EARLY WARNING AND REPORTING SYSTEM (EWARS) ANNUAL REPORT 2021

Government of Nepal
Ministry of Health and Population
Department of Health Services
Epidemiology and Disease Control Division
Disease Surveillance and Research Section
Teku, Kathmandu

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PREFACE

It is my great pleasure to be able to present "**Annual Bulletin on Early Warning and Reporting System (EWARS)**" that is published by Disease Surveillance and Research Section, Epidemiology and Disease Control Division, Department of Health Services.

Over the years, EWARS has been undertaking surveillance and response of infectious diseases. The health institutions registered as sentinel sites are reporting to this surveillance system for the disease of epidemic/outbreak potential and the diseases under elimination. The main objective of EWARS is to generate prompt alerts, strengthen the flow of information on vector borne and other outbreak prone infectious diseases from the local level, and facilitate instant outbreak response through the Rapid Response Team (RRT) at Central, Provincial, District and Local level,

This bulletin provides a comprehensive scenario of the diseases/syndromes reported from the sentinel sites in the EWARS at national and provincial level along with key age group.

I would like to thank Epidemiology and Disease Control Division for their efforts in producing this report.

Dr. Dipendra Raman Singh

Director General

Department of Health Services

5 July, 2022

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FOREWORD

Early Warning and Reporting System (EWARS) is the only surveillance currently used by Government of Nepal for early detection and control of outbreak. It is a hospital- based sentinel surveillance system currently operation in 118 sentinel sites. It was designed to complement the country's Health Management Information System (HMIS) by providing timely reporting for the early detection of selected vector borne, water and food borne diseases with outbreak potential.

The hospital-based reporting system provides timely signal or alert and early detection of possible outbreaks due to increased number of cases in the community leading to timely response. Epidemiology and Disease Control Division (EDCD) has been producing weekly bulletin for the selected 6 priority diseases reported from these sentinel sites. These weekly reports provide trend of diseases over the last 3 years.

The current bulletin provides a comprehensive summary of diseases providing descriptive analysis for time (weekly trend), place (district-wise distribution), and person (age and sex distribution) of a selected set of diseases/syndromes reported through EWARS in 2021 at both national and provincial level. The selected diseases/syndromes were defined as all priority diseases/syndromes, i.e., AGE, cholera, SARI, dengue, kala azar, and malaria and those diseases/syndromes for which more than 500 cases were reported (influenza like illness, i.e., ILI, enteric fever, and scrub typhus).

This report provides an in-depth analysis on national, provincial and district case distribution along with age-sex distribution of cases. Further the report provides reporting status for sentinel site for 2021. I hope this report will be helpful for the individuals and organizations to understand the disease pattern reported in EWARS and help in providing further feedback to improve the existing system.

I want to congratulate Diseases Surveillance and Research Section for bringing out this comprehensive report.

Dr. Chuman Lal Das

Director

Epidemiology and Disease Control Division

5 July, 2022

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Abbreviations

AGE: Acute Gastro Enteritis

EDCD: Epidemiology and Disease Control Division

EWARS: Early Warning and Reporting System

ILI: Influenza like Illness

SARI: Severe Acute Respiratory Infection

Introduction

Early Warning and Reporting System (EWARS) is a hospital-based sentinel surveillance system, - established in 1997 - for early detection of six priority vector-borne, water and food borne diseases/syndromes/syndromes with outbreak potential, namely acute gastroenteritis (AGE), cholera, severe acute respiratory illness (SARI), dengue, kala azar, and malaria. Currently, 118 hospitals from all provinces and districts in the country have been selected as sentinel sites to report cases of these diseases/syndromes and other additional diseases/syndromes on a weekly basis or immediately if there is an outbreak.

EWARS provides an early insight on the trends of the outbreak prone diseases/syndromes, which in turn helps to carry out response in a timely manner if there is an outbreak. Hence, Epidemiology and Disease Control Division (EDCD) analyses data reported in EWARS routinely and produces and disseminates a EWARS weekly bulletin. These weekly bulletins are easily accessible through EDCD's website.

This Annual EWARS Report 2021 analyses data reported in EWARS throughout 2021 with following objectives:

1. To assess a national, provincial and district distribution of the reported cases of priority and other diseases/syndromes reported in EWARS
2. To assess a weekly trend of the reported diseases/syndromes at national and provincial level
3. To assess age distribution of the reported cases at national level
4. To assess sex distribution of the reported cases at national and provincial level
5. To assess status of completeness of reporting by sentinel sites

Methodology

Descriptive analysis for time (weekly trend), place (district-wise distribution), and person (age and sex distribution) of a selected set of diseases/syndromes reported through EWARS in 2021 was performed for both national and provincial level. The selected diseases/syndromes were defined as all priority diseases/syndromes, i.e., AGE, cholera, SARI, dengue, kala azar, and malaria and those diseases/syndromes for which more than 500 cases were reported (influenza like illness, i.e., ILI, enteric fever and scrub typhus). Five hundred cut off point was taken to have meaningful graphs and tables. Weekly trend analysis was done based on case reporting for Epidemiological week in EWARS.

COVID-19 was excluded from the time-place-person analysis as the report intended to focus on non-COVID diseases/syndromes.

To assess the completeness of reporting status, a sentinel site was considered to have completed reporting if it had reported even a single case of any diseases/syndromes for a given week.
Epidemiological week is same as defined in EWARS guideline, i.e. Sunday to Saturday and starting from the first Sunday of January.

Results

A total of 43,360 cases belonging to more than twenty diseases/syndromes that were reported in EWARS during 2021, of which 9 diseases/syndromes/syndromes were included in the analysis. The total number of cases reported for these 9 diseases/syndromes/syndromes were 24,703. The final cases included in the analysis was 24,695.

National Overview

Out of the selected diseases/syndromes among reported in the EWARS, the highest number of cases was reported for SARI (n=9360; 37.9%), followed by AGE (n=7889; 31.9%), ILI (2901; 11.7%) and scrub typhus (n=2017; 8.2%). The cases reported for other selected diseases/syndromes were enteric fever (n=1653; 6.7%); dengue (n=530; 2.1%); kala azar (n=274; 1.1%), malaria (n=52; 0.2%), and cholera (n=19; 0.1%).

The case reporting first peaked at week 14 with a total of 791 cases, mainly composed of AGE cases (Figure 1). This was followed by a steep dip in reported cases between 18-24 weeks. Cases started to rise gradually from Week 25 and peaked at week 38, mainly driven by increasing reporting of SARI cases.

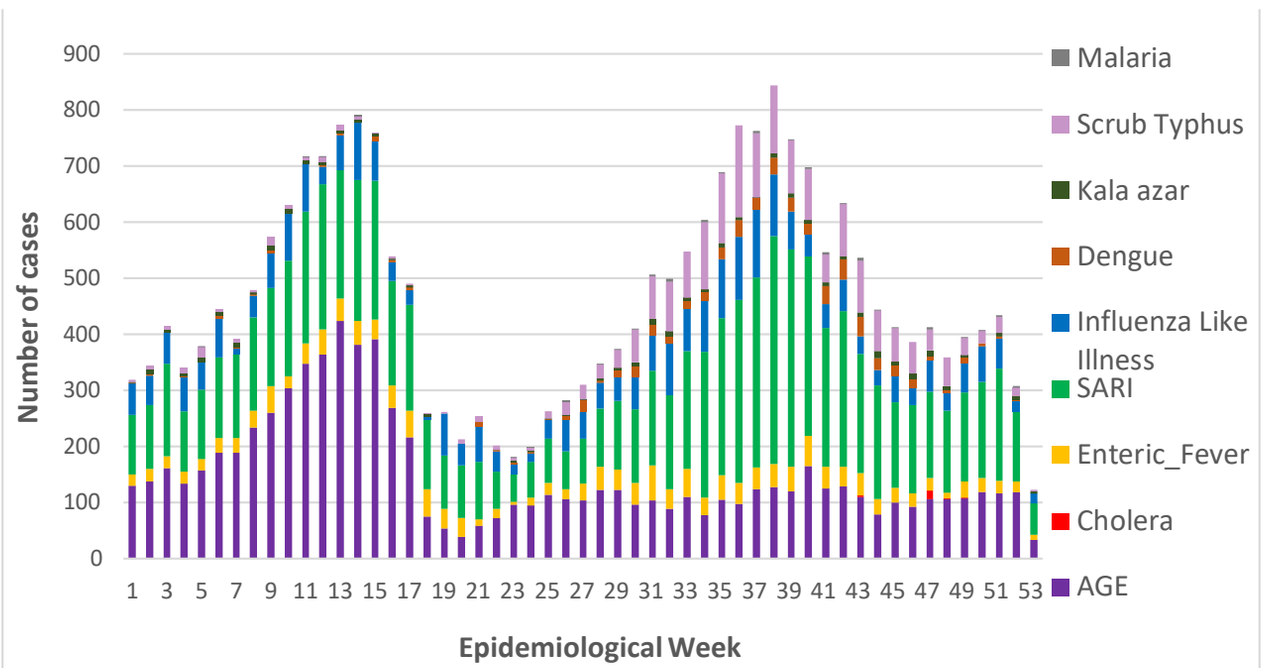

Figure 1: Overall weekly trend of selected diseases/syndromes reported in EWARS (N=24695)

The weekly trend analysis of selected diseases/syndromes showed a seasonal variation in reported cases of AGE, SARI, dengue, and scrub typhus (Figure 2). The AGE cases were reported more on the first half of the year, while dengue, scrub typhus and malaria were reported more at the latter half. SARI and ILI cases were reported in two waves, early part of the year smaller peak and the relatively high peak at the latter part of the year. A similar pattern can be seen in kala azar and enteric fever as well.

AGE was reported from all 77 districts, with more than 200 cases reported in 12 districts (Figure 3). AGE cases were more concentrated in terai and hill districts than the mountain districts. SARI was reported from 75 districts, except Mustang and Manang. Kala azar was reported from mountainous districts Humla, Mugu, Dolpa, and Sankhuwasabha. Cholera (not shown in the figure) was reported only from Kapilvastu (n=17) and Saptari (n=2).

Age groups that were most reported were 1-4 years (n=5533, 22.4%), followed by infants, i.e., those below one years of age (n=4321; 17.5%). For all diseases/syndromes except dengue, the age group with highest reported cases were the age-groups below 10 years old.

Proportionally males were more affected by kala azar, malaria and SARI while females were more affected by scrub typhus (Figure 04).

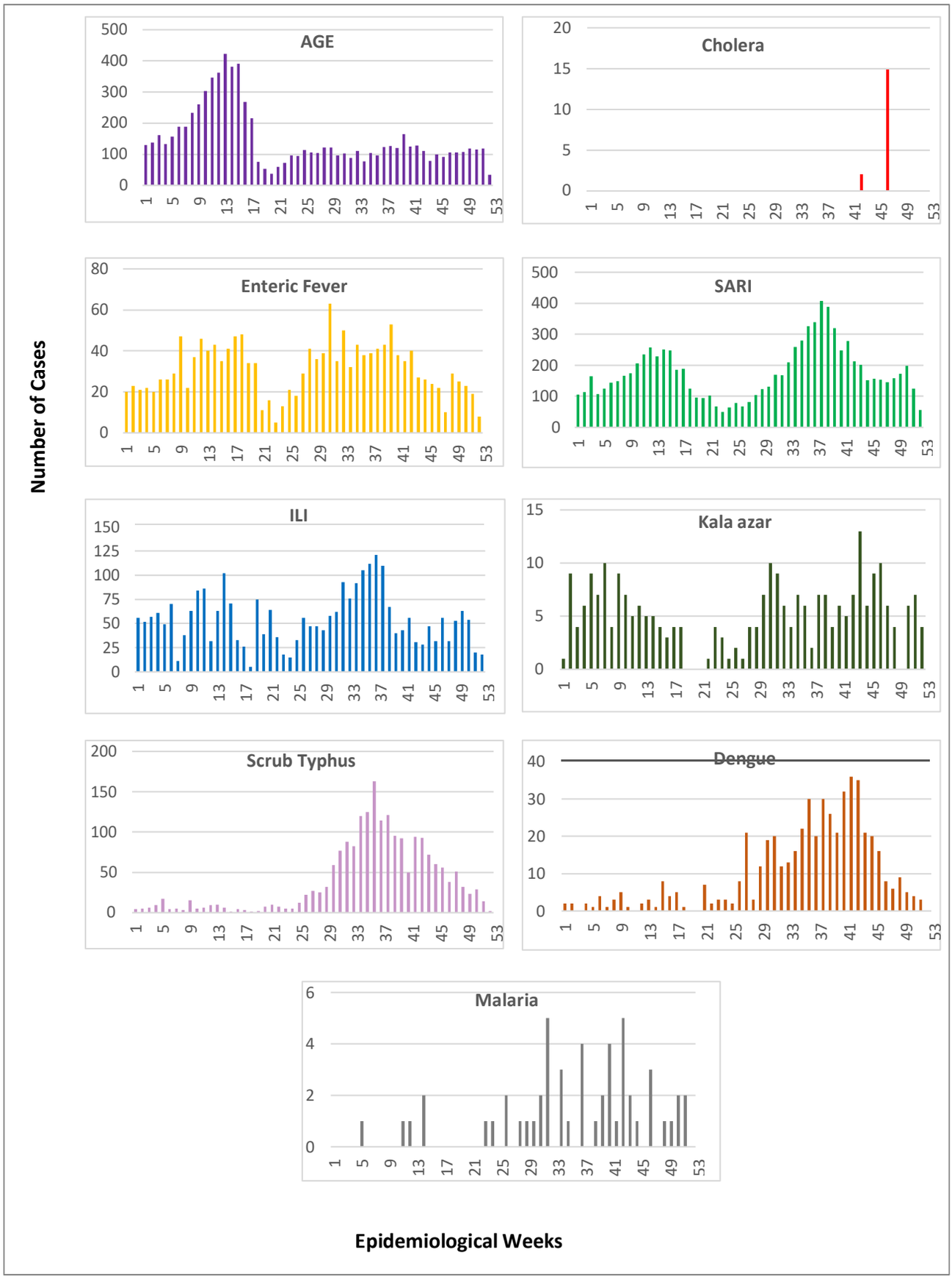

Figure 2: Disease-wise weekly trend of selected diseases/syndromes at national level

