

Epidemiological situation, weeks 1-52

During epidemiologic weeks 1-52 of 2022, a total of 3,968 suspect cases were reported from MenAfriNet districts that submitted data from Burkina Faso and Niger, an increase from 3,541 cases during 2021. Specimens were collected from 94% of suspect cases, 11% were confirmed by PCR or culture tests, and 25% were probable cases (Table 1). Sixty-one percent of suspect cases in Niger were missing national reference lab result data, and this is reflected in this bulletin's analyses. MenAfriNet partners in Niger are currently in the process of harmonizing lab and epidemiological surveillance data to address this data issue. MenAfriNet data sources used for analyses in this year's bulletin were national case-based meningitis surveillance data from Burkina Faso and Niger, both obtained through the STELab platform.

Table 1. Epidemiological situation, weeks 1-52

	Burkina Faso	Niger	Total
Characteristics	N (%)		
Epidemiologic			
Population under Surveillance	22,184,452	24,465,620	46,650,072
MenAfriNet districts reporting in CBS system†	70/70 (100)	71/72 (99)	141/142 (99)
Aggregate suspected cases*	1,688	1,884	3,572
MenAfriNet suspected cases	2,140	1,828	3,968
Deaths [∞]	77 (4)	61 (3)	138 (3)
Laboratory[§]			
Specimens collected	2,102 (98)	1,645 (90)	3,747 (94)
Specimens received at NRL	1,710 (80)	740 (40)	2,450 (62)
Specimens analyzed by PCR or culture [‡]	1,671 (78)	700 (38)	2,371 (60)
Specimens analyzed with gram stain	1,803 (84)	224 (12)	2,027 (51)
Probable bacterial meningitis**	457 (21)	546 (30)	1,003 (25)
Confirmed bacterial meningitis	201 (9)	243 (13)	444 (11)

Abbreviation: CBS: Case-based surveillance; CSF, cerebrospinal fluid; NRL, National Reference Lab; PCR, Polymerase Chain Reaction (real-time)

† 2/2 (Burkina Faso) and 20/21 (Niger) MenAfriNet districts reported 0 cases both through the aggregate reporting system and CBS system.

* Data source: Weekly district-level aggregate reports of clinically defined meningitis cases and meningitis-related deaths.

[∞] Deaths listed as outcome in case-based data

[§] Denominator for laboratory characteristics = number of MenAfriNet suspected cases

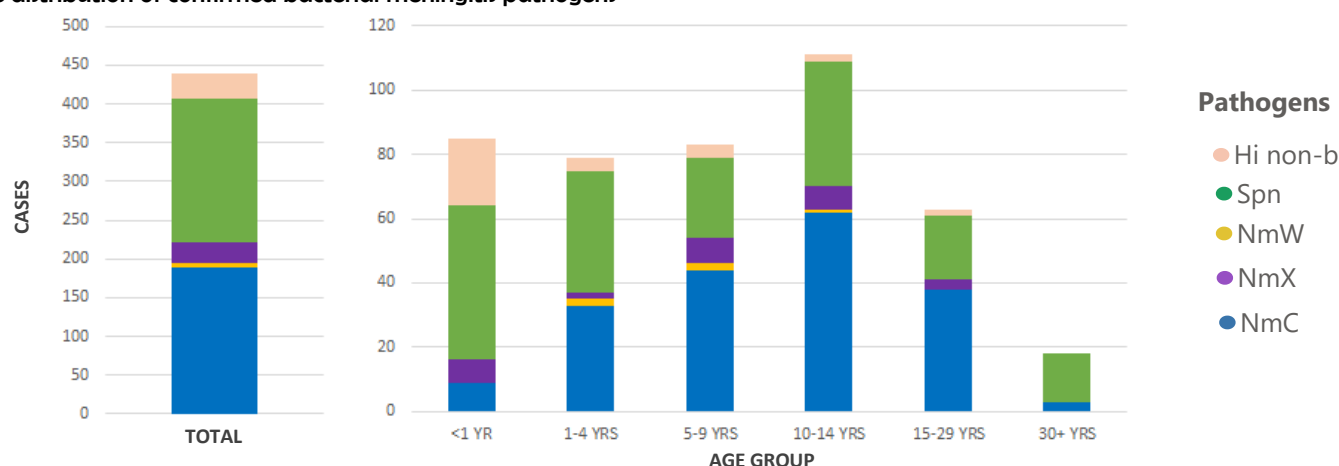
[‡] CSF analyzed by PCR or culture at any lab (district, region, or national levels)

