MODELLING INTERVENTIONS' IMPACT IN AFRICA

Impact modelling was conducted with Imperial College (part of the Malaria Modeling Consortium) to investigate the combined impact of the three initial focus interventions.

HUMAN TARGETS

DRUGS
Use of ACTs *[ACT—Artemisinin combination therapy, current top-line therapy]*

Seasonal malaria chemoprevention (SMC)—administered to children during transmission season

VACCINES

VECTOR CONTROL

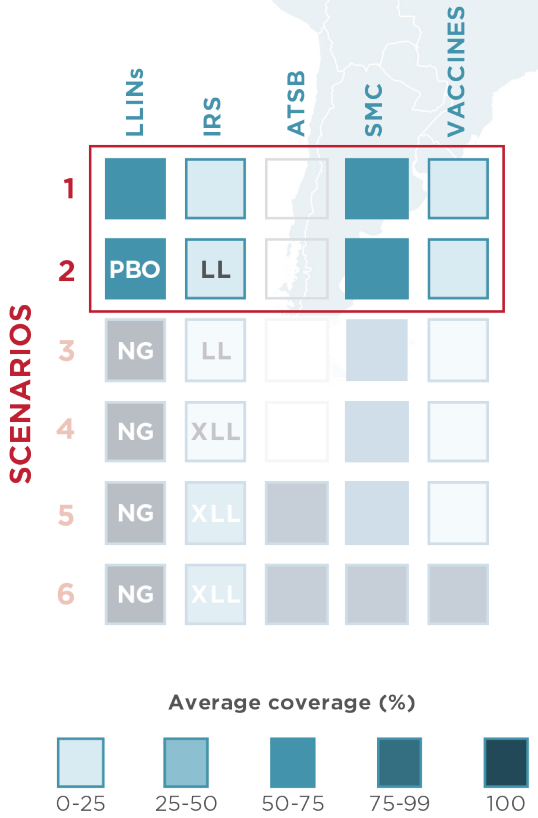
LLINs
PBO
Next Gen