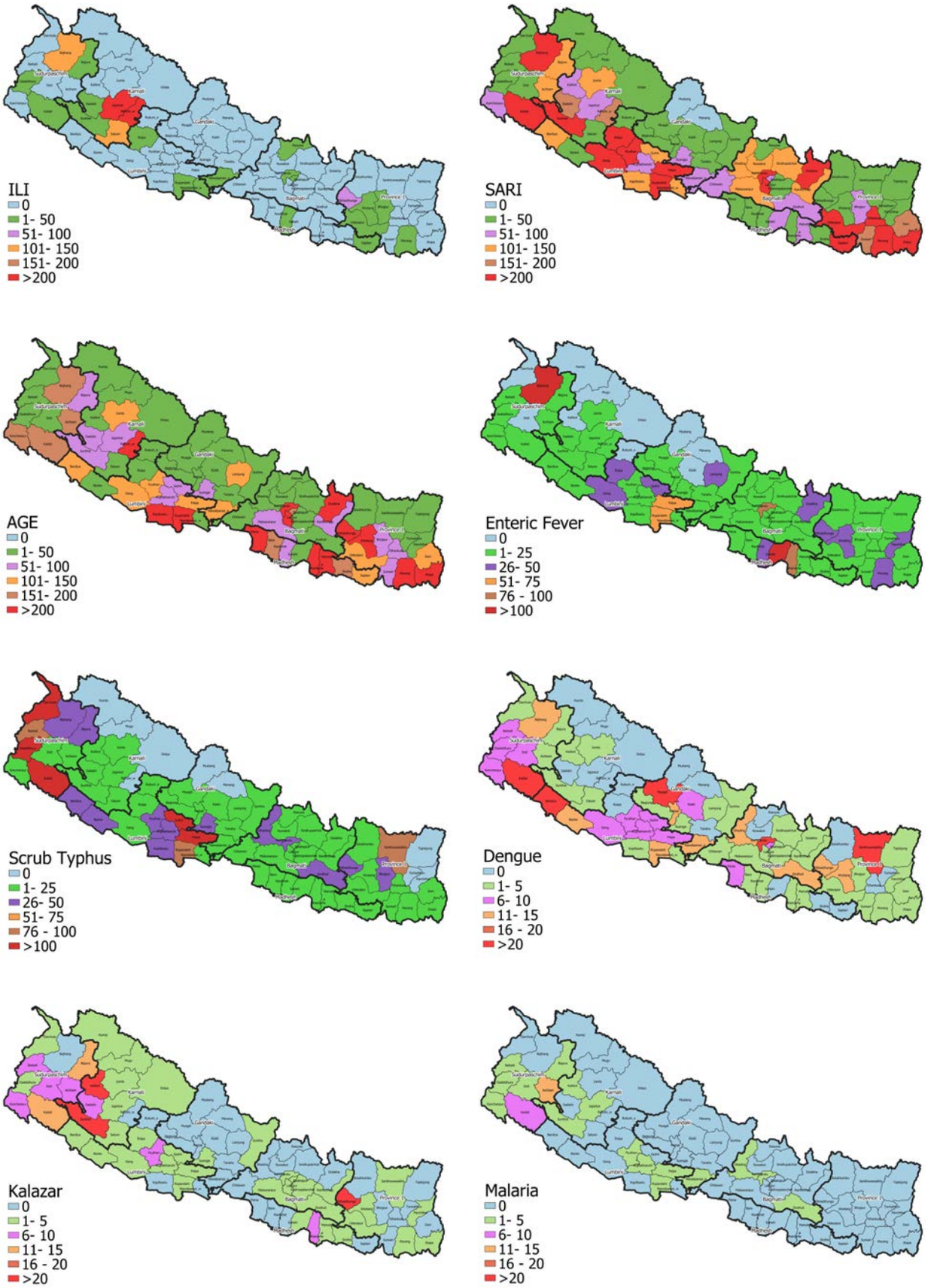

Figure 3: District wise number of cases of selected diseases/syndromes

Table 1: Age distribution of cases of nine selected diseases/syndromes at national level

Age (yrs)	AGE	Cholera	Dengue	Enteric Fever	ILI	Kala azar	Malaria	SARI	Scrub Typhus
	Number of Cases (%)								
<1	827(10.5)	0 (0.0)	8 (1.5)	27 (1.6)	485(16.7)	5 (1.8)	1 (1.9)	2946 (31.5)	22(1.1)
1-4	00(0.0)	2(10.5)	27(5.1)	218(13.2)	731(25.2)	64(23.4)	0 (0.0)	264(28.2)	135(6.7)
5-9	538 (6.8)	8(42.1)	32(6.0)	157(9.5)	295(10.2)	27(9.9)	6(11.5)	442(4.7)	179(8.9)
10-14	347 (4.4)	4(21.1)	27(5.1)	117(7.1)	192(6.6)	17(6.2)	3(5.8)	176(1.9)	124(6.1)
15-19	379 (4.8)	0 (0.0)	38(7.2)	135(8.2)	204(7.0)	18(6.6)	5(9.6)	93(1.0)	144(7.1)
20-24	538 (6.8)	2(10.5)	62(11.7)	142(8.6)	193(6.7)	26(9.5)	8(15.4)	146(1.6)	165(8.2)
25-29	482 (6.1)	0 (0.0)	48(9.1)	137(8.3)	133(4.6)	16(5.8)	6(11.5)	130(1.4)	159(7.9)
30-34	389 (4.9)	1(5.3)	35(6.6)	109(6.6)	124(4.3)	20(7.3)	4(7.7)	149(1.6)	123(6.1)
35-39	364 (4.6)	0 (0.0)	35(6.6)	125(7.6)	99(3.4)	19(6.9)	2(3.8)	176(1.9)	121(6.0)
40-44	293 (3.7)	0 (0.0)	40(7.5)	76(4.6)	77(2.7)	15(5.5)	7(13.5)	156(1.7)	117(5.8)
45-49	316 (4.0)	1(5.3)	31(5.8)	90(5.4)	73(2.5)	10(3.6)	4(7.7)	157(1.7)	111(5.5)
50-54	329 (4.1)	00 (0.0)	29(5.5)	80(4.8)	59(2.0)	13(4.7)	1(1.9)	212(2.3)	122(6.0)
55-59	276 (3.5)	1(5.3)	34(6.4)	64(3.9)	70(2.4)	9(3.3)	2(3.8)	201(2.1)	109(5.4)
60-64	280 (3.5)	0 (0.0)	30(5.7)	56(3.4)	54(1.9)	7(2.6)	0 (0.0)	353(3.8)	104(5.2)
65-69	233 (2.9)	0 (0.0)	22(4.2)	36(2.2)	37(1.3)	3(1.1)	1(1.9)	289(3.1)	92(4.6)
70-74	267 (3.4)	0 (0.0)	13(2.5)	39(2.4)	42(1.4)	3(1.1)	2(3.8)	433(4.6)	82(4.1)
75-79	148 (1.9)	0 (0.0)	10(1.9)	26(1.6)	15(0.5)	0 (0.0)	0 (0.0)	306(3.3)	68(3.4)
≥80	171 (2.2)	0 (0.0)	9(1.7)	19(1.1)	18(0.6)	2(0.7)	0 (0.0)	351(3.8)	40(2.0)
Grand Total	**7889 (100.0)**	**19 (100.0)**	**530 (100.0)**	**1653 (100.0)**	**2901 (100.0)**	**274 (100.0)**	**52 (100.0)**	**9360 (100.0)**	**2017 (100.0)**

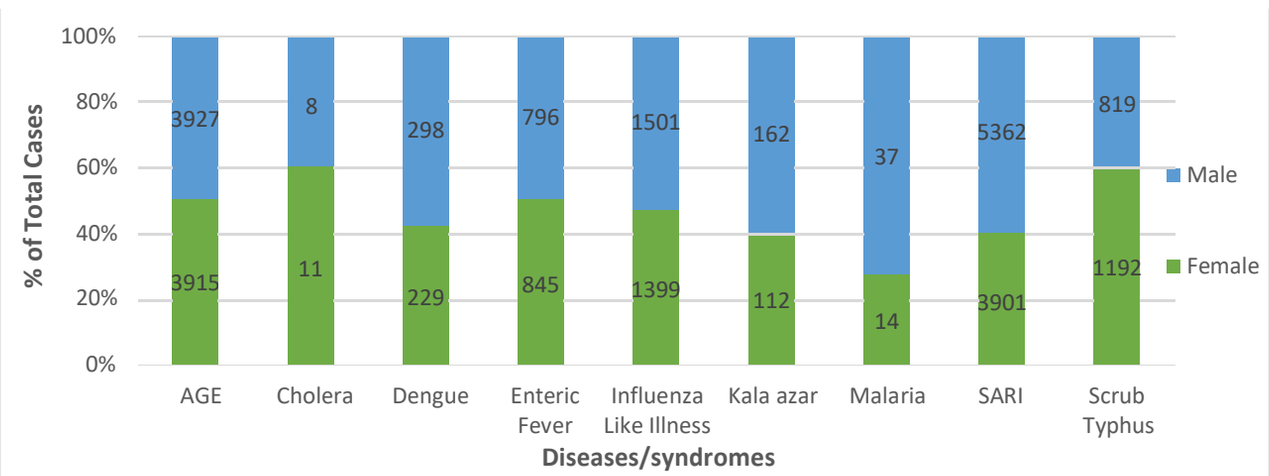

Figure 4 Sex distributions of cases of selected diseases/syndromes at national level

Province 1

Total 4539 cases of seven selected diseases/syndromes were reported in Province 1, with SARI (n=2454; 54.1%) being the most reported disease, followed by AGE (n=1467, n=32.3%), scrub typhus(n=200; 4.4%), enteric fever (n=188; 4.1%), dengue(n=108; 2.4%), ILI (n=80; 1.8%), and Kala azar (n=42; 0.9%) (Figure 5).

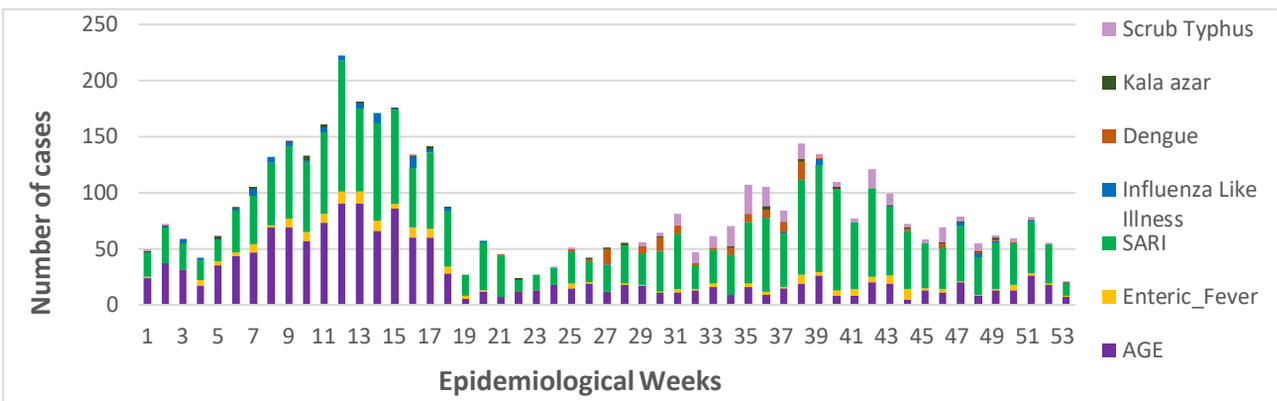

Figure 5 Disease-wise weekly trend of selected diseases/syndromes reported in Province 1(N=4539)

Seasonal variation in reporting was observed for all diseases/syndromes except kala azar where the variation is not obvious (Figure 6). Trend was comparable to that of the national level.

