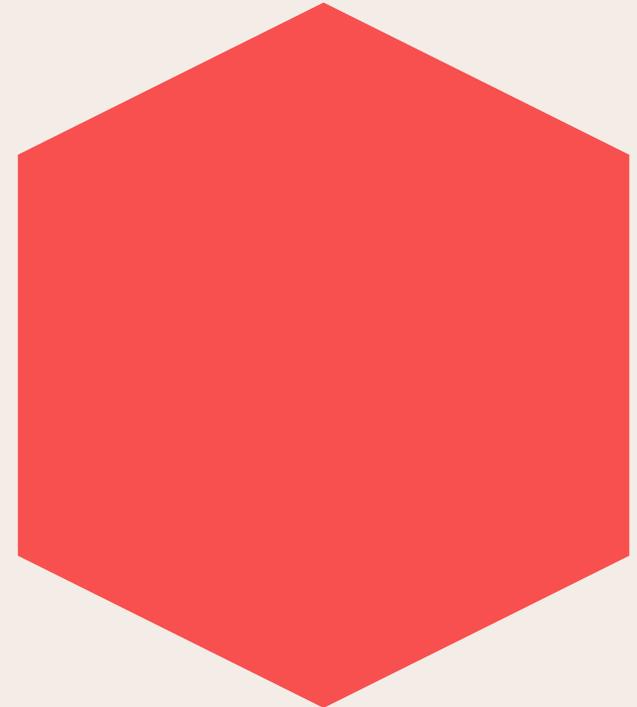


April 20, 2021

Interim update from the New Nets Project pilot evaluations

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- 1 ITN use landscape and malaria burden
- 2 Entomological landscape and baseline results
- 3 Next steps

ITN landscape

Percent population that slept under an ITN last night, data from cross-sectional surveys

Burkina Faso

| Gaoua (Standard ITNs) | | Banfora (IG2 ITNs) | | Orodara (PBO ITNs) | |
|--------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 2019 | 2020 | 2019 | 2020 | 2019 [†] | 2020 |
| 20.8% (18.6%–23.1%) | 44.2% (40.9%–47.5%) | 67.7% (64.9%–70.3%) | 90.4% (88.5%–92.1%) | 78.8% (76.1%–81.2%) | 84.8% (82.3%–87.0%) |

Rwanda

| Nyamagabe (Standard ITNs) | | Karongi (IG2 ITNs) | | Ruhango (Standard ITNs + IRS) | |
|------------------------------|------------------------|------------------------|------------------------|----------------------------------|------------------------|
| Feb* 2020 | Dec 2020 | Feb 2020 | Dec 2020 | Feb* 2020 | Dec 2020 |
| 70.5% (66.8%–74.0%) | 68.7% (65.0%–72.2%) | 68.2% (64.5%–71.8%) | 70.9% (67.3%–74.3%) | 73.3% (69.8%–76.6%) | 78.8% (75.4%–82.0%) |

Western Mozambique

| Chemba (Standard ITNs) | Guro (IG2 ITNs) | Changara (PBO ITNs) |
|---------------------------|------------------------|------------------------|
| 2020 | 2020 | 2020 |
| 33.3% (32.1%–34.7%) | 18.5% (17.2%–19.8%) | 23.0% (21.8%–24.2%) |

Northern Mozambique

| Gurue (Standard ITNs) | Cuamba (IG2 ITNs) | Mandimba (RG ITNs) |
|--------------------------|------------------------|------------------------|
| 2020 | 2020 | 2020 |
| 23.0% (21.3%–24.7%) | 19.4% (17.9%–21.0%) | 17.0% (15.5%–18.6%) |

Nigeria

| Ejigbo (Standard ITNs) | Asa (IG2 ITNs) | Moro (RG ITNs) | Ife North (PBO ITNs) |
|---------------------------|---------------------|------------------------|-------------------------|
| 2020 | 2020 | 2020 | 2020 |
| 19.7% (17.8%–21.7%) | 3.0% (2.2%–3.9%) | 18.1% (16.2%–20.1%) | 24.2% (22.2%–26.3%) |

*The ITN distribution campaign was ongoing at the time of the cross-sectional survey

[†]The ITN distribution campaign was complete at the time of the cross-sectional survey

