MenAfriNet Surveillance Feedback Bulletin

2020 | Annual

Annual feedback bulletin on bacterial meningitis

Epidemiological situation, weeks 1 - 53

During 2020, a total of 3,172 suspect cases were reported in 2020 from MenAfriNet districts conducting case-based surveillance, with the largest number of cases reported from Burkina Faso. Specimens were collected from 90% of suspect cases, and 11% of suspect cases were confirmed (Table 1). Specimens referenced in this bulletin refer to CSF, but include 9 blood samples from Togo and 181 blood samples from Mali. Data sources used for the creation of this bulletin include validated national case-based surveillance data from Burkina Faso and provisional national case-based surveillance data from Mali, Niger, Chad, and Togo.

Table 1. Epidemiological situation, weeks 1-53

	Burkina Faso	Mali	Niger	Chad	Togo	Total
Characteristics	**N (%)**					
Demographics						
Population under Surveillance	19,632,147	11,602,530	20,651,070	677,785	3,471,632	53,628,218
Districts submitting data†	57/70 (81)	21/33 (64)	32/72 (44)	3/4 (75)	28/35 (80)	141/214 (66)
Aggregate suspected cases*	1845	652	589	523	289	3898
MenAfriNet suspected cases	1810	460	409	121	372	3172
Deaths∞	86 (5)	3 (1)	26 (6)	1 (1)	26 (7)	142 (4)
Laboratory §						
Specimens collected	1762 (97)	449 (98)	230 (56)	118 (98)	289 (78)	2848 (90)
Specimens received at NRL	1317 (73)	408 (89)	160 (39)	113 (93)	77 (21)	2075 (65)
Specimens analyzed by PCR or culture ¥	1318 (73)	408 (89)	150 (37)	46 (38)	188 (51)	2110 (67)
Specimens analyzed with gram stain	1594 (88)	421 (92)	34 (8)	44 (36)	225 (60)	2318 (73)
Probable bacterial meningitis**	114 (6)	0 (0)	10 (2)	NR	2 (1)	126 (4)
Confirmed bacterial meningitis	276 (15)	43 (9)	29 (7)	NR	13 (3)	361 (11)

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

∞ Deaths listed as outcome in case-based data

§ Denominator for laboratory characeristics = number of MenAfriNet suspected cases

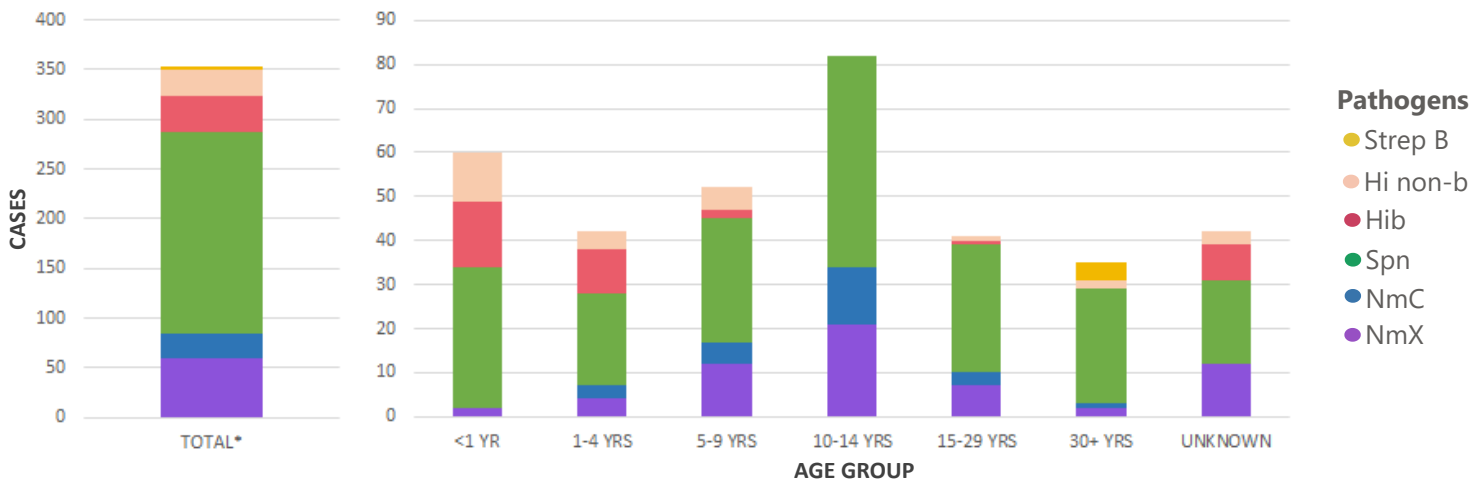
¥ CSF analyzed by PCR or culture at any lab (district, region, or national levels)

