

Epidemiological situation, weeks 1 - 13

During epidemiologic weeks 1-13 of 2022, a total of 1,392 suspect cases were reported from MenAfriNet districts that submitted data from Burkina Faso and Niger. Specimens were collected from 84% of suspect cases, and 24% of suspect cases were confirmed (Table 1). Due to the ongoing implementation of a new meningitis surveillance data management system in Niger, national case-based surveillance data were not accessible at the time of this bulletin's publication. Data sources used for analyses in this quarter's bulletin include national case-based meningitis surveillance data from Burkina Faso and case-based national reference laboratory data from Niger. Using laboratory data from Niger likely results in an underestimate of the number of specimens collected reported below.

Table 1. Epidemiological situation, weeks 1-13

	Burkina Faso	Niger	Total
Characteristics	N (%)		
Demographics			
Population under Surveillance	22,184,452	24,465,620	46,650,072
Districts submitting data†	63/70 (90)	29/72 (40)	92/142 (65)
Aggregate suspected cases*	415	915	1,330
MenAfriNet suspected cases	477	915	1,392
Deaths [∞]	8	NR	8
Laboratory[§]			
Specimens collected	464 (97)	700 (77)	1,160 (84)
Specimens received at NRL	310 (65)	700 (77)	1,006 (72)
Specimens analyzed by PCR or culture [¥]	298 (62)	700 (77)	994 (71)
Specimens analyzed with gram stain	377 (79)	NR	377
Probable bacterial meningitis**	153 (32)	NR	153
Confirmed bacterial meningitis	59 (12)	278 (30)	337 (24)

Abbreviation: CSF, cerebrospinal fluid; NRL, National Reference Lab; PCR, Polymerase Chain Reaction (real-time), NR, not reported

[†] MenAfriNet districts submitting case-based data (denominator = Total number of MenAfriNet districts performing case-based surveillance)

* Data source: Weekly district-level aggregate reports of clinically defined meningitis cases and meningitis-related deaths. This number is used as MenAfriNet suspect cases in Niger due to the unavailability of national case-based surveillance data and is used as the denominator to calculate certain performance indicators.

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

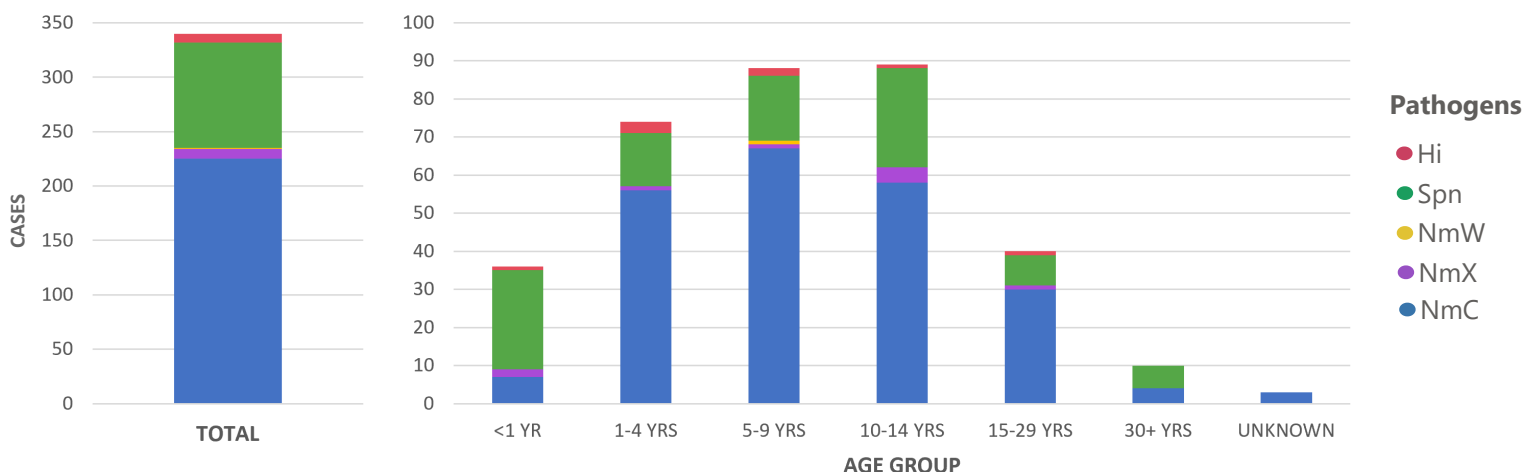
[§] Denominator for laboratory characteristics = number of MenAfriNet suspected cases

