CLINTON HEALTH ACCESS INITIATIVE

Subnational tailoring of malaria interventions and strategies

July 11, 2024

Disclaimer

- All country maps included in this presentation are for **illustrative purposes only** and should not be interpreted or used for any other purpose
- The material presented here was primarily developed by WHO-GMP (Dr. Beatriz Galatas), or co-developed for francophone Africa by WHO-GMP and CHAI

World Health Organization

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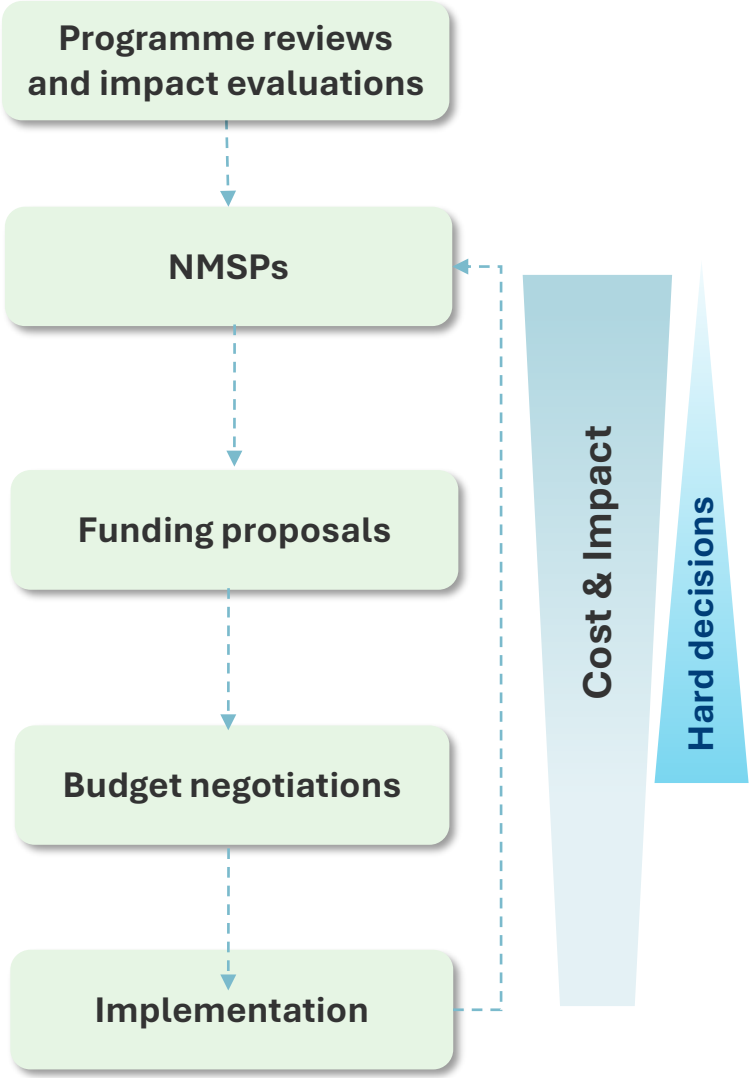
What?

Subnational tailoring of malaria interventions (SNT)

The use of local data and contextual information to determine the appropriate mixes of interventions and strategies, for a given area, for optimum impact on transmission and burden of disease



Where should we intervene?

What interventions or strategies should be used?

What interventions can we afford?

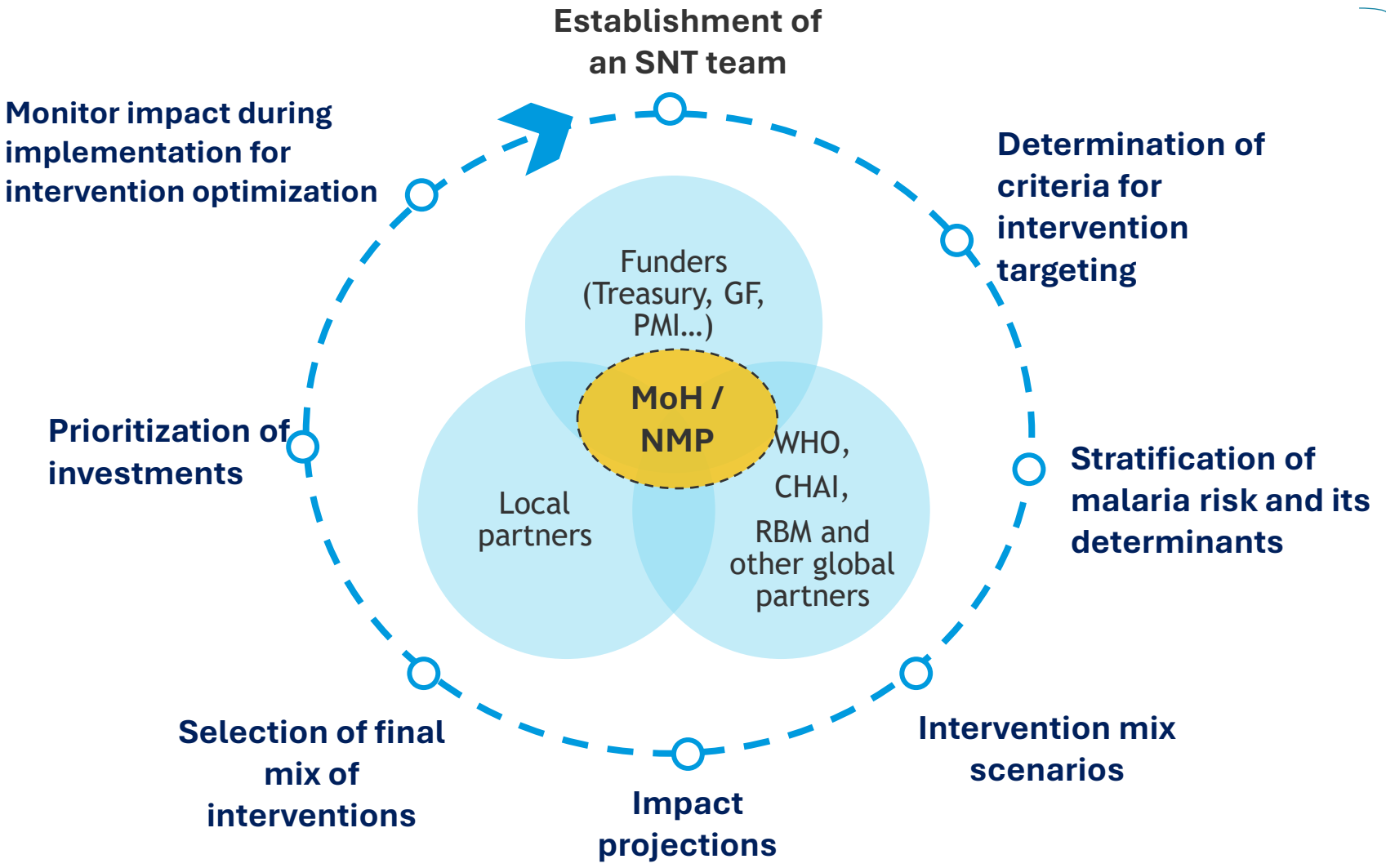
What interventions should be prioritized?

When should we intervene?

What will be the most efficacious delivery strategy?

How ?

The process requires a system-wide and multi-stakeholder participation anchored on the broad principles of health sector priority setting



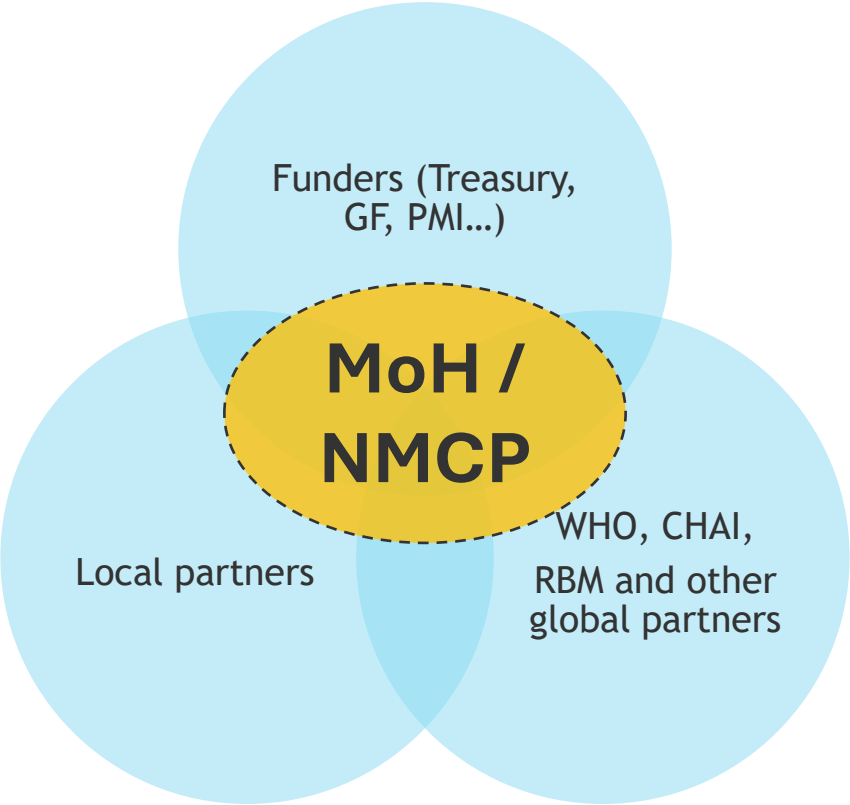
DATA

Structured databases on relevant indicators to understand malaria risk and its determinants

How ?