** Tested negative or missing culture/PCR result. Macroscopic aspect of cerebrospinal fluid (CSF) turbid, cloudy or purulent; or with a CSF leukocyte count >10 cells/mm³ or with bacteria identified by Gram stain in CSF; or positive antigen detection in CSF. Further details of probable meningitis cases can be found here (page 4): <https://apps.who.int/iris/bitstream/handle/10665/312141/9789290234241-eng.pdf>

Meningitis pathogens

The leading causes of confirmed bacterial meningitis cases in 2022 were *Neisseria meningitidis* serogroup C (NmC) and *Streptococcus pneumoniae* (Spn), accounting for 43% and 42% of total confirmed cases, respectively. Spn was most common in infants and children under 4 years of age. Confirmed cases among the 5-29 years age group were predominately due to NmC, with the 10-14 years age group most affected. Serogroups X and W accounted for 7% of total confirmed cases, and *Haemophilus influenzae* non-b accounted for 8%. The results below are likely an underestimate of the true number of confirmed meningitis cases due to incomplete laboratory data in both countries.

Figure 1. Age distribution of confirmed bacterial meningitis pathogens



Spatial Distribution of Confirmed Bacterial meningitis Pathogens

Among the available lab data reported from Burkina Faso and Niger, *Neisseria meningitidis* continues to be detected, with 189 cases of serogroup C, 27 cases of serogroup X, and 5 cases of serogroup W confirmed. Zero NmA cases were reported. In Niger, a confirmed NmC outbreak was reported in the Zinder region during epi week 46 of 2022 to epi week 7 of 2023. During this period, 665 cases and 27 deaths were reported from Zinder, of which 344 cases and 5 deaths were from the district of Dungass. The 5-14 years age group was most impacted by this outbreak. Reactive vaccination campaigns were completed in health centers in Dungass, Matameye, Mirriah, and Goure. A similar NmC outbreak occurred in this same region in 2021, but fewer cases were reported in the most recent outbreak, potentially due to faster outbreak response and vaccination efforts. In Burkina Faso, no district crossed the epidemic threshold in 2022.

Figures 2a-2d. District-level Distribution of *N. meningitidis* C, *N. meningitidis* W, *S. pneumoniae*, and *Haemophilus influenzae* across Burkina Faso and Niger