Malaria burden to date

Prevalence estimates from baseline and year 1 cross-sectional surveys

Burkina Faso

Malaria prevalence for children under 5 (RDT+) (95% CI)

| Gaoua (Standard ITNs) | | Banfora (IG2 ITNs) | | Orodara (PBO ITNs) | |
|--------------------------|------------------------|------------------------|------------------------|------------------------|---------------------|
| 2019 | 2020 | 2019 | 2020 | 2019 [†] | 2020 |
| 81.0% (74.9%–86.0%) | 49.0% (41.9%–56.1%) | 39.6% (33.0%–46.6%) | 18.4% (13.5%–24.6%) | 28.4% (22.4%–35.3%) | 3.6% (1.8%–7.5%) |

Rwanda

Malaria prevalence for all ages (RDT+) (95% CI)

| Nyamagabe (Standard ITNs) | | Karongi (IG2 ITNs) | | Ruhango (Standard ITNs+IRS) | |
|------------------------------|---------------------|-----------------------|---------------------|--------------------------------|----------------------|
| Feb* 2020 | Dec 2020 | Feb 2020 | Dec 2020 | Feb* 2020 | Dec 2020 |
| 2.36% (1.14%–4.3%) | 2.7% (1.4%–4.8%) | 2.5% (1.3%–4.49%) | 2.7% (1.4%–4.7%) | 1.3% (0.49%–2.9%) | 5.2% (3.27%–7.9%) |

Western Mozambique

Malaria prevalence for children under 5 (RDT+) (95% CI)

| Chemba (Standard ITNs) | Guro (IG2 ITNs) | Changara (PBO ITNs) |
|---------------------------|------------------------|------------------------|
| 2020 | 2020 | 2020 |
| 44.3% (36.5%–52.1%) | 17.1% (11.6%–22.7%) | 5.7% (2.3%–9.1%) |

Northern Mozambique

Malaria prevalence for children under 5 (RDT+) (95% CI)

| Gurue (Standard ITNs) | Cuamba (IG2 ITNs) | Mandimba (RG ITNs) |
|--------------------------|------------------------|------------------------|
| 2020 | 2020 | 2020 |
| 64.9% (54.8%–75.0%) | 47.5% (38.1%–57.0%) | 66.0% (57.5%–74.4%) |

Nigeria

Malaria prevalence for children under 5 (RDT+) (95% CI)

| Ejigbo (Standard ITNs) | Asa (IG2 ITNs) | Moro (RG ITNs) | Ife North (PBO ITNs) |
|---------------------------|------------------------|------------------------|-------------------------|
| 2020 | 2020 | 2020 | 2020 |
| 38.4% (33.8%–43.3%) | 63.1% (58.3%–67.7%) | 49.9% (45.0%–54.8%) | 48.3% (43.5%–53.2%) |

[†]The ITN distribution campaign was complete at the time of the cross-sectional survey.

*The ITN distribution campaign was ongoing at the time of the cross-sectional survey.

Baseline vector landscape

Rwanda

| | Nyamagabe (Standard ITNs) | Karongi (IG2 ITNs) | Ruhango (Standard ITNs + IRS) |
|--|--|----------------------------------|-----------------------------------|
| | 2020 baseline | 2020 baseline | 2020 baseline |
| Most abundant vector (% of likely vector species collected) | <i>An. funestus</i> s.l. (92%) | <i>An. gambiae</i> s.l. (91%) | <i>An. funestus</i> s.l. (51%) |
| Second most abundant vector | <i>An. gambiae</i> s.l. (8%) | <i>An. coustani</i> (6%) | <i>An. gambiae</i> s.l. (49%) |
| Third most abundant vector | – | <i>An. funestus</i> s.l. (3%) | – |
| <i>An. gambiae</i> molecular IDs | | | |
| <i>An. gambiae</i> s.s. | 77.8% | 93.5% | 81.4% |
| <i>An. arabiensis</i> | 22.2% | 6.5% | 18.6% |
| HLC nightly landing rates (<i>An. gambiae</i> s.l.) | | | |
| Indoor:outdoor ratio | 0.50 | 1.10 | 0.53 |
| Pyrethroid resistance profile | LOW to MODERATE: Mitigated by PBO | | |
| WHO Tube Test Mortality | 97% – 100% | 93% – 100% | 86% – 100% |

