

ITN washing practices

AMP monthly call
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Introduction



- Ongoing concerns around net durability
- Net durability depends on many factors
- Focus here on net care by household, particularly behaviors related to washing
- Use secondary data analysis to:
 - Estimate net washing frequency across countries and within countries (**how often?**)
 - Examine net attributes, household attributes, and net use behaviors that are associated with frequency of net washing (**predictors?**)
 - Assess whether frequent washing is associated with increased risk of net failure (**does it matter?**)

Data source

LLIN DURABILITY MONITORING

Home Monitoring Sites Tools Results Contact Us Account



The President's Malaria Initiative (PMI) has established this website as a repository for tools and datasets from long-lasting insecticidal net (LLIN) durability monitoring activities, conducted primarily under PMI-funded mechanisms. Resources available on this website include study protocols for durability monitoring, questionnaires, consent forms, training materials, data entry screens, and tools for data cleaning, preparation, and analysis. This site will also provide briefer reports combining LLIN durability data from multiple countries, to inform PMI programming. To access the content on this site you will need to become a registered user. To register or login, click the Login button at the top of the screen.



Monitoring Sites

Durability monitoring sites and completed study reports.

[Learn More>>](#)



Tools

All the tools needed to plan, conduct, analyze and report on durability monitoring.

[Learn More>>](#)



Results

Protocols, questionnaires and data for completed studies (login required).

[Learn More>>](#)

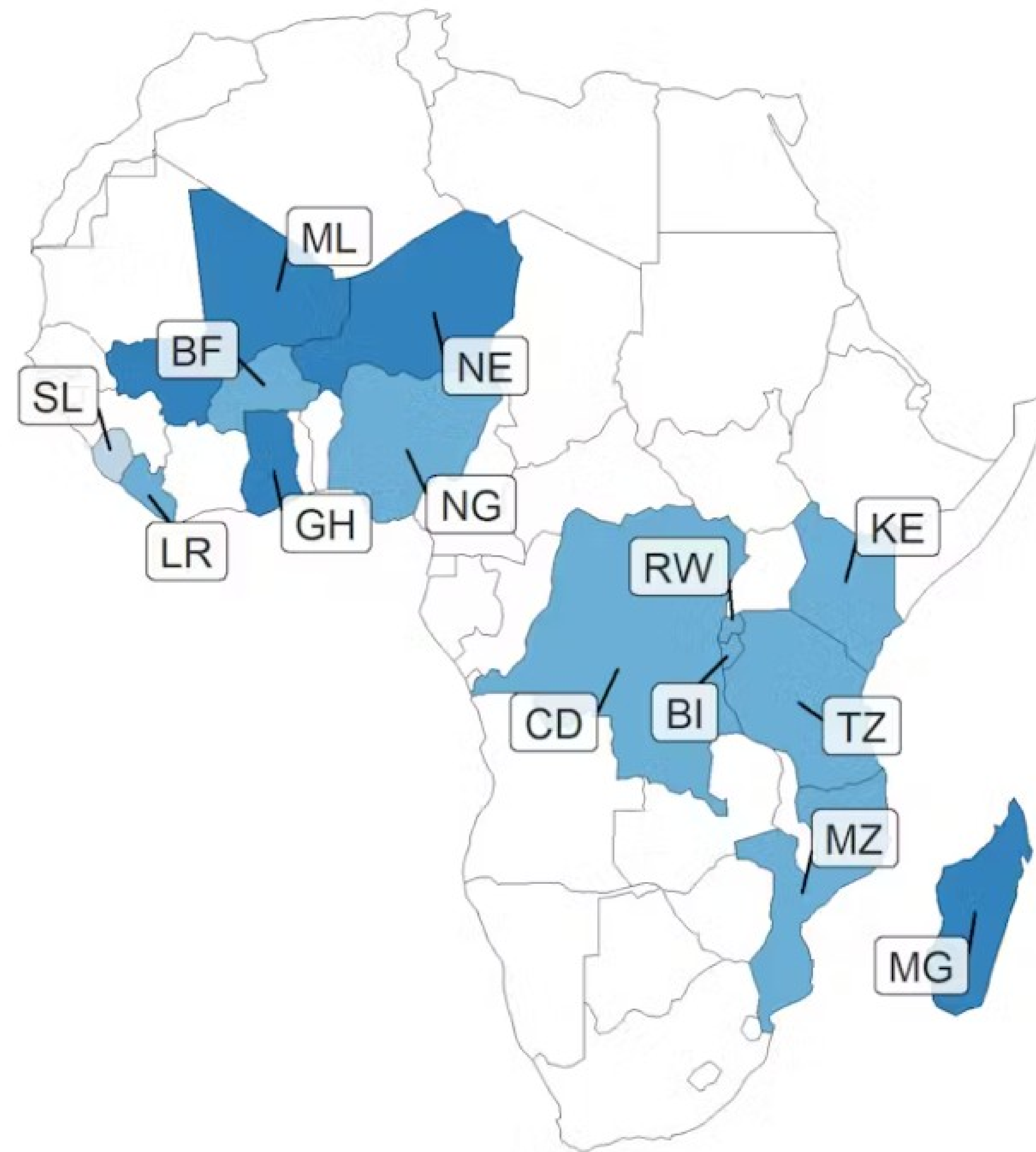
- Durability monitoring studies are prospective studies that collect data on cohorts of ITNs
 - Surveys conducted at baseline, 12 months, 24 months and 36 months post-distribution
- Physical examination of ITNs and household questionnaires at each timepoint
- Standardized methods and reporting
- 14 PMI-funded durability monitoring studies conducted between 2016 and 2023 (+ 2 pilot deployment studies)
- Starting with **40,629 observations** of **17,343 nets**

Source: www.durabilitymonitoring.org

How often do people wash their nets?