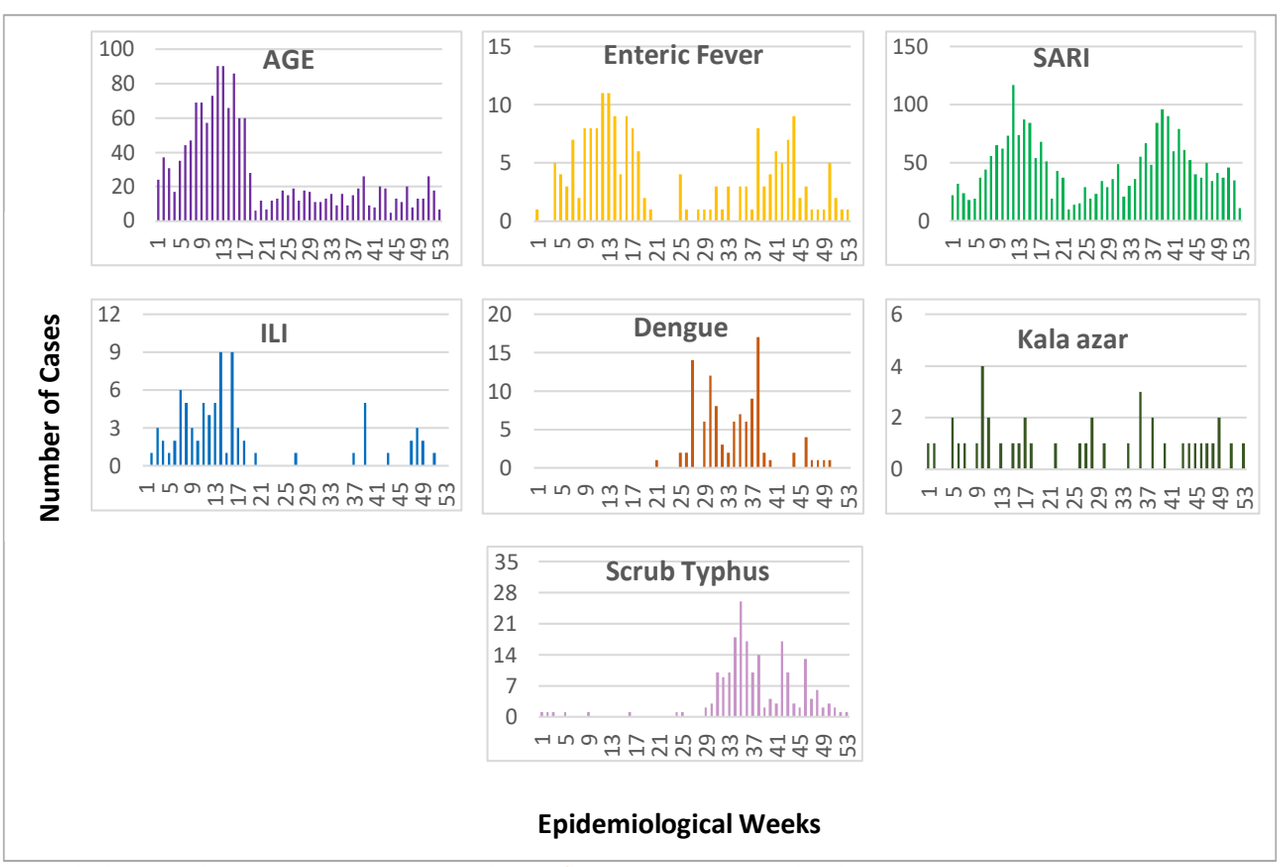

Figure 6: Disease-wise weekly trend of selected diseases/syndromes reported in Province 1

Higher case load among male were observed for SARI, ILI, dengue, and Kala azar whereas it was reverse for AGE and enteric fever. Distribution of scrub typhus was nearly equal among male and female (Figure 7).

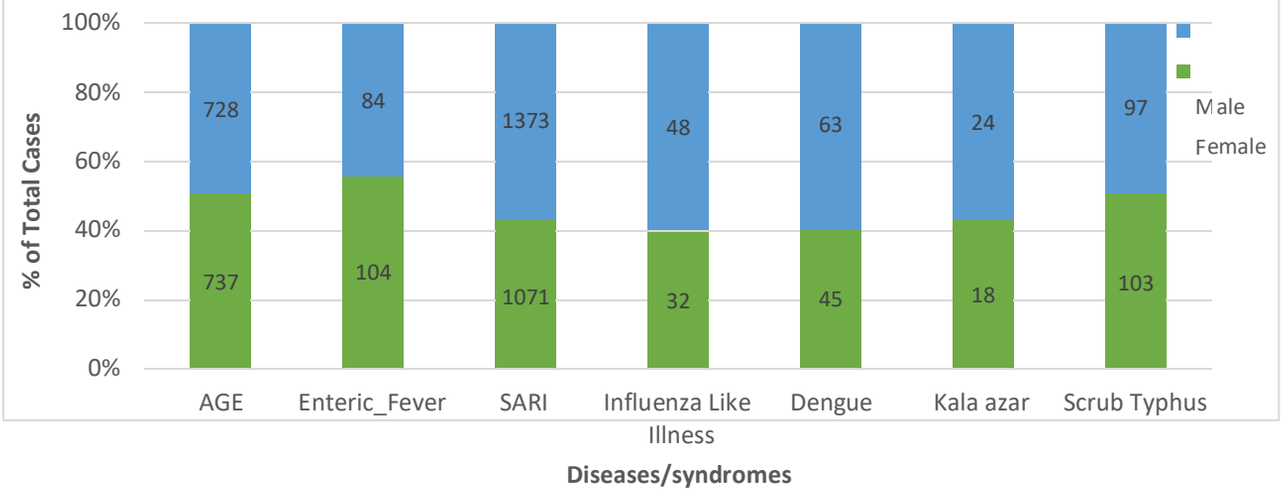

Figure 7: Sex distribution of cases of selected diseases/syndromes reported in Province 1

Out of 18 sentinel sites in Province 1, only 9 (50%) reported on at least 80% of the epidemiological weeks (i.e., ≥43 epidemiological weeks). Median number of weeks in which a sentinel site reported in EWARS was 40.5 for the province (Figure 8).

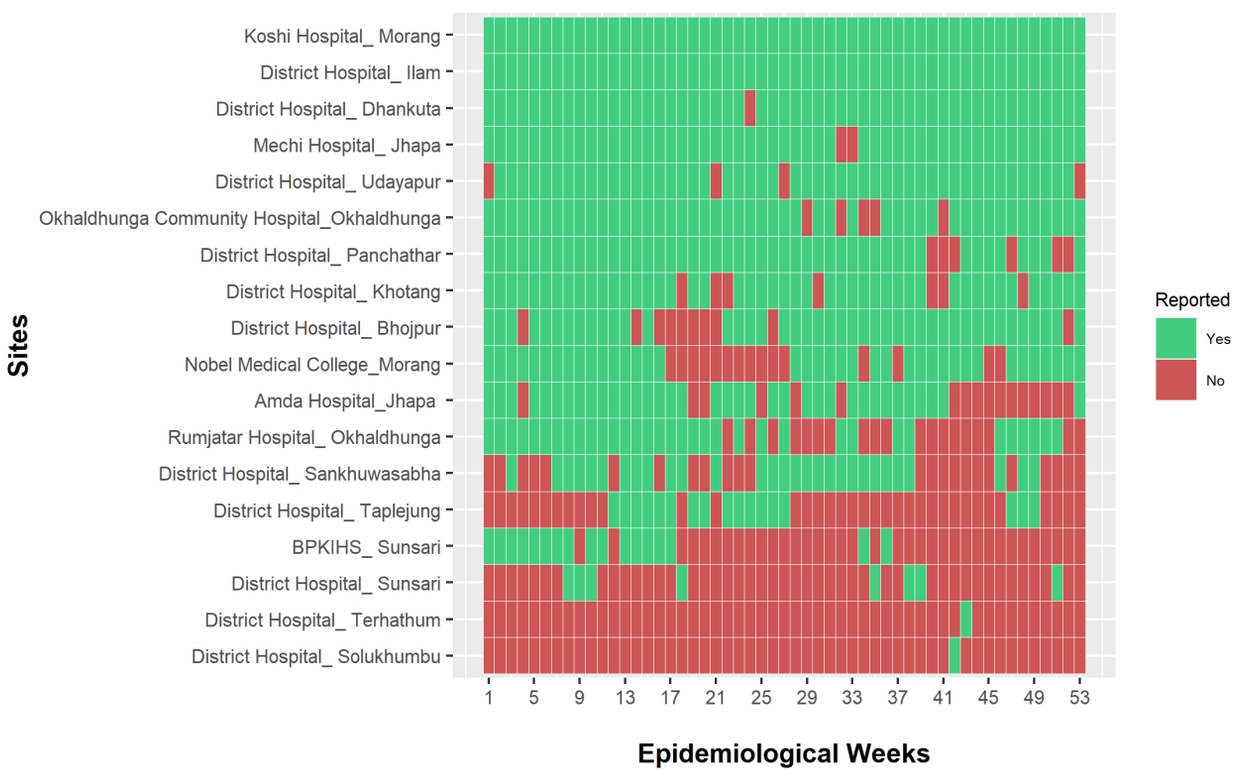

Figure 8: Weekly reporting status of sentinel sites in Province 1

Madhesh Province

Total 3157 cases of eight selected diseases/syndromes were reported in Madhesh, with AGE (n=1533; 48.6%) being the most reported disease, followed by SARI (n=931; 29.5%), enteric fever (n=577; 18.3%), scrub typhus(n=81; 2.6%), kala azar (n=16; 0.5%), dengue (n=15; 0.5%), cholera (n=2; 0.06%), and ILI(n=2; 0.06%) (Figure 9).

Seasonal variation was apparent for AGE, enteric fever, SARI, and scrub typhus (Figure 10).

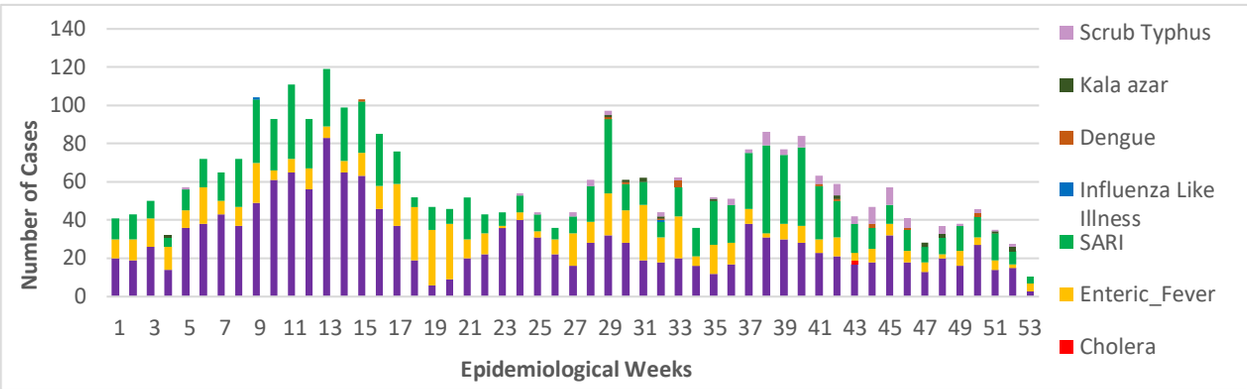

Figure 9: Disease-wise weekly trend of selected diseases/syndromes reported in Madhesh Province (N=3157)

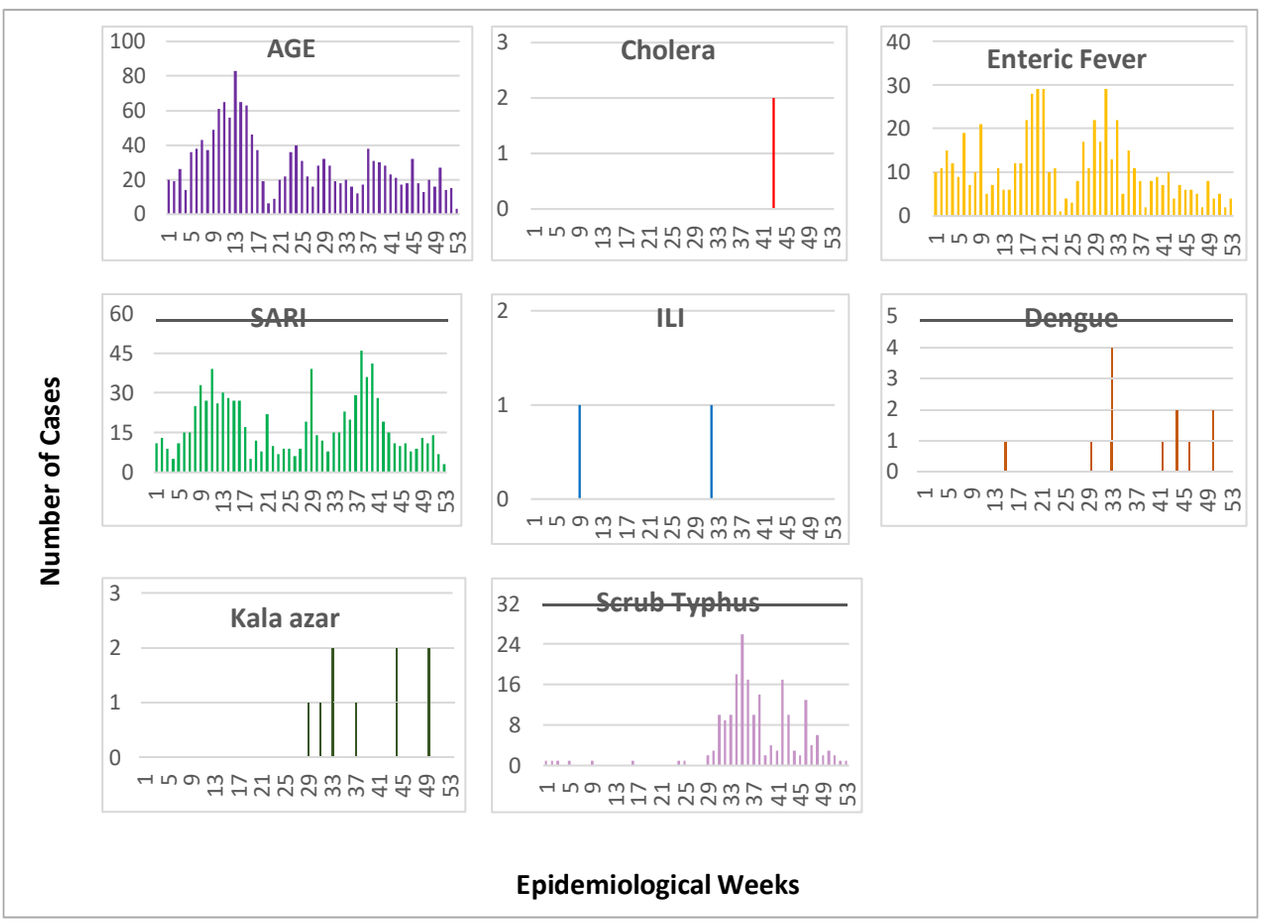

Figure 10: Disease-wise weekly trend of selected diseases/syndromes reported in Madhesh Province

For dengue, SARI, and kala azar, higher number of cases was seen among males. Female were more affected by scrub typhus as comparison to male (Figure 11).