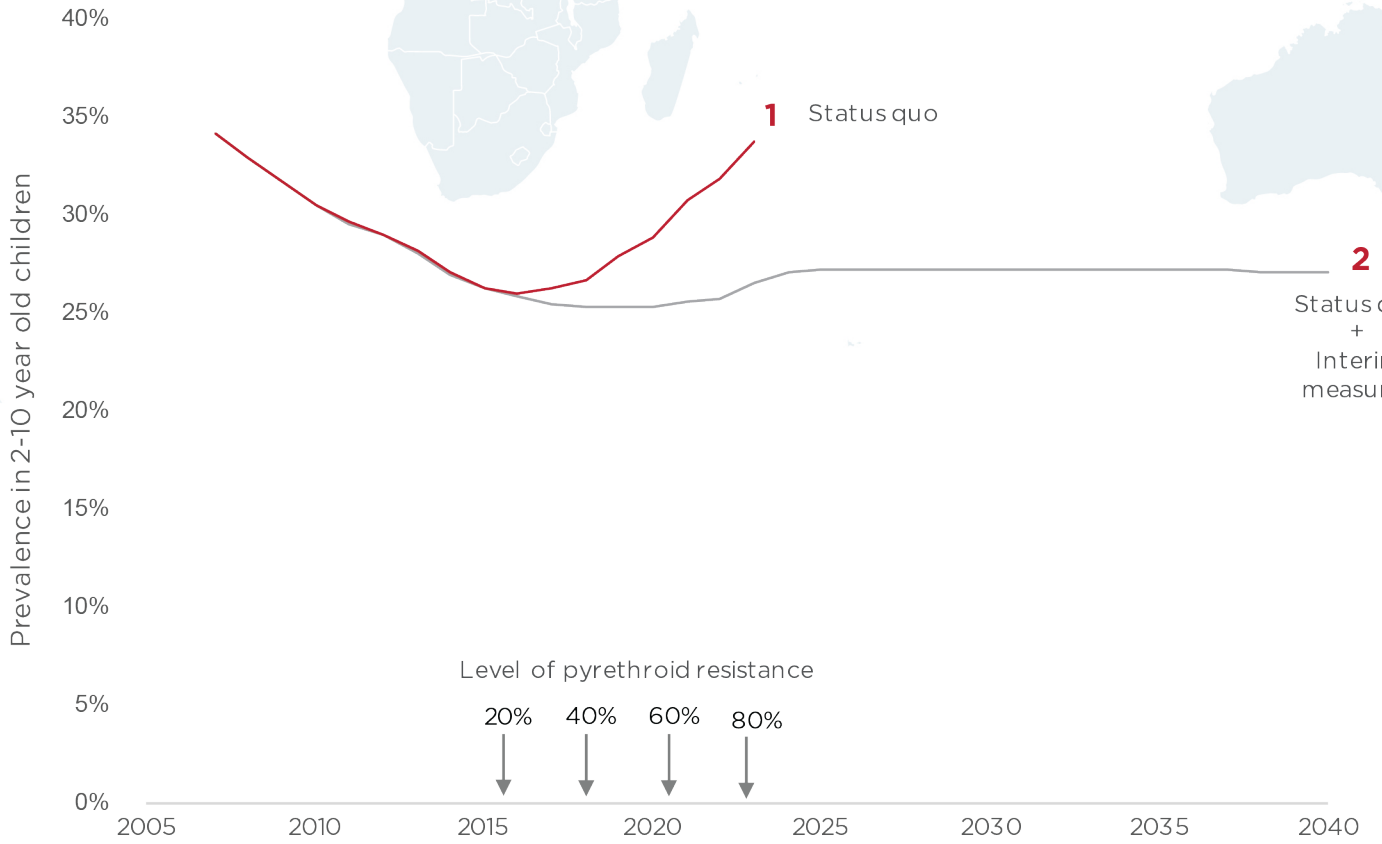
IRS
LLIRS
XLLIRS

ATSB

MODELLING INTERVENTIONS' IMPACT IN AFRICA

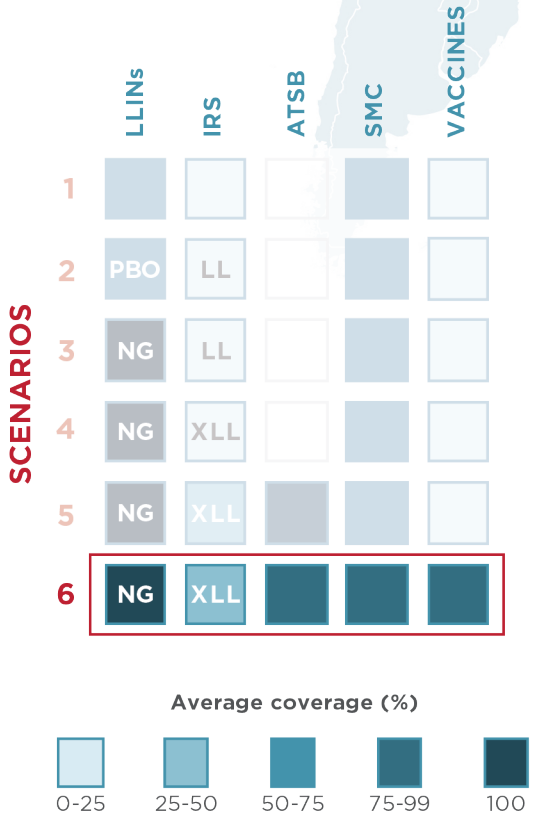
If we take no action, and continue to pursue the status quo, malaria cases and deaths will increase again

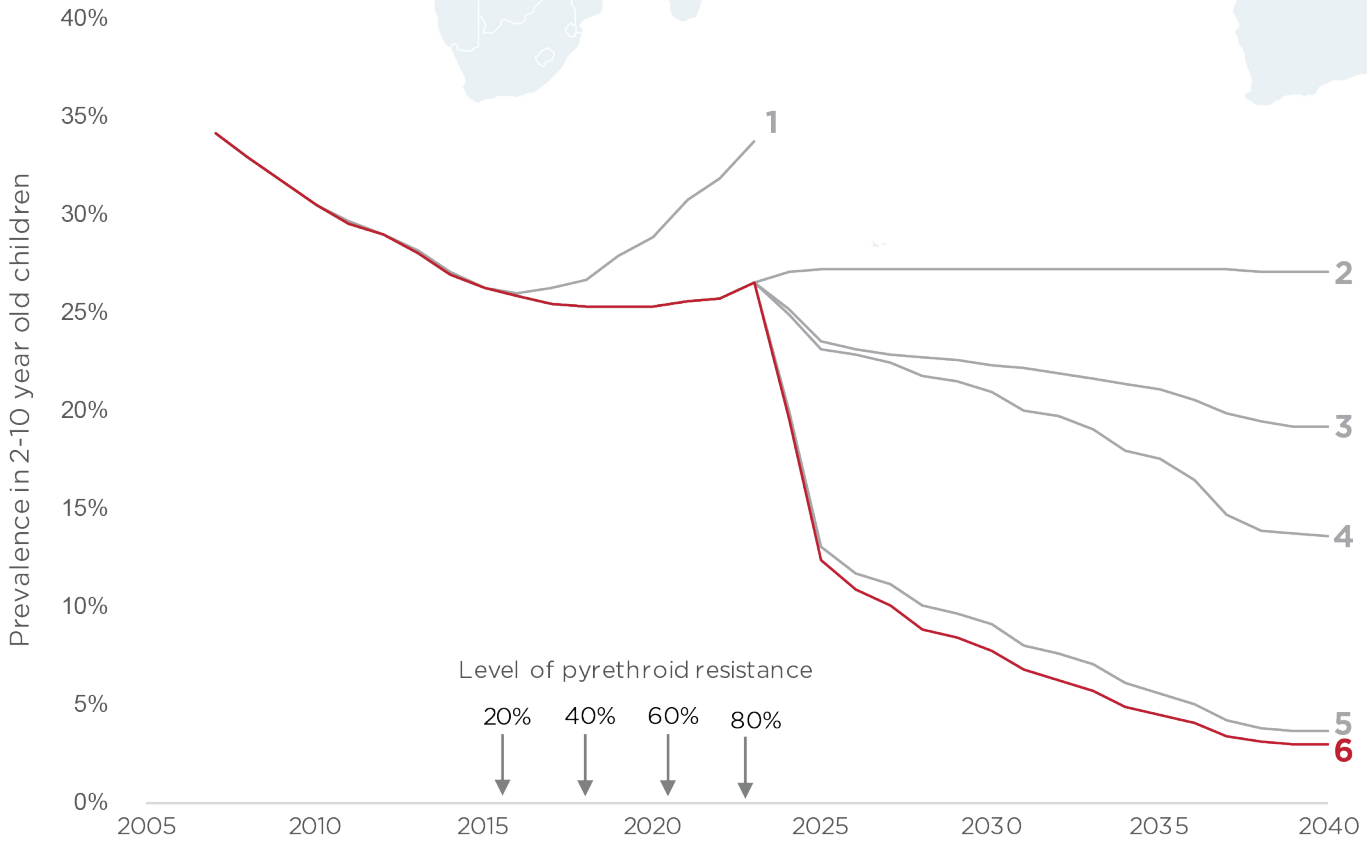




MODELLING INTERVENTIONS' IMPACT IN AFRICA

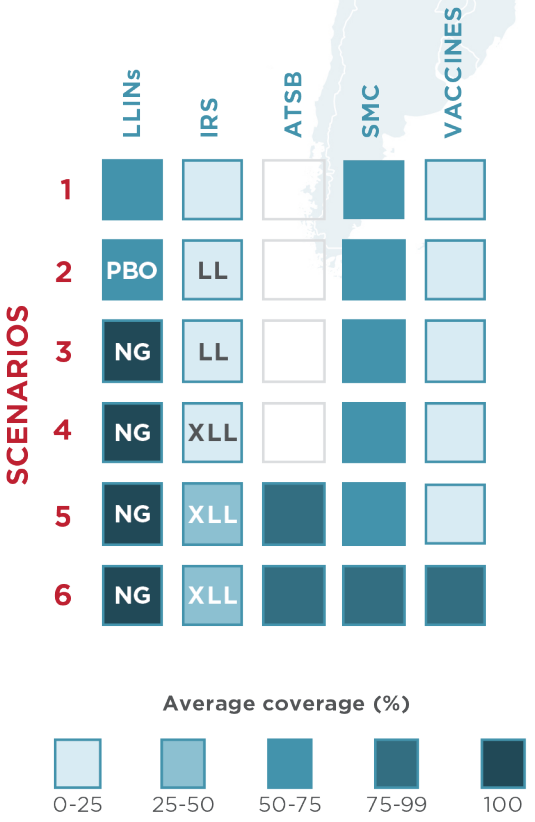
Fully exploiting the three initial focus interventions could technically have a big impact on malaria prevalence, and they are worth pursuing