** 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 *Streptococcus pneumoniae* and *Neisseria meningitidis X*, together accounting for 73% of total confirmed cases. Both *Streptococcus pneumoniae* and *Neisseria meningitis X* were most common in children between 10-14 years old (see Figure 1).

Figure 1. Meningitis pathogens by age group, 2020



**This figure excludes four confirmed cases caused by pathogens classified as 'other germ' or non-serogrouped Nm.*

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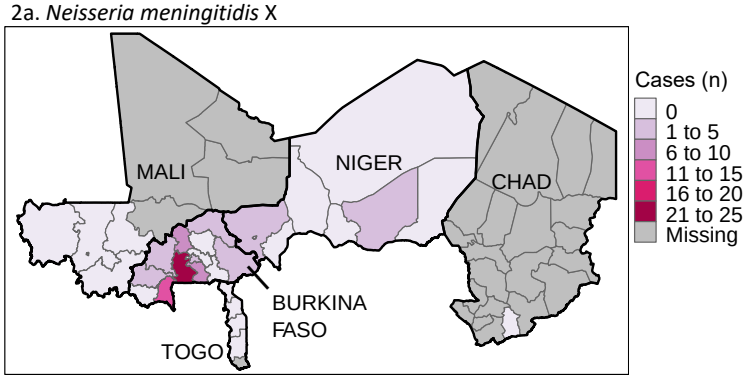
Bacterial meningitis Pathogen Distribution

During 2020, 60 confirmed cases were reported to be caused by *Neisseria meningitidis* X and 25 by *Neisseria meningitidis* C across Burkina Faso, Niger, and Mali. Zero *Neisseria meningitidis A* cases were reported. The district of Mirriah in the Zinder Region of Niger crossed the epidemic threshold (>10 suspect cases per 100,000 inhabitants per week) during epidemiologic weeks 52 and 53, and NmC was identified as the primary pathogen driving the outbreak.

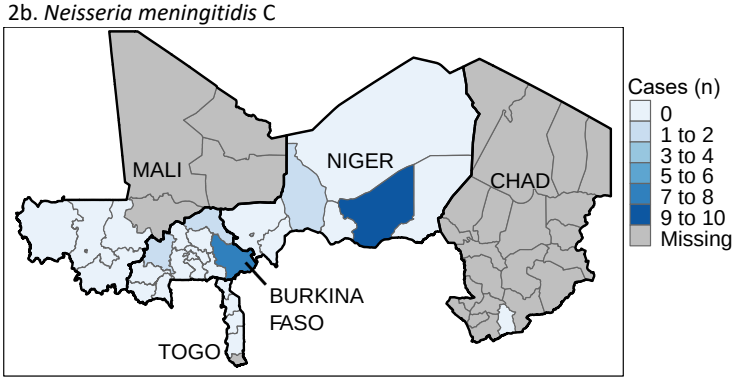
Figures 2a-2d. Regional distribution of *Neisseria meningitidis X, Neisseria meningitidis C, Streptococcus pneumoniae,* and *Haemophilus influenzae* across Burkina Faso, Niger, Mali, Togo, and Chad

2a. *Neisseria meningitidis* X



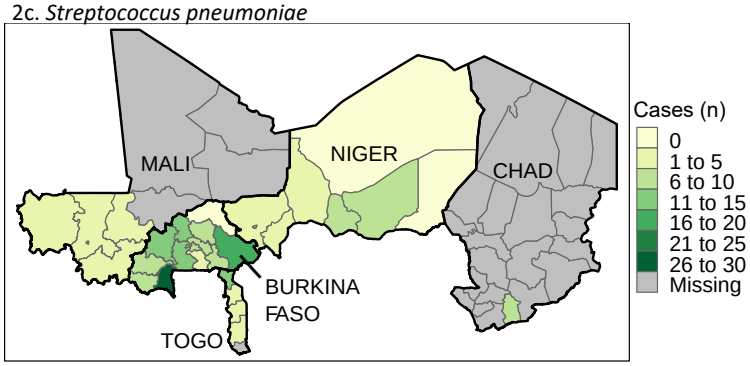
Centre-Ouest, Burkina Faso reported the highest number of confirmed cases due to NmX (n=21), followed by **Sud-Ouest, Burkina Faso** (n=13).