Frequency of net washing by country



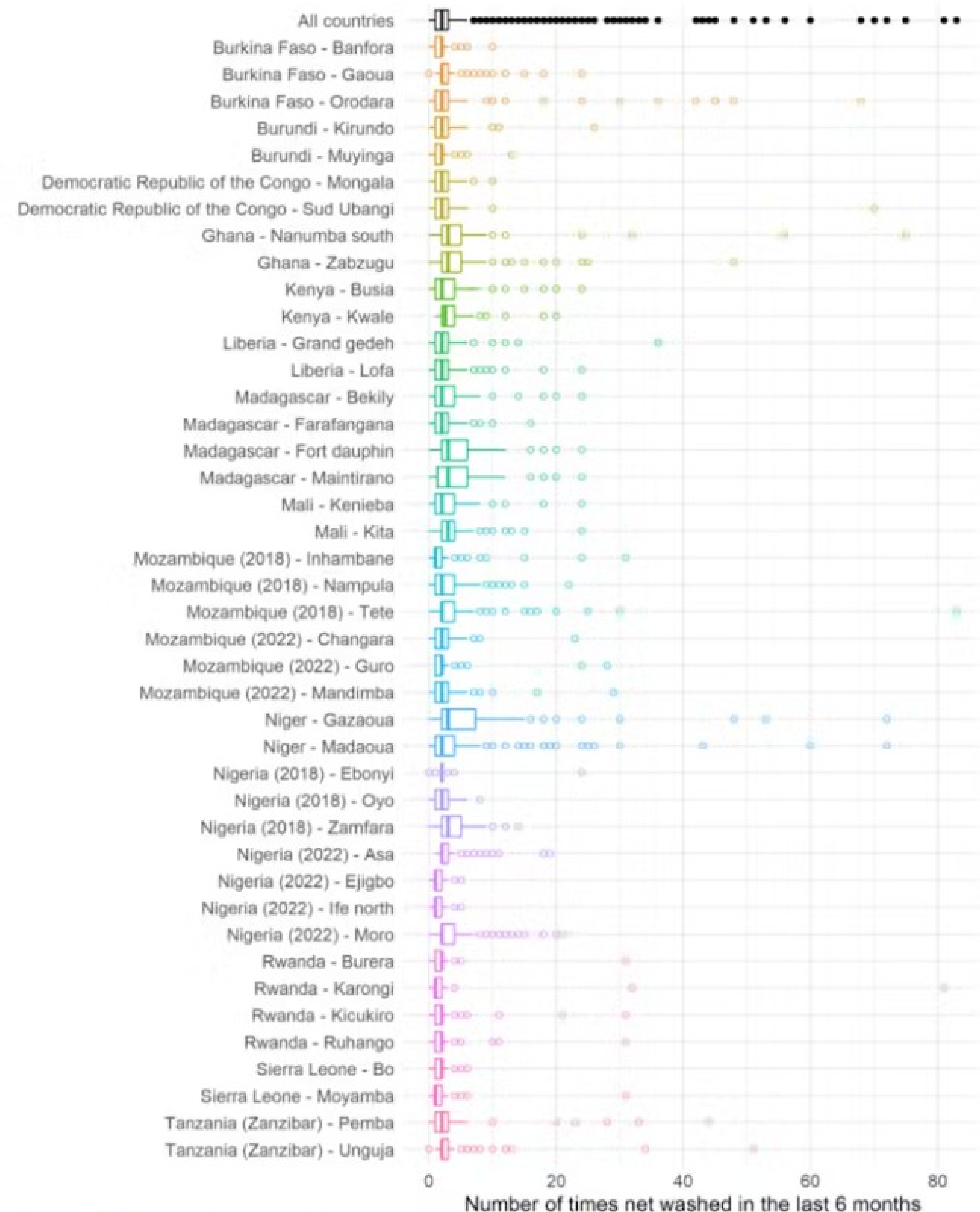
Median washes last 6 months

Color	0	1	2	3	4
Lightest Blue	0	1	2	3	4

Median number of washes for nets that have been washed at least once (22,273 observations of 11,523 nets):

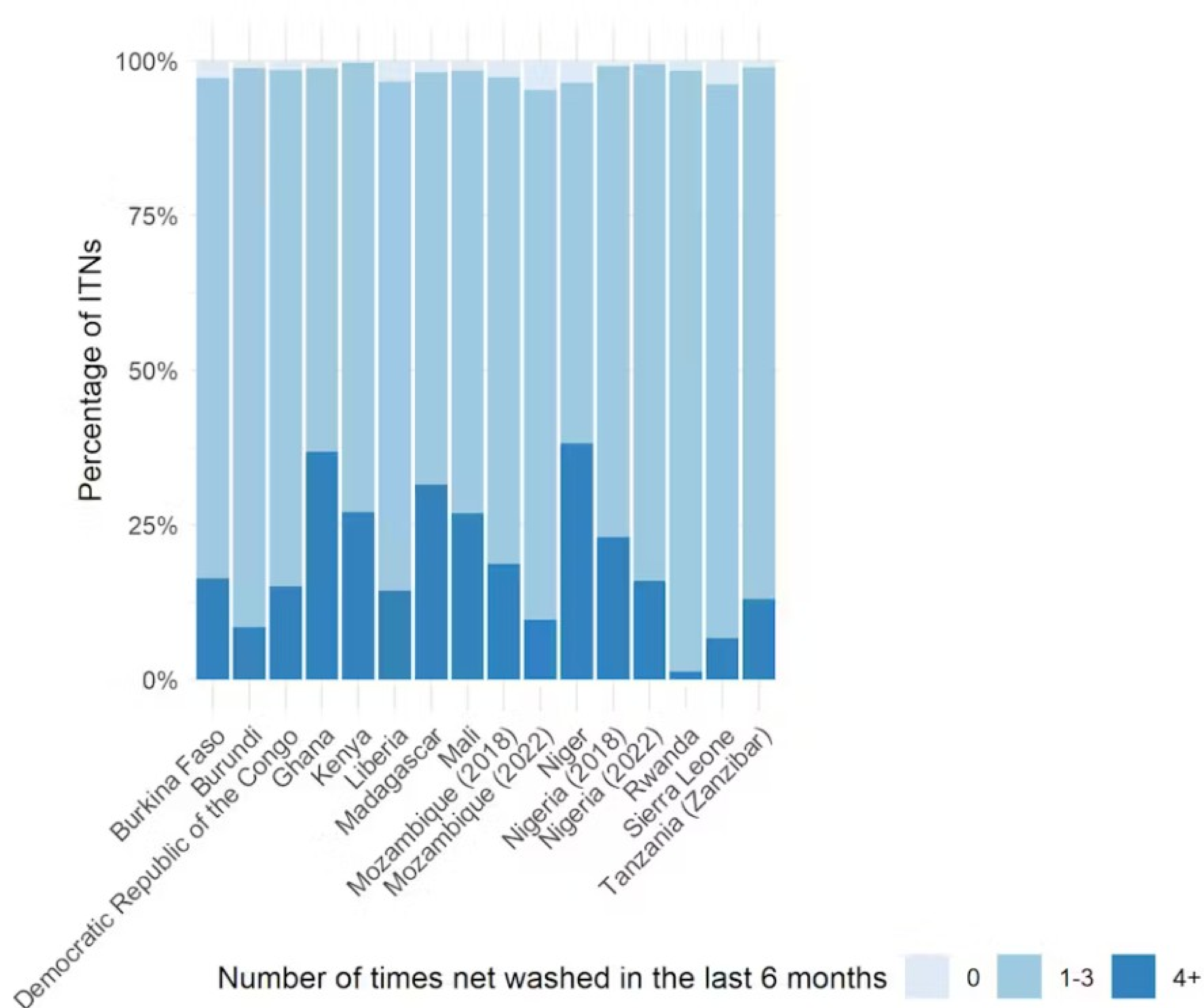
- Overall, the median number of washes in the previous six months was *two*
- By country, median ranged between *one* and *three* times in the previous six months
- Lower in Sierra Leone (once in past six months)
- Higher in Ghana, Madagascar, Mali, and Niger (three times in past six months)