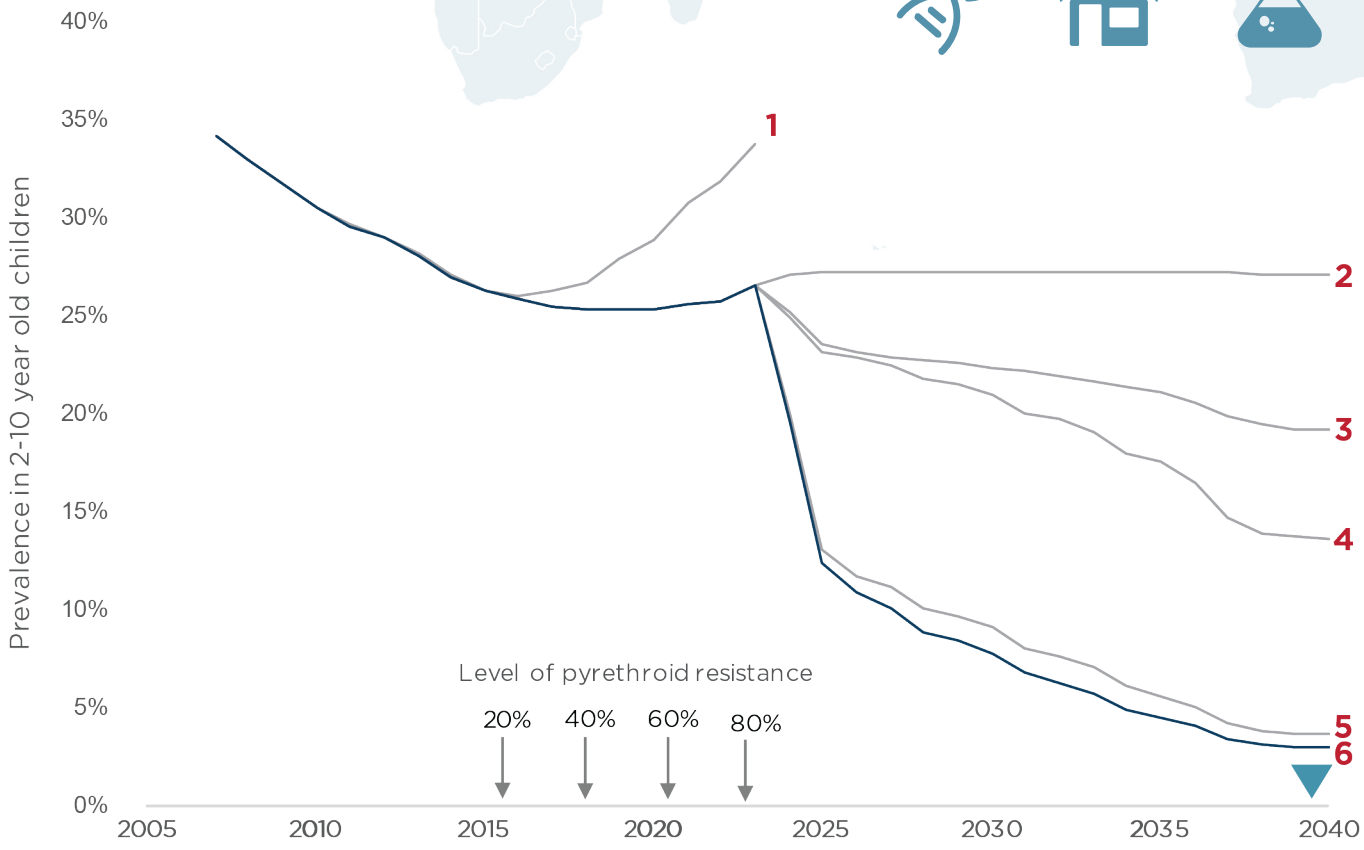




MODELLING INTERVENTIONS' IMPACT IN AFRICA

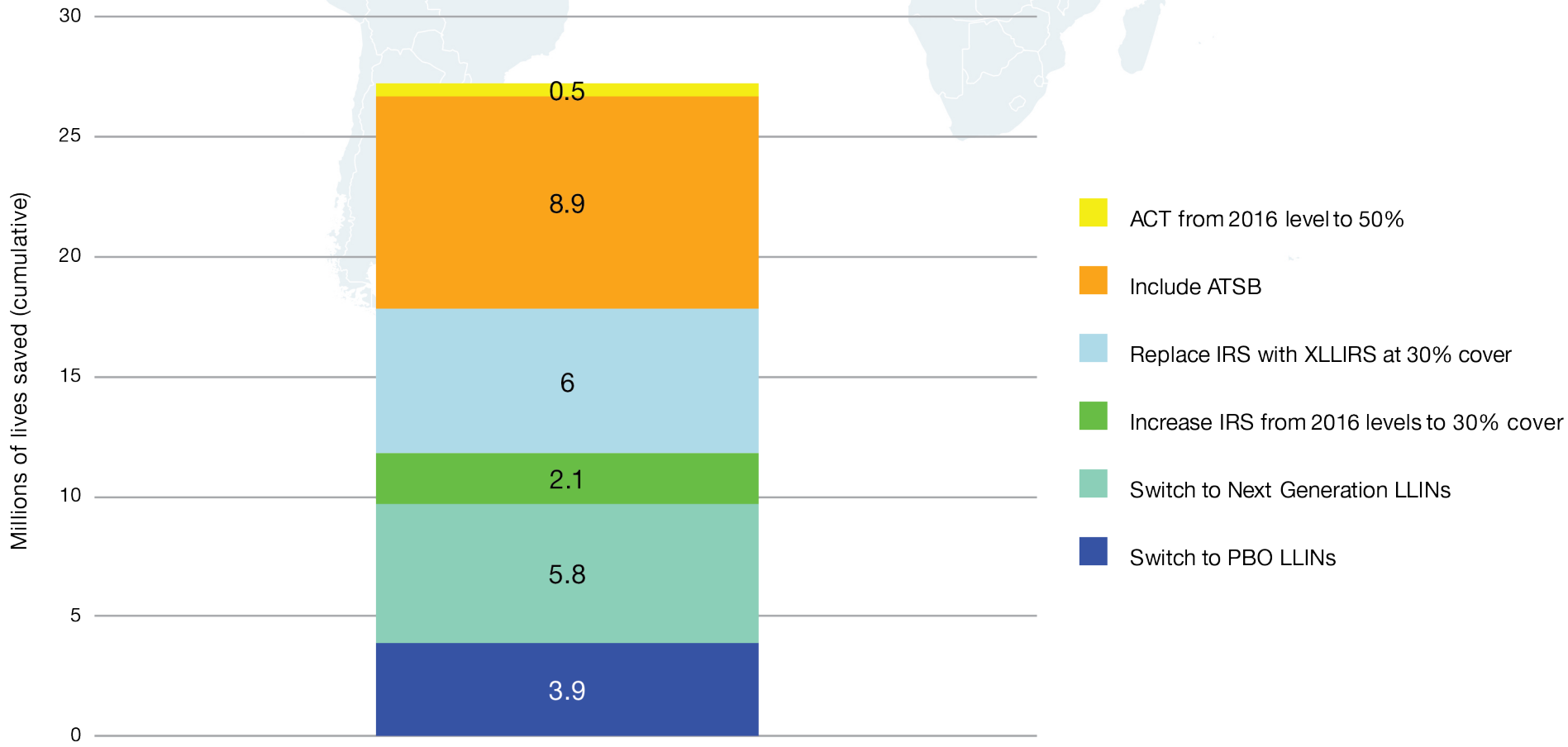
The role of vector control is critical in reaching our goal of eradication by 2040, supported by wider solutions across vaccines, drugs and gene drives