Establishment of an SNT team

Lead by NMCP but includes other government departments, national, regional and global partners with consent from the NMCP. This team is responsible for the whole process, from **data assembly, analysis, strategy development, resource mobilization and prioritization, and implementation**.



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Determination of criteria for intervention targeting

The national team compiles all **interventions and strategies under consideration and develops the criteria** to be used for tailoring each one of them building on the WHO normative guidance

WHO recommended interventions and targeting criteria adapted to country context

	Transmission (Incidence, Prevalence, Mortality, *etc*)	Age distribution of burden	Seasonality	Entomo-logical indicators	Environment and urbanicity	Vulnerable populations, conflict, emergencies	*etc*[1]
ITNs	+			+	+	+	
IRS	+		+	+			
LSM	+			+	+		
SMC	+	+	+				
MDA	+	+				+	
IPTp	+						
PMC	+	+	+				
Vacc.	+	+					
iCCM	+					+	
Surv.	+	+					
etc[2]							

1- Health system capacity, access to care, EPI coverage, previous exposure to interventions, community acceptability ...

2- Targeted improvements of case management, surveillance systems, intervention-specific delivery strategies ...

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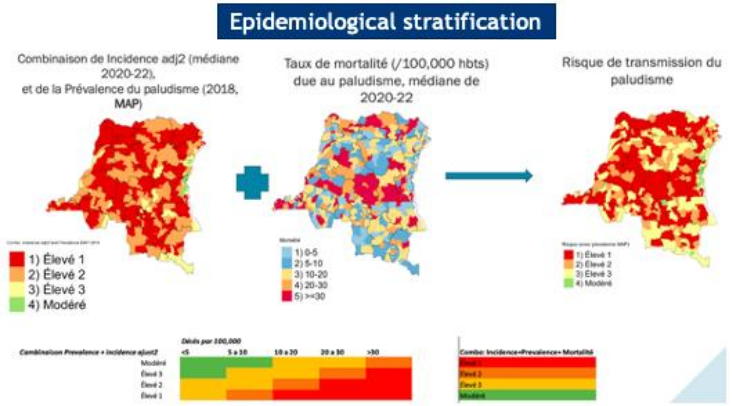
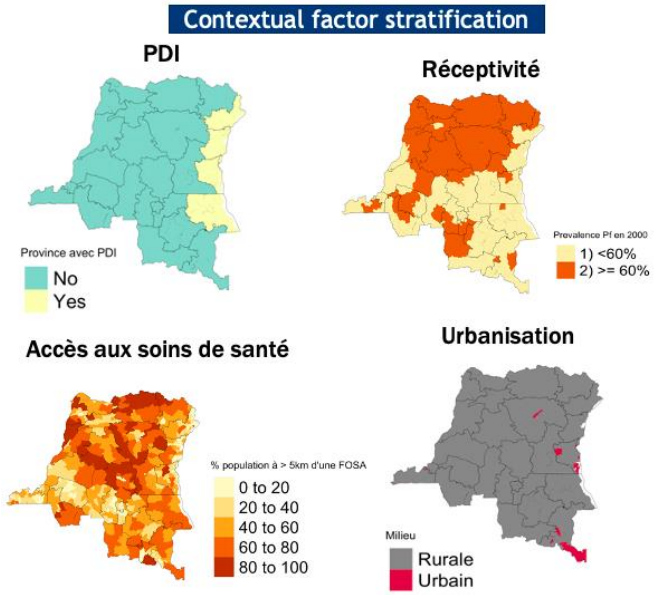
Stratification of malaria risk and its determinants

Ecological, interventional, systemic, social and other **determinants are stratified at operational units of relevance and in ways that answer the specific question at hand based on the agreed upon criteria**. As such the process of stratification depends on the specific intervention or strategy under discussion and moves away the use epidemiological metrics alone**. Here statistical and geospatial methods are useful**.





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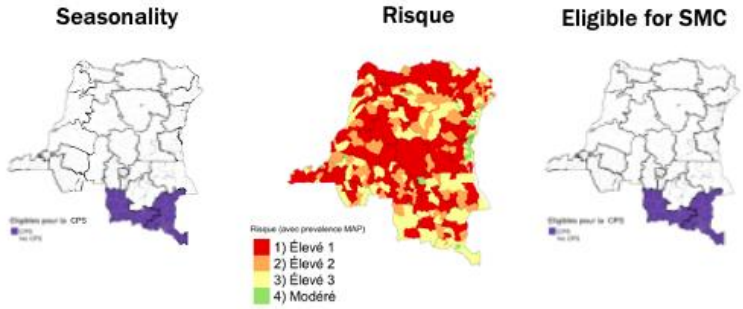
Intervention mix scenarios

Stratified layers required to inform intervention or strategy-specific criteria are used to develop various scenarios of intervention mixes

	Seasonality	Transmission (Incidence, Prevalence, Mortality, *etc*)	Age distribution of burden
SMC	+	+	+



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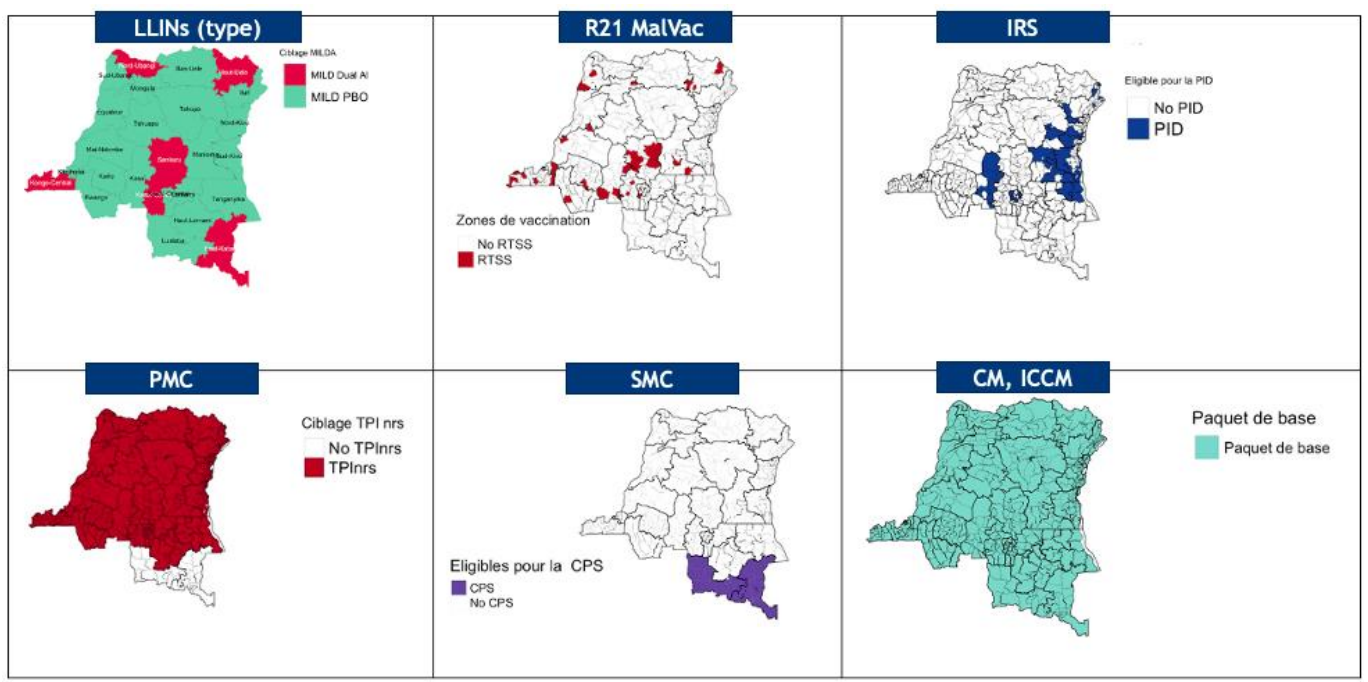
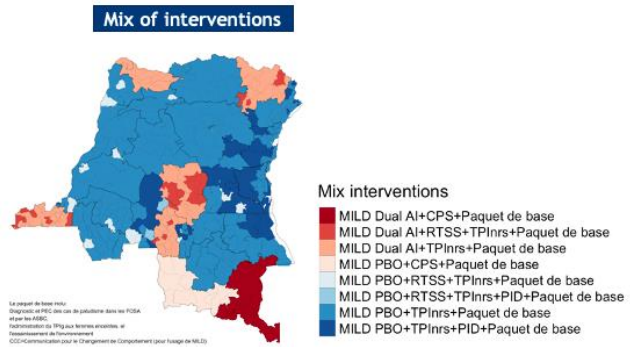
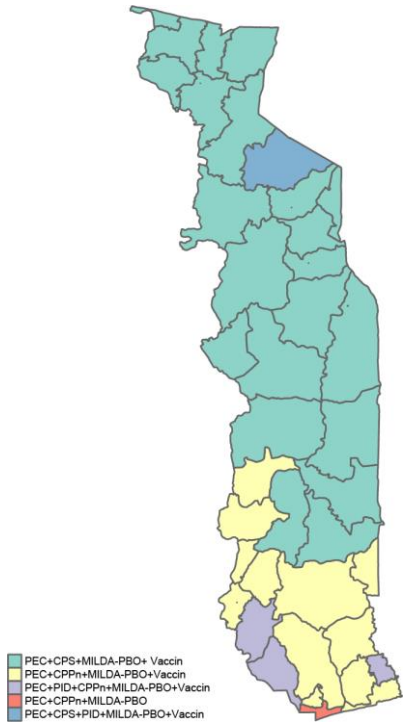