2b. *Neisseria meningitidis* C



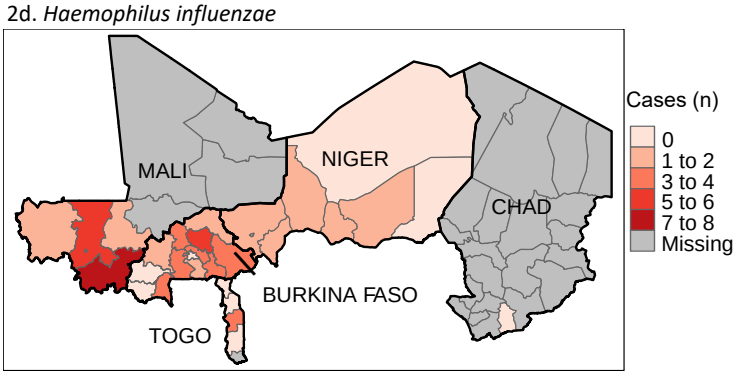
Zinder, Niger reported the highest number of confirmed cases due to NmC (n=10), followed **Est, Burkina Faso** (n=8).

2c. *Streptococcus pneumoniae*



Sud-Ouest, Burkina Faso reported the highest number of confirmed cases due to Spn (n=27), followed by **Est, Burkina Faso** (n=17).