POTENTIAL IMPACT OF TRANSFORMATIONAL INTERVENTIONS OVER TIME:

27.2 million lives saved; 2023–2040



Prevalence in children under the age of 10 (%) in 2040

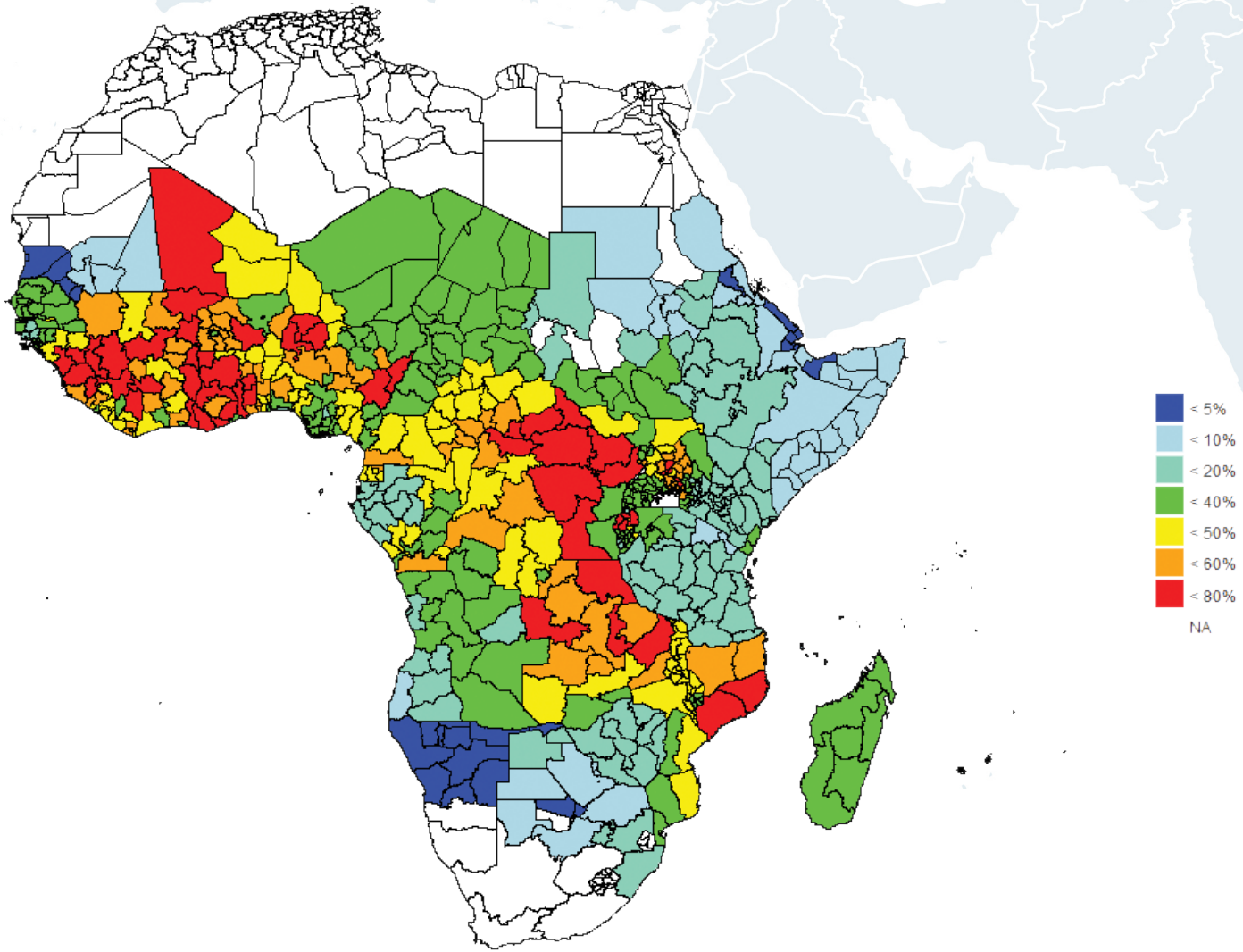
Counterfactual, no mitigation for pyrethroid resistance

SCENARIO 1

LLINs at existing coverage

IRS at existing coverage

50-75% seasonal malaria chemoprevention (SMC) treatments (in the Sahel region only)