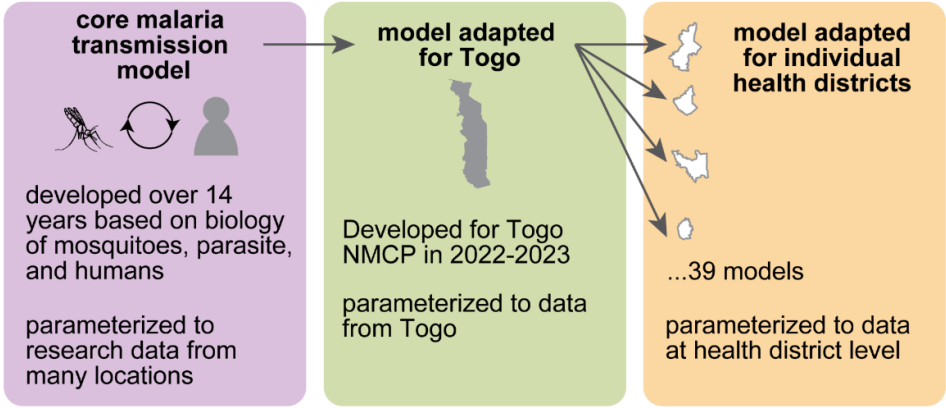


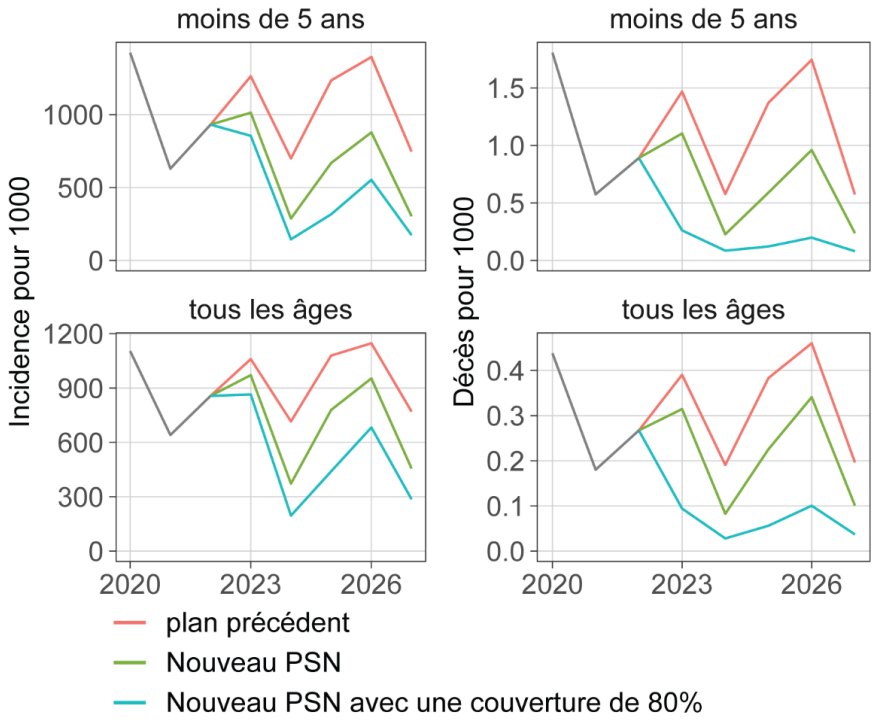
How ?

Impact projections

The impact of these scenarios is estimated using mathematical models . At this point further refinements may be made to the scenarios. **A consensus based approached** informed by the evidence is used to select the final mix of intervention and strategies.







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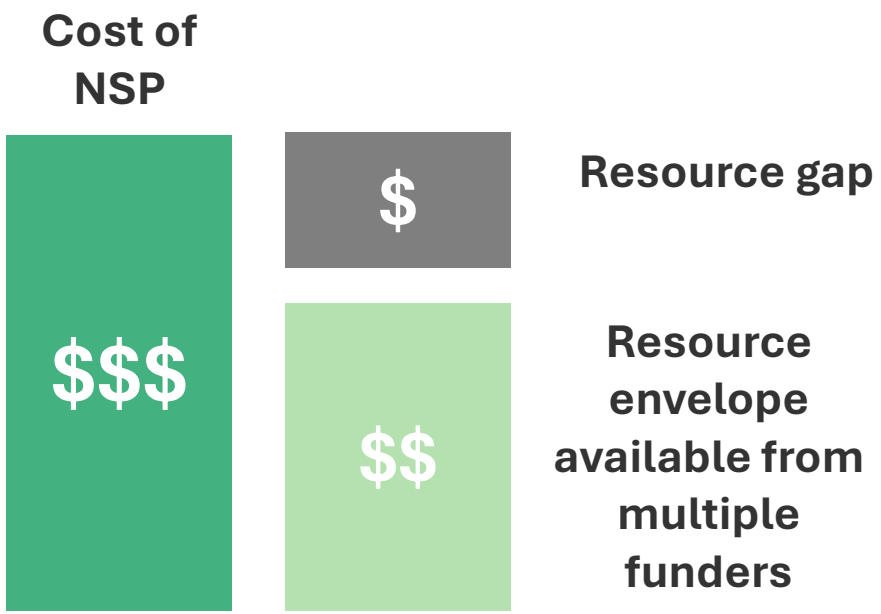
Costing of agreed-upon plan

This plan is then costed and is used for resource mobilization.

Mathematical modeling is helpful as an advocacy tool for additional resource mobilization



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Mathematical modeling is helpful at this point to assess the impact of the various prioritization decisions.

Prioritization of investments

Once there is clarity **in the available resources, the costed strategic plan is used as the basis to further inform rational prioritization of investments to maximize impact** if the resources are insufficient.

This is usually the most challenging part of the process.

Mathematical modeling is helpful at this point to assess the impact of the various prioritization decisions.

Guiding principles for prioritizing malaria interventions in resource-constrained country contexts to achieve maximum impact

?

Background

In line with the goals of the *Global technical strategy for malaria 2016–2030 (1)* and with Sustainable Development Goal 3, to ensure healthy lives and promote well-being for all at all ages, the World Health Organization (WHO) Global Malaria Programme continues to promote the principle of leaving no one behind and to ensure access to effective malaria interventions for all those in need.

Due to the heterogeneous distribution of malaria transmission and its determinants, subnational tailoring (SNT) provides an analytical framework to facilitate the targeting of each population with appropriate intervention packages for maximum impact to inform national strategic planning and prioritization based on resources available. The WHO Global Malaria Programme recommends the use of subnational data on disease epidemiology and other relevant local contextual factors to facilitate the process of SNT. Once the strategies and intervention mixes have been defined, programmes can proceed to the prioritization of interventions for effective programming, based on available resources.

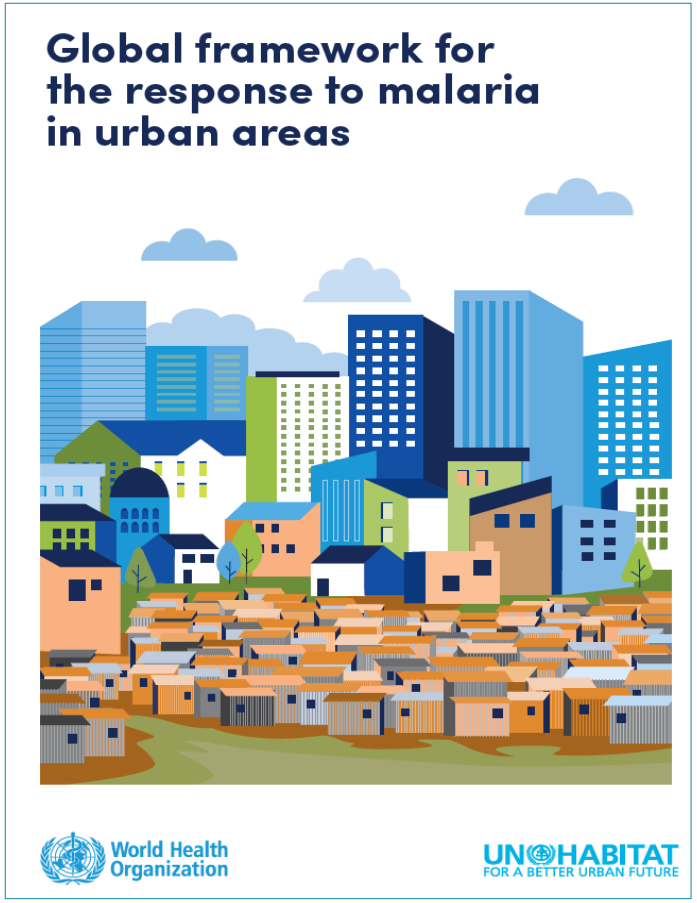
In response to ever increasing financial constraints, the WHO Global Malaria Programme and Regional Offices, in consultation with selected national malaria programme managers and technical partners, have developed these guiding principles for prioritizing interventions in resource-constrained countries to achieve maximum impact for national malaria control programmes. Prioritization is the process of subnationally selecting the most impactful mixes of interventions for implementation and de-prioritizing others because of financial constraints, considering equity and programmatic feasibility. This process requires difficult choices to be made to minimize the negative impact of withholding some interventions included in the national strategic plan. It differs from optimization – the process during planning and implementation by which programmes ensure that the strategies and effective interventions deployed achieve the maximum impact with the most efficient use of available resources.