2d. *Haemophilus influenzae*

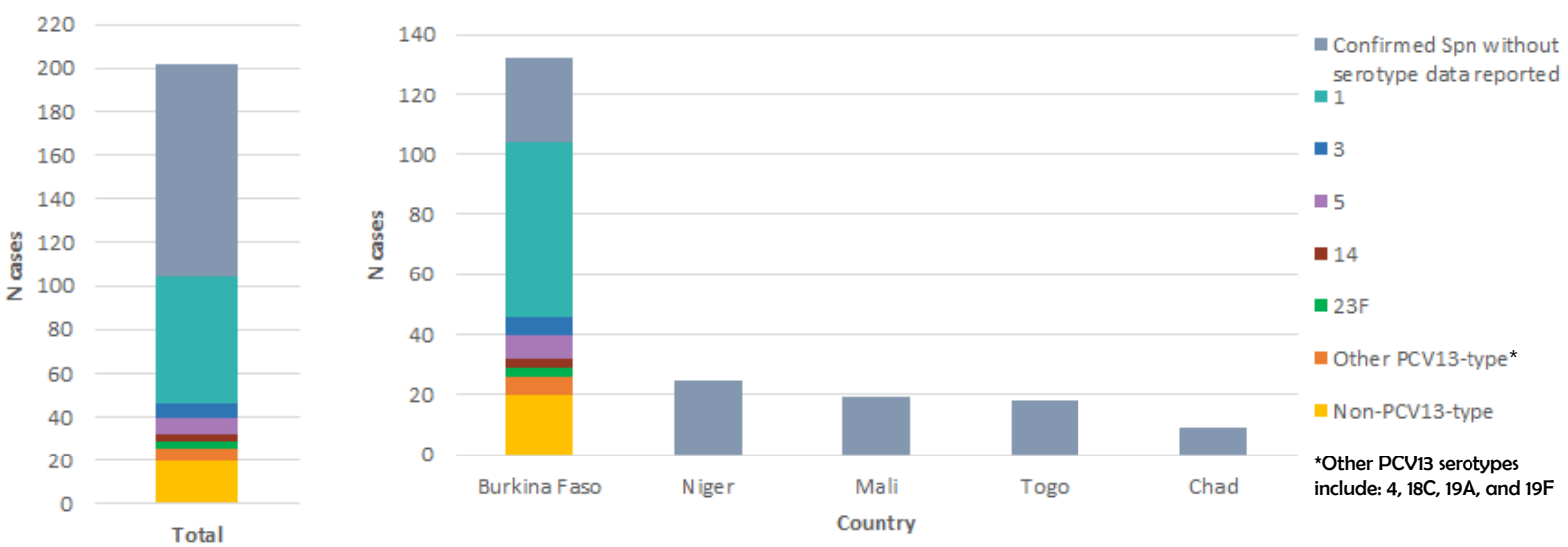


Sikasso, Mali reported the highest number of confirmed cases due to Hi (n=8), followed by **Bamako, Mali** (n=6) and **Centre-Nord, Burkina Faso** (n=6).

Streptococcus pneumoniae serotype distribution

Burkina Faso was the only country that reported *S. pneumoniae* serotype results in 2020 for inclusion in this bulletin. Among 132 total confirmed *S. pneumoniae* cases reported from Burkina Faso, 104 (79%) had serotype results reported. Of these, serotype 1 (n=58) was the most commonly detected (see figure 3).

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

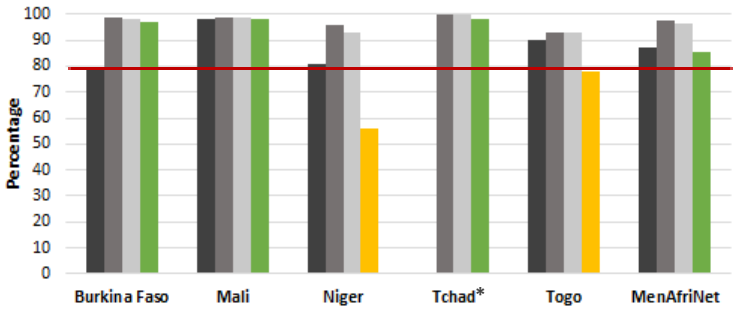


MenAfriNet case-based surveillance performance indicators

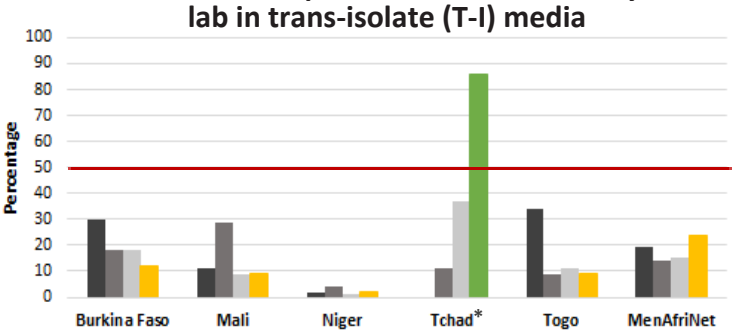
Despite challenges posed by the COVID-19 pandemic, countries within the MenAfriNet consortium were resilient in their continued public health action against meningitis. Specimen collection remained high in many countries, and all five countries maintained a low percentage of contamination among samples received at the NRL for culture test (Figures 4a and 4h). Timely specimen transport and confirmatory lab capacity declined in 2020 and were among key challenges experienced (Figures 4e-4g). Please see appendix A for how indicators were calculated. A key for interpreting the following tables is provided below.

Figure 4. Annual Trends of Surveillance and Laboratory Performance Indicators

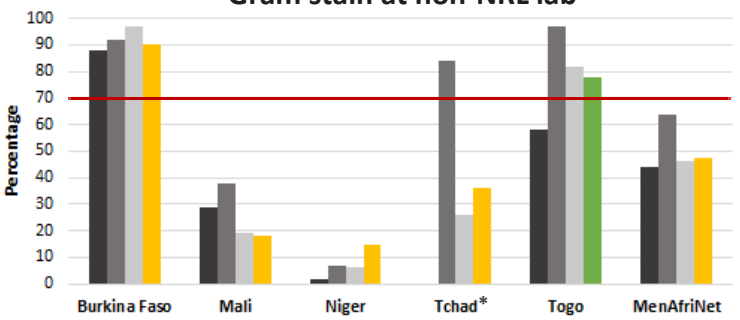
4a. Percent cases with specimen collected