Imperial College London modelling predictions: 2019

Prevalence in children under the age of 10 (%) in 2040

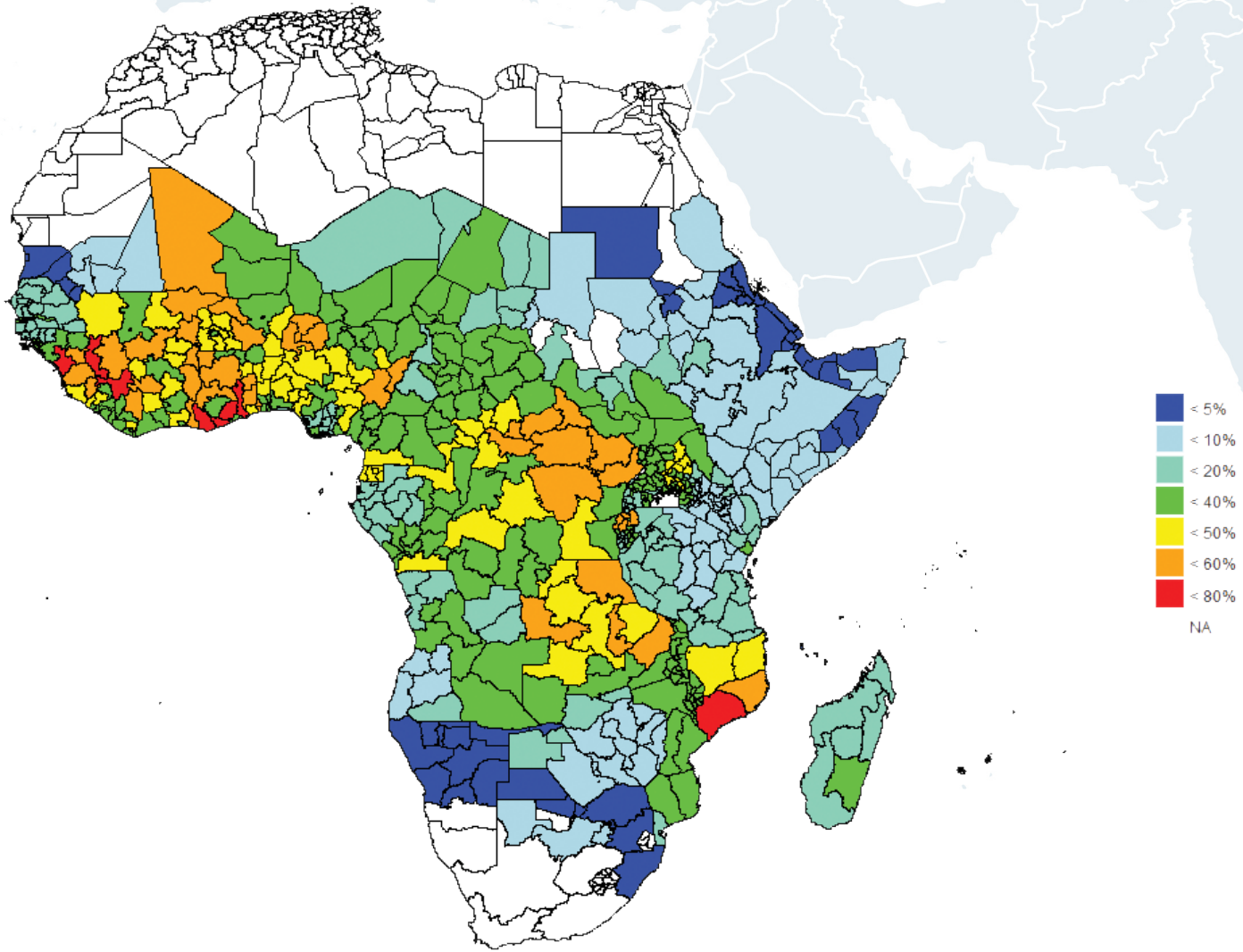
Mitigation with already available nets (PBO-synergist nets) and LLIRS (non-pyrethroid) maintaining 2016 usage levels

SCENARIO 2

PBO - LLINs at existing coverage

Switch to LLIRS at existing coverage

50-75% SMC treatments (in the Sahel region only)



Imperial College London modelling predictions: 2019

Prevalence in children under the age of 10 (%) in 2040

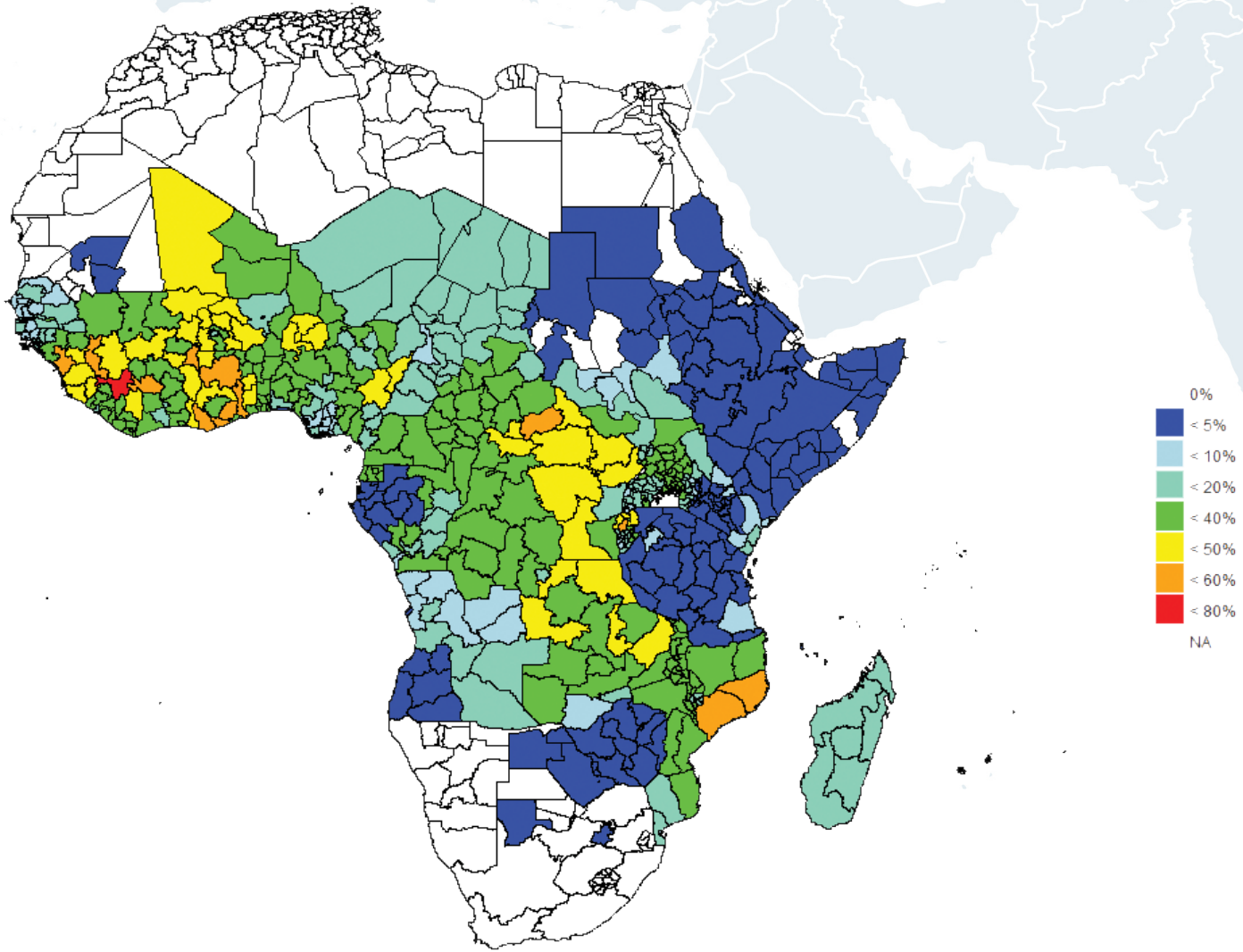
Mitigation with next-generation nets where usage is above 75% everywhere and LLIRS (non-pyrethroid) is maintained at 2016 coverage levels