Prioritization must be guided by the basic principles of primary health care and universal health coverage: patient-centredness, community empowerment, self-determination, accessibility, acceptability, equity, quality, intersectoral collaboration, value and sustainability, accountability and transparency. It should be aligned with the broader national health prioritization processes and the development of health benefit packages, consistent with the principles of country ownership, cost-effectiveness, financial risk protection and political acceptability *(2)*.

World Health Organization

	rable ations	*etc*[1]
ITNs	-	++
~~IRS~~		
LSM		
SMC		++
~~MDA~~	-	
IPTp		
PMC		
Vacc.		
iCCM	-	++
Surv.		

Microplanning the malaria response in urban areas

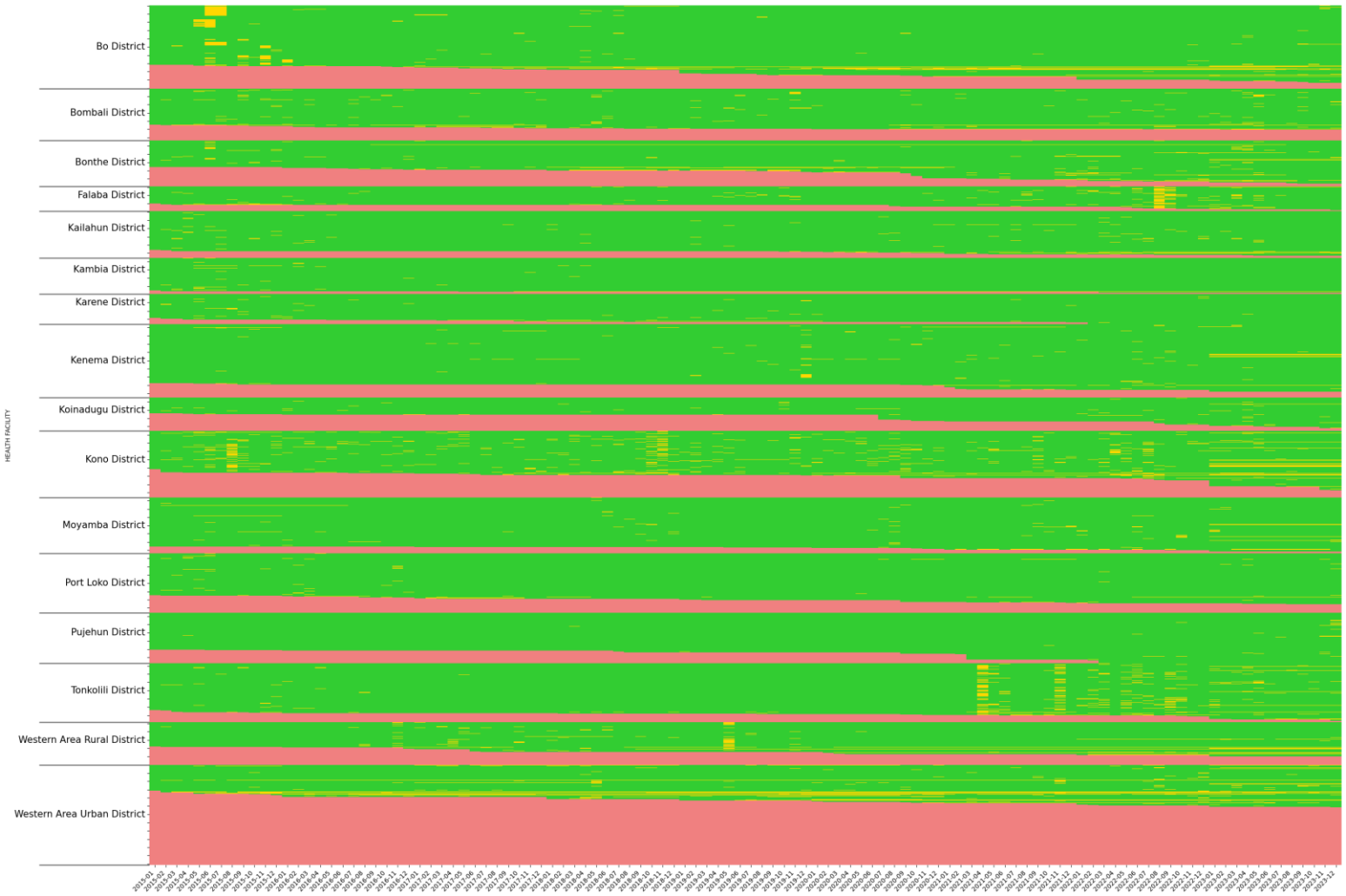


RURAL	URBAN
Transmission is mainly due to natural ecology, although some human activities (e.g. mining) may lead to increased risk	Transmission is influenced considerably by environmental modifications, and prevalence and incidence are influenced by human population movement
Transmission is generalized in most moderate- and high-transmission settings, but focal in low-transmission and elimination settings	Transmission is mostly focal – often higher in peri-urban areas and informal settlements – with a few areas accounting for most local infections
In moderate- and high-transmission settings, most older children and adults have immunity	Overall population immunity is low
Most infections are locally acquired	A large proportion of infections may be linked to travel to and from rural areas with higher transmission
The public health sector is often the main source of care for fevers	The private health sector is a major source of care for fevers, especially in sub-Saharan Africa
High acceptability of IRS and ITNs, and use of ITNs	Moderate or low acceptability of IRS and ITNs, and use of ITNs in some settings
Most housing types allow high levels of indoor mosquito biting	Many housing types reduce indoor biting, except in poor-quality housing in low-income areas
Aquatic habitats of malaria mosquitoes are often large and plentiful (e.g. flooded grasslands, drainage channels, large pools)	Aquatic habitats are more diverse (e.g. polluted pools, flooded fields, overhead tanks, stagnant pools, other exposed water features)

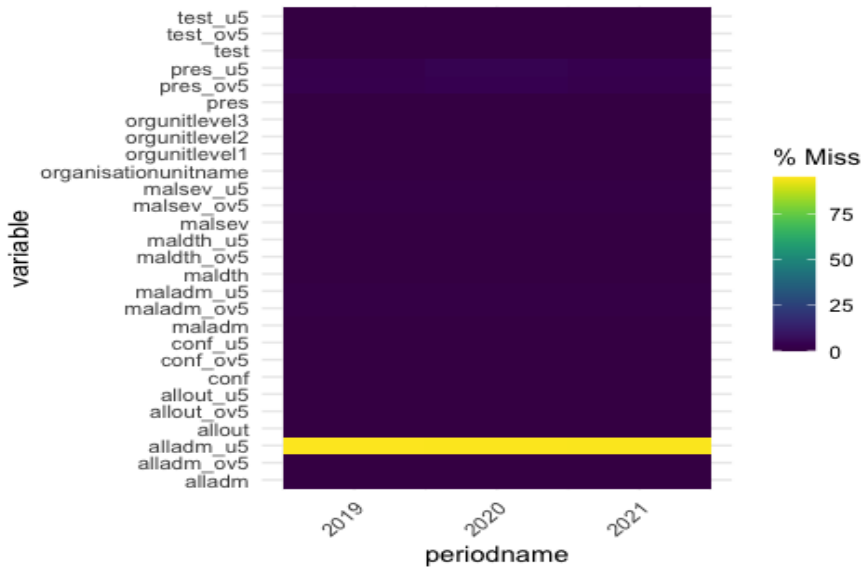
Key concepts in SNT data analysis

Reporting Rate Choice and impact on transmission assessment

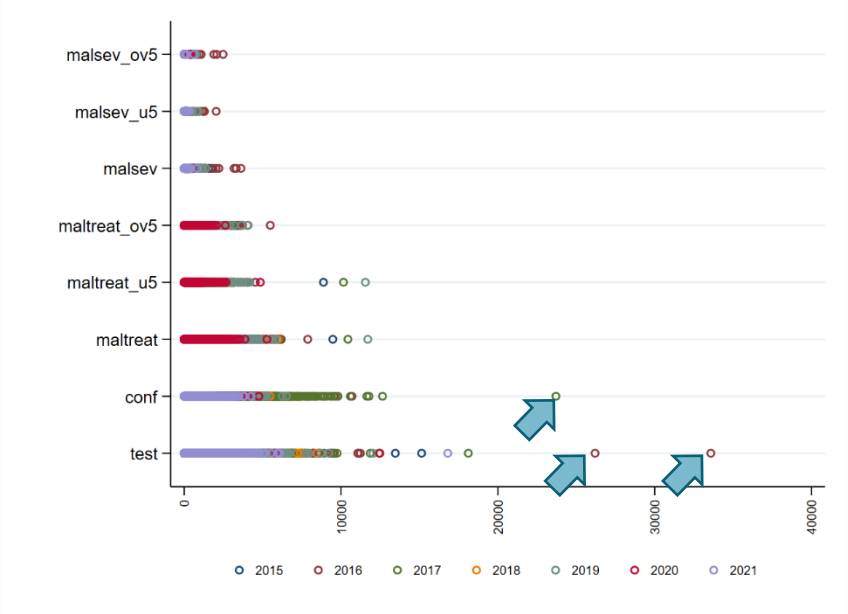
Reporting of at least one variable: all-cause outpatients, tested, confirmed or treated for malaria