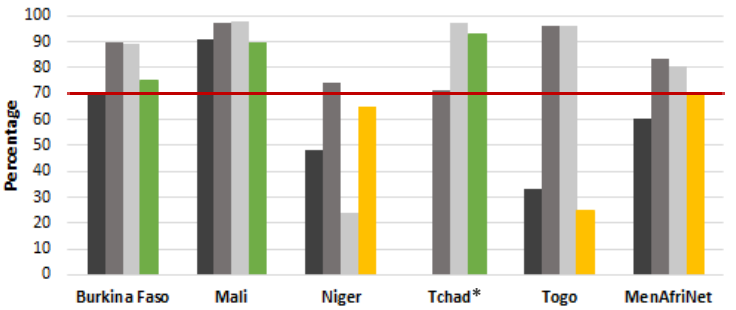
4b. Percent specimens received at any lab in trans-isolate (T-I) media



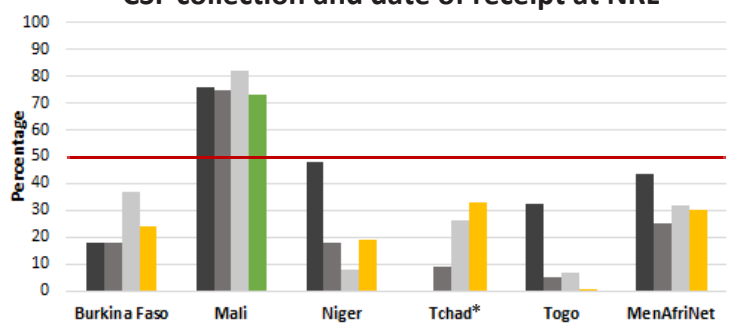
4c. Percent specimens tested by Gram stain at non-NRL lab



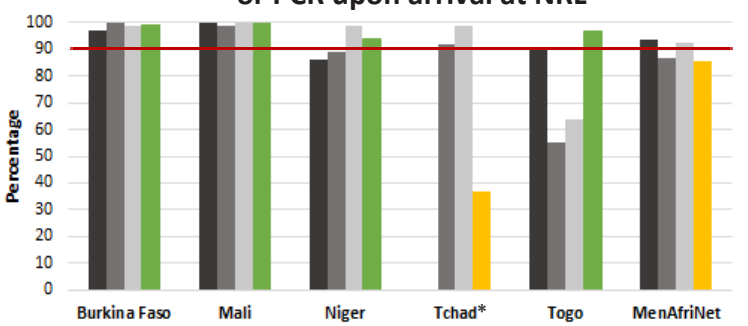
4d. Percent specimens received at NRL



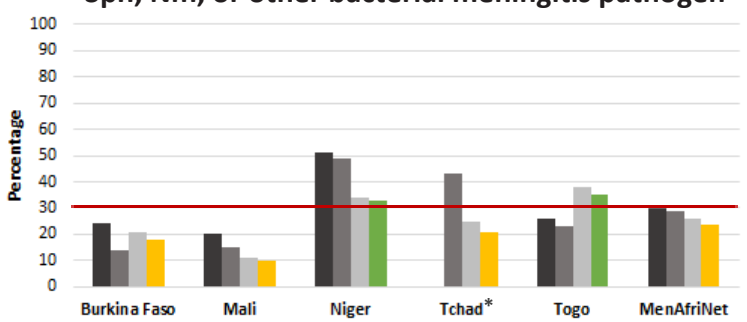
4e. Percent cases with <7 days delay between CSF collection and date of receipt at NRL



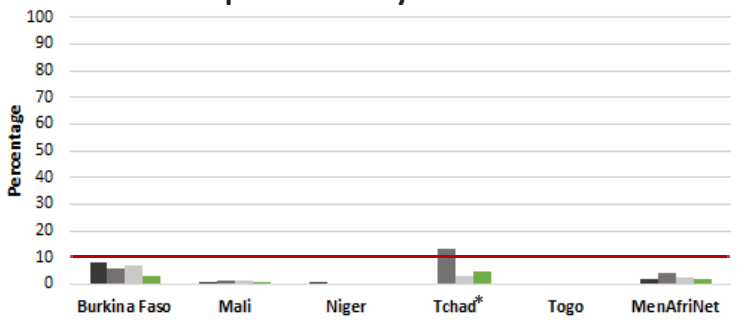
4f. Percent specimens analyzed by culture or PCR upon arrival at NRL