Frequency of net washing within country



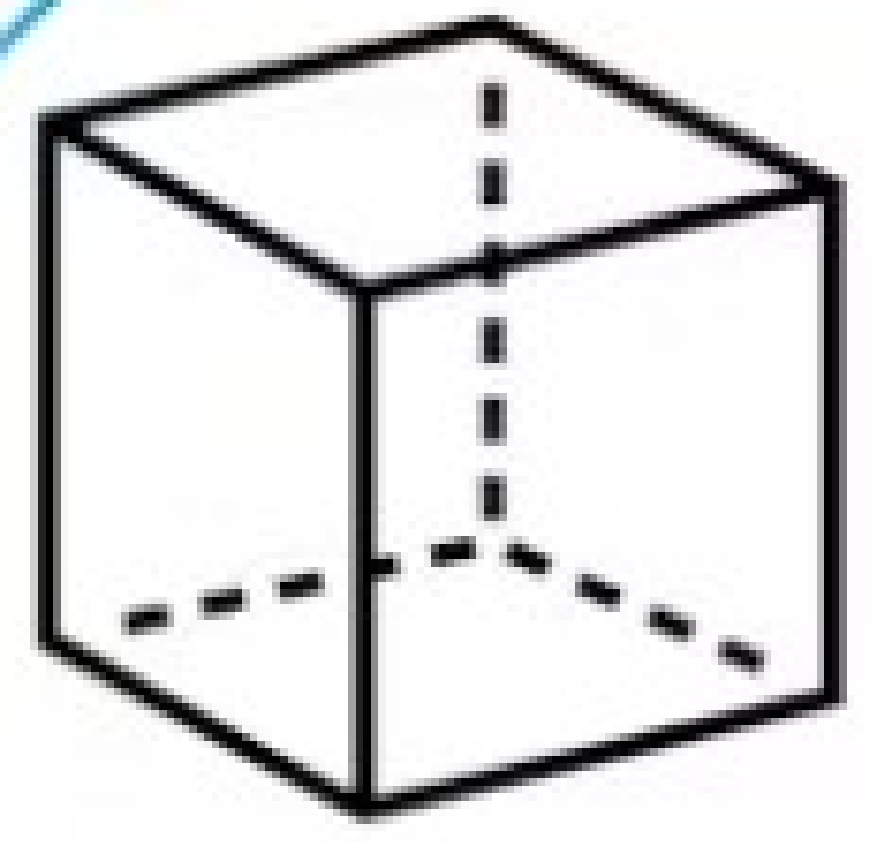
- Median wash frequency at the national level are generally low...
- ...but there is plenty of variation between sites in the same country
- ...and variation between households within the same site, with clear outliers reporting washing their nets very frequently
- We would consider this frequency “overwashing”
 - More frequent than recommended
 - More frequent than assumed when evaluating new ITN products

Frequency of “overwashing” (more than three times in six months)



- Most households fall in the **light blue** category (washing nets no more than three times in past six months)
 - Some households fall into the **dark blue** category (washing nets more than three times in past six months)
- What factors are associated with whether a household falls in the **light blue** or the **dark blue** category?

What factors are associated with frequent net washing?



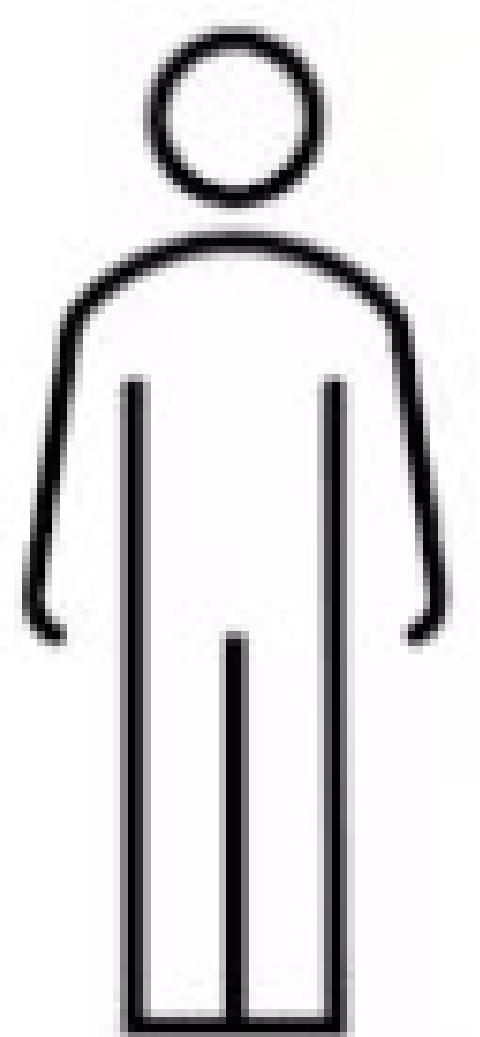
Net attributes

- **Age:** older nets (>12mo) are more likely to be overwashed than new nets
- **Damage:** nets with more, bigger holes are more likely to be overwashed than more minimally damaged nets (but no way to know if causal and/or in what direction)
- **Color:** nonwhite nets are equally likely to be overwashed as white nets, except for green nets which are less likely to be overwashed than white nets



Household attributes

- **Children under five:** households with children under five are more likely to overwash their nets than households without children under five
- **Socioeconomic status:** there is no difference between wealth tertiles in the odds of overwashing



Use and care

- **Use:** nets that were used every night the previous week were more likely to be overwashed than nets only used some nights or not at all
- **Storage:** there was no difference in nets that were found hanging, tied up, or stored away
- **Soap:** there was no association between the type of cleaning product used and overwashing

Conclusions based on adjusted odds ratios and 95% confidence intervals calculate from Generalized Estimating Equations

Does frequent washing impact net survival?



Survival analysis

Characteristic	Adjusted HR ¹	95% CI ¹	p-value
Household size at baseline			
1 - 3 people	Reference		
4 - 6 people	1.11	0.97, 1.26	0.128
7+ people	1.51	1.31, 1.74	<0.001
Presence of any child under five in household			
No	Reference		
Yes	1.21	1.08, 1.34	<0.001
Wealth tertile			
Highest	—	—	
Lowest	1.33	1.18, 1.49	<0.001
Middle	1.26	1.12, 1.41	<0.001
Store food in sleeping rooms			
Never	—	—	
Sometimes or always	1.03	0.91, 1.17	0.594
Cook in sleeping rooms			
Never	—	—	
Sometimes or always	1.25	1.13, 1.38	<0.001
Combined SBC exposure and net care attitudes			
SBC never - attitude never	Reference		
SBC any number - attitude once or more	0.75	0.63, 0.90	0.002
SBC at least once - attitude never	0.73	0.59, 0.91	0.004
SBC twice or more - attitude twice or more	0.49	0.40, 0.60	<0.001
Dominant net users			
Adults only	—	—	
Child and adults	1.20	1.08, 1.33	<0.001
Child only	1.32	1.12, 1.56	<0.001
Fold net up during day when hanging			
Sometimes or always	Reference		
Never	1.50	1.36, 1.66	<0.001
Washed net more than three times in past six months			
No	Reference		
Yes	1.08	0.96, 1.21	0.207

¹HR = Hazard Ratio, CI = Confidence Interval

Adapted from previous work on determinants of net survival

e.g. Kilian et al Malar J 20, 26 (2021)
<https://doi.org/10.1186/s12936-020-03549-2>

Washing a net more than three times in six months does not impact risk of failure