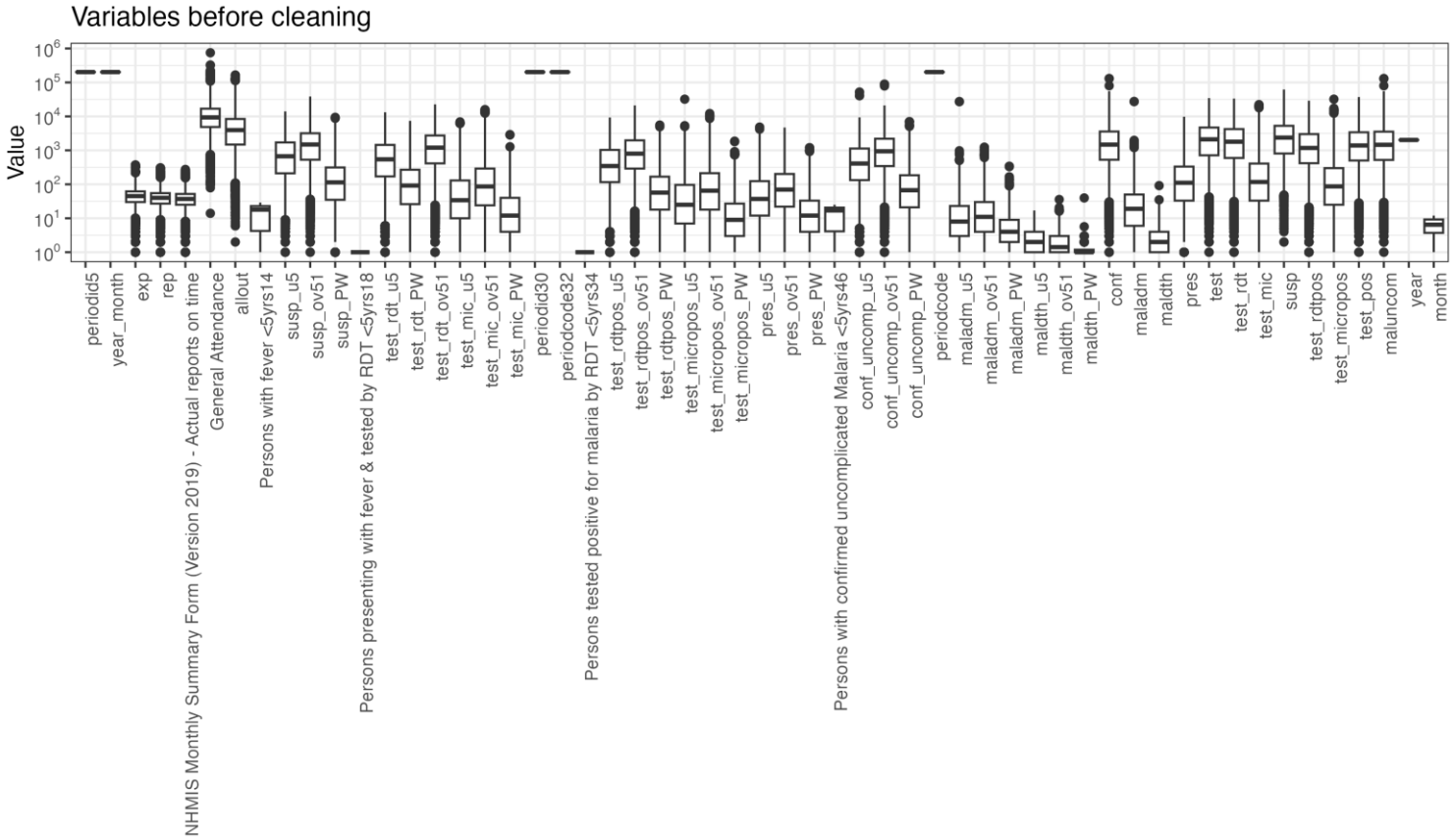


Red = Missing HF-month record without previous reporting
Green = HF-month record reported
Yellow = HF-month missing record after a previously reported record



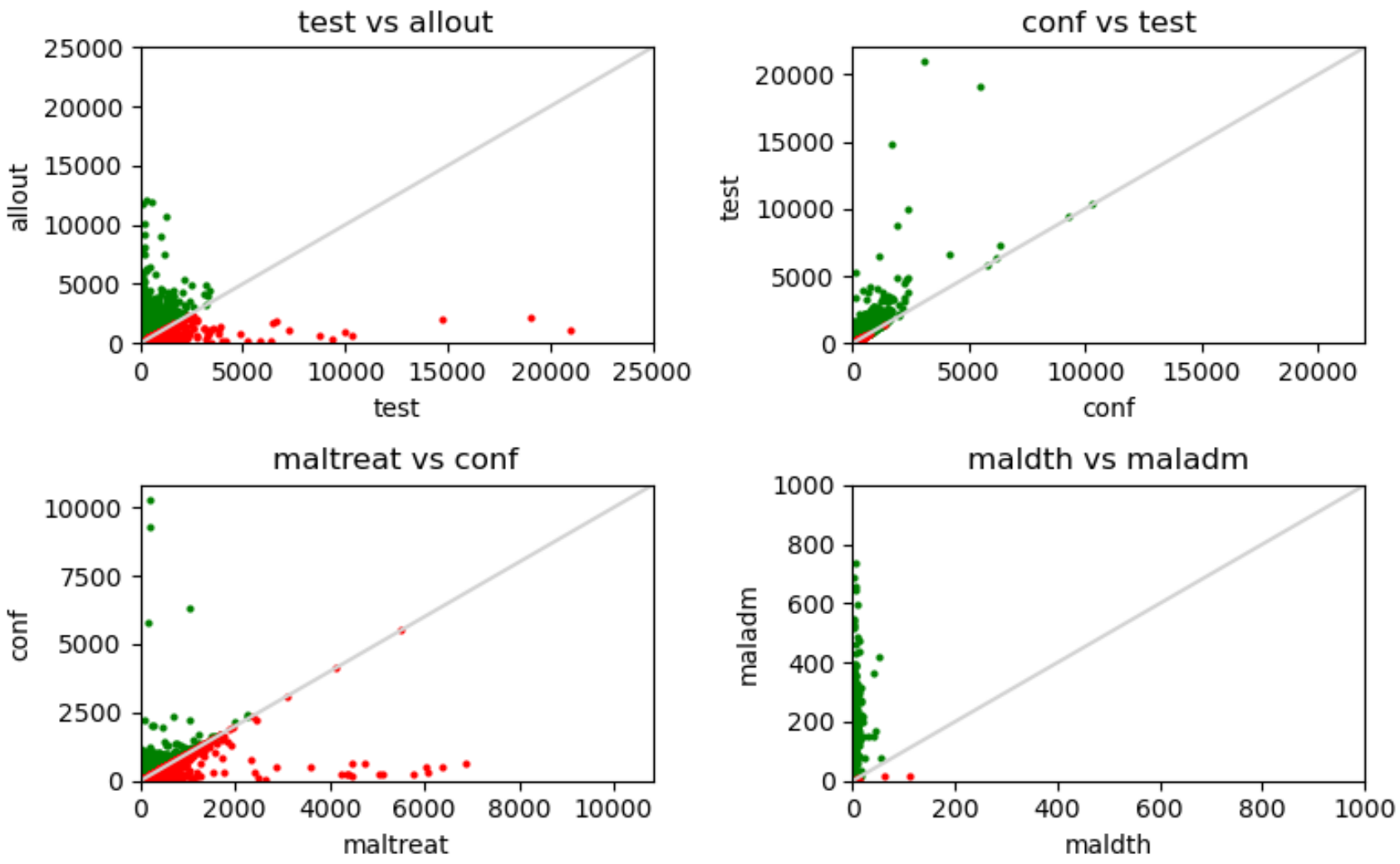
Outlier Correction: Key to Accurate District Prioritization





adm1	adm2	hfname	time	test	test_corr
Gitega	DS Kibuye	CDS Bukirasazi	2016m3	33,581	3,607.5
Karusi	DS Buhiga	CDS Kanyange	2016m11	26,197	2,932
Gitega	DS Gitega	CDS Giheta	2017m12	23,702	2,025.5