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



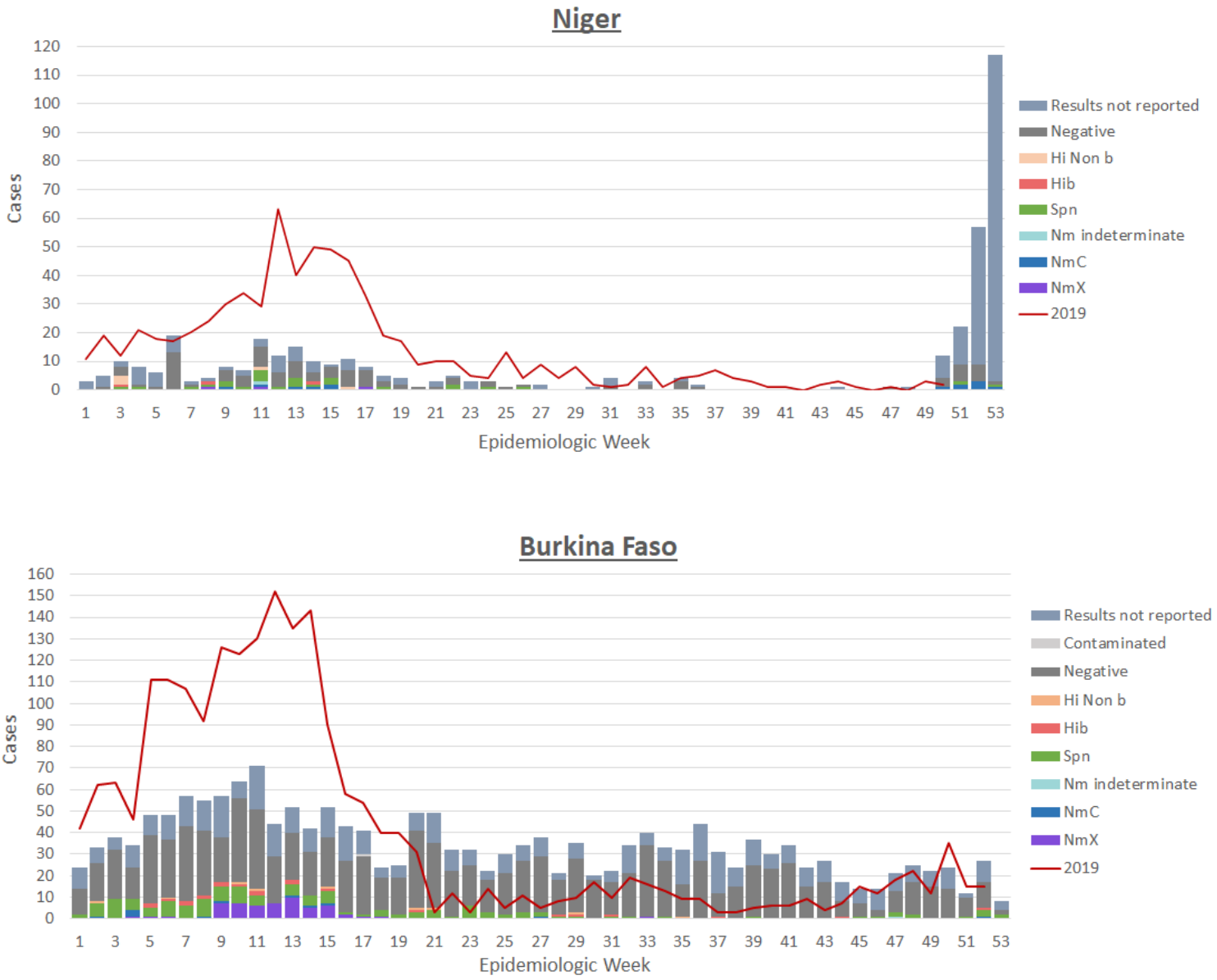
Key: 2017 2018 2019 2020 (meets target) 2020 (does not meet target) Indicator target

*2017 data from Chad were not available for analysis at the time of this bulletin's creation and are not included in Figure 4 indicator analysis tables.

