

Epidemiological situation, weeks 27 - 39

During epidemiologic weeks 27-39 of 2022, a total of 611 suspect cases were reported from MenAfriNet districts that submitted data from Burkina Faso and Niger, a decrease from 923 cases during the second quarter. This rate of reduction is expected, as the third quarter is a period outside of the meningitis season. Specimens were collected from 97% of suspect cases, and 7% of suspect cases were confirmed (Table 1). A large discrepancy was observed between the Niger's number of aggregate suspected cases (n=54) and the number of cases reported from the case-based surveillance system (n=131). MenAfriNet partners in Niger are currently in the process of validating case-based surveillance data for meningitis, and potential causes of this discrepancy are under review. Data sources used for analyses in this quarter'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 27-39

	Burkina Faso	Niger	Total
Characteristics	N (%)		
Epidemiologic			
Population under Surveillance	22,184,452	24,465,620	46,650,072
MenAfriNet districts reporting ≥ 1 case in CBS system†	56/70 (80)	20/72 (28)	76/142 (54)
MenAfriNet districts reporting aggregate data†	70/70 (100)	72/72 (100)	142/142 (100)
Aggregate suspected cases*	427	54	481
MenAfriNet suspected cases	480	131	611
Deaths [∞]	8	2	10
Laboratory[§]			
Specimens collected	475 (99)	118 (90)	591 (97)
Specimens received at NRL	280 (58)	69 (53)	349 (57)
Specimens analyzed by PCR or culture [¥]	297 (62)	68 (52)	365 (60)
Specimens analyzed with gram stain	412 (86)	67 (37)	479 (78)
Probable bacterial meningitis**	71 (15)	16 (12)	81 (13)
Confirmed bacterial meningitis	16 (3)	6 (5)	41 (7)

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

[†] 14 districts in Burkina Faso districts and 50 districts in Niger did not report cases through the CBS system. 11/14 (Burkina Faso) and 50/50 (Niger) of these districts reported 0 cases through the aggregate reporting system, suggesting that the absence of these 61 districts in CBS data are more likely due to having zero cases to report, rather than failure to report cases.

* 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

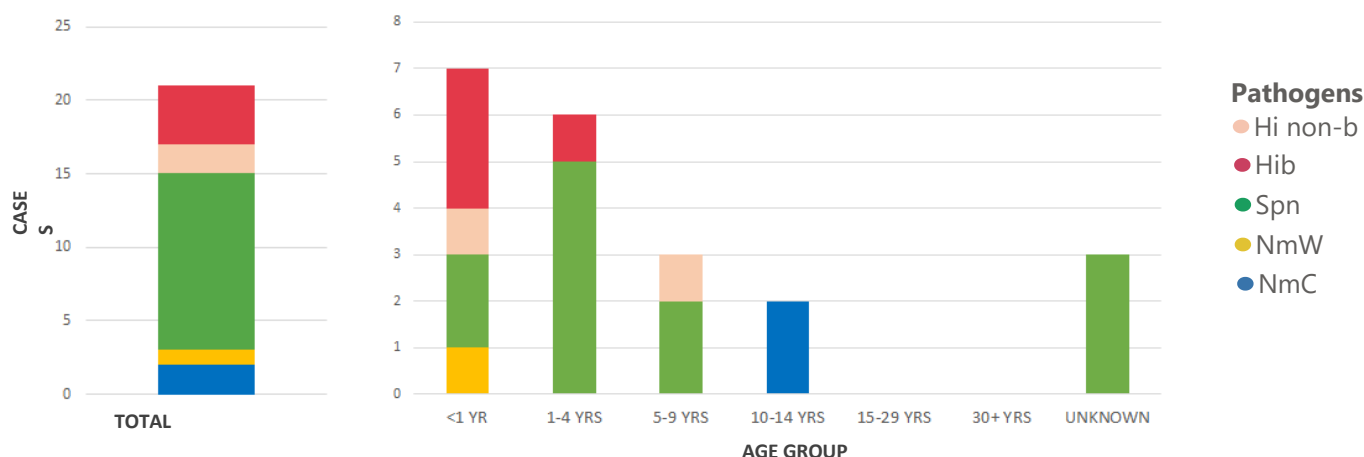
[¥] CSF analyzed by PCR or culture at any lab (district, region, or national levels)