15,729 observations of ever washed cohort nets with 1,915 failures

Caveat

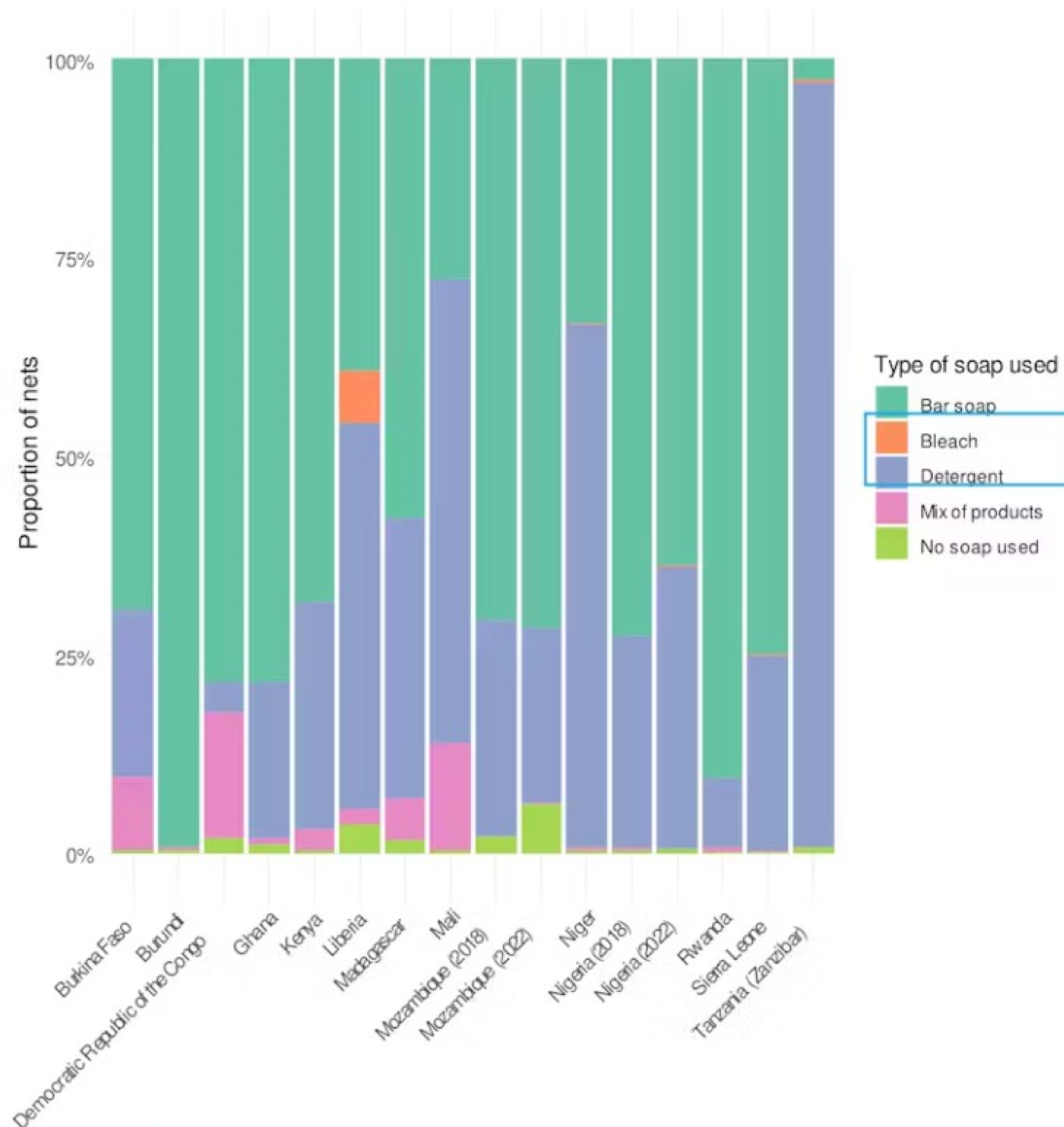
- Net survival is based on the net being ***present*** and in ***serviceable*** condition
- Serviceable is based on physical durability (measuring holes)
- Survival analysis does not capture impact on chemical content or bioefficacy, which is likely impacted by frequent washing



What about other net washing practices?