Epidemiological trends over time

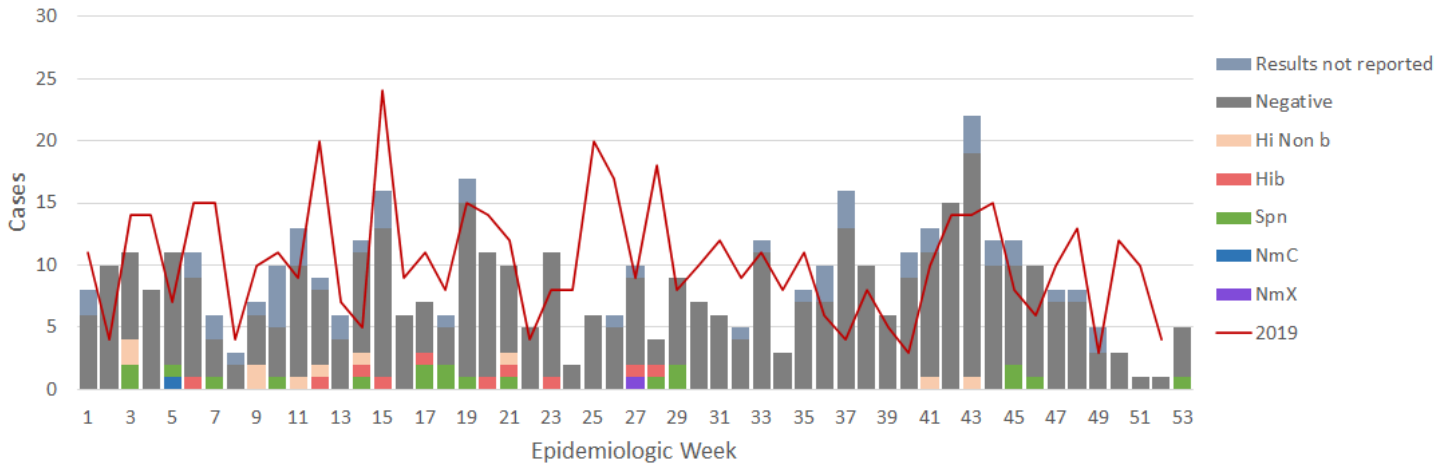
The overall number of suspected bacterial meningitis cases reported was low in 2020. As shown in Figure 5, cases reported during the meningitis season (epidemiologic weeks 1-26) decreased significantly in 2020 compared to the previous year, most notably in Burkina Faso, Niger, and Togo. The sharp increase of cases seen in Niger during epidemiologic weeks 52 and 53 is due to the outbreak that occurred in the the district of Mirriah within the Zinder region, which reported an attack rate of 15.9 and 25.6 cases per 100,000 inhabitants during the two weeks, respectively.

Figure 5. Epidemic curves by country, weeks 1-53, 2020 (Note y-axes vary by country)