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

** Tested negative for all pathogens and serogroups. 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 were *Neisseria meningitidis* serogroup C (NmC) and *Streptococcus pneumoniae* (Spn), together accounting for 95% of total confirmed cases. NmC was most common in children and adolescents between 5 and 14 years old, and Spn was most common in infants <1 year of age (see Figure 1).

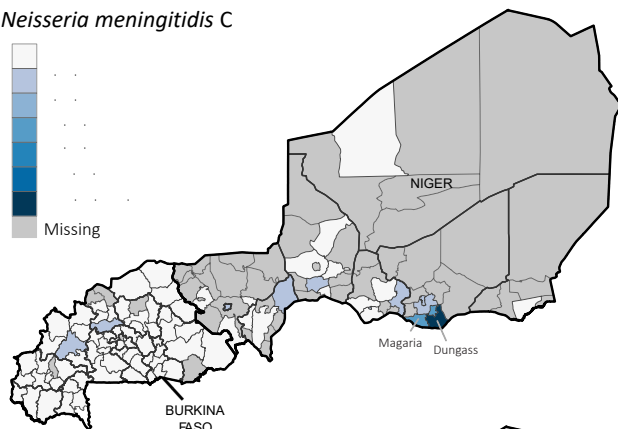
Figure 1. Age distribution of confirmed bacterial meningitis pathogens

Spatial Distribution of Bacterial meningitis Pathogens

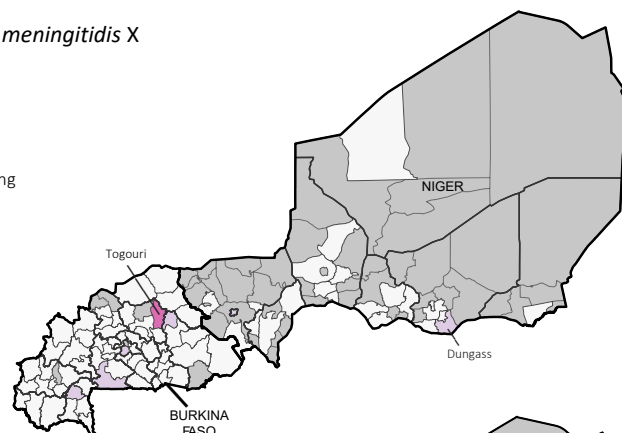
Neisseria meningitidis continues to be detected throughout Burkina Faso and Niger, with serogroup C (NmC) as the dominant serogroup. In total, 225 confirmed cases were reported to be caused by NmC, 9 by NmX, and 1 by NmW. Zero NmA cases were reported. The number of NmC cases detected during the first half of the epidemic season is dramatically higher compared to the same period during the previous year. This can be attributed to the confirmed NmC outbreak that took place in the Zinder region's Dungass and Magaria sub-districts from January 1 to May 15. During the outbreak, 845 cases and 35 deaths were reported. A reactive vaccination campaign targeting persons aged 1-29 took place during March 17-22 in the affected sub-districts with vaccines provided through the International Coordination Group on Vaccine Provision. Initial report of vaccination coverage was 80%.