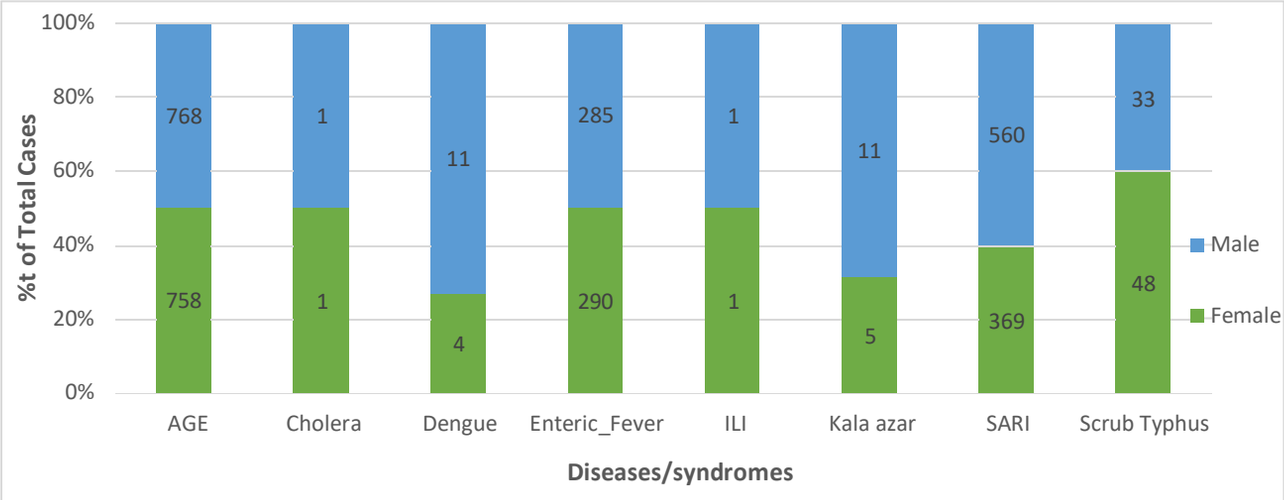

Figure 11: Sex distribution of selected diseases/syndromes in Madhesh Province

Out of 13 reporting sites – of which 12 are official sentinel sites - in Madhesh Province, only 6 (46.1%) reported on at least 80% of the epidemiological weeks (i.e., ≥43 epidemiological weeks). Median number of weeks in which a sentinel site reported in EWARS was 22 for the province (Figure 12).

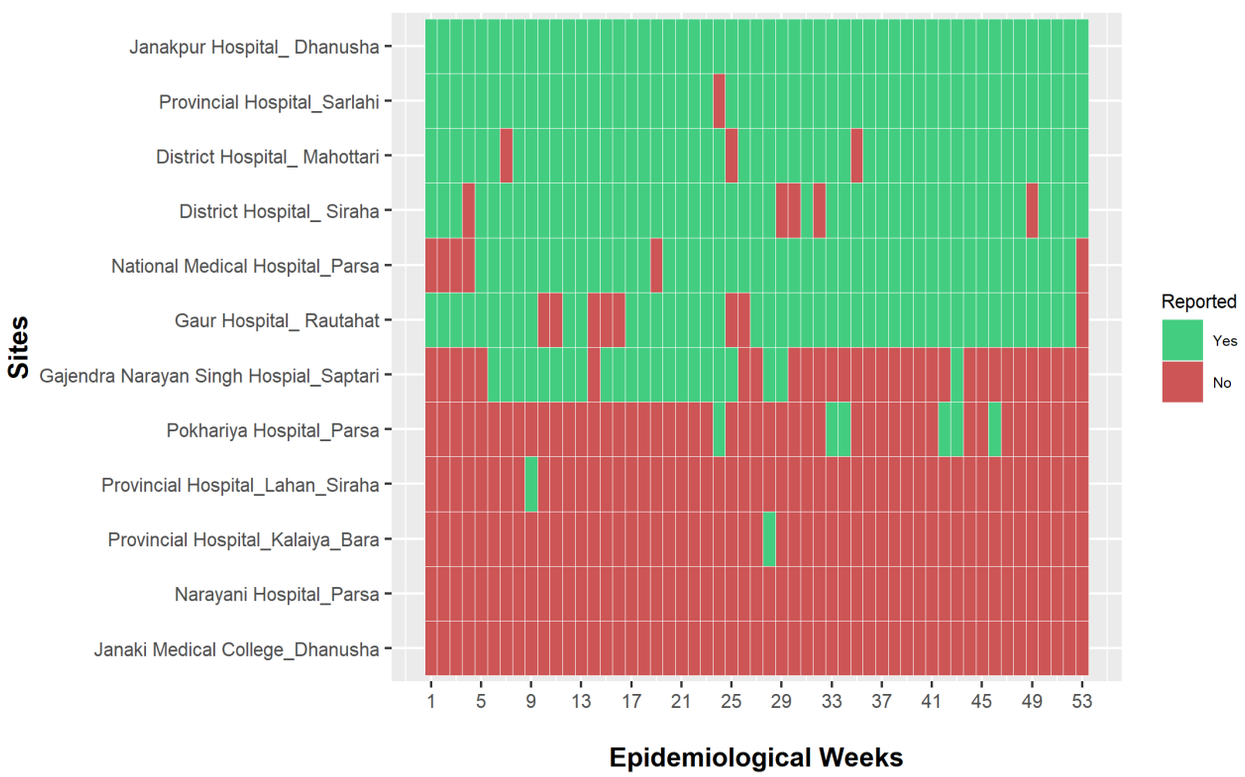

Figure 12: Weekly reporting status of sentinel sites in Madhesh Province*

**Pokhariya Hospital, Parsa is not officially a sentinel site*

Bagmati Province

Total 3539 cases of eight selected diseases/syndromes were reported in Bagmati, with SARI (n=1671; 47.2%) being the most reported disease, followed by AGE (n=1234; 34.9%), enteric fever (n=256; 7.2%), scrub typhus(n=207; 5.8%), dengue (n=107; 3.0%), ILI (n=44; 1.2%), kala azar (n=15; 0.4%), and malaria(n=5; 0.1%) (Figure 13).

Seasonal variation was apparent for AGE, SARI, dengue and scrub typhus (Figure 14).

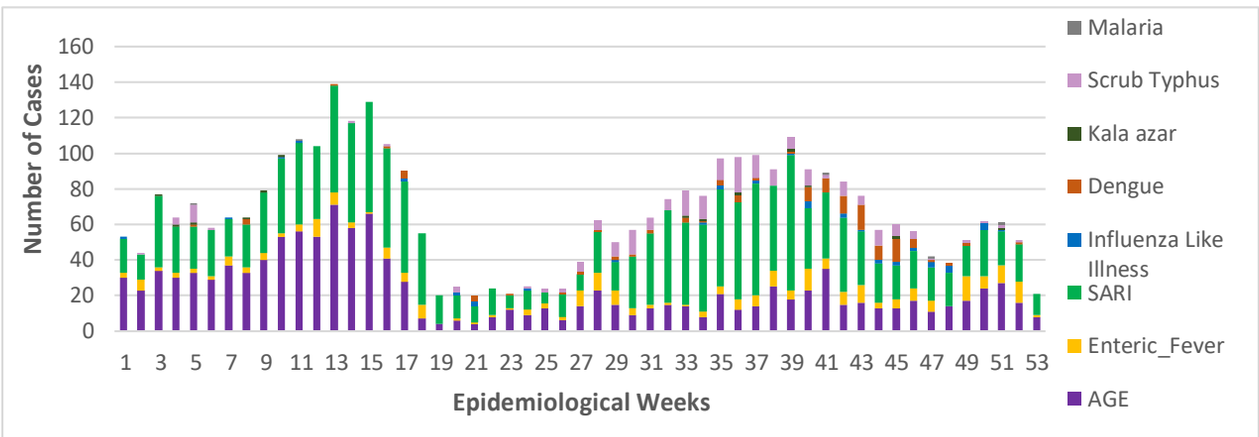

Figure 13 Overall weekly trend of selected diseases/syndromes reported in Bagmati Province (N=3539)

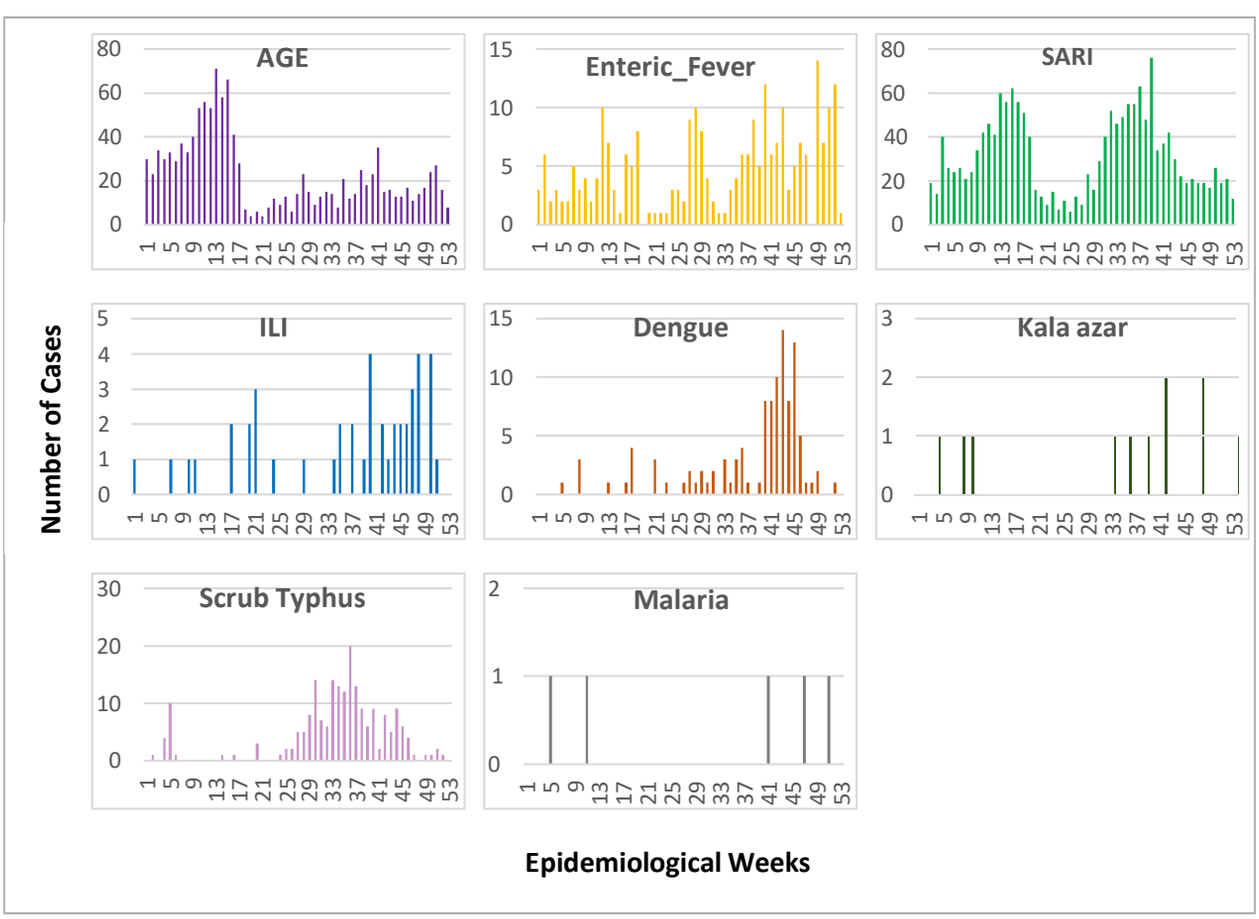

Figure 14: Disease-wise weekly trend of selected diseases/syndromes reported in Bagmati Province

For dengue, enteric fever, ILI, and SARI, males were more affected whereas for AGE, females were more affected (Figure 15).