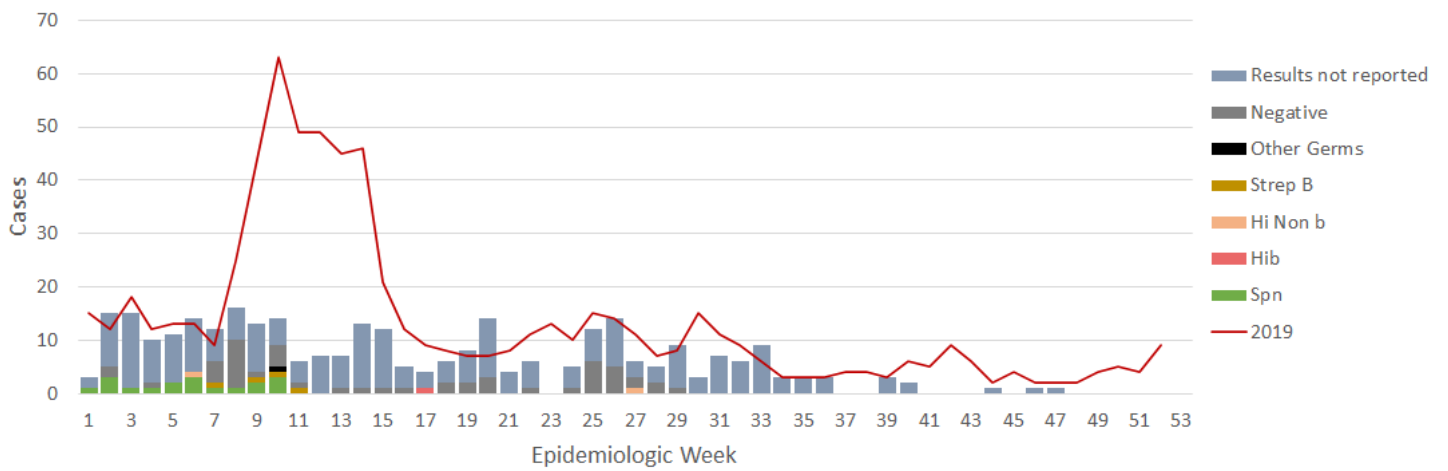


On March 11, 2020, the World Health Organization declared COVID-19 a global pandemic. The COVID-19 pandemic has negatively impacted bacterial meningitis surveillance, laboratory, and data management capacities throughout the meningitis belt. Urgent in-country demands and needs of the COVID-19 response resulted in reduced availability of health staff dedicated to meningitis surveillance, control, and outbreak response activities in countries within the MenAfriNet consortium. Due to delays of data validation exercises in Niger, Togo, Mali, and Chad, there may be incomplete transmission of case-based data. This is reflected in the epidemiologic and laboratory data published in this bulletin.

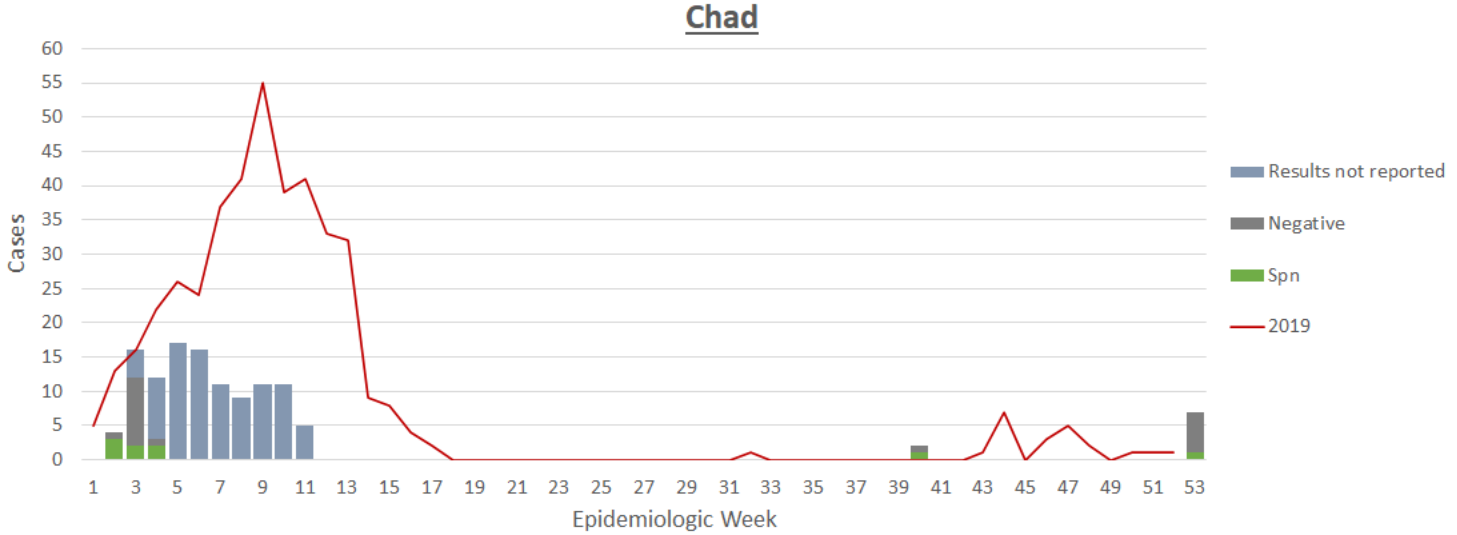
Mali



Togo



Chad



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 received at the NRL