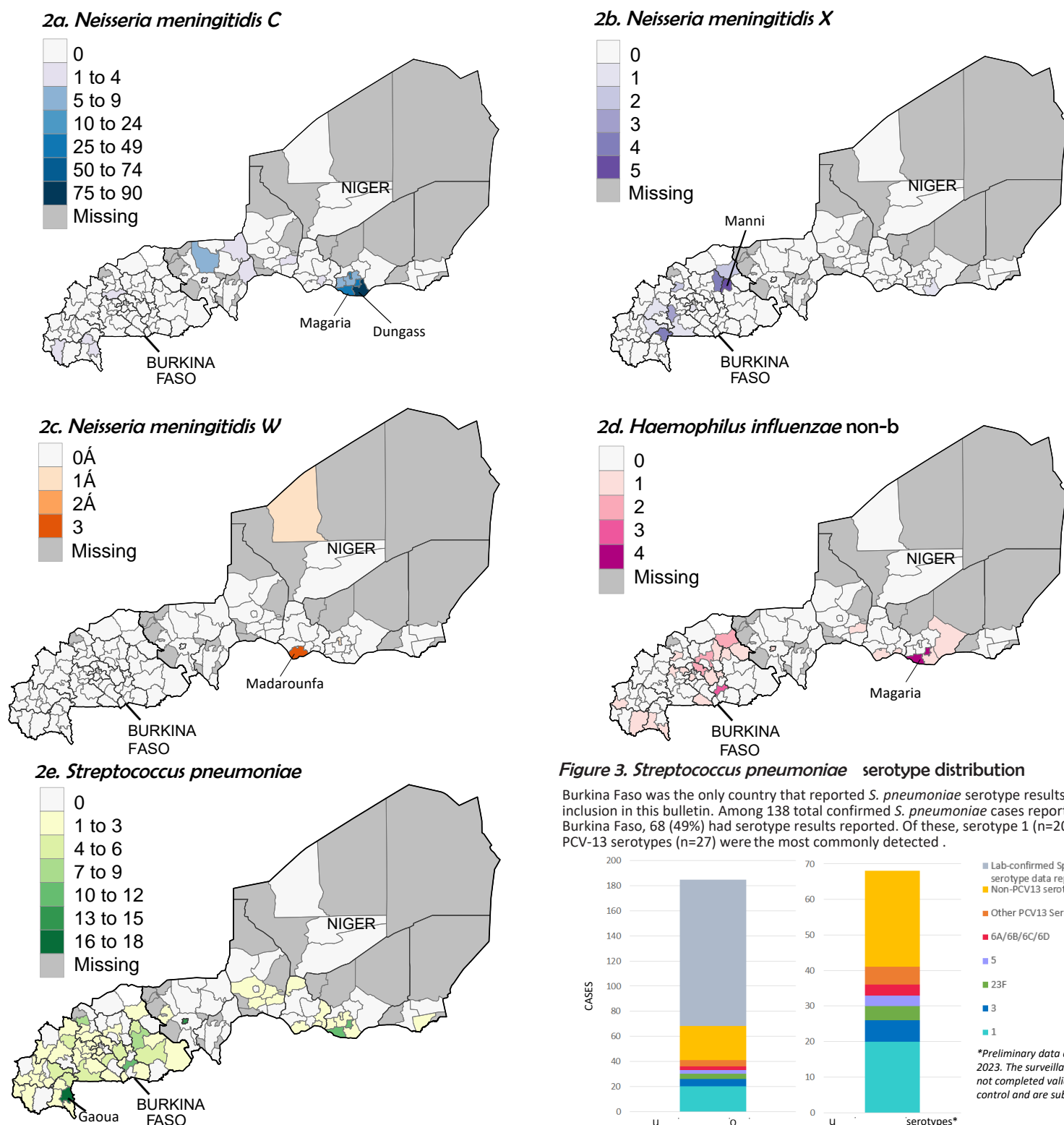
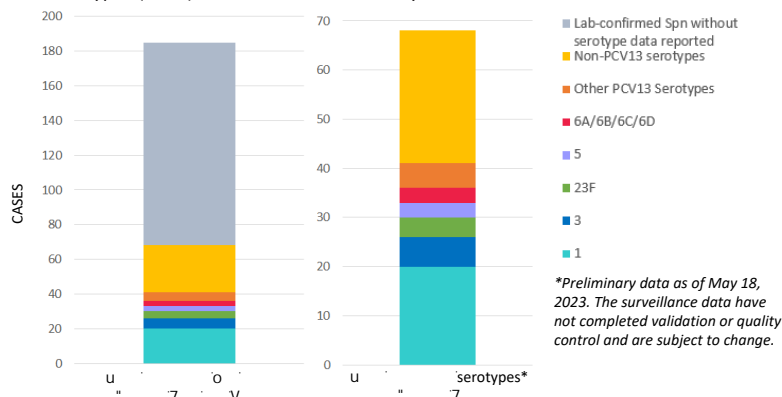


Figure 3. *Streptococcus pneumoniae* serotype distribution

Burkina Faso was the only country that reported *S. pneumoniae* serotype results for inclusion in this bulletin. Among 138 total confirmed *S. pneumoniae* cases reported in Burkina Faso, 68 (49%) had serotype results reported. Of these, serotype 1 (n=20) and non-PCV-13 serotypes (n=27) were the most commonly detected.