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

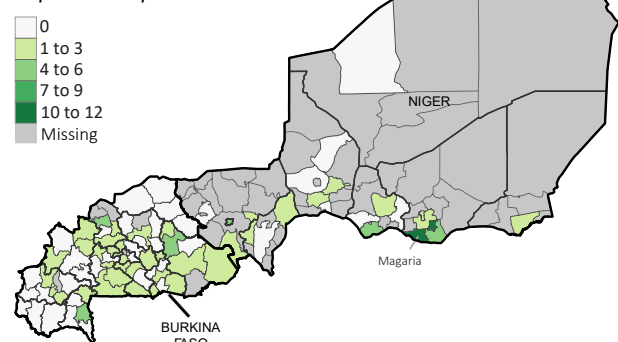
2b. *Neisseria meningitidis* C



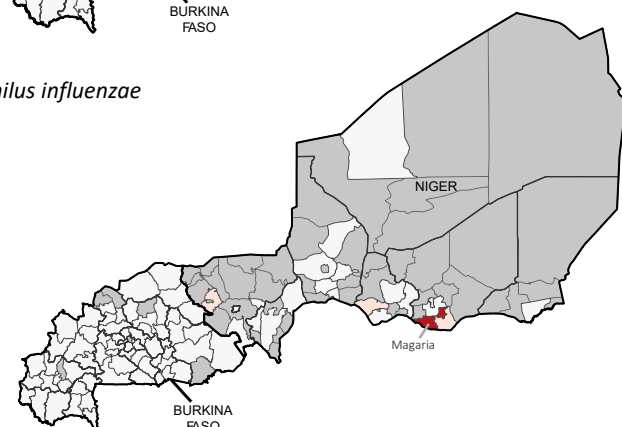
2b. *Neisseria meningitidis* X



2c. *Streptococcus pneumoniae*



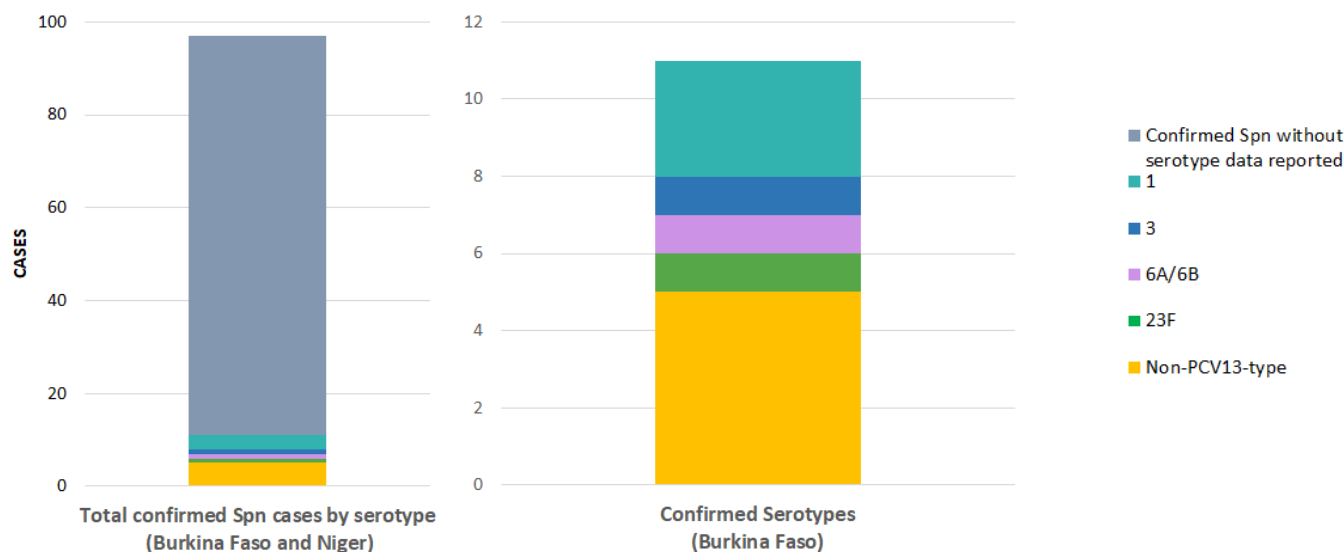
2d. *Haemophilus influenzae*



Streptococcus pneumoniae serotype distribution

Burkina Faso was the only country that reported *S. pneumoniae* serotype results for inclusion in this bulletin. Among 52 total confirmed *S. pneumoniae* cases reported in Burkina Faso, 11 (21%) had serotype results reported. Of these, serotype 1 (n=3) and non-PCV-13 serotypes (n=5) were the most commonly detected (Figure 3).