** Tested negative or missing culture/PCR result. 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 cause of confirmed bacterial meningitis cases during epi weeks 27-39 was *Streptococcus pneumoniae* (Spn), accounting for 57% of total confirmed cases. Spn was most common in infants and children under 9 years of age. Two cases of *Neisseria meningitidis* (Nm) serogroup C were confirmed in adolescents aged 10-14 years, and one case of serogroup W was confirmed in an infant (Figure 1). The results below are likely an underestimate of the true number of confirmed meningitis cases due to missing laboratory data. Forty-seven percent and 36% of total cases in Niger and Burkina Faso, respectively, had missing confirmatory lab results. Surveillance officers in both countries are aware of this gap and are working on improving data completeness for this quarter's meningitis reporting.

Figure 1. Age distribution of confirmed bacterial meningitis pathogens

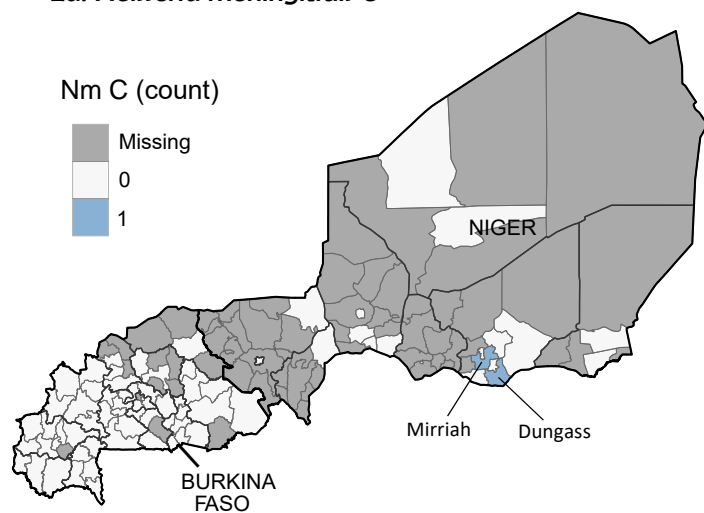


Spatial Distribution of Confirmed Bacterial meningitis Pathogens

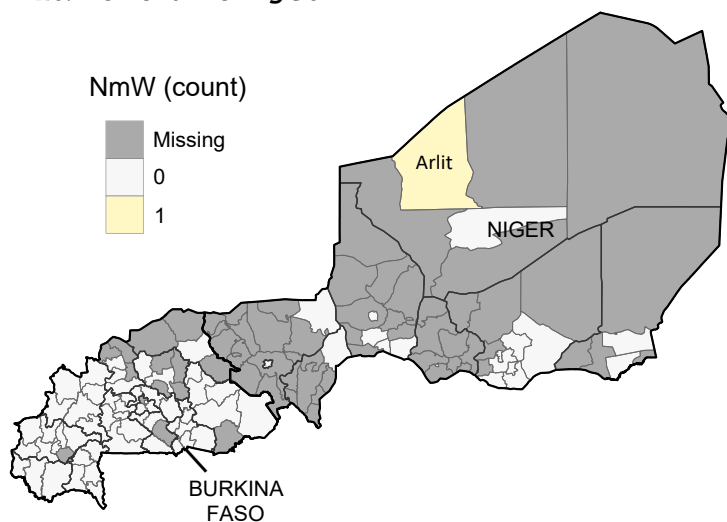
Among the available lab data reported from Burkina Faso and Niger during epi weeks 27-39, *Neisseria meningitidis* continues to be detected, with 2 cases of serogroup C and 1 case of serogroup W confirmed. Zero NmA cases were reported. No districts in either Burkina Faso or Niger entered the alert or epidemic threshold during this period. Overall, a low number of confirmed cases were reported. In July, Niger completed the training and roll-out of a new case-based data management system, STELab. This quarter's bulletin is the first time Niger's meningitis case-based data from this surveillance system has been analyzed. MenAfriNet partners in Niger are in the process of retroactively completing lab and epidemiologic data entry for 2022. In Burkina Faso, data validation activities for 2021 and 2022 case-based meningitis data have been planned to take place in the new year. During this validation process, laboratory and epidemiologic data will be cross-checked and entered with higher completion.