SCENARIO 3

Next-generation nets at 75% usage everywhere

Switch to LLIRS at existing coverage

50-75% SMC treatments (in the Sahel region only)



Imperial College London modelling predictions: 2019

Prevalence in children under the age of 10 (%) in 2040

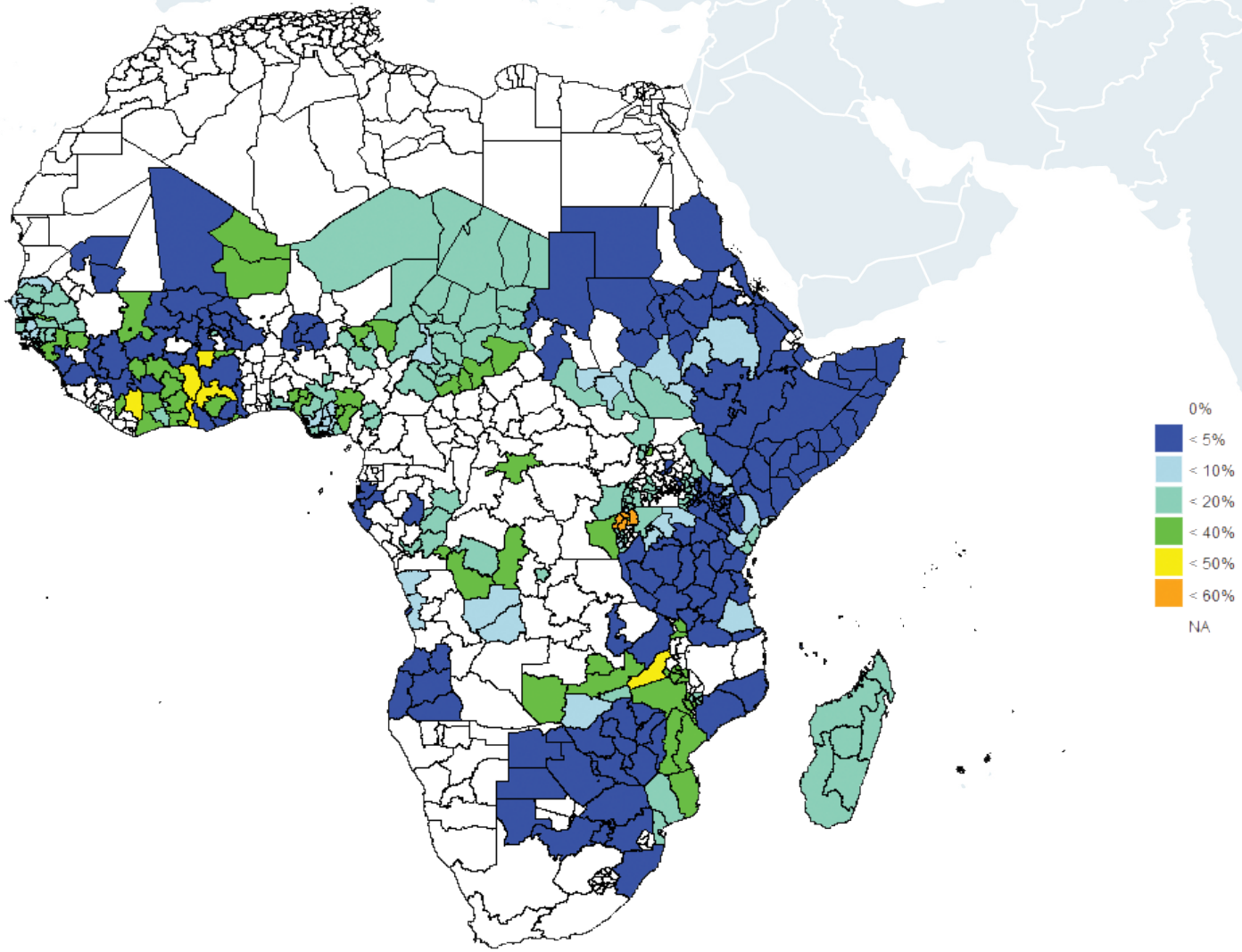
Mitigation with next-generation nets + XLLIRS in the 30% of regions with highest malaria levels, with coverage in these areas increasing to 100%

SCENARIO 4

Next-generation nets at 75% usage everywhere

XLLIRS in the 30% most prevalent regions

50-75% SMC treatments (in the Sahel region only)



Imperial College London modelling predictions: 2019

Prevalence in children under the age of 10 (%) in 2040

Mitigation with next-generation nets. XLLIRS + ATSB everywhere (NOTE: efficacy against mosquitoes taken from single trial in one location, generalisability not yet known)