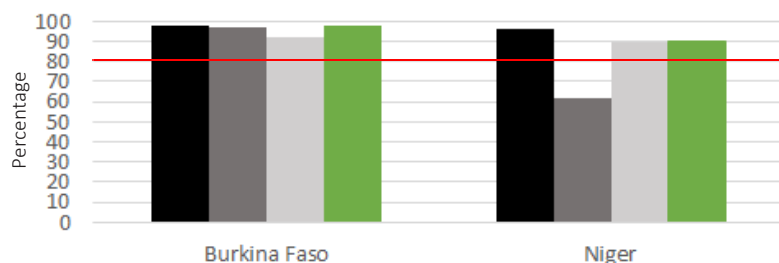


MenAfriNet case-based surveillance performance indicators

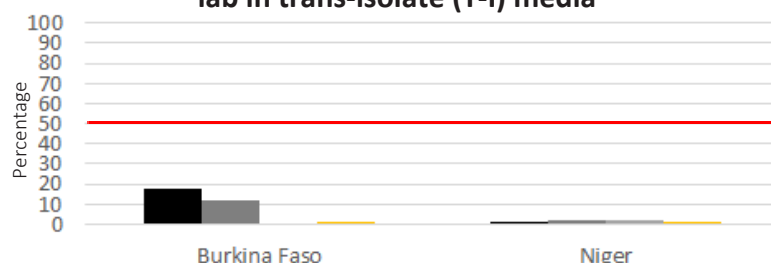
Specimen collection remained high in both Burkina Faso and Niger in 2022 (Figure 4a). A high percentage of these specimens were received at the National Reference Lab in Burkina Faso, and the available data in Niger shows that there are important opportunities to strengthen specimen delivery to the NRL (Figure 4d). Investigations should be done to identify specific obstacles leading to challenges in specimen delivery. Specimen transport times from CSF collection to arrival at the NRL remains an obstacle in both countries, although an improvement is seen in Burkina Faso compared to previous years (Figure 4e). Once received at the NRL, both countries have high rates of confirmatory testing on these samples by PCR or culture (Figure 4f). Gram stain testing at periphery labs has been above the target percentage in Burkina Faso from 2019-2022. Collaboration between lab, data, and surveillance officers will help to better understand how to improve data completeness (discussed in Figure 4c) for this indicator to identify the necessary actions needed to provide more targeted support.

Figures 4a-4h. Annual Trends of Surveillance and Laboratory Performance Indicators

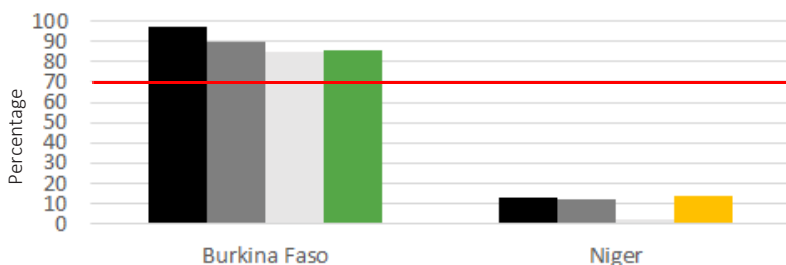
4a. Percent cases with specimen collected



4b. Percent of specimens received at any lab in trans-isolate (T-I) media

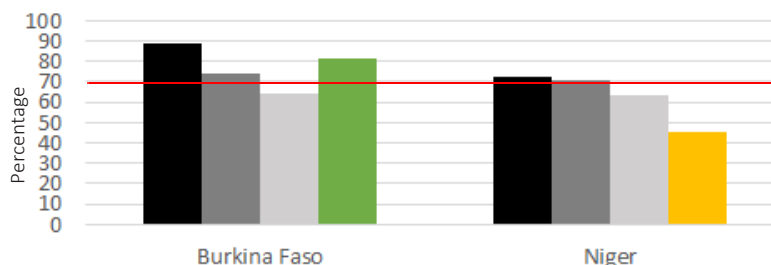


4c. Percent specimens tested by Gram stain at non-NRL lab*

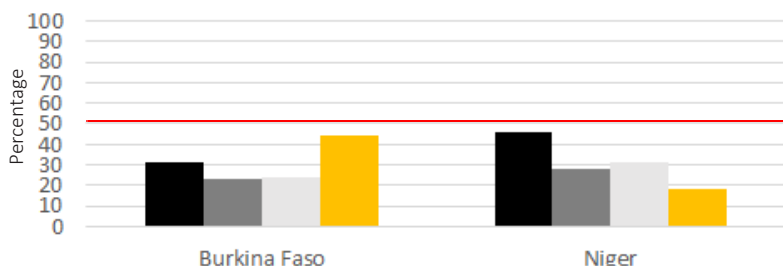


*Greater than 90% of data for gram stain tests at a periphery lab were missing in Niger (2019-2022), so these numbers may be an underestimate of the true number of gram stain tests performed.