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

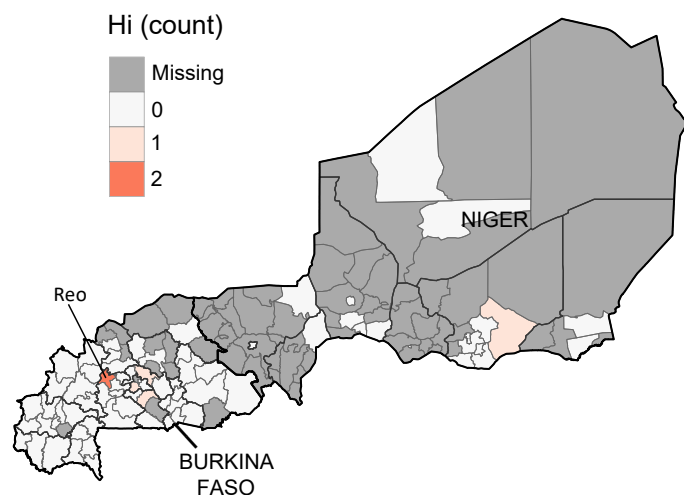
2a. *Neisseria meningitidis* C



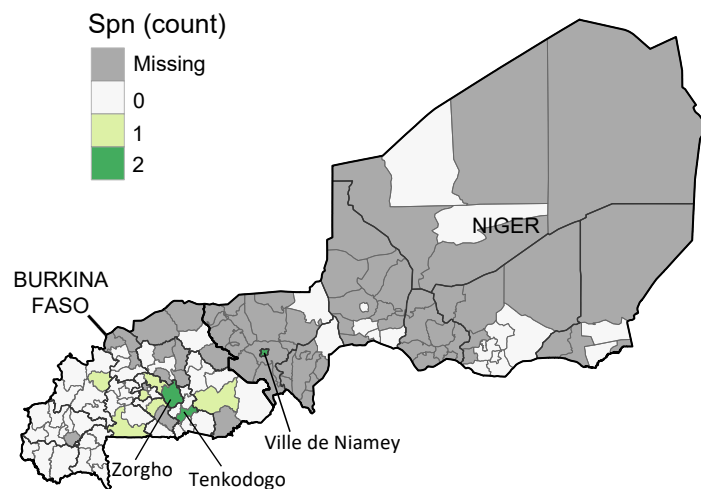
2b. *Neisseria meningitidis* W



2c. *Haemophilus influenzae*



2c. *Streptococcus pneumoniae**



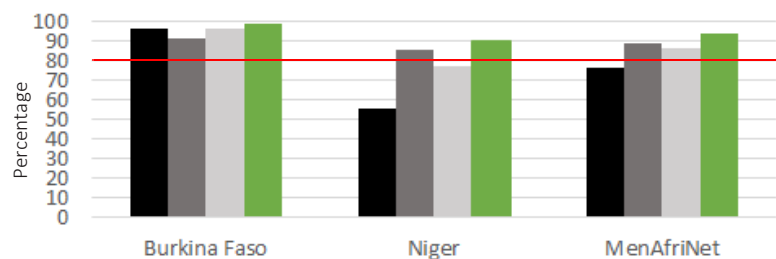
*Serotype data were not reported in Burkina Faso or Niger during this quarter, so Spn serotype information is not included in the bulletin at this time.