Nigeria

| | Ejigbo (Standard ITNs) | Asa (IG2 ITNs) | Moro (RG ITNs) | Ife North (PBO ITNs) |
|--|---|--------------------------------|--------------------------------|--------------------------------|
| | 2020 baseline | 2020 baseline | 2020 baseline | 2020 baseline |
| Most abundant vector (% of likely vector species collected) | <i>An. gambiae</i> s.l. (88%) | <i>An. gambiae</i> s.l. (100%) | <i>An. gambiae</i> s.l. (100%) | <i>An. funestus</i> s.l. (82%) |
| Second most abundant vector | <i>An. funestus</i> s.l. (6%) | – | – | <i>An. gambiae</i> s.l. (14%) |
| <i>An. gambiae</i> molecular IDs | | | | |
| <i>An. gambiae</i> s.s. | 73.3% | 66.7% | 73.4% | 66.7% |
| <i>An. coluzzii</i> | 26.7% | 26.7% | 21.5% | 33.3% |
| <i>An. arabiensis</i> | – | 2.5% | 5.1% | – |
| HLC nightly landing rates (<i>An. gambiae</i> s.l.) | | | | |
| Indoor:outdoor ratio | 0.92 | 9.75 | 2.50 | 10.00 |
| Pyrethroid resistance profile | MODERATE to HIGH: Partially mitigated by PBO | | | |
| WHO Tube Test Mortality | 73% - 94% | 12% - 38% | 41% - 57% | 20% - 71% |

Baseline vector landscape

Western Mozambique

| | Chemba (Standard ITNs) | Guro (IG2 ITNs) | Changara (PBO ITNs) |
|---|--|-----------------------------------|-----------------------------------|
| | 2020 baseline | 2020 baseline | 2020 baseline |
| Most abundant vector (% of all likely vectors collected) | <i>An. gambiae</i> s.l. (57%) | <i>An. gambiae</i> s.l. (100%) | <i>An. gambiae</i> s.l. (100%) |
| Second most abundant vector | <i>An. funestus</i> s.l. (43%) | – | – |
| <i>An. gambiae</i> molecular IDs | | | |
| <i>Pending</i> | | | |
| HLC nightly landing rates (<i>An. gambiae</i> s.l.) | | | |
| Indoor:outdoor ratio | 0.67 | | |
| Pyrethroid resistance profile | MODERATE to HIGH: Mitigated by PBO | | |
| WHO Tube Test Mortality | 60% - 85% (<i>gambiae</i>); 85% - 100% (<i>funestus</i>) | | |

Northern Mozambique

| | Gurue (Standard ITNs) | Cuamba (IG2 ITNs) | Mandimba (RG ITNs) |
|--|--|-----------------------------------|-----------------------------------|
| | 2020 baseline | 2020 baseline | 2020 baseline |
| Most abundant vector (% of likely vector species collected) | <i>An. gambiae</i> s.l. (89%) | <i>An. gambiae</i> s.l. (100%) | <i>An. funestus</i> s.l. (69%) |
| Second most abundant vector | <i>An. funestus</i> s.l. (11%) | – | <i>An. gambiae</i> s.l. (21%) |
| <i>An. gambiae</i> molecular IDs | | | |
| <i>Pending</i> | | | |
| HLC nightly landing rates (<i>An. gambiae</i> s.l.) | | | |
| Indoor:outdoor ratio | 0.82 | | |
| Pyrethroid resistance profile | MODERATE to HIGH: Mitigated by PBO | | |
| WHO Tube Test Mortality | 60% - 85% (<i>gambiae</i>); 85% - 100% (<i>funestus</i>) | | |