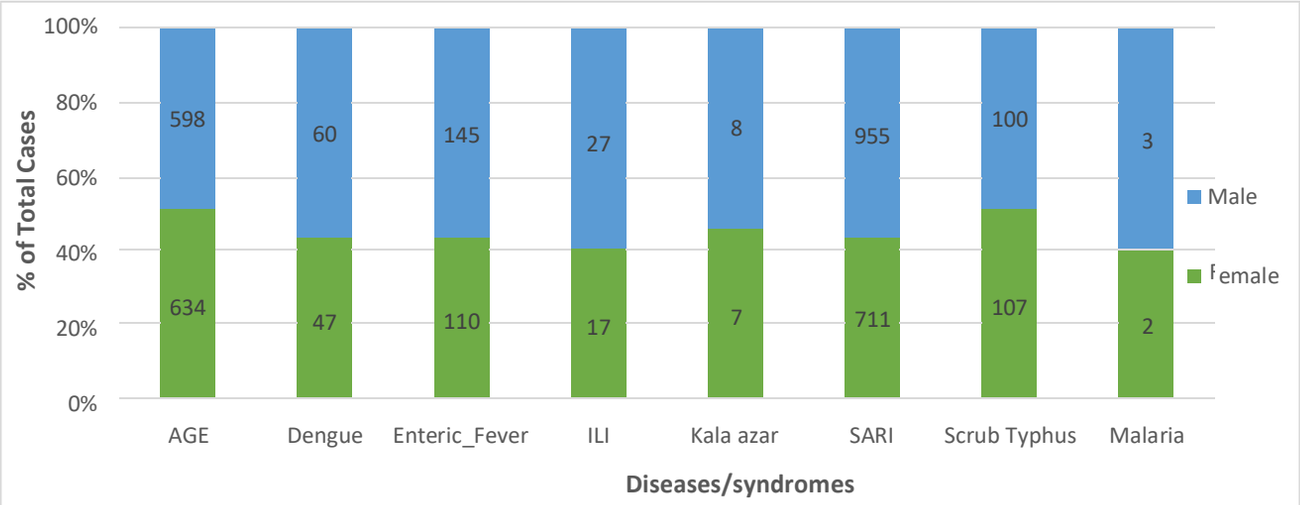

Figure 15: Sex distribution of cases of selected diseases/syndromes reported in Bagmati Province

Out of 36 reporting sites – of which 35 are official sentinel sites - in Bagmati Province, only 8 (22.2%) sent report on at least 80% of the epidemiological weeks (i.e., ≥43 epidemiological weeks). Median number of weeks in which a sentinel site reported in EWARS was 21.5 for the province (Figure 16).

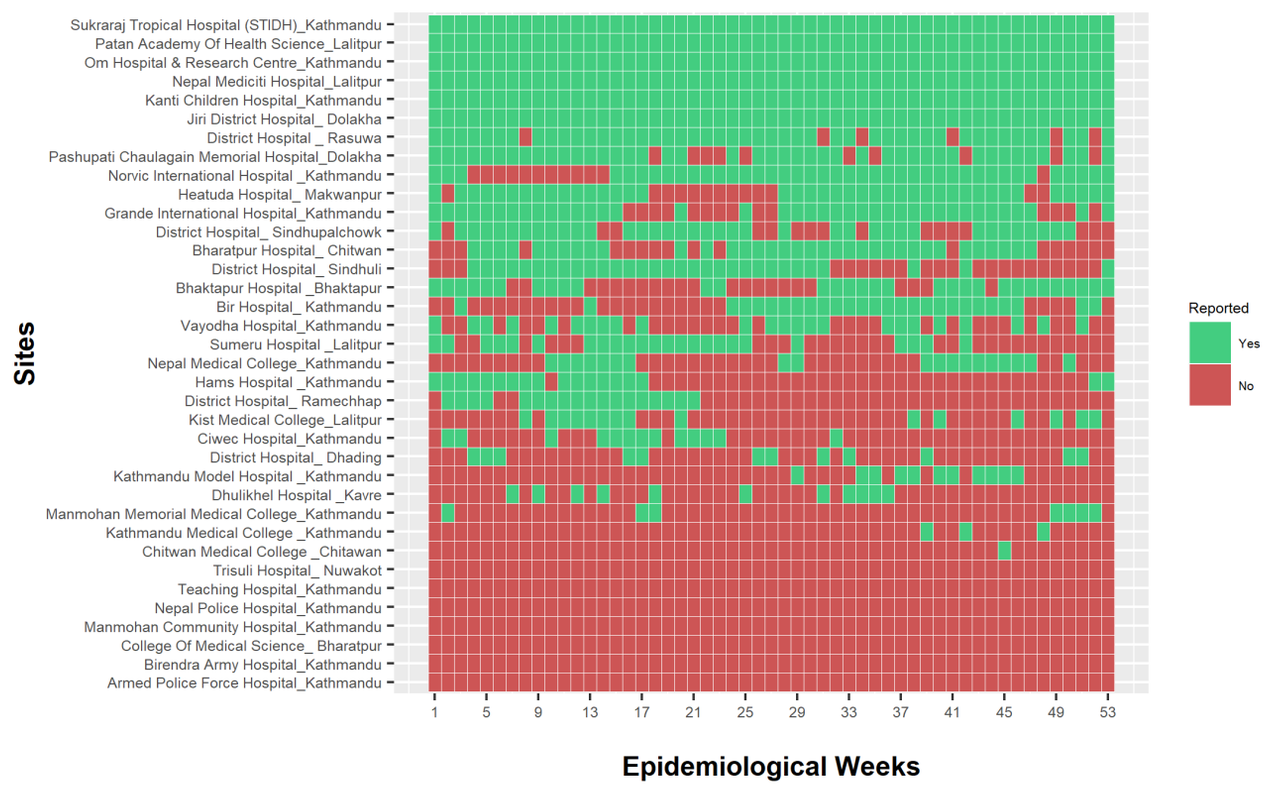

Figure 16: Weekly reporting status of sentinel sites in Bagmati Province*

* *Manmohan Memorial Medical College is not officially a sentinel site;*

** Some reporting sites' name have been shortened*

Gandaki Province

Total 1045 cases of eight selected diseases/syndromes were reported in Gandaki, with AGE (n=483; 46.2%) being the most reported disease, followed by SARI (n=261; 25.0%), scrub typhus (n=122; 11.7%), dengue(n=99; 9.5%), enteric fever (n=75; 7.2%), kala azar (n=3; 0.3%), ILI (n=1; 0.1%), , and malaria(n=1; 0.1%) (Figure 17).

Seasonal variation was apparent for AGE, enteric fever, SARI, dengue and scrub typhus (Figure 18).

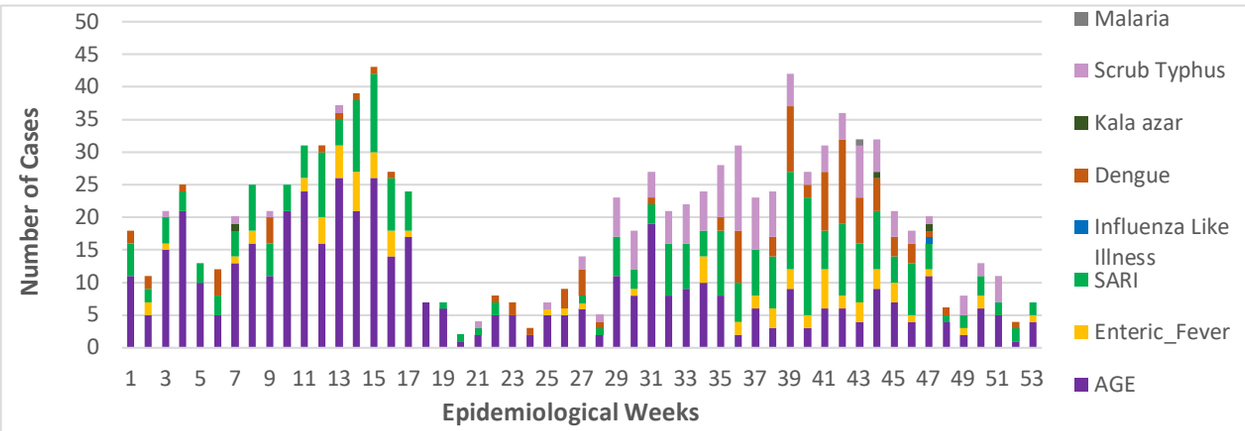

Figure 17: Overall weekly trend of selected diseases/syndromes reported in Gandaki Province (N=1045)

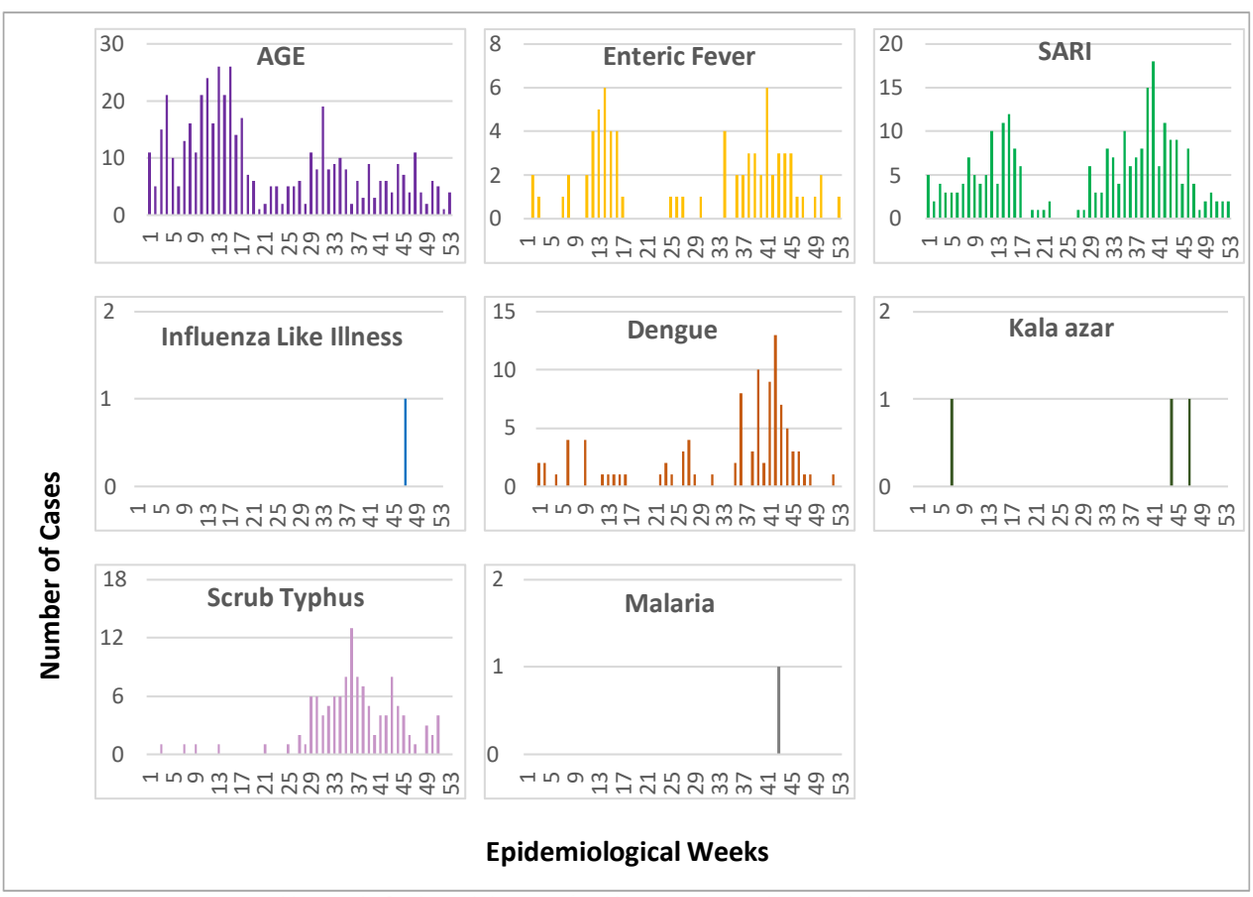

Figure 18: Disease-wise weekly trend of selected diseases/syndromes reported in Gandaki Province

For dengue, enteric fever, and SARI, males were proportionately more affected whereas for scrub typhus, female were more affected (Figure 19).

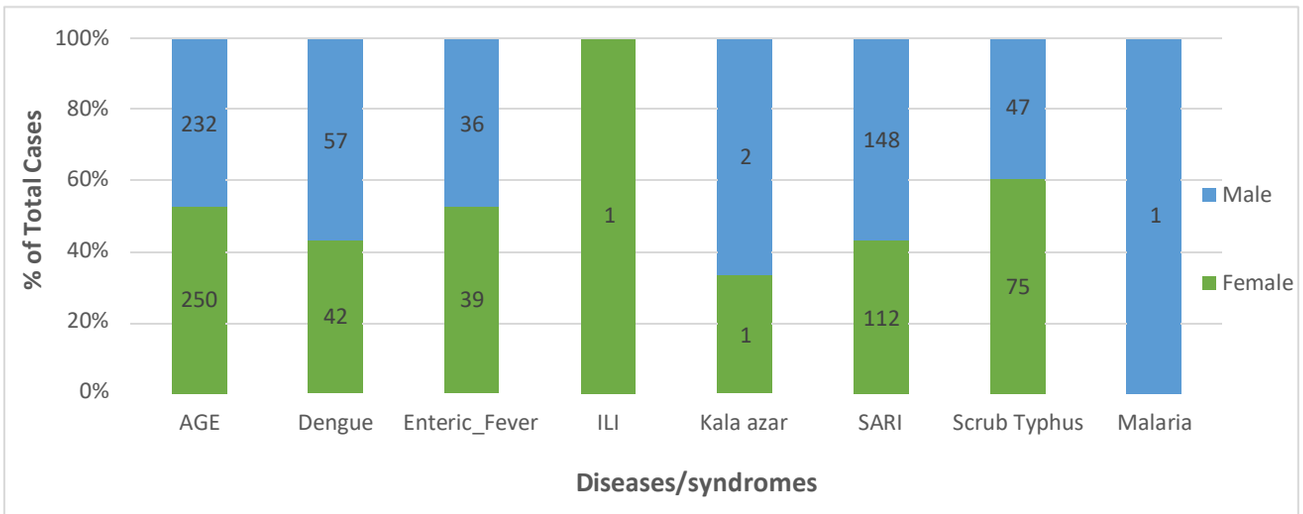

Figure 19: Sex distribution of cases of selected diseases/syndromes reported in Gandaki Province

Out of 14 reporting sites – of which 13 are official sentinel sites - in the province, only 3 (21.4%) reported on at least 80% of the epidemiological weeks (i.e., ≥43 epidemiological weeks). Median number of weeks in which a sentinel site reported in EWARS was 17 for the province (Figure 20).