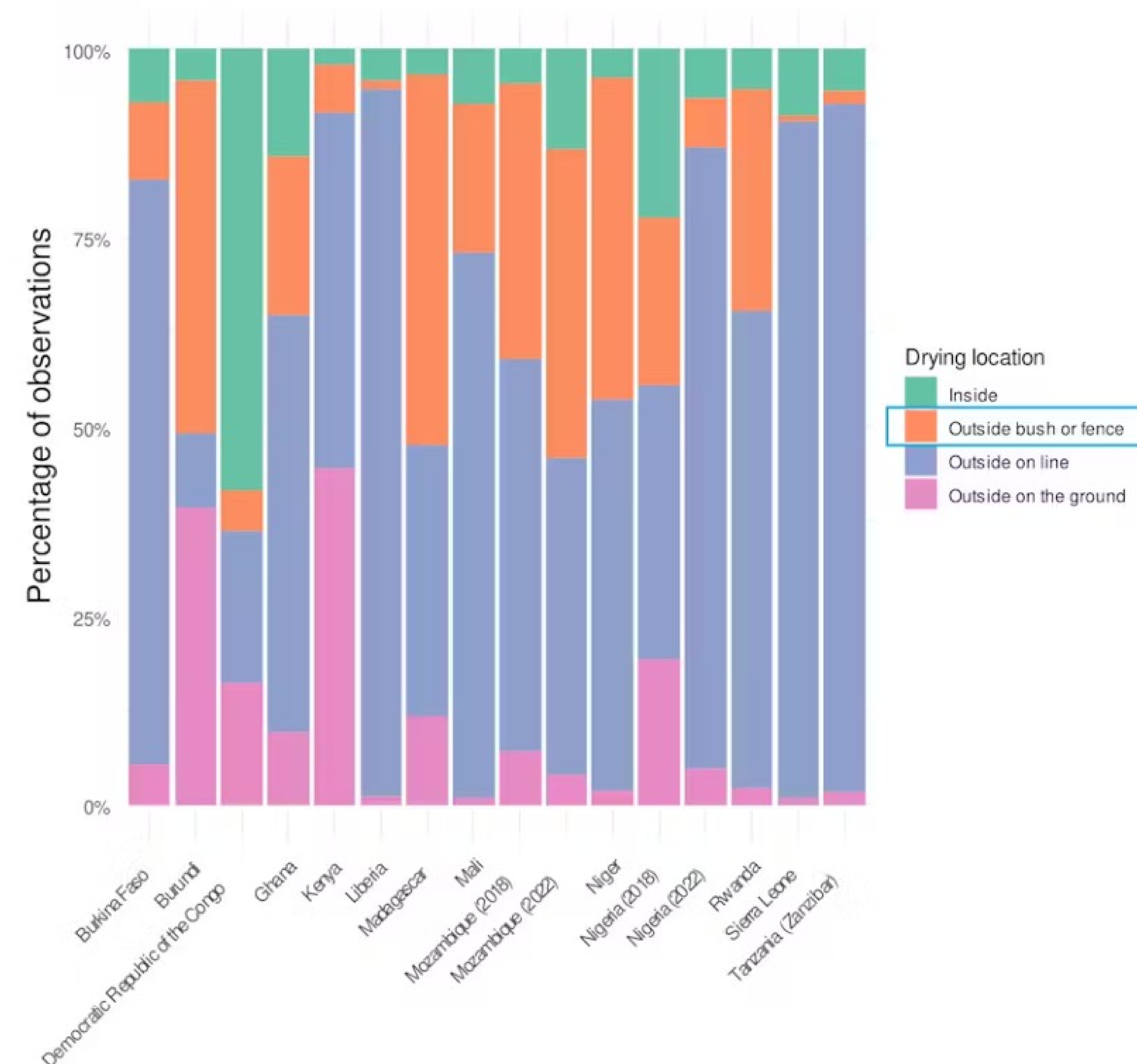
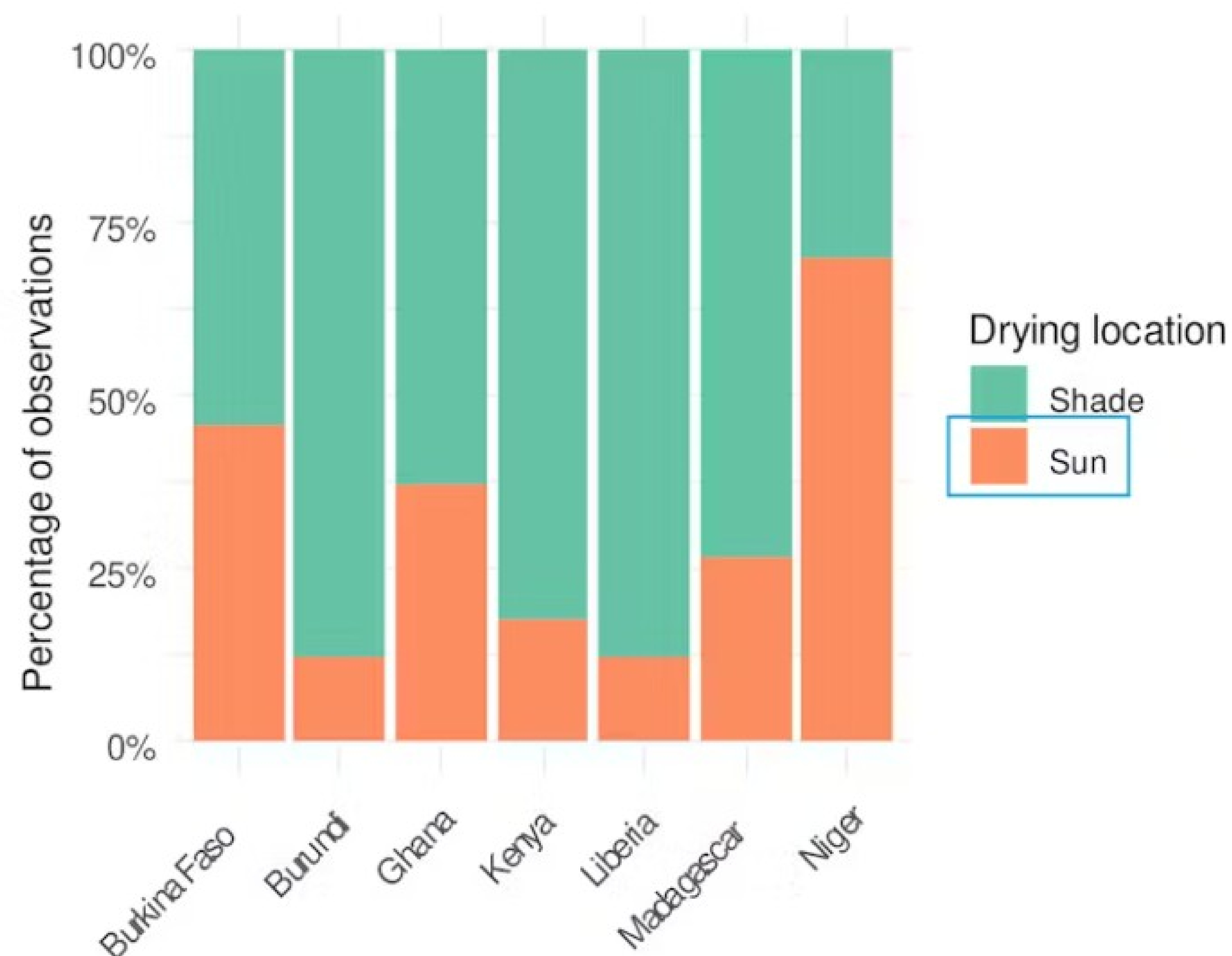
Frequency of washing is not the only behavior that could impact the continued efficacy of a net



- Bleach is particularly damaging
- Very few nets were reported to have been washed with bleach (less than 100)
- Use of detergent is also discouraged but it is much more common than bleach
- Most nets were reported to have been washed with detergent or bar soap

Frequency of washing is not the only behavior that could impact the continued efficacy of a net

- Exposure to sunlight can degrade insecticide and fibers
- Drying on bushes can snag, causing holes to form or enlarge