MenAfriNet case-based surveillance performance indicators

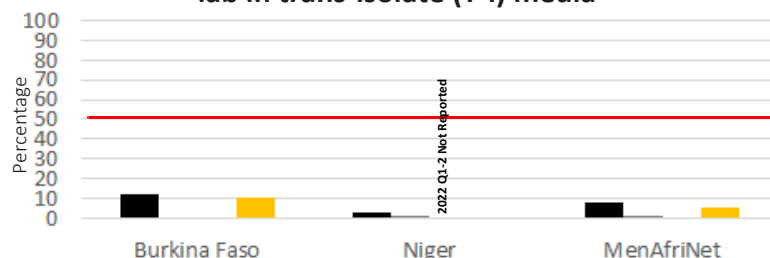
Specimen collection remains high in Burkina Faso, and it improved in Niger compared to the first two quarters of 2022 (4a). The proportion of cases with gram stain procedures performed at periphery labs also stayed high in Burkina Faso and increased significantly in Niger compared to the prior 2 years (Figure 4c). Specimen transport times have consistently been below the target in both countries, but improvements were observed during quarter 3, where both had higher performance than previous years (Figure 4e). Specimen delivery to the NRL dropped this quarter in both countries, however, the percent of delivered specimens analyzed by a confirmatory lab test continues to be a strength. Given the high percentage of lumbar punctures performed, it is critical to better understand the factors leading to low completion of specimen delivery to the NRL and how targeted support may be provided to address specimen transport barriers.

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

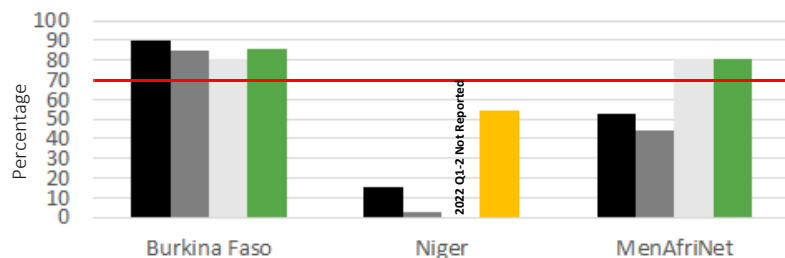
4a. Percent cases with specimen collected



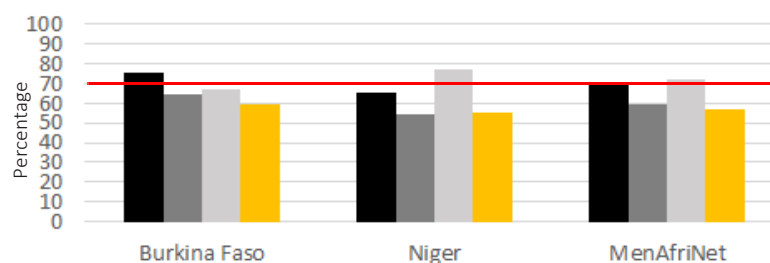
4b. Percent of specimens received at any lab in trans-isolate (T-I) media



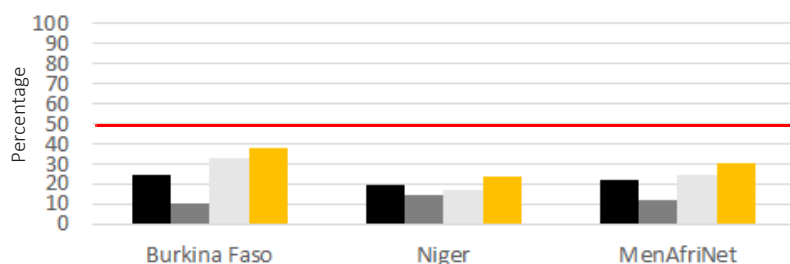
4c. Percent specimens tested by Gram stain at non-NRL lab