Checking for inconsistencies helps determine reliability



Some outliers were excluded for visibility

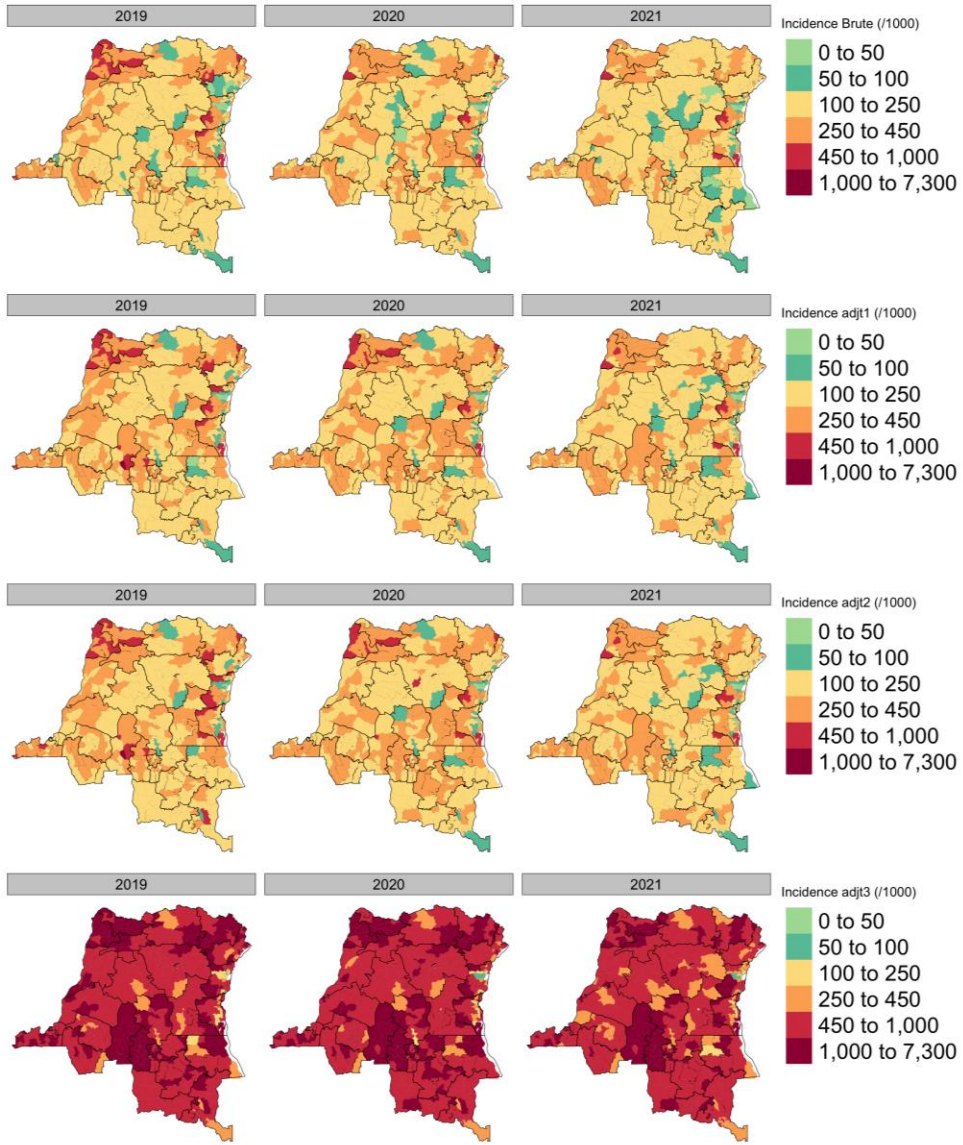
Incidence adjustment using WHO methodology helps mitigate known limitations of routine data

Incidence brute =
C: Cas confirmés
D: Population

Incidence ajustée pour les tests:
N1: Cas confirmés + (Cas presumés*TPR)
D: Population
*TPR=Taux de Positivité des tests

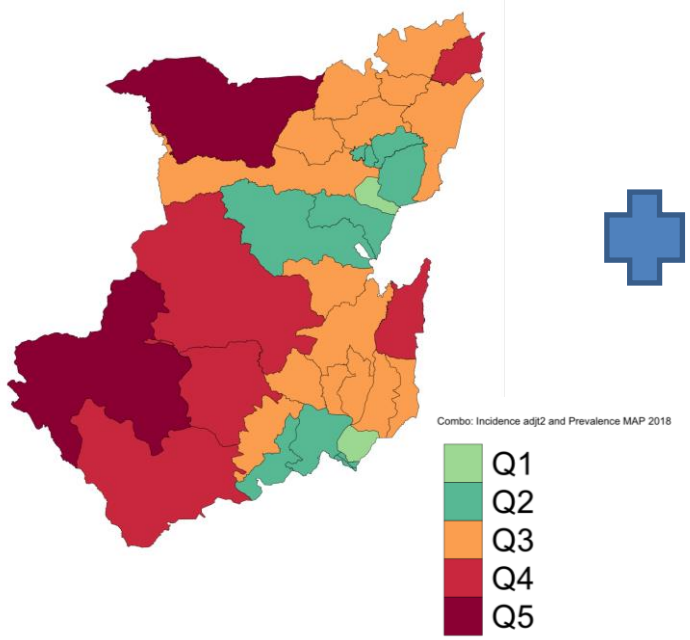
Incidence ajustée pour les tests et le rapportage:
N3: N2/TR
D: Population

Incidence ajustée pour les tests, le rapportage et la recherche des soins:
N3: N2+ (N2*privé/pub)+ (N2*non/pub)
D: Population

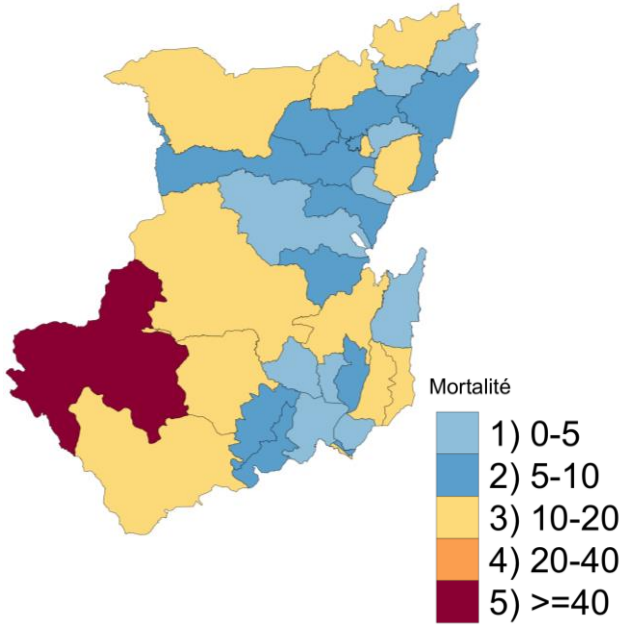


Composite indicator can help mitigate the limitations of variables taken individually

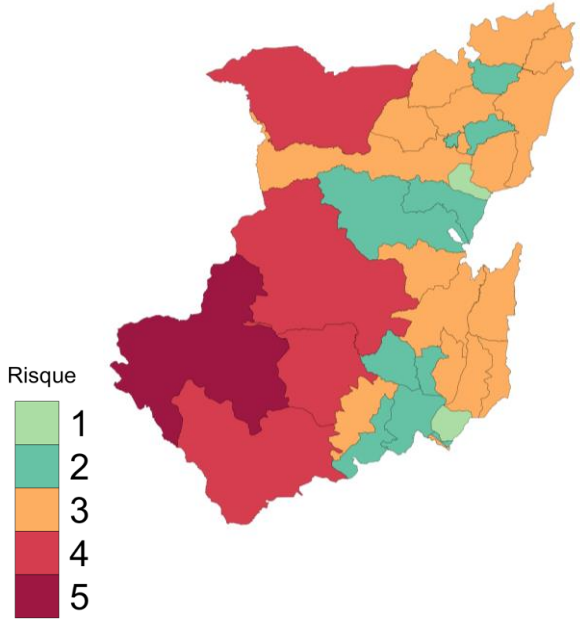
Morbidity
Incidence + Prevalence



Mortality



Risque



Morbidity score	Mortality score	Risk
Q1: 1-3, score =1	1	1: (1, 3]
Q2: 3-6, , score =2	2	2: (3, 5]
Q3: 6-8, , score =3	3	3: (5, 7]
Q4: 8-10, , score =4	4	4: (7, 9]
Q5:10-12, , score =5	5	5: (9, 10]

Criteria for prioritization – Example from Nord Kivu in DRC

01 **Highest transmission areas**

Relative to the transmission spectrum of the DRC, as the country has high transmission nearly everywhere.

02 **Highly urbanized health zones, and altitude**

With ecologies less suitable for the vector population, improved infrastructure, SES, access to care, behavior unfavorable to enable effectiveness of vector control, etc.

03 **Areas with substantial impact of previous campaigns**

Where the scale back of ITN distributions could lead to much greater resurgences than in areas where receptivity is similar, but the impact is lower.