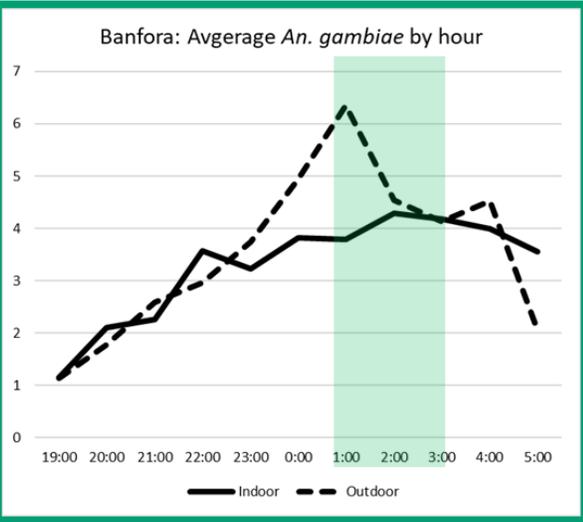
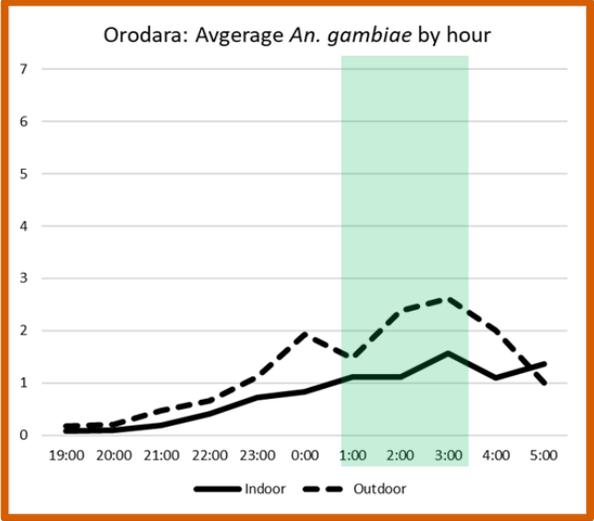
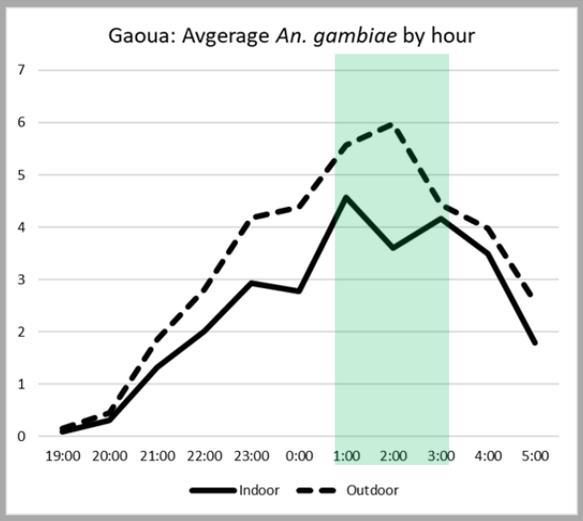
Baseline vector landscape

Burkina Faso

| | Gaoua (Standard ITNs) | Banfora (IG2 ITNs) | Orodara (PBO ITNs) |
|---|-------------------------------------|------------------------------------|------------------------------------|
| | 2019 baseline | 2019 baseline | 2019 baseline |
| Most abundant vector (% of likely vector species collected) | <i>An. gambiae</i> s.l. (67.9%) | <i>An. gambiae</i> s.l. (97.7%) | <i>An. gambiae</i> s.l. (92.9%) |
| Second most abundant vector (% of all anophelines collected) | <i>An. funestus</i> s.l. (23.4%) | – | – |
| <i>An. gambiae</i> molecular IDs | | | |
| <i>An. gambiae</i> s.s. | 93.3% | 35.1% | 81.1% |
| <i>An. coluzzii</i> | 5.2% | 64.7% | 18.9% |
| <i>An. arabiensis</i> | 1.5% | 0.2% | 0.0% |
| HLC nightly landing rates (<i>An. gambiae</i> s.l.) | | | |
| Indoor:outdoor ratio | 0.86 | 0.75 | 0.64 * |

- Peak biting is between 0100h and 0300h
- District-level resistance patterns are currently being assessed, but early data indicates **HIGH pyrethroid resistance** (WHO tube test mortality < 50%) by multiple mechanisms (partially mitigated by PBO pre-exposure)

Nightly biting patterns of the most abundant vectors—*An. gambiae* s.l.



What happened with mosquitoes?