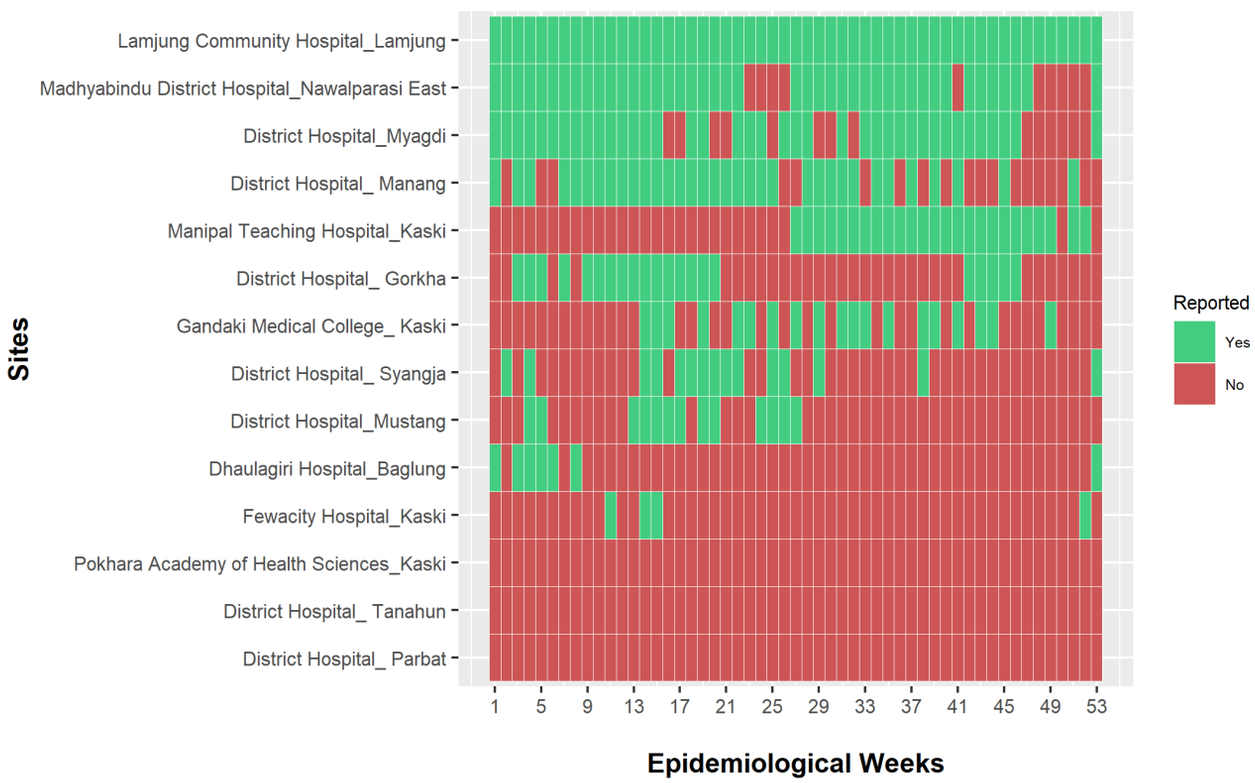

Figure 20: Weekly reporting status of sentinel sites in Gandaki Province*

**Fewacity hospital is not officially a sentinel site*

Lumbini Province

As seen in the Figure 21, of the total 4913 cases reported of selected diseases/syndromes/syndromes, majority were SARI cases (n=2156, 44%), followed by AGE (n=1644, 33%), scrub typhus (n=619, 12.6%), enteric fever (n=301, 6.1%), dengue (n=94, 1.9%), ILI (n=40, 0.8%), kala azar(n=35, 0.7%), cholera(n=17, 0.3%), and malaria(n=7, 0.1%). Seasonal variation was observed for all diseases/syndromes reported in the province except malaria (Figure 22).

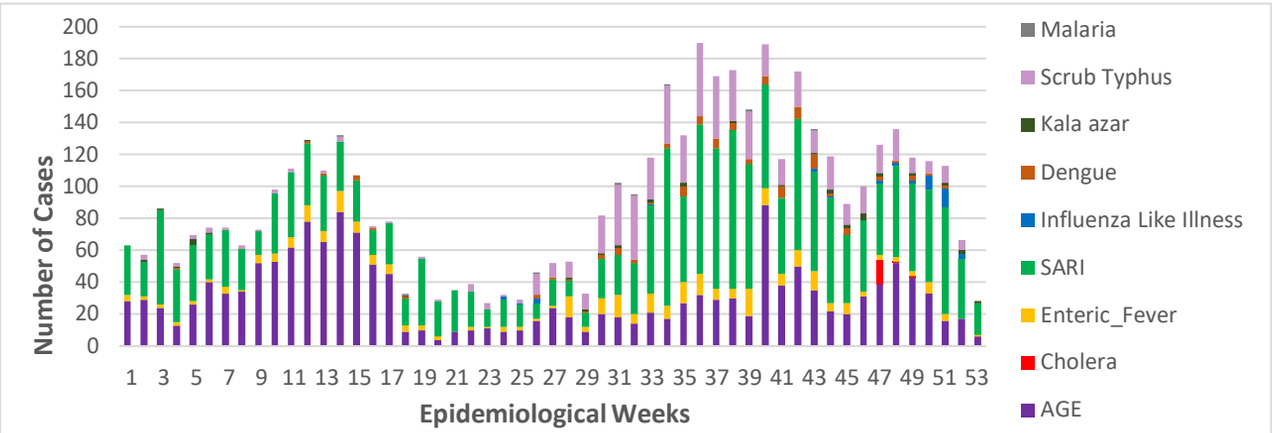

Figure 21 Overall weekly trend of selected diseases/syndromes reported in Lumbini Province (N= 4913)

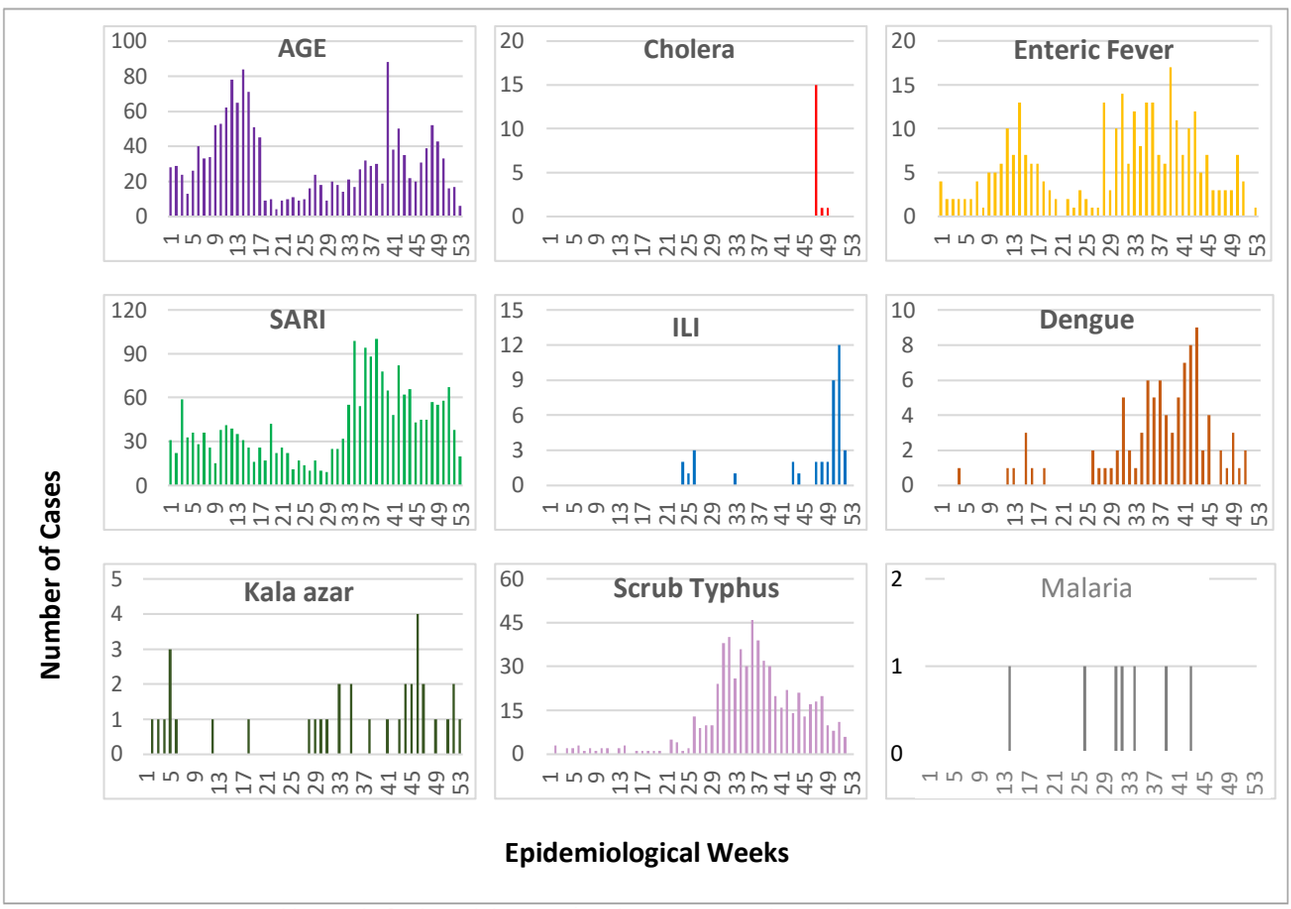

Figure 22 Disease-wise weekly trend of selected diseases/syndromes reported in Lumbini Province

Male proportion was higher for SARI, where female was more affected by AGE, and scrub typhus (Figure 23).

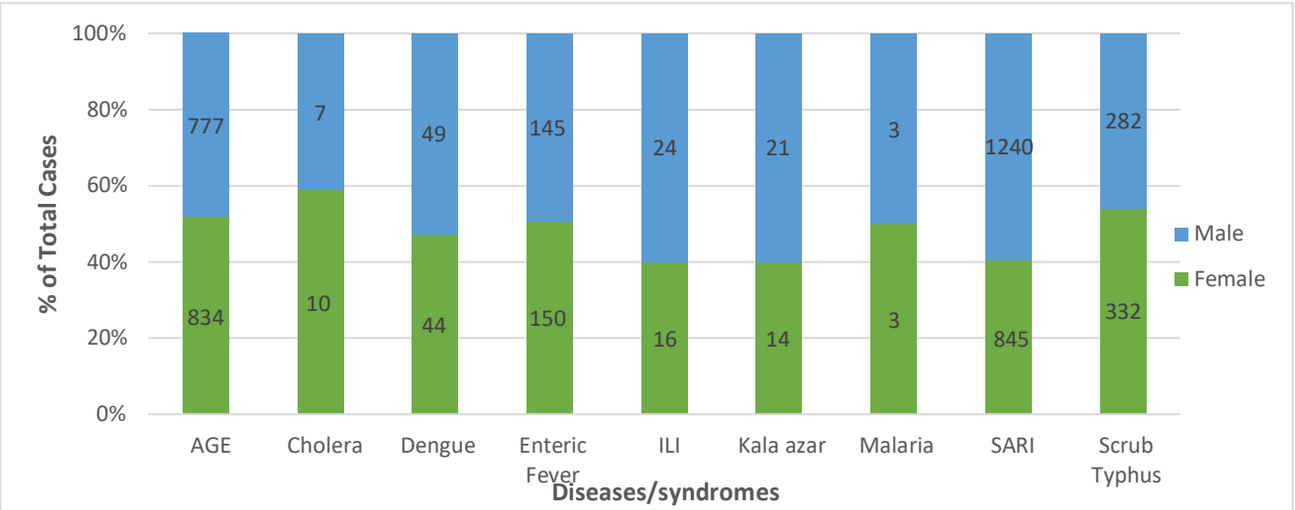

Figure 23 Sex distribution of selected reported cases in Lumbini Province

Out of 19 sentinel sites in Lumbini Province, only 9 (47.3%) sent report for at least 80% of the epidemiological weeks (i.e., ≥43 epidemiological weeks). Median number of weeks in which a sentinel site reported in EWARS was 38 for the province (Figure 24).