04 **Currently low transmission but high receptivity**

Determined by prevalence of infection before the scale-up of community-based interventions (2000)

05 **Limited access to healthcare**

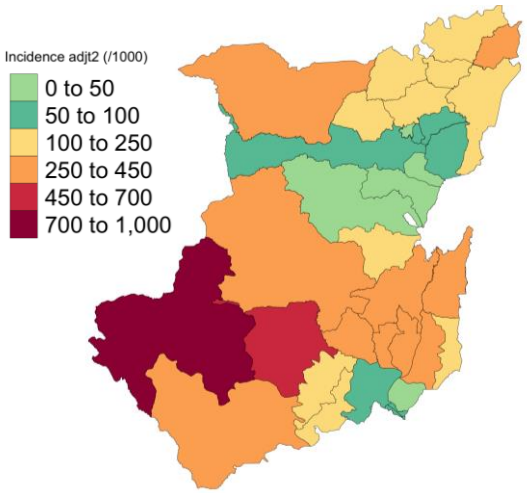
06 **Presence of parasites resistant to ACTs**

07 **Presence of Internally displaced people**

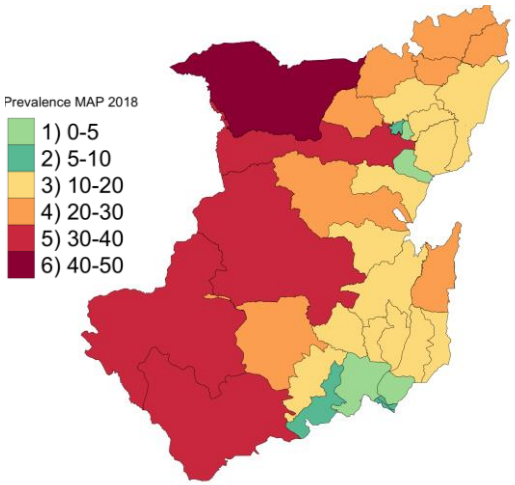
- Data on resistance to pyrethroids to determine the type of net needed in priority areas.
  Access to and use of mosquito nets will not be used as areas with low access and use should not be penalized

Indicators for decision-making in Nord-Kivu

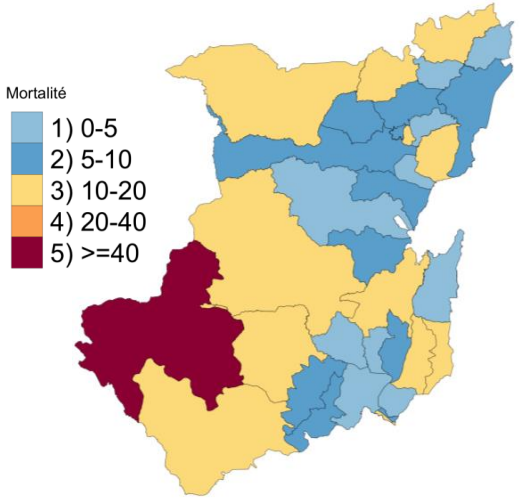
Incidence, med



Prévalence (2018)



Mortalité pal, med



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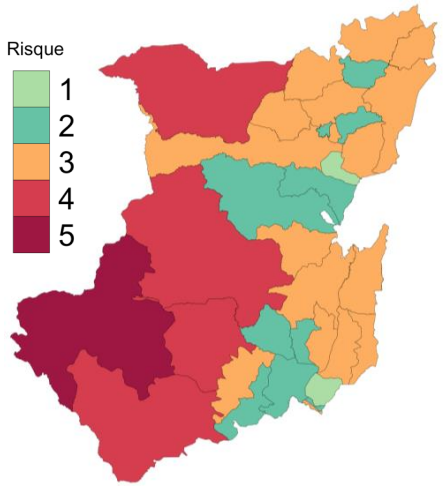
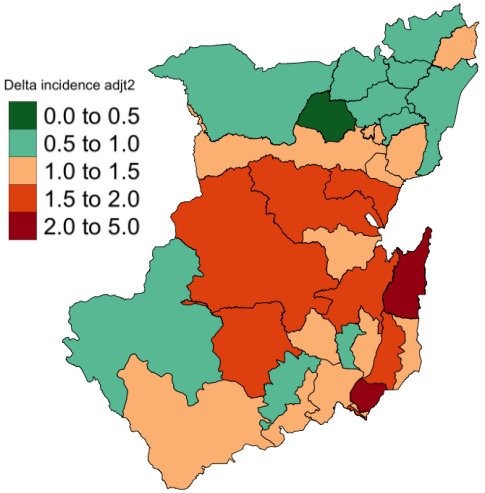
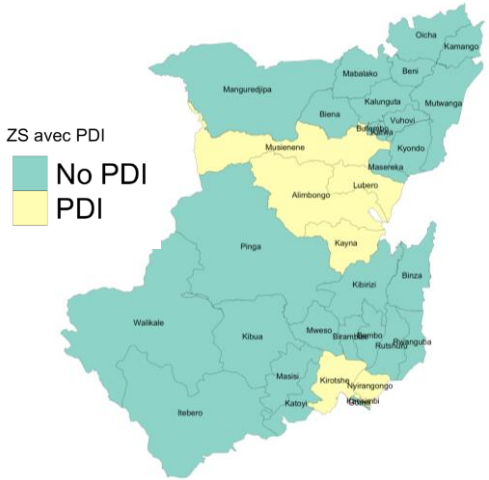