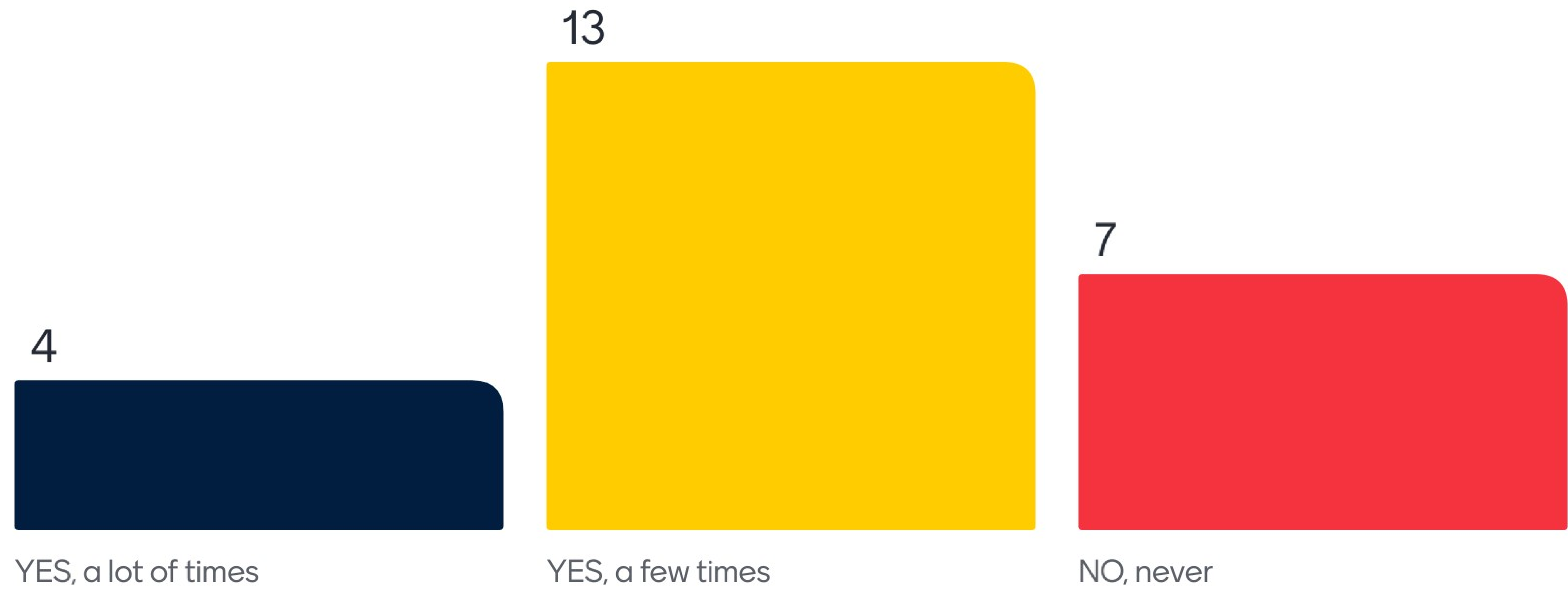


Summary

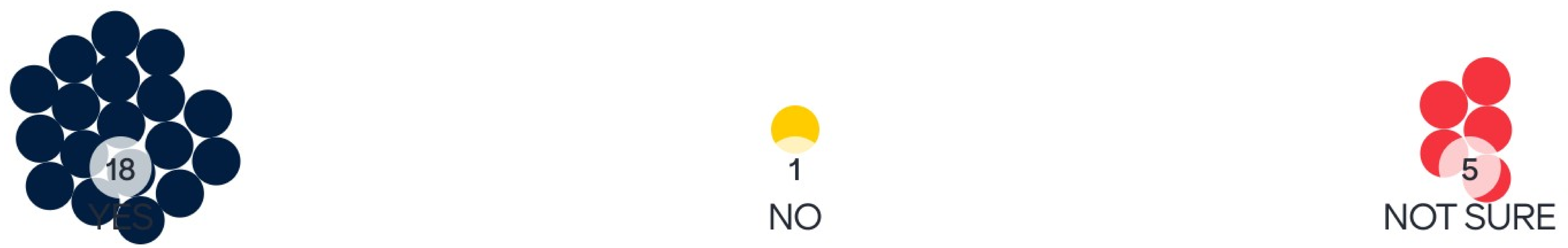
- How frequently do people wash their ITNs?
 - It varies by country, region, and household
 - But most people are not washing their nets more frequently than three times in six months
- Why do people wash their nets frequently?
 - Different factors associated with “overwashing” outcome
 - May be related to how frequently a net becomes dirty or is perceived to become dirty
 - Does not seem to be associated with other net care behaviors
- Does frequent washing impact net survival?
 - No, it does not appear to be a significant factor
 - But this may be due to measuring physical durability rather insecticidal durability
- Next steps
 - Use of chemical content and bioefficacy data
 - Further analysis of other net washing and drying behaviors
 - DM data does not capture all aspect of net care – what data are missing that would be useful to know?

SBC considerations for ITN washing practices

I have washed an ITN before



Are ITN washing practices and behaviour in communities important for us?



Are washing behaviour important?

The majority of these studies (11 out of 17 studies) reported no significant relationship between wash frequency and the outcomes:

- physical integrity (four out of eight studies)
- chemical content (three out of four studies) or
- bioefficacy (four out of five studies)

Why are ITN washing practices / behaviours important to us?

Hygiene

To better understand durability

Pour réaligner les conseils de lavage si besoin

for ITN durability

To maintain the net efficacy

To better enhance SBC messaging

Insecticidal efficacy

To maximise the use and benefit of the nets

Why are ITN washing practices / behaviours important to us?

The assumption initially was washing affects durability of the nets and efficacy.

To adapt SBC messages

ITN durability

Promote hygiene

Un lavage correct permet de maintenir la qualité et l'efficacité

Because each practice mean one behaviour particularly

Net durability

L'efficacité de la Milda tiens également de la concentration de l'insecticide et le lavage impacté cette concentration

Why are ITN washing practices / behaviours important to us?

ITNs can last longer

Sont importants parce qu'une MILD devient sale apres un temps d'usage , raison d'hygiene

Maintenir l'efficacité des MII

To understand how nets are actually used, not assumed to be used, to inform manufacturing standards.

Para facilitar as mensagens de comunicacao e appear a comunidade a levar de forma correta

É importante para manter a higiene

I have responded not sure for the previous question but answering this question i think is important to promote the use of nets

Net care and maintenance

Why are ITN washing practices / behaviours important to us?

Hygiène en respectant
la fréquence minimum
requis

Higiene

Better understanding of
probable unseen during
monitoring durability

Durability and hygiene.

Why are washing practices important?

- We want to extend the life (both physical and chemical) of an ITN
- Certain washing products can be particularly detrimental to ITNs; the lower the alkalinity of the soap used for washing, the less damaging the process is for the insecticide. Locally made or bar soap is less harmful than industrial detergents, and bleach is especially harmful not only to the insecticide but also to the textile fibre.
- The physical process of washing and drying of ITNs also provides opportunities for holes to form or enlarge, potentially exacerbating existing damage caused, for example, by snags, burns, or rodents, and reducing physical durability of the net.
- **Take home message: We don't just look at how often nets are washed, but also how they are washed.**

What have we been messaging to households when it comes to washing their ITNs?

Regular washing

How to wash and dry nets for longevity.

How to wash the net

Use soft soap /bar soap for washing.

Use ordinary soap and not dry in the sun

Use of bar soap, hang in a shade, and can be washed for at least 21 washes

- Don't use harsh detergents - 4 to 5 times a year

No drying in sun

What have we been messaging to households when it comes to washing their ITNs?

Lavage avec savon ordinaire . Sechage a l'ombre pour ne pas enleve les produits insecticide

Lavez vous MILDA avec de l'eau simple et du savon quand elle est sal et l'étaler à l'ombre

It can damage the net and decrease insecticide efficacy

The way and frequency

Laver sans détergent mais avec savon local sans caustique et exposer à l'ombre

Don't dry nets on bushes, dry them on a line in the shade.

Laver les MII une fois par trimestre avec un savon doux et la sécher à l' ombre

Utilisation du savon en barre Pas de detergent

What have we been messaging to households when it comes to washing their ITNs?