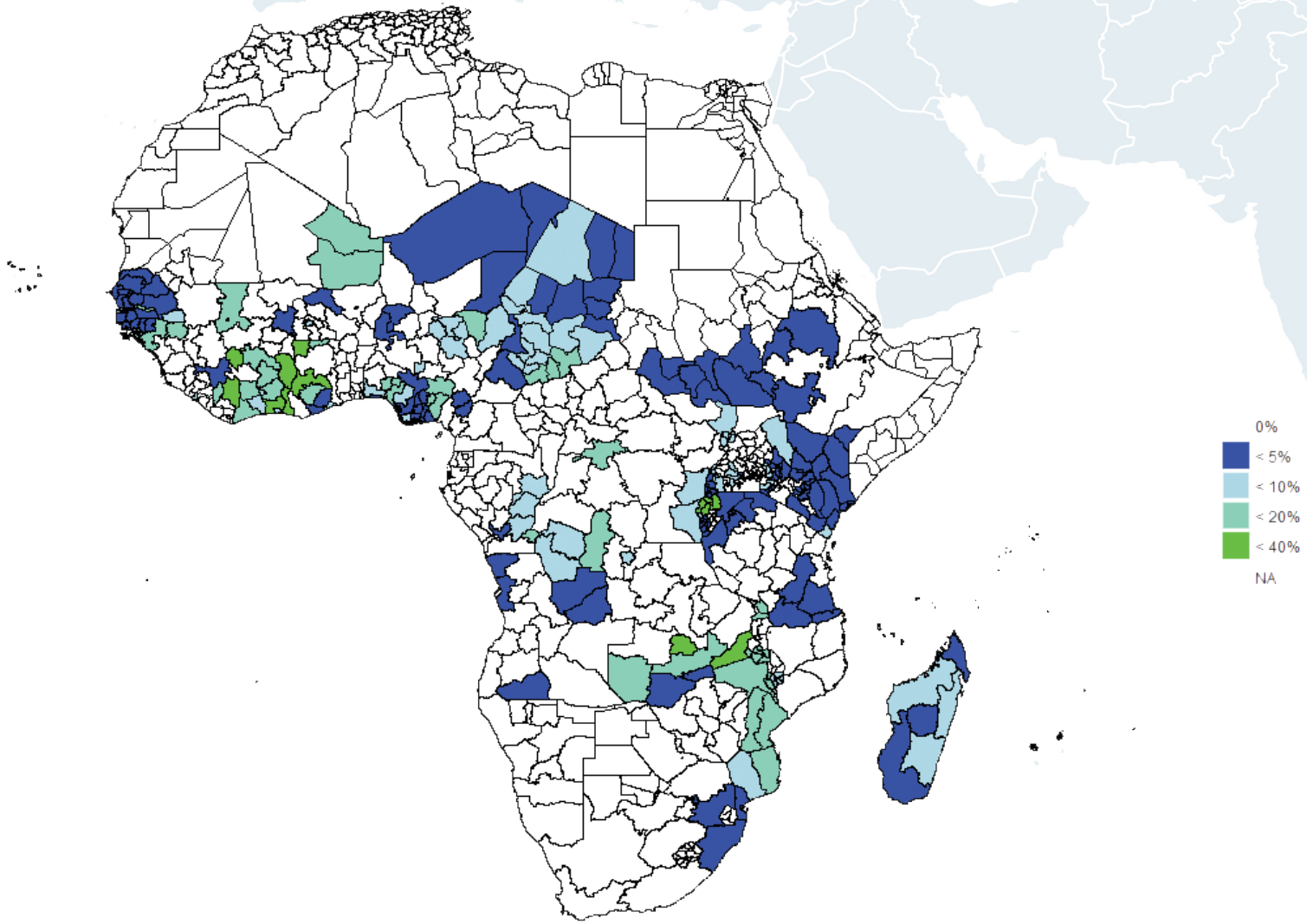
SCENARIO 5

Next-generation nets at 75% usage everywhere

XLLIRS in the 30% most prevalent regions

Attractive toxic sugar bait (ATSB) everywhere (MAJOR assumption; ATSB efficacy against mosquitoes is taken from a single trial in one location and its generalisability is not yet known)

50-75% SMC treatments (in the Sahel region only



Imperial College London modelling predictions: 2019

Prevalence in children under the age of 10 (%) in 2040

Maximal vector control + first-line treatment of clinical cases + seasonal malaria chemoprevention in the Sahel region + vaccine in high malaria burden regions

SCENARIO 6

Next-generation nets at 75% usage everywhere

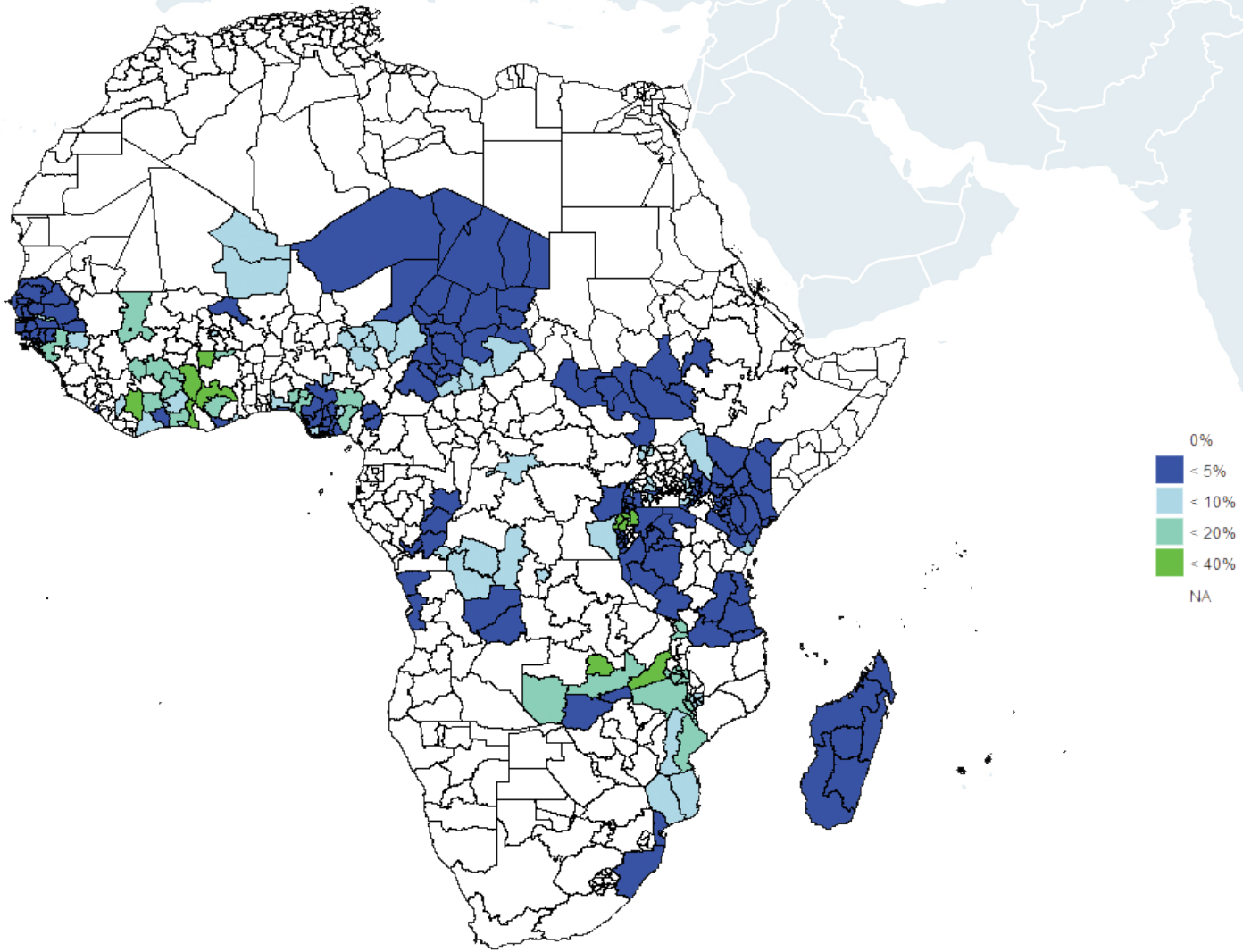
XLLIRS in the 30% most prevalent regions