Figure 3. *S. pneumoniae* serotypes reported by country

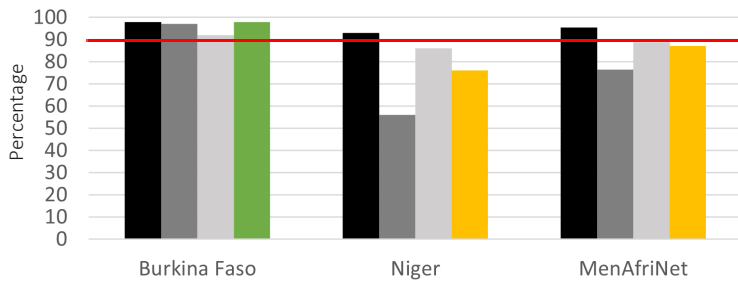


MenAfriNet case-based surveillance performance indicators

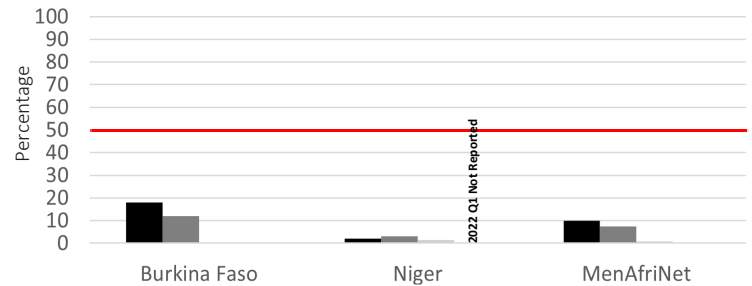
Specimen transport performance indicators improved in both Burkina Faso and Niger compared to the previous year. Although not all targets were met by both countries, the percent of specimens received at NRL, specimens transported within 7 days to the NRL, and specimens tested by a confirmatory method all increased during the first quarter of this year (Figures 4d-4f). Burkina Faso continues to collect a high percentage of specimens, and both countries maintained low proportions of specimen contamination (Figure 4h). Further investigation is needed to identify factors affecting specimen collection in Niger.

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

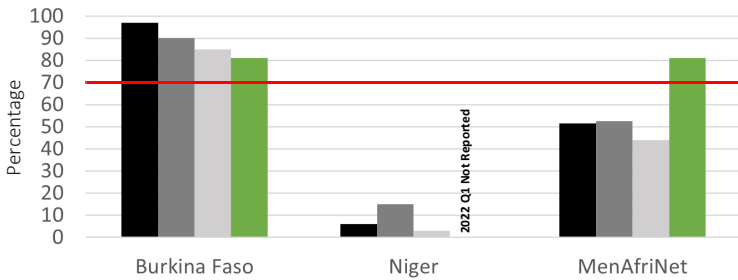
4a. Percent cases with specimen collected



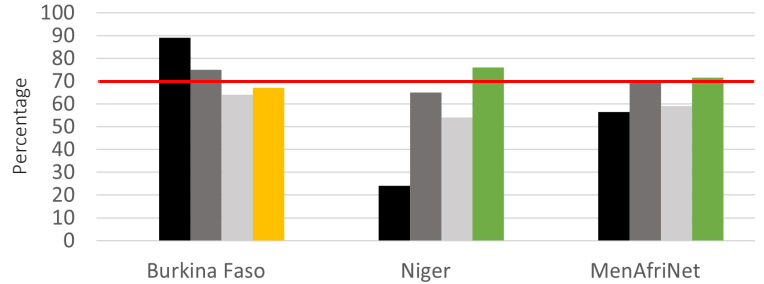
4b. Percent of specimens received at any lab in trans-isolate (T-I) media