User Sabado em barra e
sever na sombra

Additionally through the
water used in the toilet or pit
latrine to prevent

less availability of bar
soap, already using
other products

poor SBC

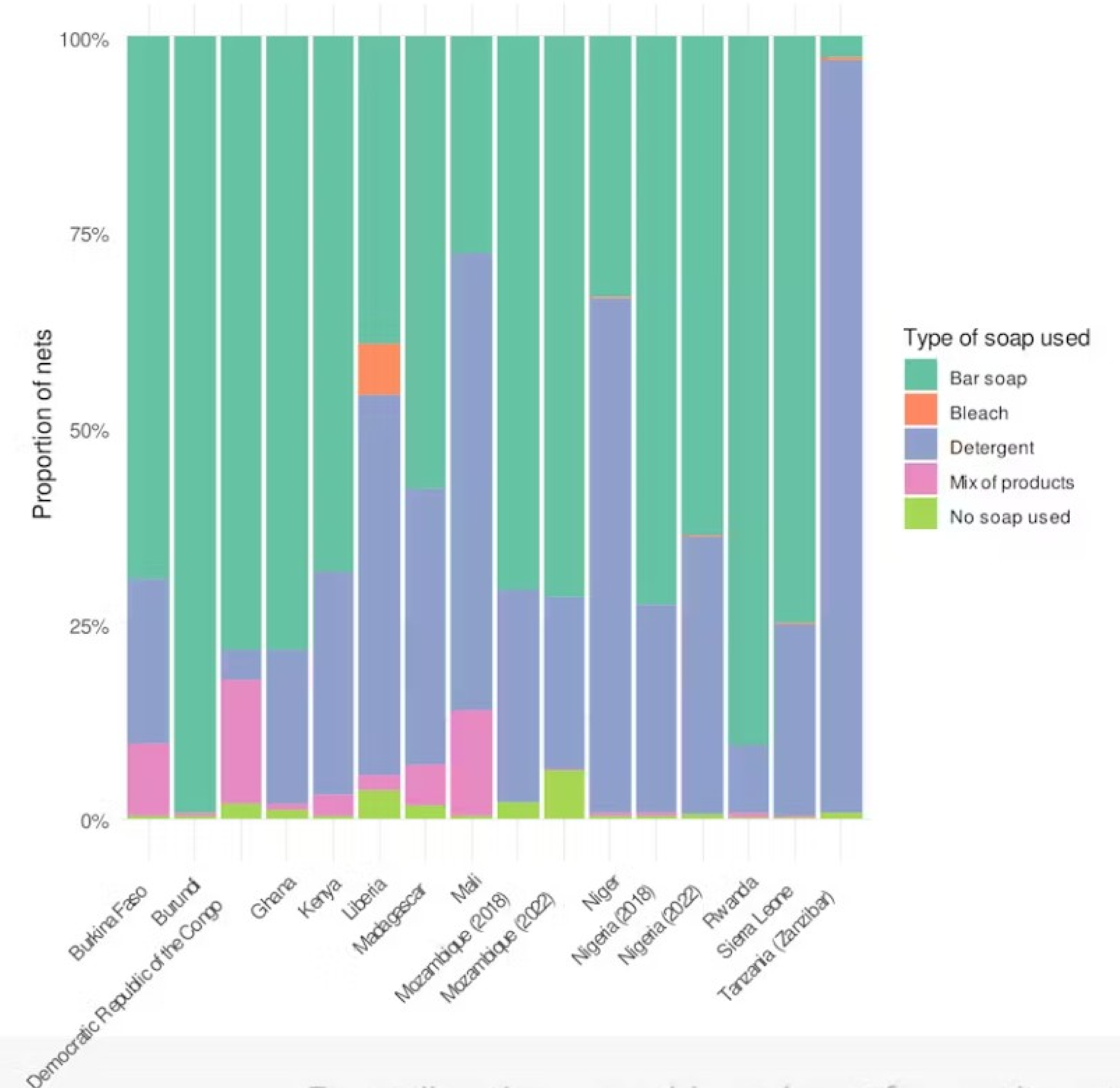
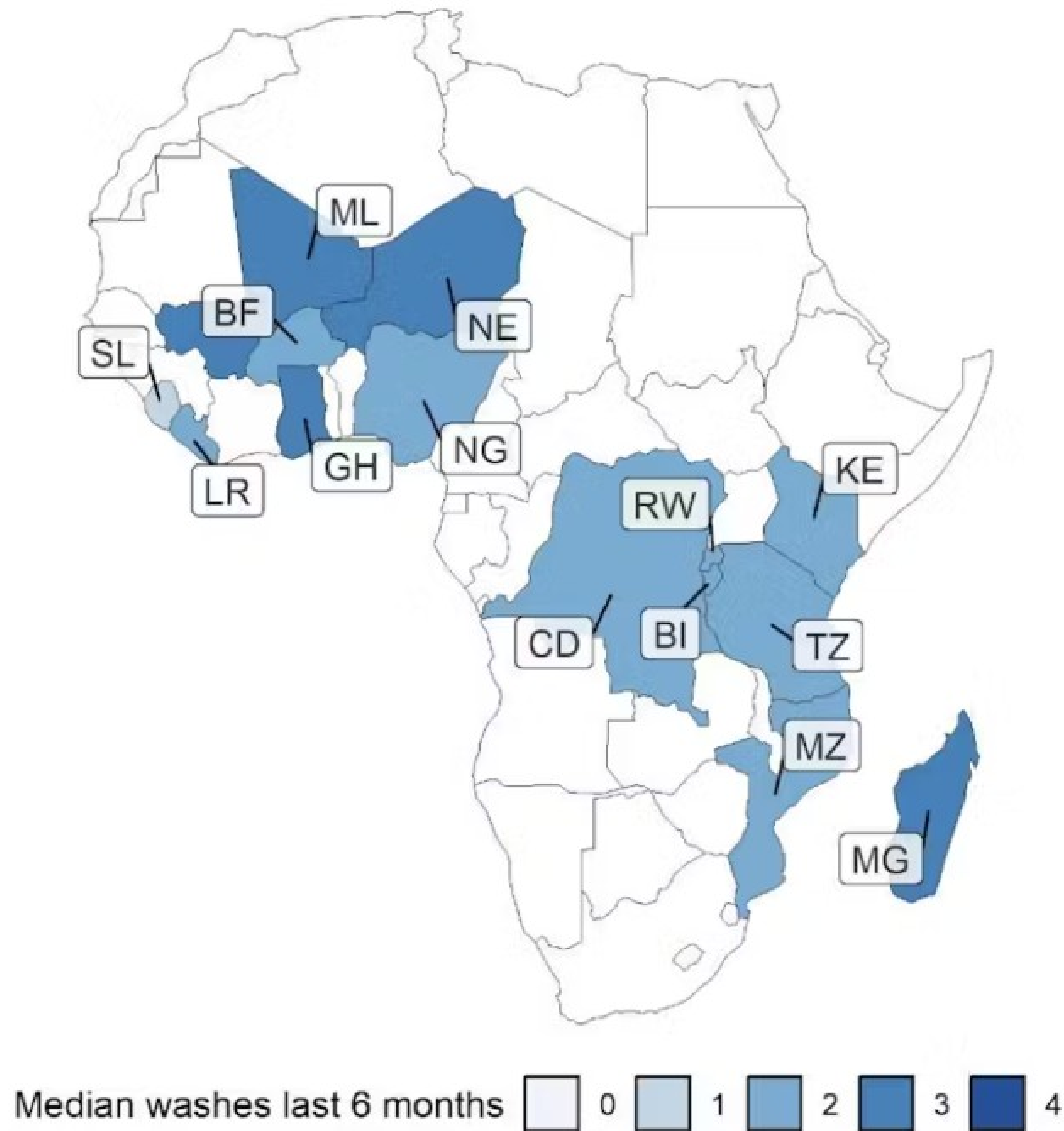
Examples of messages to households