Burkina Faso

Changing biting patterns in *An. gambiae* s.l. before and after ITN distributions (between baseline and Y1)

Mosquito biting rates decreased significantly in

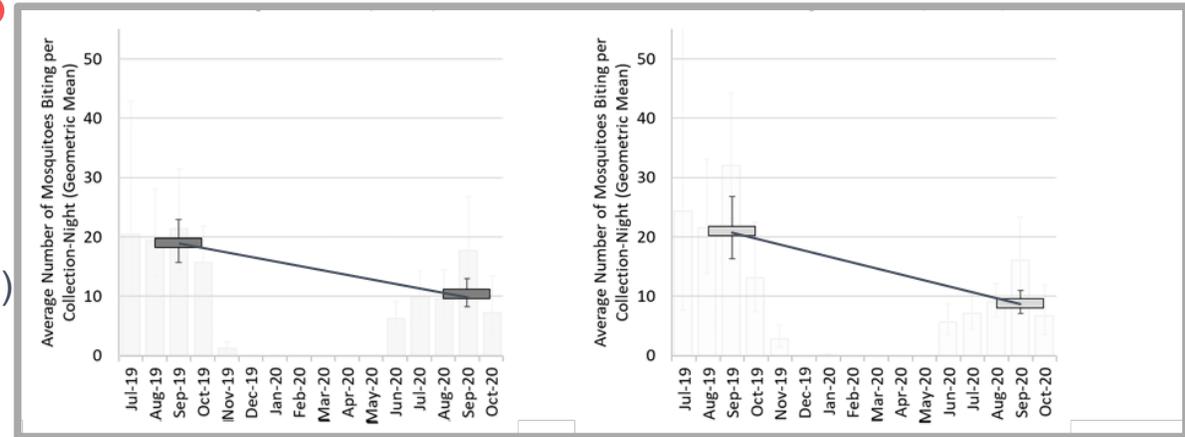
- Gaoua (standard ITN district)
- Banfora (IG2 district)

But increased significantly in

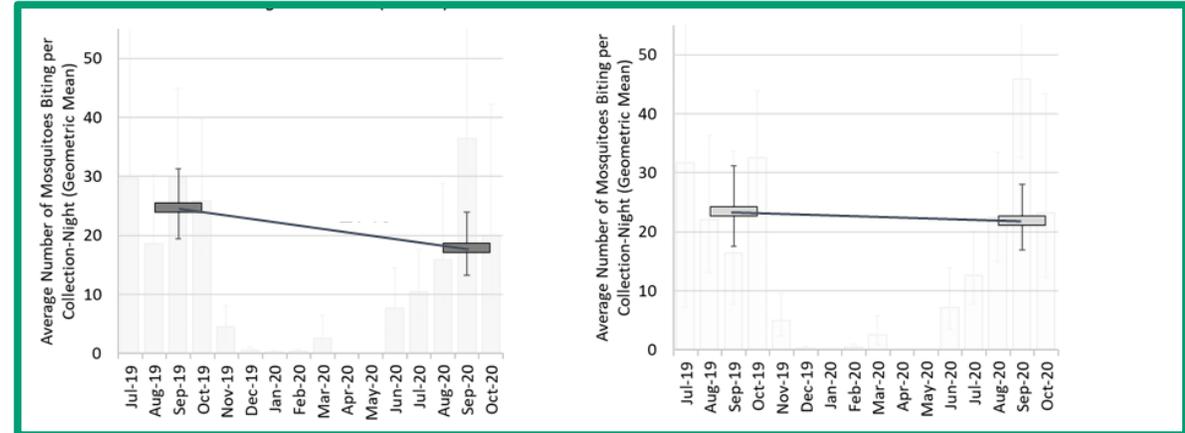
- Orodara (PBO district)