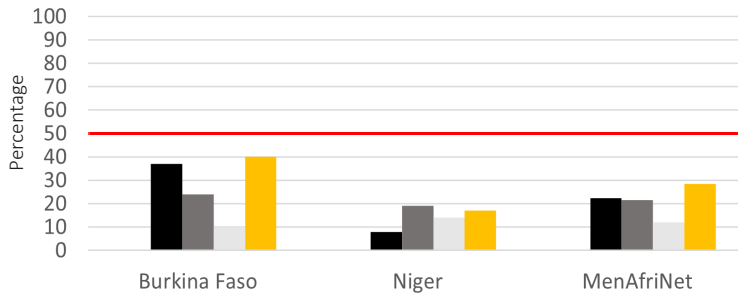
4c. Percent specimens tested by Gram stain at non-NRL lab



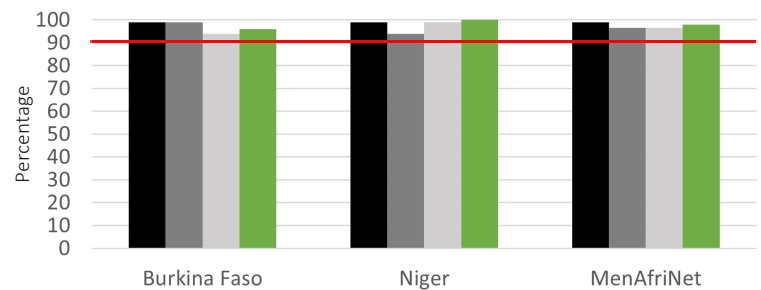
4d. Percent specimens received at NRL



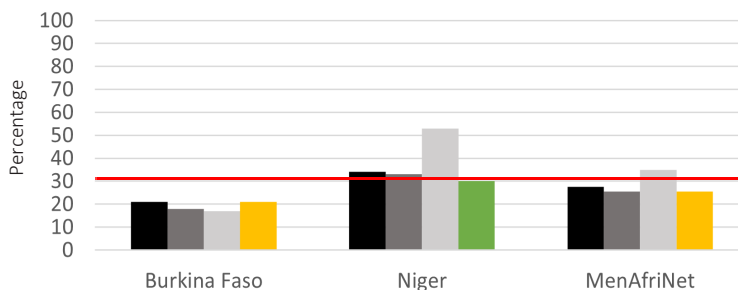
4e. Percent cases with <7 days delay between CSF collection and date of receipt at NRL



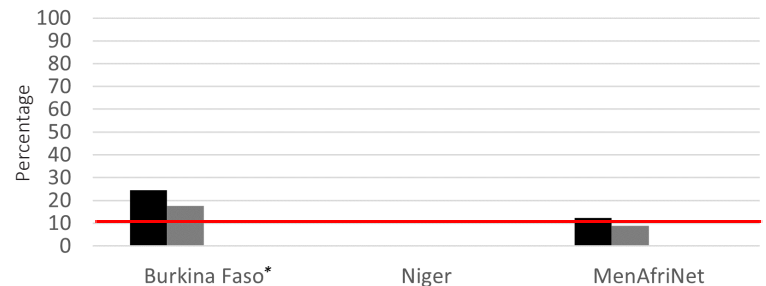
4f. Percent specimens analyzed by culture or PCR upon arrival at NRL