- Wash your nets only when they are dirty
- The LLINs in your house should be washed with mild soap and water twice a year, and dried in the shade. If the net is treated well, it will protect you and your family for up to 3 years.
- When the net is dirty, wash with mild soap. Spread under the shade to dry; avoid spreading under the sun.
- Wash the net only when it's dirty. Wash the net with water and soap, and not bleach. Always dry your net in the shade.
- Wash your nets not more than 4-5 times in a year with plain water and if it gets torn sew it with thread and needle to prevent mosquitoes from entering the net



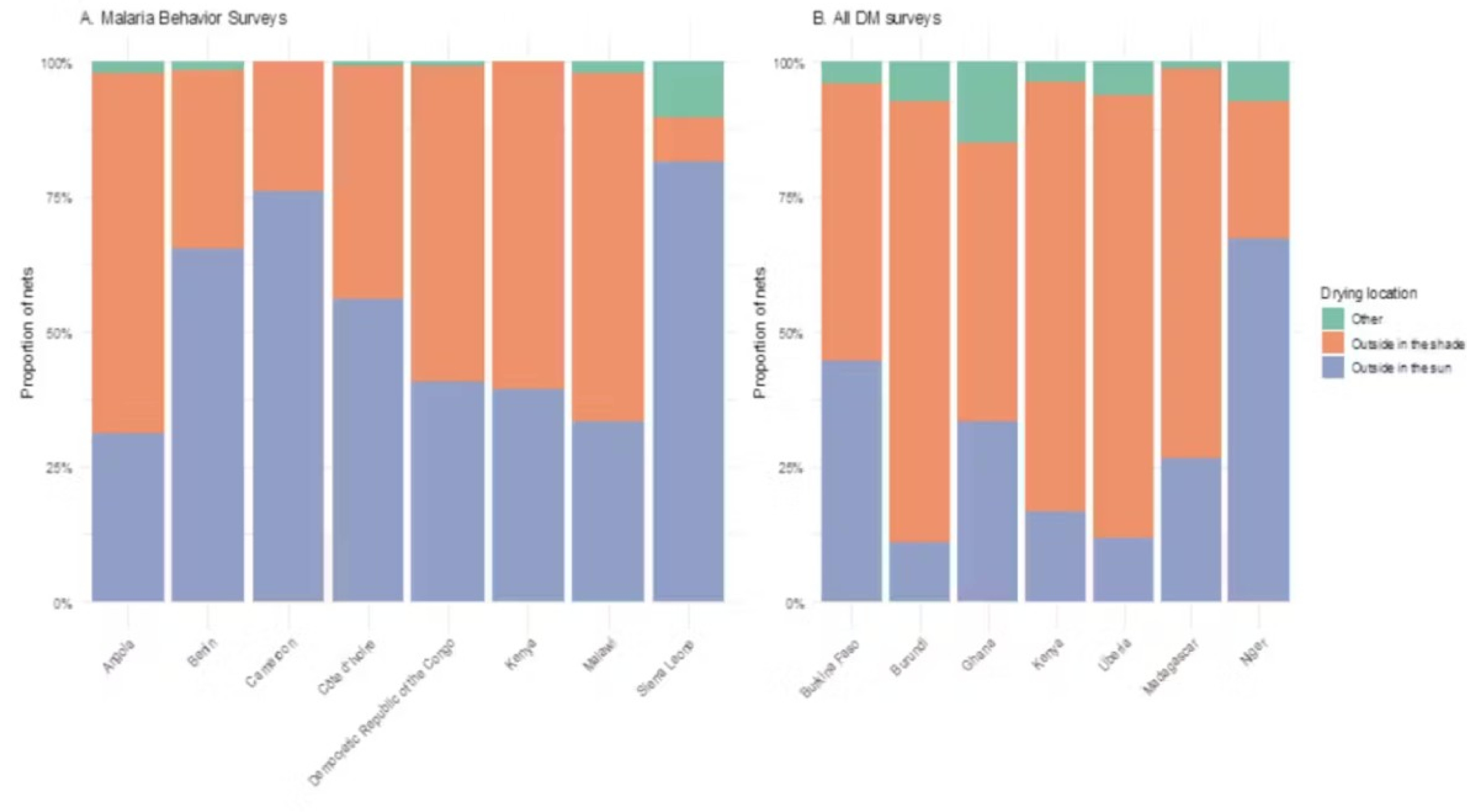
What behaviour are we seeing?

B. Durability monitoring surveys



What behaviour are we seeing?

Net drying location by country



What behaviour are we seeing?



Take home message

- These results reinforce that wash practices are not static (they are not the same within and across countries) and may be influenced by attributes of the net as well as messaging around net use, care, and repair.
- The variation in net washing practices of individuals highlights the value of qualitative studies in understanding what underlies this variation.

Why should we be messaging about ITN washing?

- Helinski et al 2015 reported that net washing frequency decreased from 18.4 to 9.9 times per year following social and behavior change communication in Uganda.
 - Messaging about other ITN washing behaviours might also have the same outcome and impact
- Limited funding means that there will be less nets available for distribution
 - We need to extend the life of ITNs

• Why are we still seeing “negative” ITN washing behaviours?

Faible communication

Primary motivator for net washing behaviors is not extending life of net

Because we don't continue SBC post distribution

The nets are really dirty and needs to be washed !

Family and household reality doesn't align with sbc best practices

Realités locales , par exemple on utilise que le savon ou detergent qui est disponible.

Low communication

Not enough messaging on positive net washing.
Poverty

•Why are we still seeing “negative” ITN washing behaviours?

Poor post campaign
SBC

Insuffisance et qualité
des messages .

Ineffective channels
being used for SBC

hygiene seen as more
important than net life

Queremos desencorajar
o meu uso

What should we be messaging when it comes to ITN washing?

Only wash when net looks very dirty and not more than once in three months

Ne lavez pas vos MILDA avec la javel

Respecter la fréquence

I think that we need to make the messaging clearer and simple

Frequence de lavage.
Sechage a l'ombre.
Eviter les detergents

Keep usual messaging but be super clear on bleach and detergent and where to dry it

Laver la MII une fois tous les 3 mois

Les messages jusqu'à preuve du contraire sont bons , peut être intégrer plus désormais les réalités locales

What should we be messaging when it comes to ITN washing?

Levar apenas com Sabão e sevar na sombra, levar somente quando estiver suja

focus on method of washing and drying (since focus on hygiene is shown to be higher)

Only wash when dirty or if necessary.

Wash only with water

Wash the net when it is dirty

Adopt messages to the environment's context. e.g a mining community might need to wash more often. And still recommend how often to wash in a year and not to use detergents

Wash using mild soap and dry in the shade

Dry the net under the shed

Why are we still seeing negative washing practices

Some things to consider

- Are our SBC strategies sufficiently “informed” by data and evidence?
 - What is the real issue for our target group
 - How do they best get their information
- Are we “recycling” the **same messages** through the **same communication channels**
- Are we innovating our SBC strategy
- Do we need to “revisit”:
 - what we are messaging
 - how we are messaging

Take home message

- We need to help households extend the life of ITNs
- SBC should consider ITN washing practices
- Key messages should cover the whole “process” of ITN washing, not just frequency
- Programs should assess the effectiveness of their SBC activities / messages and revisit them if necessary
- SBC strategies, activities and messages should be informed by data



Q&A

amp | The Alliance for Malaria Prevention