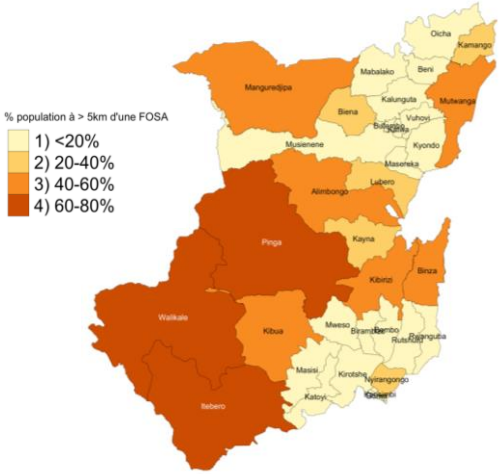
Incidence (2023 vs 2020



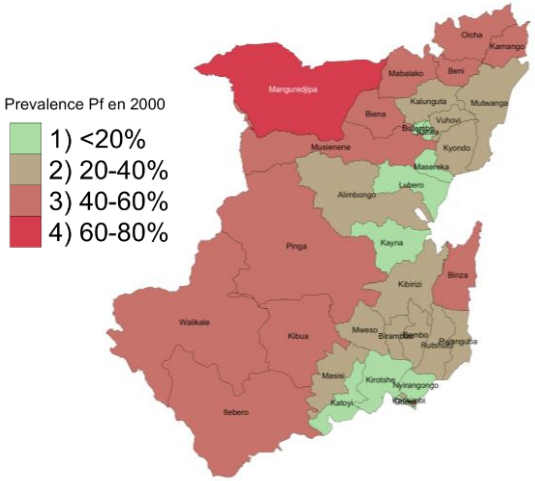
PDI



Accès aux soins de santé



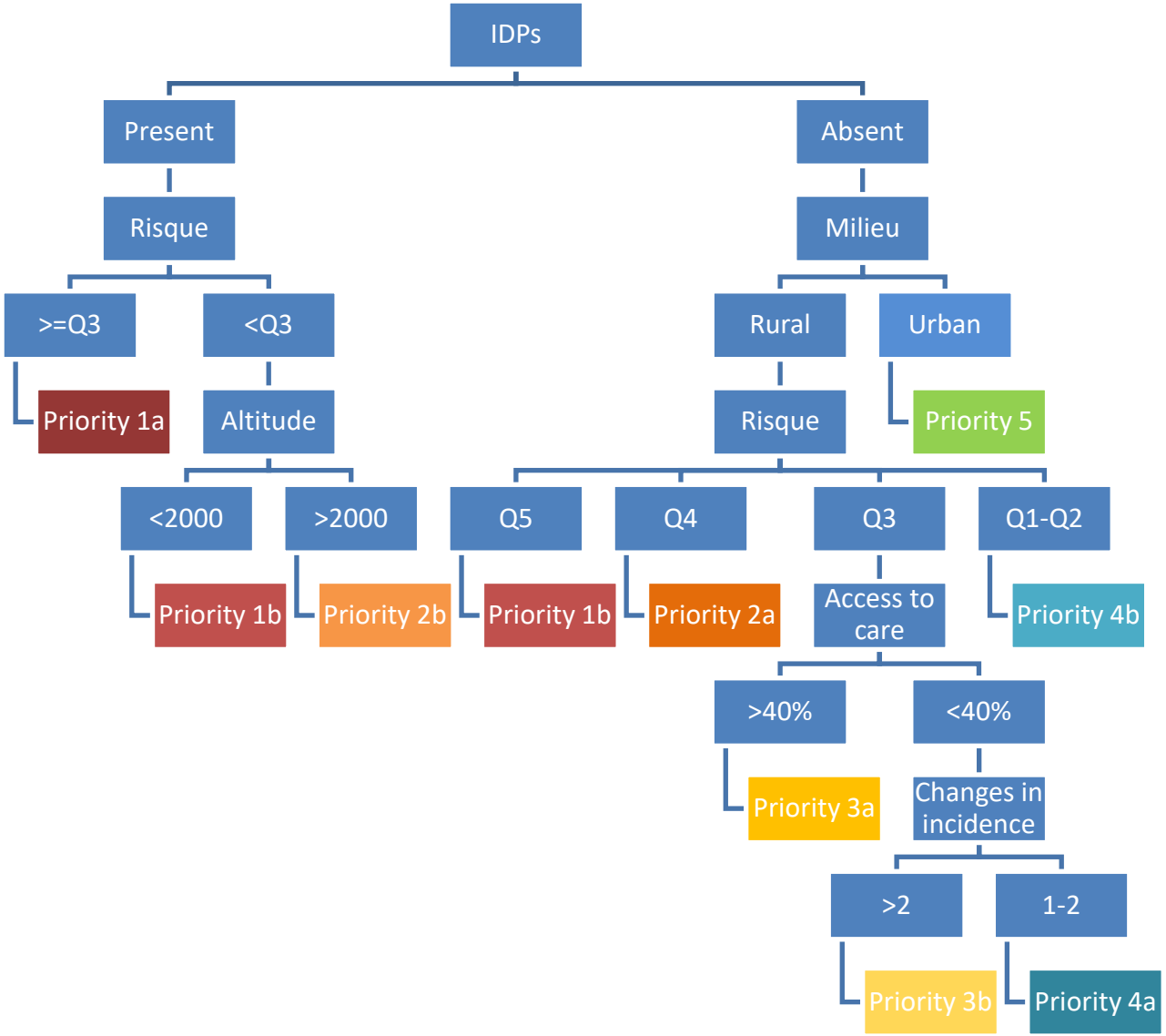
Réceptivité



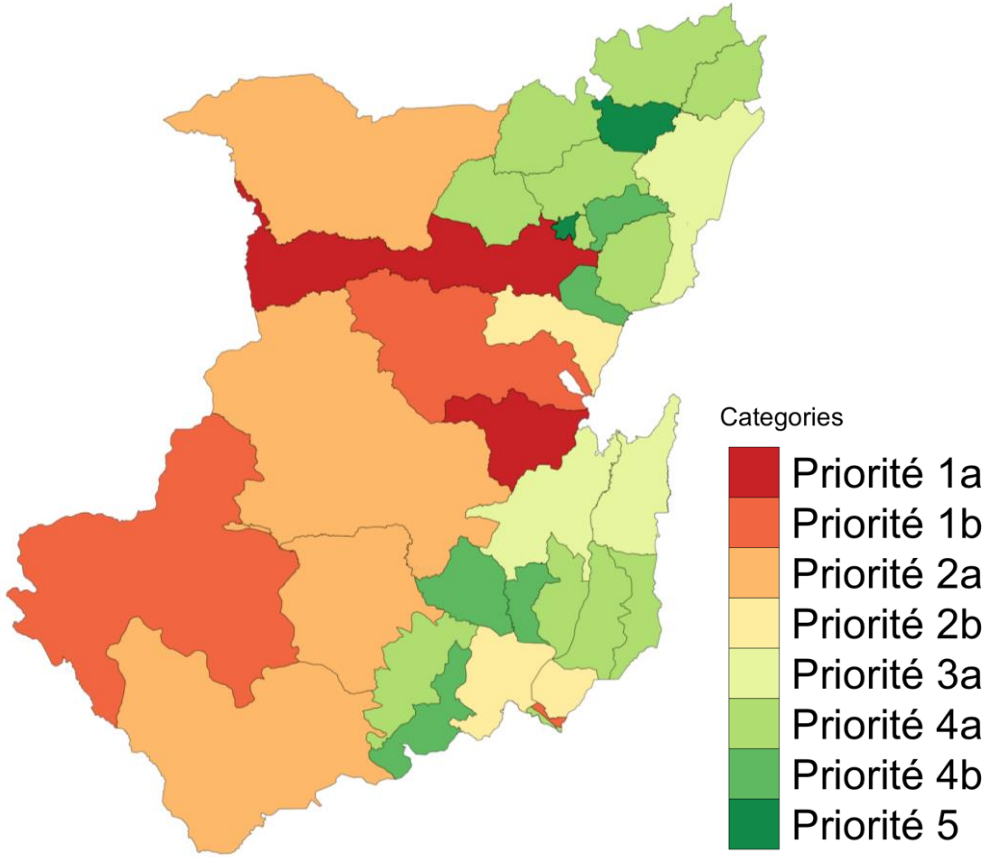
Altitude

Urbanisation

Algorithm for Nord-Kivu



Prioritization of districts to receive LLINs in Nord-Kivu



Priority	Number of health zones	Population 2024	Total LLIN 2024	Cumulative number of LLINs
Priority 1a	2	827,484	482,699	
Priority 1b	3	1,401,095	817,305	1,300,004
Priority 2a	4	695,043	405,442	1,705,446
Priority 2b	3	1,330,451	776,096	2,481,542
Priority 3a	3	1,064,388	620,893	3,102,435
Priority 4a	12	3,984,768	2,324,449	5,426,884
Priority 4b	5	1,536,304	896,177	6,323,061
Priority 5	2	831,297	484,923	6,807,984
Total	**34**	11,670,830	6,807,984	

How ?

Impact projections

The impact of these scenarios is estimated using mathematical models . At this point further refinements may be made to the scenarios. **A consensus based approached** informed by the evidence is used to select the final mix of intervention and strategies.

Costing of agreed-upon plan

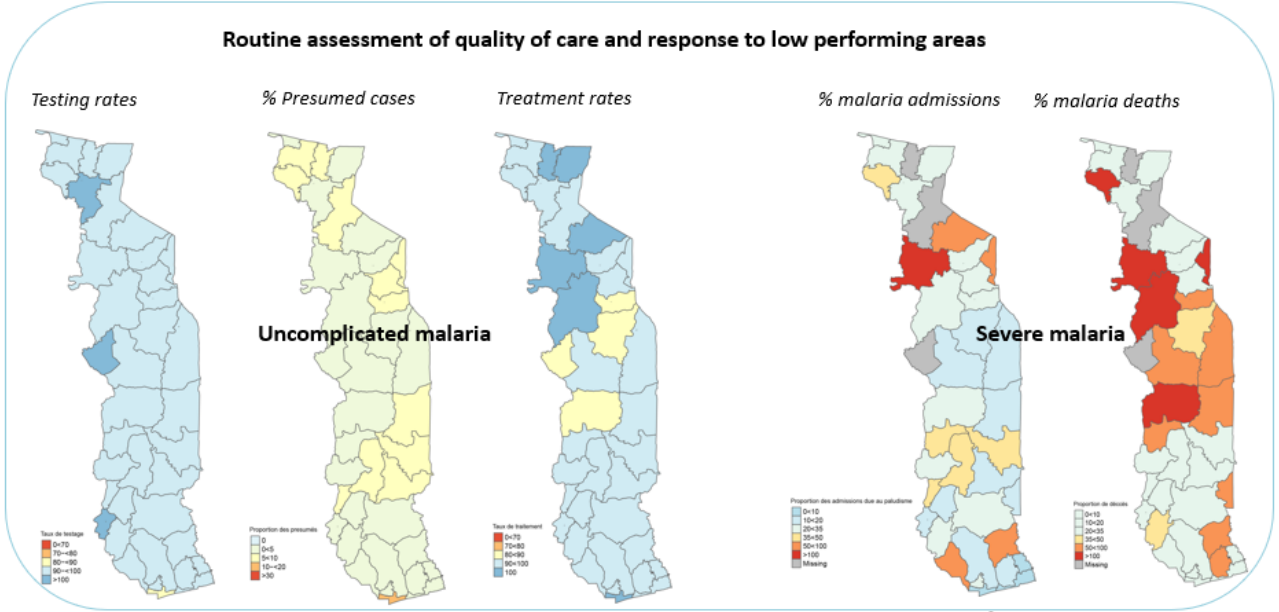
This plan is then costed and is used for resource mobilization

Prioritization of investments

Once there is clarity **in the available resources, the costed strategic plan is used as the basis to further inform rational prioritization of investments to maximize impact** if the resources are insufficient. This is usually the most challenging part of the process. Mathematical modeling is helpful at this point to assess the impact of the various prioritization decisions.

Monitor impact

During the budgeting process it is expected that sufficient **capacity to monitor the impact of the deployed intervention packages are set aside** so that the response is sharpened over time and resources are reprioritized as needed.



Principles

*'Priority-setting determines **the strategic directions of the national health plan**. Led by citizens who are the principals and decision-makers, priority-setting is a shared responsibility between the ministry of health (MoH) and the entire health stakeholder community.'* (WHO definition)

Ownership

Countries set their own strategies for the response to malaria, provide strong leadership responsible for strengthening their institution and for providing transparency in the investments.

Evidence-informed

The choice of interventions and strategies should be underpinned by strong evidence of their effectiveness within a given context.

Alignment

External donor support aligns behind these plans and prioritizes the use of local delivery systems

Harmonization

Globally, donors coordinate, simplify procedures and share information to avoid duplication in the malaria response.

Invest for results

Countries and donors agree to focus on real and measurable impact on development and invest in local systems that collect the required information.

Mutual accountability

Measuring impact also requires that all stakeholders are accountable for results.

Capacity development

To build the ability of countries to manage their own future, donors should support countries capacities in the development of sound strategic and operational plans, delivery systems and surveillance, monitoring and evaluation processes.

For more information, please contact:

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