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



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



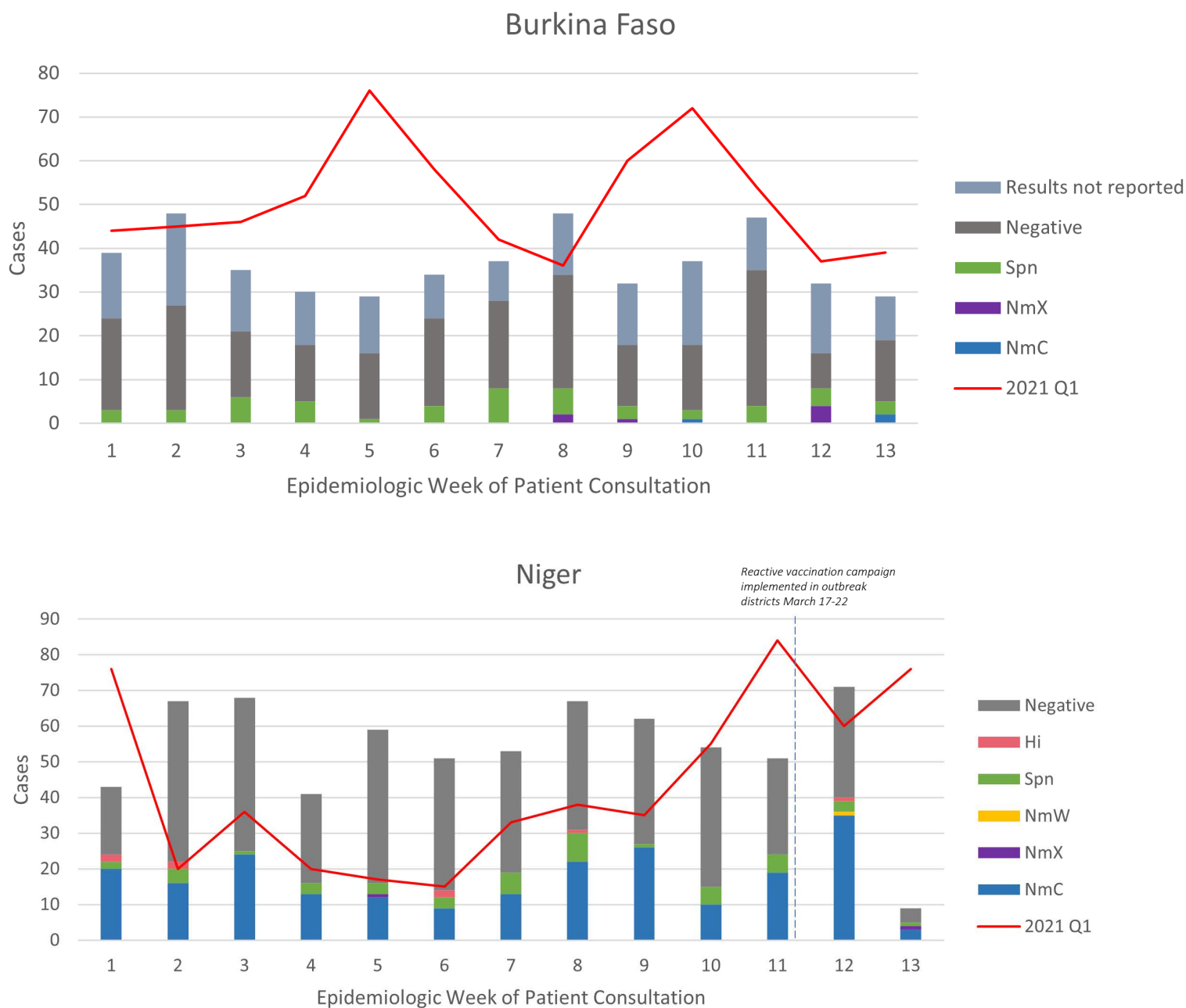
*92% and 90% of data used to calculate this indicator were missing in 2021 and 2022 Q1, respectively. Please see Appendix A for how calculation of this indicator changed from previous bulletins in an effort to more accurately capture the true percentage of contamination.

Key: 2019 2020 2021 2022 Q1 (meets target) 2022 Q1 (does not meet target) — Indicator target

Epidemiologic trends over time

The overall number of suspected meningitis cases reported in Burkina Faso was low during epi weeks 1-13. However, compared to the previous year, a noticeable rise in the number cases reported during EW 2-9 was observed in Niger, with a peak number of reported cases and NmC incidence occurring during epi week 12. A reactive vaccination campaign was carried out during epi weeks 11 and 12 in response to a confirmed NmC outbreak.

Figure 5. Epidemic curves by country, weeks 1-13, 2021 (Note y-axes vary by country)



The COVID-19 pandemic negatively impacted bacterial meningitis surveillance, laboratory, and data management capacities throughout the meningitis belt. The urgent in-country demands and needs of the COVID-19 response resulted in reduced availability of health staff dedicated to meningitis surveillance, control, and outbreak response activities in countries within the MenAfriNet consortium. This is 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 less than 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 MenAfriNet bulletins) to number of specimens tested by culture at an NRL.*