another study conducted in west Hararghie zone, Ethiopia, and Sudan revealed the measles CFR of 6.7 % and 0.9%, respectively; which was higher than the current finding.
- These all differences might be due to immunization status and coverage differences, socio-cultural influences, early detection and response, malnutrition and overcrowding.
- This outbreak assessment indicated that the majority of the cases were the age group ranging from 1 to 4 years (456, 46.7%).
- This is consistent with the study conducted in Indonesia in which the highest AR (50.0%) occurred among 1-4 years age group.

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Discussion…

- This finding indicated that the sex-disaggregated distribution of AR was male (492, 50.40%) and female (484, 49.60%),this mean the ratio of male to female was almost one to one.
- This is almost consistent with the study conducted in Sudan, which showed that 51% male and 49% female were affected by measles outbreak.
- In contrast to this finding, the study conducted in Indonesia revealed that about 64.3% of measles cases were male.
- This assessment showed that the CFR was slightly higher among female (0.6%) than male (0.2%).

Discussion…

- This finding is consistent with the study conducted in Simada district of Amhara region, Ethiopia which revealed that a majority of deaths occurred among females (9/13, 69.2%).
- The possible explanation for this finding was the female were more affected by malnutrition and there might be gender related socio-cultural influence.
- Studies revealed that the distance from the HCFs and immunization sites was one of the main reasons for not using the immunization services and risk factors for the occurrence of measles outbreak as most children are left unvaccinated due to this factor.
- In contrast to this finding the study conducted in the metropolitan setting, Addis Ababa, and Ambo Woreda, Ethiopia revealed that children far from HFs had higher odds of receiving MCV1.

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Discussion…

- The possible explanation of this difference was those children from Addis Ababa and Ambo Woreda has had an opportunity to get services at different sites or HCFs than those from the rural areas.
- The survey conducted by JSI L10K's on EPI coverage in selected Ethiopian zones including EWZ indicated that service interruption was one of the independent predictor of vaccination completions.
- In line with this, the current result showed that immunization was not being provided on daily basis at both HCs and HPs with functional refrigerators.
- In this outbreak assessment more than one-third (40%) of the cases were unvaccinated and only 1.1 % (11/976*100) of them received MCV2.

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Discussion…

- This is higher than the finding of 2019 Ethiopia mini demographic health survey (EMDHS) in Oromia region, China, and in the metropolitan setting, Addis Ababa.
- It is lower than the study conducted in west Hararghie zone, and Kabridahar district, Ethiopia.
- The probable explanation for these differences were accessibility of health care facilities, availability of trained and committed human power, availability of continuous EPI supply, and areas in which the study were conducted.
- *Key informant interview in district health office also support this idea and said: "the main reason for the occurrence of this outbreak in our district was low immunization coverage" (female Key informant interview 38years, district health office head).*

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Discussion…

- It is revealed that more than one-fourth of the cases (27%) were admitted. This result is lower than the study conducted in China, which showed that about 61% of cases had been hospitalized.
- This assessment showed that the mean date difference of cases to seek health care services was 3.1 days and the majority of them seek health care services within 3rd and 4th days.
- This result is consistent with the study conducted in in Zaka, Zimbabwe, which revealed that the median duration for seeking treatment after onset of illness was 3 days.
- It is identified that measles is one of the leading causes of death among young children especially in the malnourished once.

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Discussion…

- In consistent with this the result from the current nutritional mass screening revealed that 3.8% and 1.4% of them were moderate and severe acute malnutrition respectively with GAM rate of 5.1%.
- This assessment revealed that there is epidemic preparedness plan of the year 2019/2020 at the district level; while there was no separated and written epidemic preparedness plan at health centers levels. This is similar with the study conducted in Zaka, Zimbabwe.
- The current finding showed that the PHEM focal persons at the district and HCs levels did not analyzed data and used it for decision-making. This is similar with the study conducted in Zaka, Zimbabwe, and Dawuro Zone, Ethiopia.