Changes were consistent indoors and outdoors

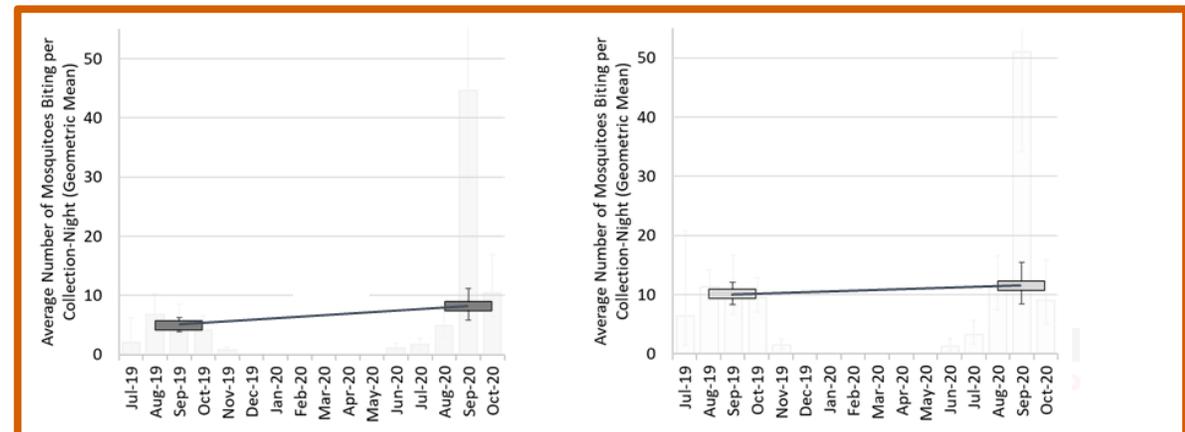
Gaoua
(Standard ITNs)



Banfora
(IG2 ITNs)



Orodara
(PBO ITNs)

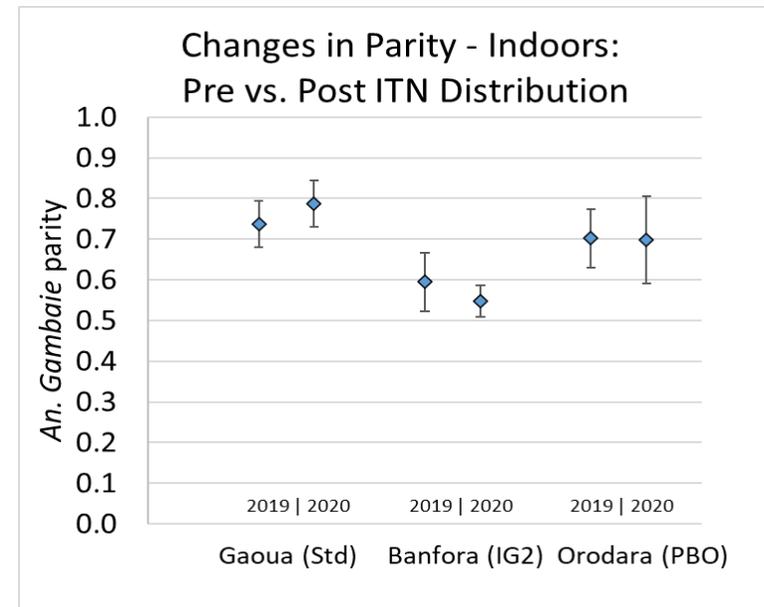
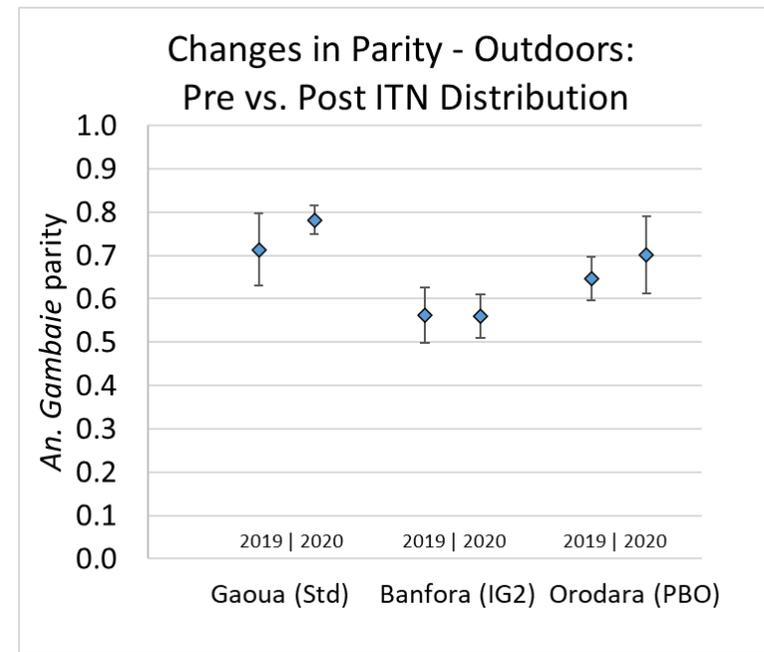


What happened with mosquitoes?