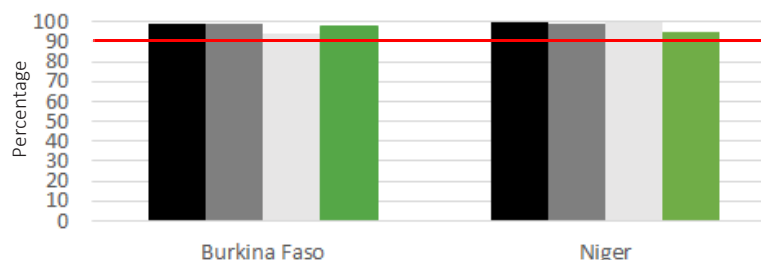
4d. Percent specimens received at NRL



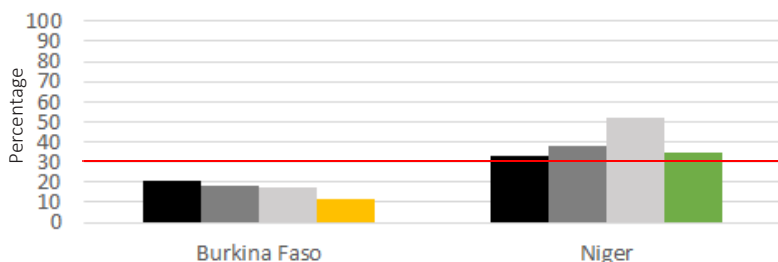
4e. Percent cases with <7 days delay between CSF collection and date of receipt at NRL



4f. Percent specimens analyzed by culture or PCR upon arrival at NRL



4g. Percent specimens confirmed at NRL for Hi, Spn, Nm, or other bacterial meningitis pathogen



4h. Percent contaminated among samples tested by culture at NRL*



*Greater than 75% data for culture test results at the NRL were missing in Burkina Faso (2019-2022) and greater than 90% missing in Niger (2019-2022).

Key: 2019 2020 2021 2022 (meets target)

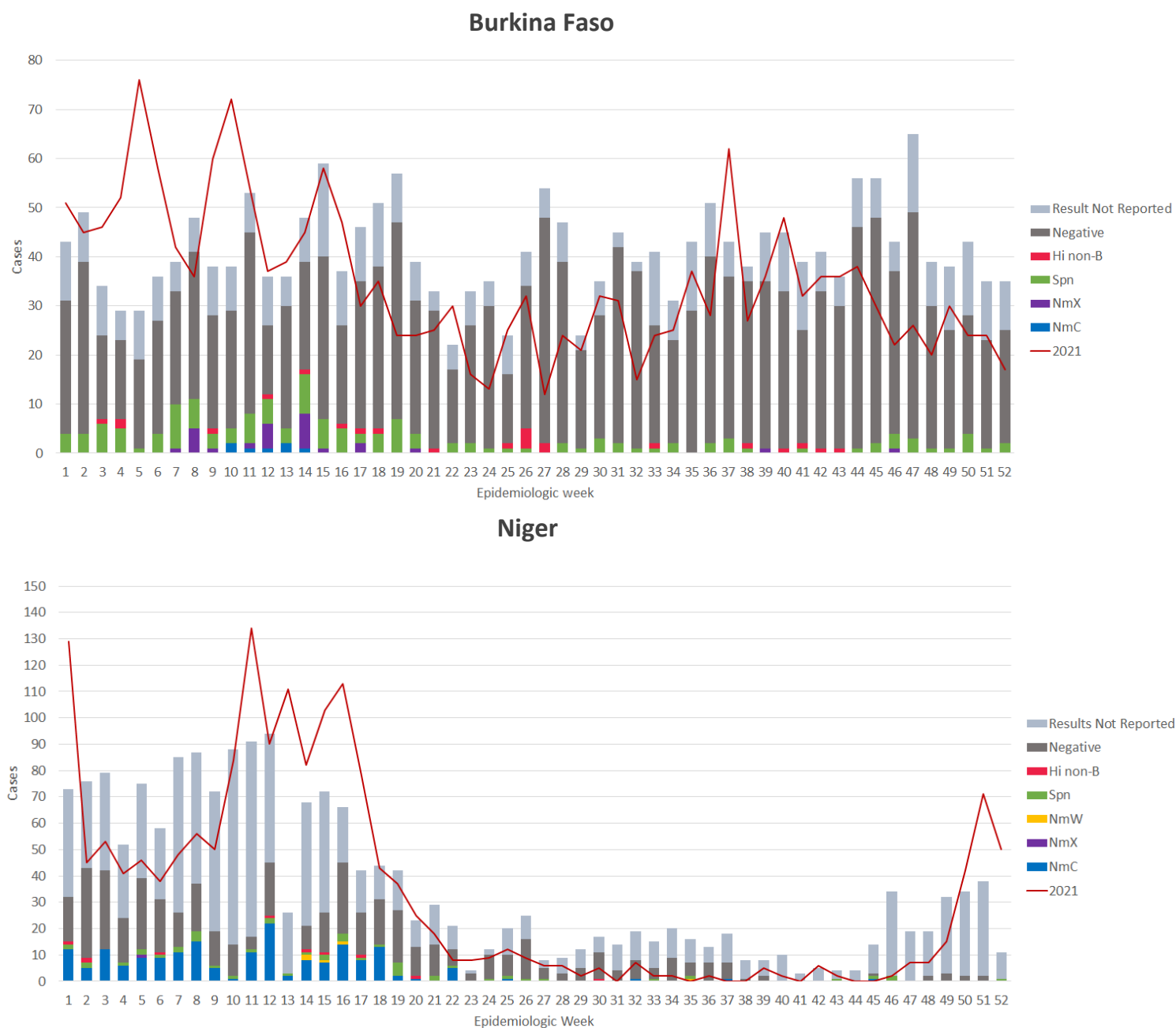
2022 (does not meet target)