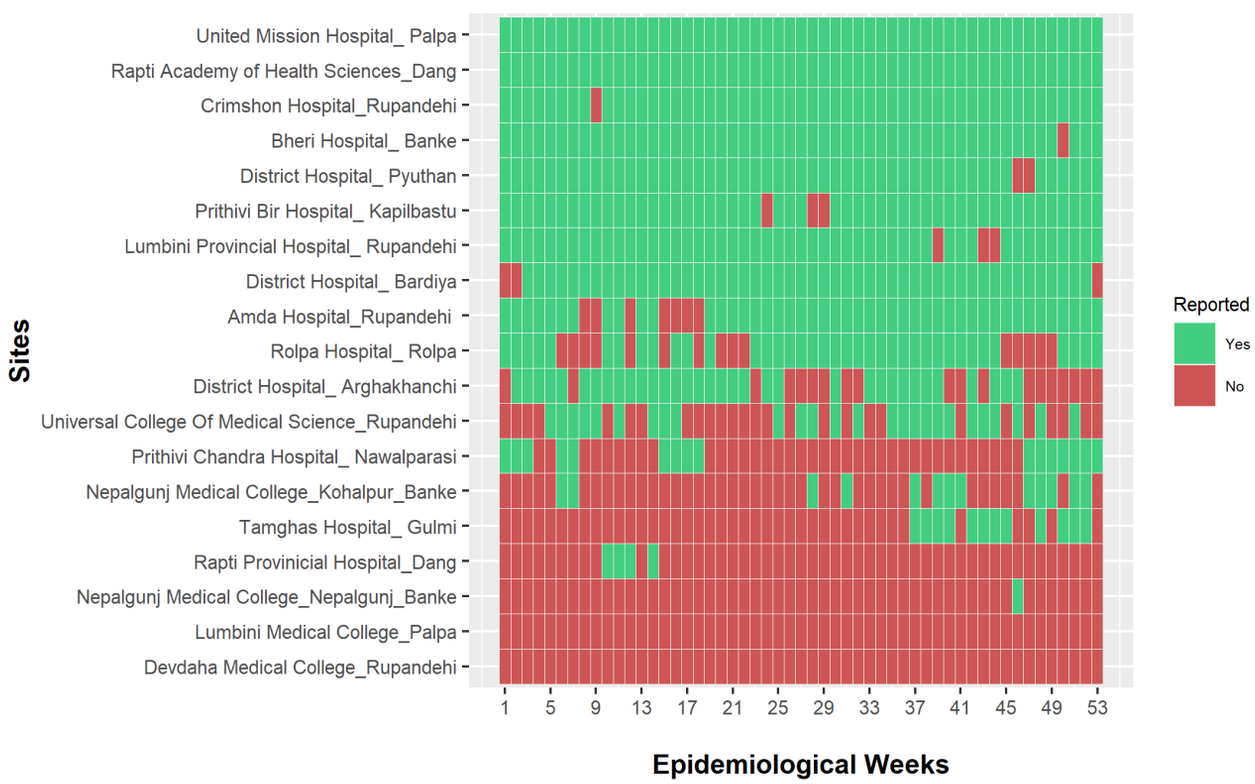

Figure 24: Weekly reporting status of sentinel sites in Lumbini Province

Karnali Province

Out of the total 4422 cases of eight selected diseases/syndromes reported in Karnali, ILI (n=2584; 58.4%) was the most reported disease, followed by SARI (n=1030; 23.3%), AGE (n=610; 13.8%), kala azar (n=97; 2.2%), enteric fever (n=50; 1.1%), scrub typhus (n=35; 0.8%), dengue (n=10; 0.2%), and malaria (n=6; 0.1%), (Figure 25).

Seasonal variation in reported cases was observed for AGE, SARI, ILI, and scrub typhus (Figure 26).

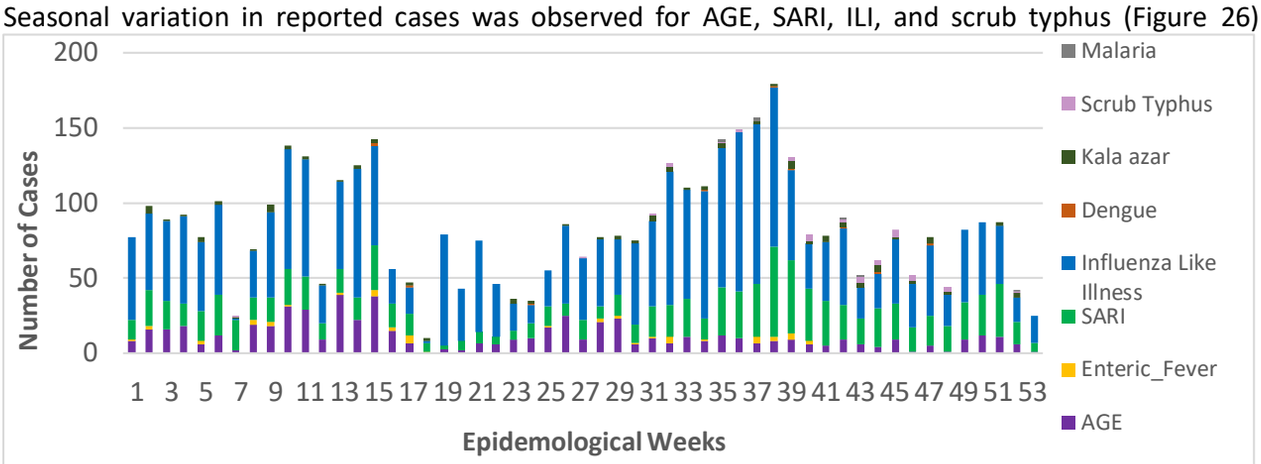

Figure 25: Overall weekly trend of selected diseases/syndromes reported in Karnali Province (N= 4422)

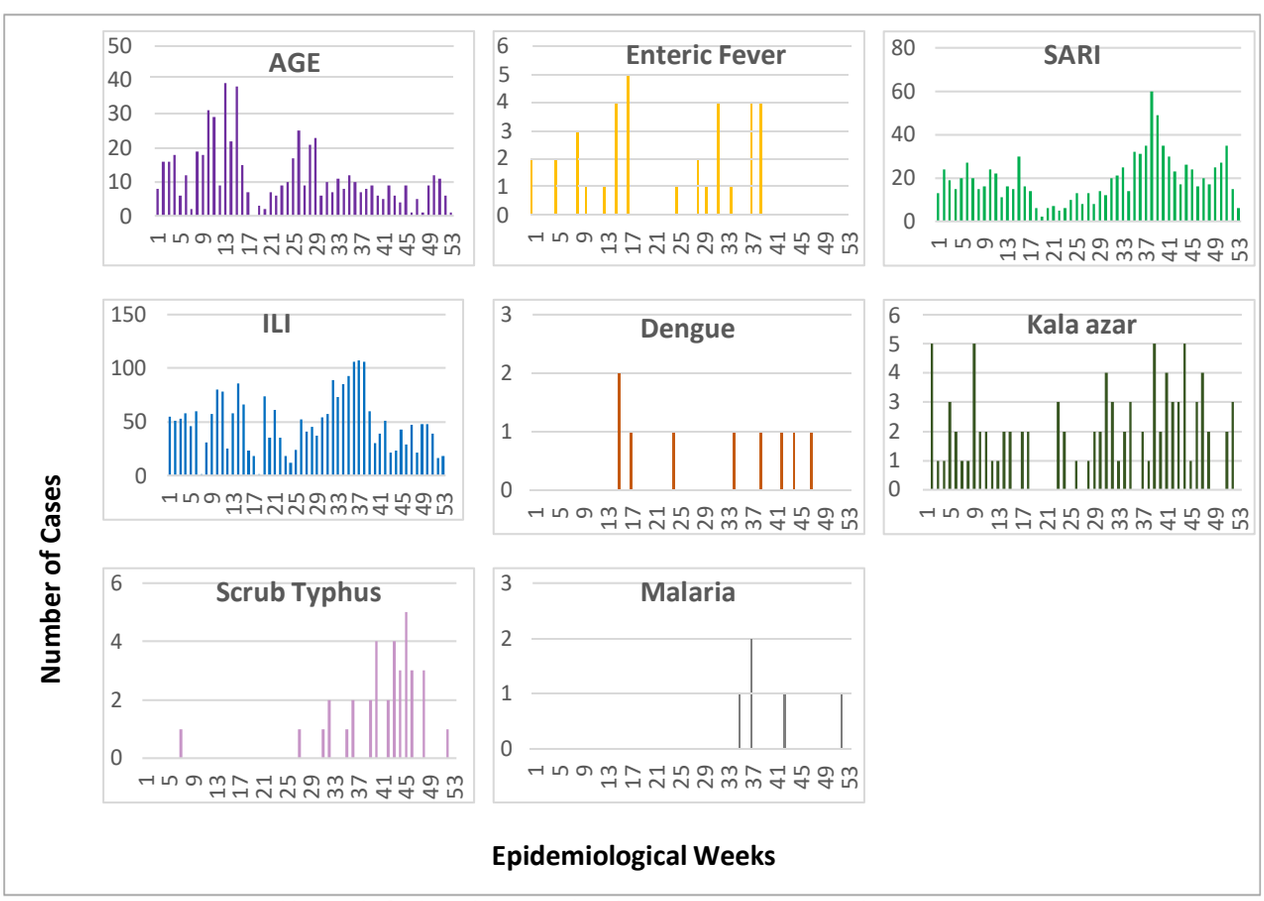

Figure 26 Disease-wise weekly trend of selected diseases/syndromes reported in Karnali i Province

Apart from scrub typhus and enteric fever, other diseases/syndromes showed male preponderance as shown in Figure 27. Total of 6 cases of malaria was reported with equal proportion in male and female (Figure 27).

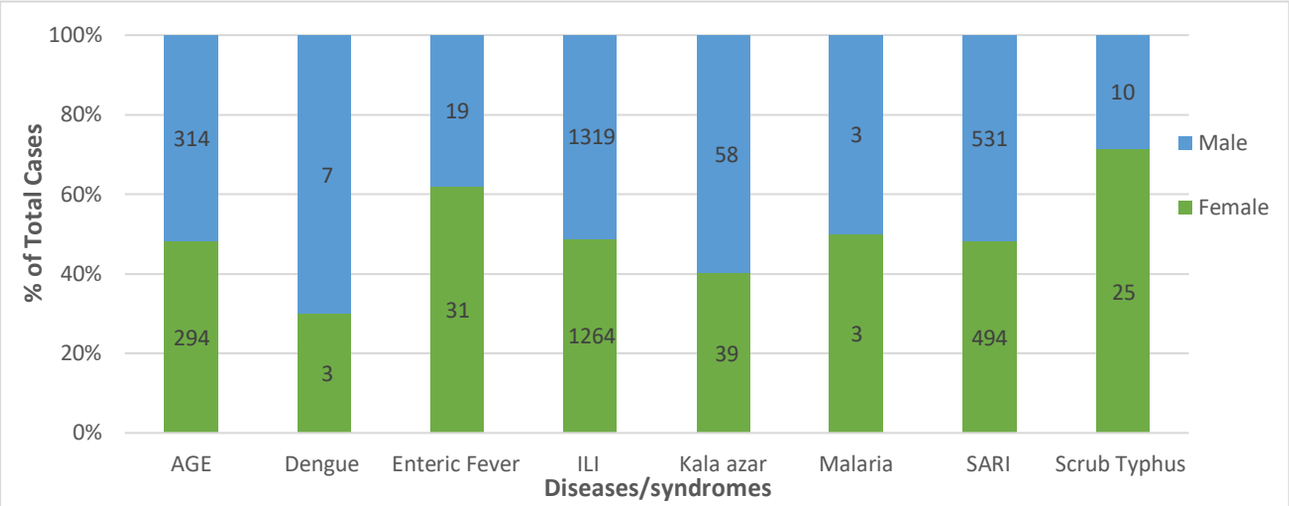

Figure 27: Sex distribution of cases of selected diseases/syndromes reported in Karnali Province

Out of 13 sentinel sites in the province, only 3 (23.0%) reported on at least 80% of the epidemiological weeks (i.e., ≥43 epidemiological weeks). Median number of weeks in which a sentinel site reported in EWARS was 16 for the province (Figure 28).

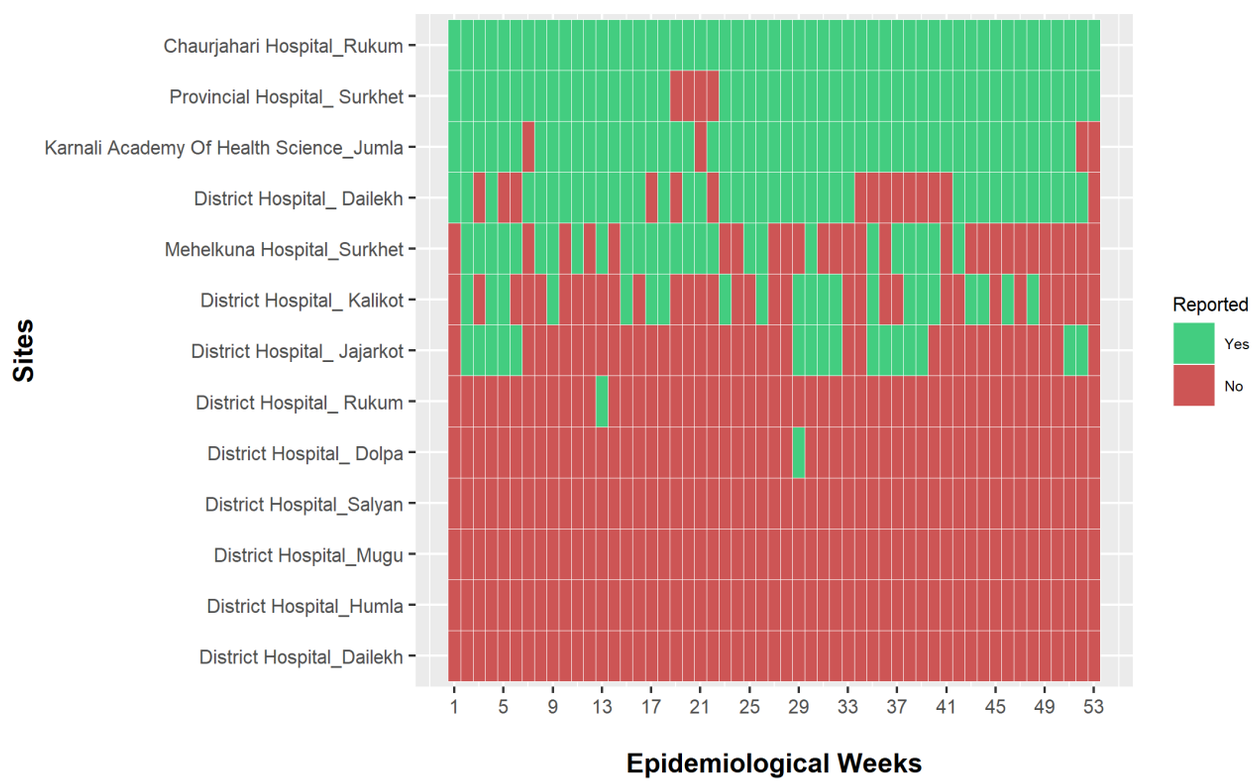

Figure 28: Weekly reporting status of sentinel sites in Karnali Province

Sudurpaschim Province

Out of 3080 total cases reported for selected diseases/syndromes in EWARS from Sudurpaschim Province, majority accounted for AGE (n= 918;29.8%) and SARI (n=857;27.8%) as shown in Figure 29. Unlike other provinces reporting for scrub typhus was high in this province (n=753; 24.5%). The cases reported for other diseases/syndromes were dengue (n=97;3.1%), enteric fever (n=206; 6.7%), ILI (n=150; 4.8%), malaria (n=33;1 %) and kala azar (n=66;2.1%). Seasonal variation was observed for AGE, SARI, dengue, kala azar, scrub typhus, and malaria (Figure 30).