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Discussion…

- The possible explanation was lack of knowledge and skills to conduct outbreak report analysis.
- Besides, it showed poor surveillance system at district and primary health care unit levels.
- This assessment revealed that the DHO delayed for about two weeks to respond and conducted the field investigations after the first index cases were reported from the health care facilities. This is similar with the study conducted in Zika, Zimbabwe.
- The study revealed that taking training on EPI was one of the independent predictor of vaccination completions.
- In this assessment, we found that all HFs(100%) have assigned designated EPI FP, and none of them took basic training on vaccine management.

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Discussion…

- Besides, only EPI FPs at two (25%) HCs took training on CC management.
- A similar study conducted in Amhara region, Ethiopia showed that 95% of visited HFs assigned designated EPI FPs and 48% of the sites had FPs trained on CC management.
- In the current assessment, we found that refrigerator is not functional at one HC and one-HP.
- Expired fridge tag was found at one of the HCs, which make the temperature reading outside of the recommended range (2-8°c).
- This assessment is similar with the survey conducted by JSI L10K's on EPI coverage, Ethiopia that indicated that refrigerators were not functional in 32% HCs and 71% of HPs. Moreover, almost two-thirds of facilities encountered breakdown of their vaccine refrigerators in the previous three months before the survey.

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Discussion…

- Of those facilities, which had functional refrigerator, the temperature reading was outside of the recommended range of 2-8°C in 46% HPs and 23% HCs on the day of the visit.
- The study conducted in Amhara region showed that about $3/4^{th}$ (76%) of surveillance FPs had a refresher training in the last 2years.
- In contrast to this, the current finding revealed that all surveillance focal persons (100%) were trained.
- WHO recommended all epidemic prone diseases like measles cases are to be reported on weekly basis including zero reporting.
- It also stated that at least 80% of reporting completeness is considered as satisfactory.

Discussion…

- In this assessment, it was revealed that the reporting completeness of PHEM report at the HC in the year 2018/2019 and the first eight months of 2019/2020 was 81% and 91% respectively.
- Likewise, HPs level PHEM report completeness during the same period was 70% and 93% respectively.
- The current finding was higher than that of WHO regional office for Africa, which was around 57%, and lowers than the completeness of data in Western African sub region, which was 94%.

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Discussion…

- In this finding, the reporting completeness of HPs in the year 2018/2019 was lower than WHO recommended set of performance indicators or targets, which was percentage of weekly report received, should be ≥ 80%.
- WHO recommended that the suspected measles cases should be investigated with house visits and notified to concerned bodies within ≤48 hours.
- In contrast to this; there was no field investigation conducted to address contact tracing and link identified cases epidemiologically in the current measles outbreak.
- This assessment also found that; there was no written feedback from DHO to HCs; and HCs to catchment HPs on PHEM activities. This is similar with the study conducted in Dawuro Zone, Ethiopia.

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Discussion…

- WHO recommendation on data analysis, presentation and reports set performance indicators or targets as:-% of weekly report received ≥80%, % of cases notified ≤48 hours after rash onset (all cases that meet the clinical case definition), % of cases investigated with house visits ≤48 hours after notification ≥80%, % of cases with adequate specimen, and laboratory results within 7 days ≥80%, and % of confirmed cases with source of infection identified ≥80%. **In contrast to this**, the current finding indicated that an average day between the date of illness onset and HCF visit was 9 days, which was higher than the study conducted in Zaka, Zimbabwe that showed the median duration for seeking treatment after onset of illness was 3 days. The possible explanations were the differences in community awareness, health seeking behaviours, socio-cultural influences, early diagnosis and response.

Discussion…

- The current finding indicated that the epidemic curve was sustained propagating in the community with no apparent periodicity and covered majority of the district Kebeles. This is similar with the study conducted in Kamwenge district, Western Uganda.

- It is a known fact that the vaccine CC is not only an integral part, but also the very backbone, of an immunization programmer. However, in the current assessment the DHO had no EPI dedicated refrigerator while one (25%) of the HCs had no their own functional refrigerator. Besides, the fridge tag is not being monitored continuously at all visited HCFs, which might have affected the vaccine potency.