Indicator target

Epidemiologic trends over time

The number of cases reported from Burkina Faso and Niger in 2022 were both higher than the previous year (2,140 vs. 1,829 in Burkina Faso and 1,828 vs. 1,712 in Niger). The overall trends of cases reported in 2021 and 2022 were similar in Burkina Faso with sporadic peaks, however, there appears to have been fewer cases reported during the first half of the 2022 meningitis season compared to 2021 (EW 1-13). In 2022, confirmed Nm cases in Burkina Faso show a seasonal pattern with more cases confirmed during the meningitis season (EW 1-26); however, there is limited seasonality of overall suspect cases, illustrated by the relatively flat curve, a sharp change from historical patterns in Burkina Faso. In Niger, the overall trends between the 2021 and 2022 were also similar, with cases drastically dropping towards the end of the meningitis season around epi week 23. A slight increase of cases during the non-meningitis season can be seen during EW 26-49, and further increases are seen towards the end of the year, due to the NmC outbreak that was subsequently declared in early 2023. Over 60% of reported cases in Niger did not have lab data available during the analysis for this bulletin, so the pathogens depicted below for Niger are likely an underestimate of incidence of each bacterial pathogen. Lab and surveillance officers are actively working on updating this data.

Figure 5. Epidemic curves by country, weeks 1-52, 2022 (Note y-axes vary by country)



Appendix A: MenAfriNet Threshold Calculation

Indicator / Threshold	Numerator	Denominator
Percentage of cases with specimens collected Threshold: > 80%	Number of suspected cases with specimens collected	Number of suspected cases
Percentage of specimens specimen received at any lab in trans-isolate (T-I) Threshold: > 50%	Number of specimens received at any lab in trans-isolate (T-I) tube	Number of suspected cases with specimens collected
Percentage of specimens specimen tested at labs other than the NRL by a Gram stain test Threshold: > 70%	Number of specimens specimen tested at district or regional lab by a Gram stain test	Number of suspected cases with specimens collect
Percentage of specimens specimens received at the NRL Threshold: > 70%	Number of specimens received at NRL	Number of suspected cases with specimens collect
Percentage of cases with a delay of <7 days between specimen collection date and date specimens received at NRL Threshold: > 50%	Delay between specimen collection date and date specimens received at NRL is within 7 days	Number of specimens received at NRL
Percentage of specimens specimen received at the NRL and analyzed by a confirmatory test (culture, PCR) Threshold: > 90%	Number of specimens analyzed by a confirmatory test at NRL level (culture, PCR)	Number of specimens received at the NRL
Percentage of specimens confirmed at the NRL for Hi, Spn, and Nm, and other pathogens. Threshold: > 30 %	Number of specimens confirmed at the NRL for Hi, Spn and Nm and other pathogens	Number of specimens analyzed by a confirmatory test at NRL (culture, PCR)
Percentage of specimens contaminated for culture procedure at the NRL Threshold: < 10 %	Number specimens contaminated for culture procedure at the NRL	Number of specimens tested by culture at NRL*

**This value changed from number of specimens received by an NRL (reflected in previous years' MenAfriNet bulletins) to number of specimens tested by culture at an NRL. This will be the denominator used to calculate this indicator in the future.*