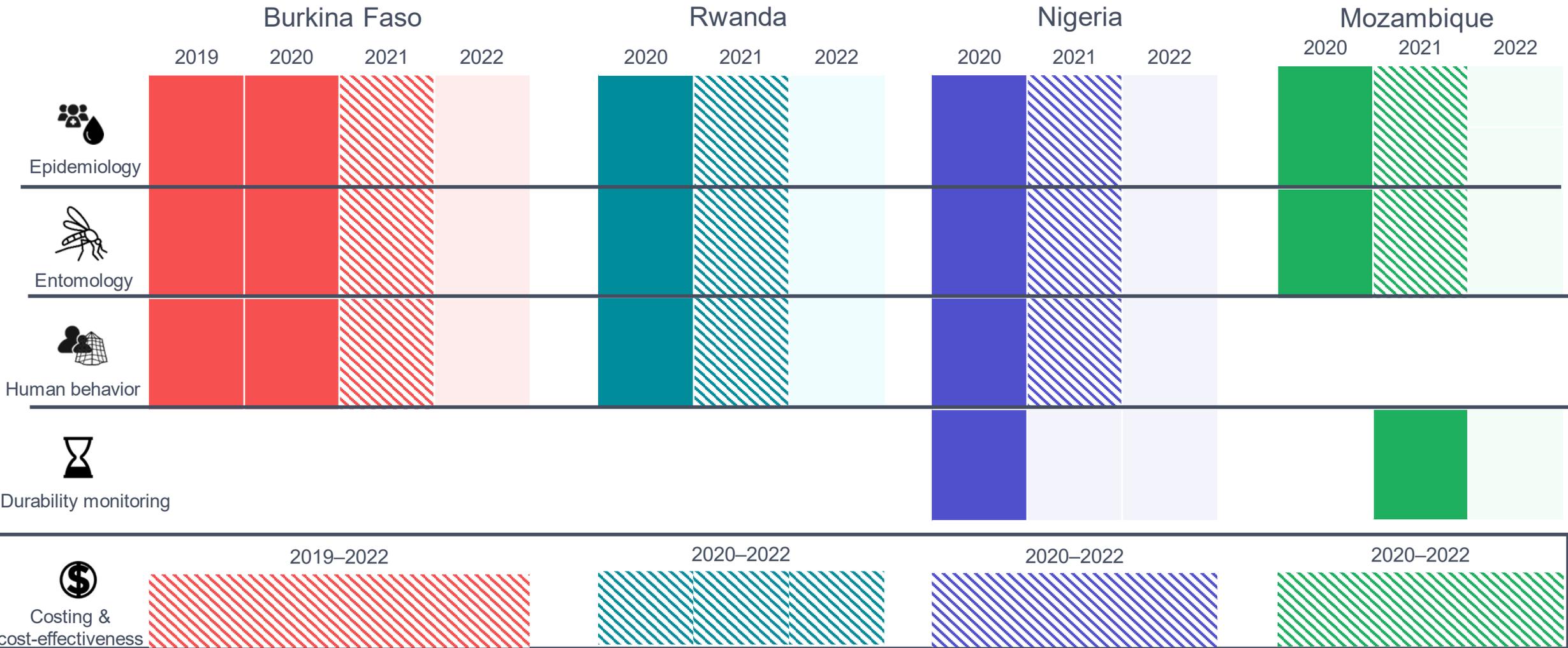
Burkina Faso

Based on crude parity rates

- *An. gambiae* probably lived longer in Gaoua District, where malaria prevalence was highest
- No evidence of changes in underlying vector population age structure for any ITN type



Next steps



Completed
 Not started
 In progress
 Not occurring in this location

PATH