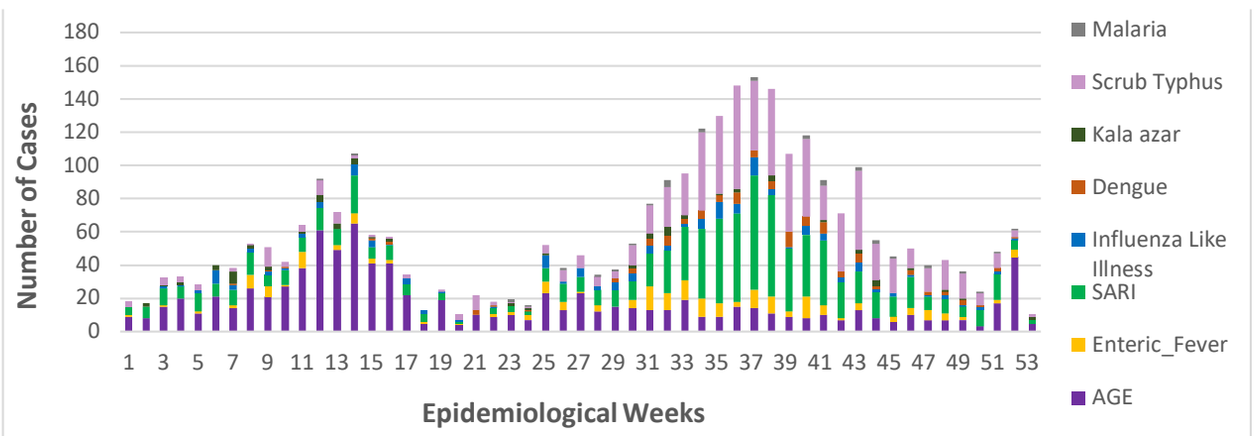

Figure 29: Overall weekly trend of selected diseases/syndromes reported in Sudurpaschim Province (N=3080)

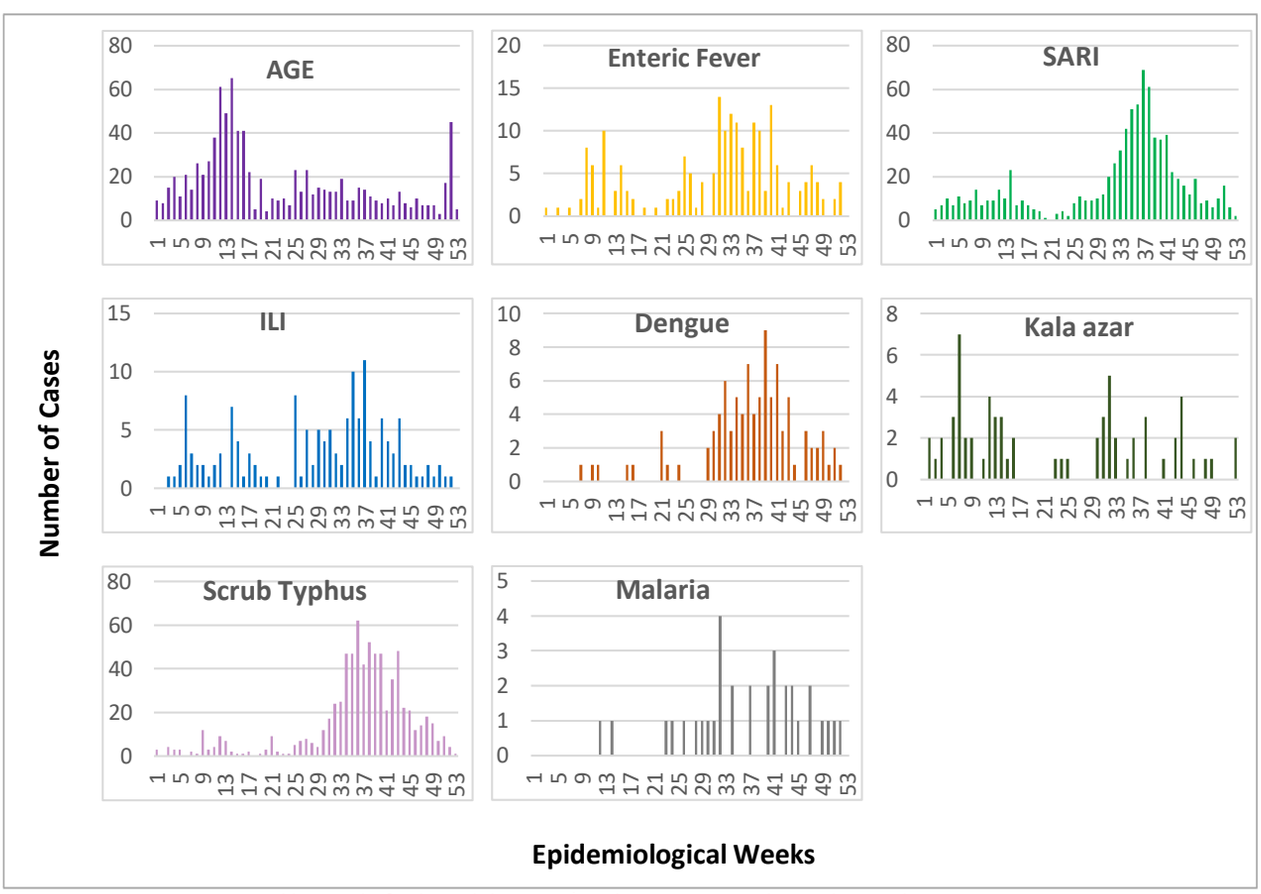

Figure 30: Disease-wise weekly trend of selected diseases/syndromes reported in Sudurpaschim Province

As shown in Figure 31, apart from enteric fever all the cases were reported in higher proportion among the males.

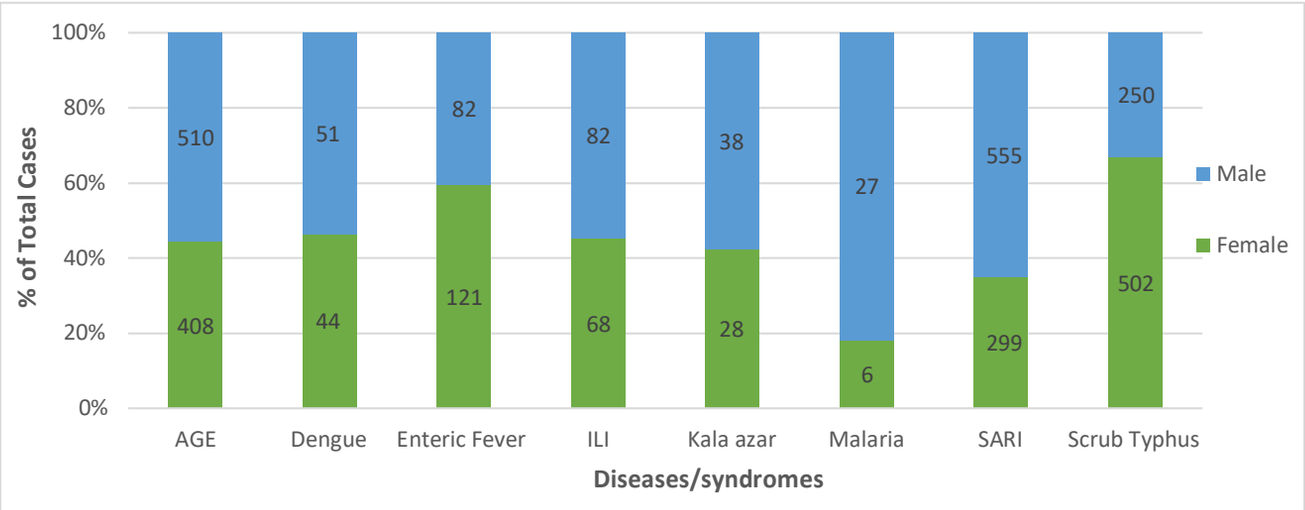

Figure 31: Sex distribution of selected diseases/syndromes reported in Sudurpaschim

Out of 12 reporting sites – of which 11 are official sentinel sites - in the province, only 3 (25%) reported on at least 80% of the epidemiological weeks (i.e., ≥43 epidemiological weeks). Median number of weeks in which a sentinel site reported in EWARS was 39.5 for the province (Figure 32).

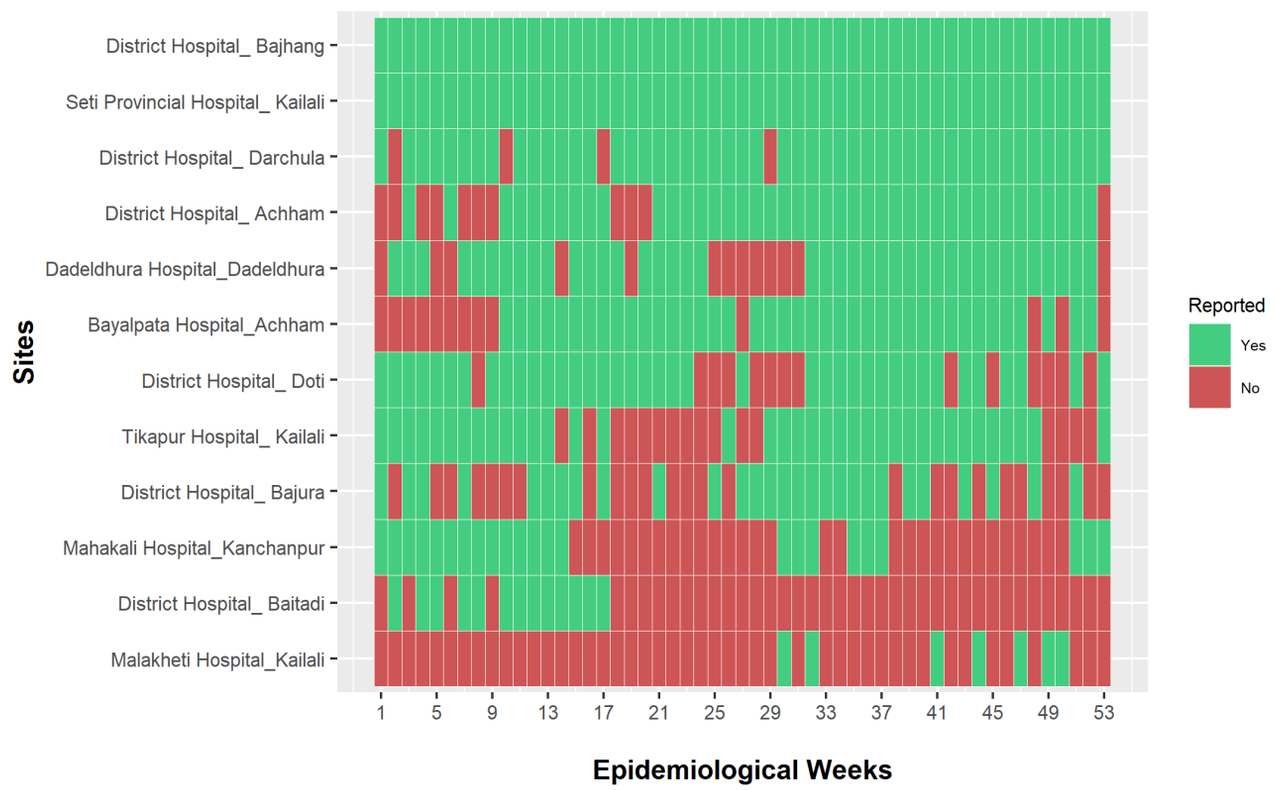

Figure 32: Weekly reporting status of sentinel sites in Sudurpaschim Province*

**Malakheti Hospital, Kailali is not officially a sentinel site.*

Annexes

Location of EWARS sentinel sites