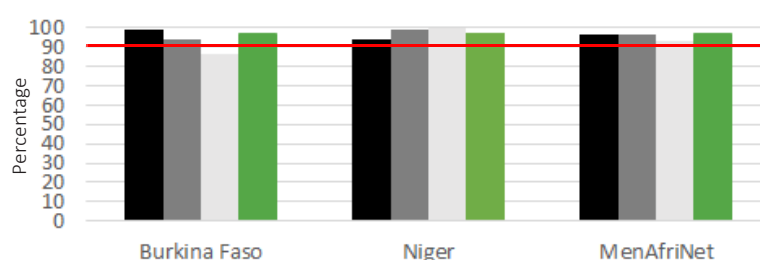
4d. Percent specimens received at NRL



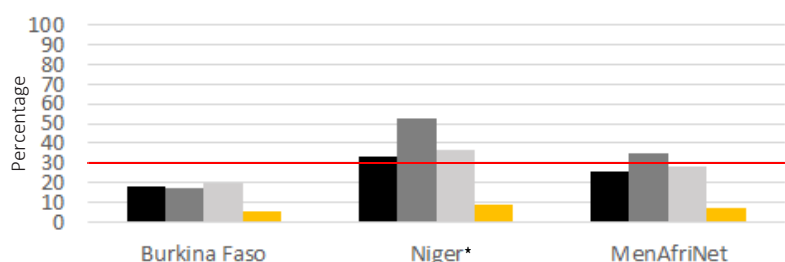
4e. Percent cases with <7 days delay between CSF collection and date of receipt at NRL



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

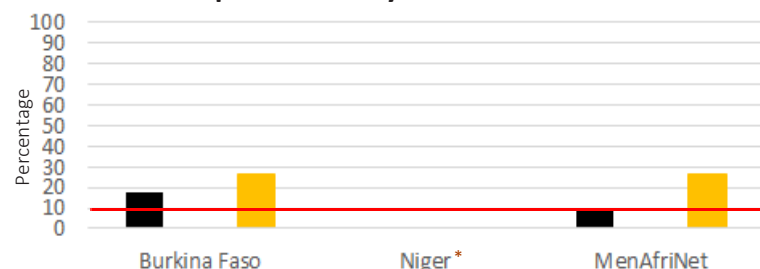


4g. Percent specimens confirmed at NRL for Hi, Spn, Nm, or other bacterial meningitis pathogen



*Minor corrections were made to 2022 Q1 and Q2 denominator in Niger, and the calculation changes are reflected here.