Attractive toxic sugar bait (ATSB) everywhere (MAJOR assumption; ATSB efficacy against mosquitoes is taken from a single trial in one location and its generalisability is not yet known)

Seasonal malaria chemoprevention (SMC) - **90% of children under 5 years given prophylactic treatment throughout the rainy season in the Sahel Region**

ACT used to treat clinical cases

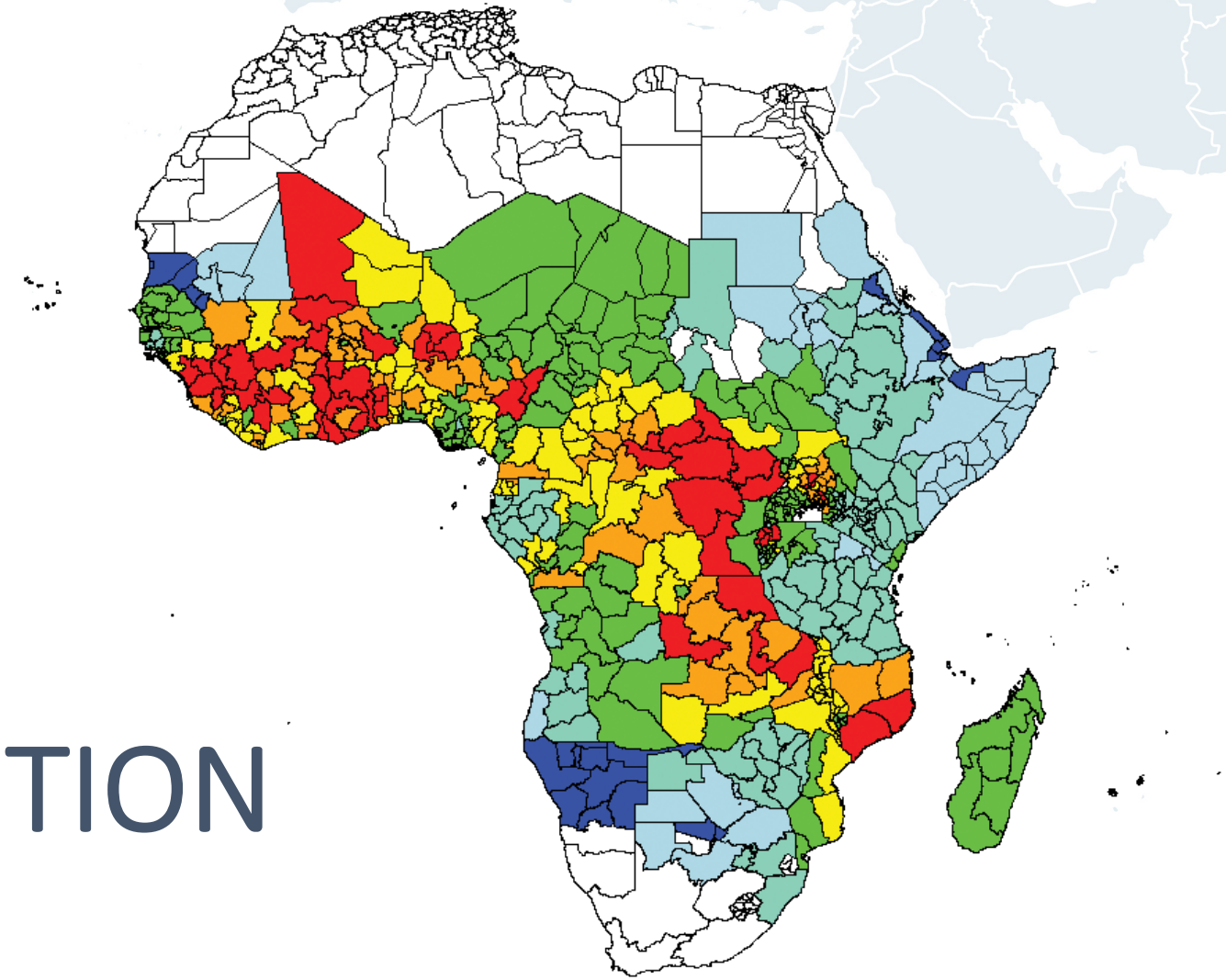
Vaccine administered to 90% of children in regions with high malaria levels



Imperial College London modelling predictions: 2019

ZERO 40

SCENARIO 4



FROM INTENTION TO IMPACT

Imperial College London modelling predictions: 2019