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Discussion…

- This assessment also revealed that there was vaccine stock out for more than two months at one HC (25%) in the district. This result is lower than that of the study conducted in Amhara region, Ethiopia in which vaccine stock out occurred in 34% of visited HFs for about 3 months.
- Another survey conducted by JSI L10K's on EPI coverage indicated that among facilities that stock vaccines overnight, 67% of HCs and 40% of HPs experienced shortage of vaccines in the past six months.
- Among visited health centers, 75% of them had EPI monitoring chart. This was lower than the study conducted in Amhara region, Ethiopia that showed that 94% of visited sites had updated EPI performance monitoring charts.

Discussion…

- The possible differences might be the assigned EPI FP commitment; knowledge; skills, and supportive supervision from district level.
- The study conducted in Amhara regional state of Ethiopia showed that the seasonal peak of measles cases noted in the hot-dry season of the year. In consistent with this; the outbreak in the current assessment reached climax at middle of January 2020 and declined by the middle of February 2020.
- This finding revealed that; there was no PHEM related written guidelines at both the district and HCs level. In contrast to this, the study conducted in Amhara region, Ethiopia showed that 87% of visited HFs had operational surveillance guidelines and 84% of them had national PHEM guidelines.

Discussion…

- The possible explanation for these differences might be high turnover of trained human power and preference of softcopy than hard copy.
- In the current assessment, we found that the SCDs on AFP, measles and NNT were available and posted in different units at both district and all HCs. This finding was higher than the finding from the study conducted in Amhara regional state of Ethiopia, which revealed that 93% of visited health facilities had these standard case definitions.
- As revealed by the survey conducted by JSI L10K's on EPI coverage showed that defaulter tracing system were independent predictors of complete vaccination.
- This was similar with the current assessment that; there was no defaulter tracing mechanism at both district and health centers level.

Limitation of the study:- There might be possibility of recall bias.

Conclusion and Recommendation

- The AR and CFR of this outbreak were higher than nationally expected target.
- Age group of 1-4years had higher AR.
- The AR for both sexes was almost similar whilst the CFR was slightly higher among female.
- More than one third of cases were not vaccinated and from hard to reach areas.
- The probable contributing factors for this outbreak were malnutrition, poor health seeking behaviour(poor community awareness and engagement), poor surveillance system, lack of training on vaccine and cold chain management, lack of functional fridge tag and refrigerator, poor PHEM report completeness, weak EPI program monitoring and evaluation, EPI antigens stock out, lack of operational surveillance guidelines and protocols, and dalliances of lab specimen result written feedback written recommended time period.

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Conclusion and Recommendation…

- The DHO should strengthen routine immunization activities at both static and outreach sites.
- HCs and HPs without refrigerators should have and use adjacent HFs functional refrigerators.
- The DHO should have its own EPI dedicated refrigerator.
- All PHCUs in the district should be actively engaged in active case search and response activities.
- Strong collaboration should exist between PHEM and all programs in general; particularly MCH program.
- ZHD should conduct training gap inventory and train EPI and PHEM FPs on updated guidelines and protocols.

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Conclusion and Recommendation…

- CC management system should be strengthened at the district and PHCUs.
- ZHO should facilitate to equip HFs with no functional fridge.
- CCE inventory should be done at least bi-annually at the district and PHCUs.
- EPI (RED/REC data base) and PHEM performance should be monitored and evaluated at the district and PHCUs.
- Defaulter tracing mechanism should be in place at PHCUs levels by using RED/REC categorization data base, tracer box or other options.
- Special consideration should be given for hard to reach or pocket areas in the district.

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Conclusion and Recommendation…

- Routine nutritional screening and interventions should be in place at PHCUs levels.
- Community awareness creation and engagement activities on epidemic prone diseases should get due attention at PHCUs levels.
- Regular updating of baseline data like <1 years and pregnant women in the districts.
- Strengthening health centers and health posts linkage.
- Strengthening PHEM and EPI programs related SS.
- All epidemic prone diseases should get political attention and should earmark PHEM dedicated budget.

Conclusion and Recommendation…

- Field assessment of Vaccine effectiveness (VE) should be conducted in suspected areas by area experts.
- The regional and national measles diagnosis centers should provide written lab result feedback within recommended time period.

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Thank You For Your Attention & Time!!

Galatoomaa !!

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