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



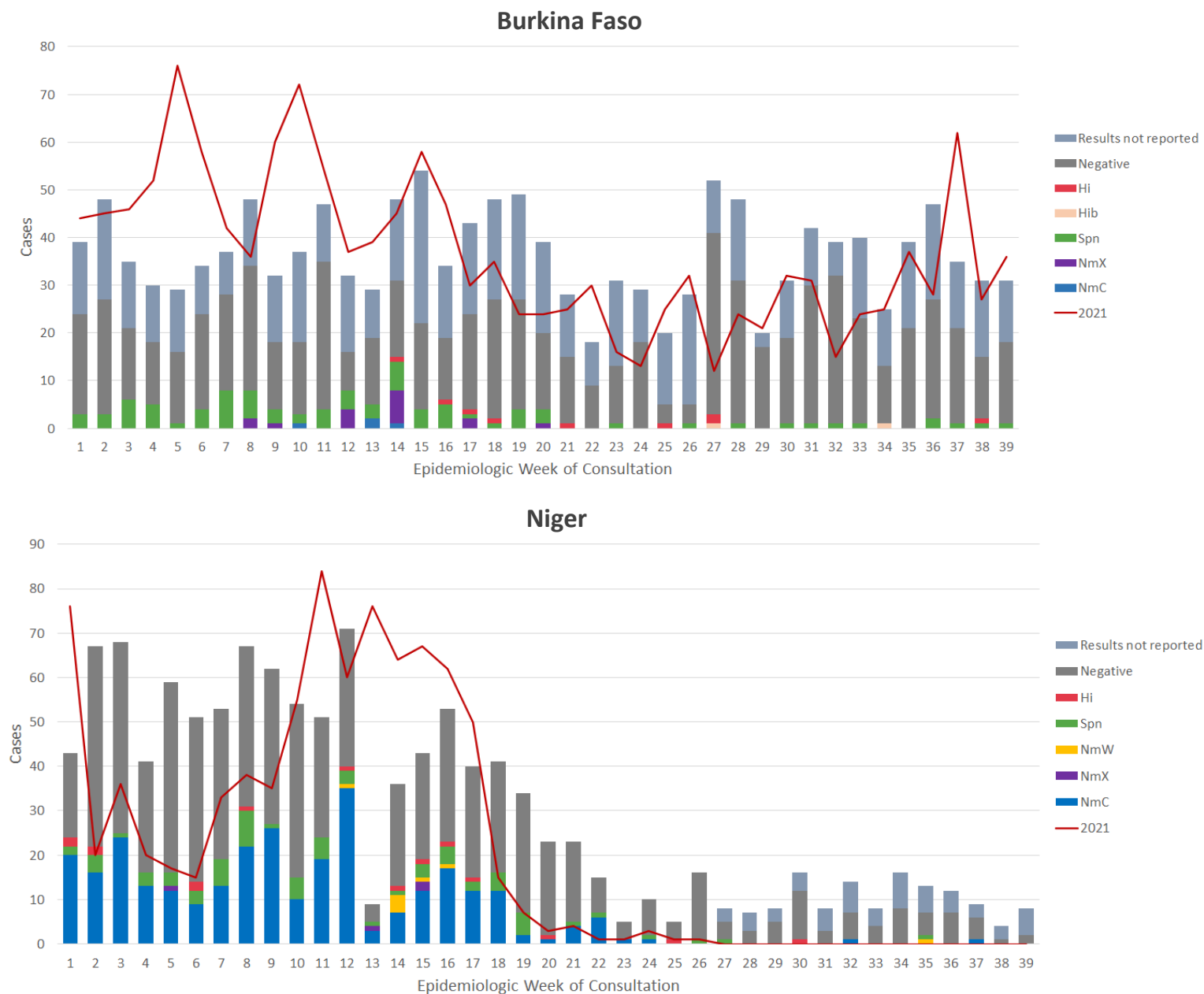
*100% of culture data from the NRL were missing in Niger's data shared for analysis in this quarter 3 bulletin. Previous years in both countries are also affected by low data completeness for this indicator, so these calculations are likely underestimates of the true rates of contamination.

Key: 2020 2021 2022 Q1-2 2022 Q3 (meets target) 2022 Q3 (does not meet target) — Indicator target

Epidemiologic trends over time

The cumulative number of cases reported from epi weeks 27-39 was higher in Burkina Faso compared to the same period during 2021. The overall trends of cases reported in Q3 in 2021 and 2022 were similar in Burkina Faso with sporadic peaks. It will be important to track how trends evolve in the coming months, as the meningitis season approaches. In Niger, an increased number of cases were reported in quarter 3 of 2022 compared to the previous year, but the overall trends between the two years were also similar, with cases drastically dropping towards the end of the meningitis season around epi week 23. The number of cases entered into Niger's NRL database (N=138) in quarter 3 was comparable to that of the STELab database and had zero missing lab results, suggesting that the missing data reflected in STELab may not be solely due to possible gaps in laboratory capacity, but also due to the ongoing data migration and merging activities in response to the new system.

Figure 5. Epidemic curves by country, weeks 1-39, 2022 (Note y-axes vary by country)



The COVID-19 pandemic negatively impacted bacterial meningitis surveillance, laboratory, and data management capacities throughout the meningitis belt. Although many countries are adapting to these changes, the urgent in-country demands and needs of the COVID-19 response continue to impact availability of staff dedicated to meningitis surveillance, control, and outbreak response activities in countries within the MenAfriNet consortium. This may be reflected in the epidemiologic and laboratory data published in this bulletin.

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.