Antimalarial market complexity and diversity across 8 sub-Saharan African countries one decade after the introduction of artemisinin combination therapy

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ACT watch
Evidence for Malaria Medicine Policy

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The ACTwatch Group*

BACKGROUND

Malaria control programs in sub-Saharan Africa tasked with ensuring effective treatment responded to non-artemisinin therapy (nAT) drug resistance by adopting artemisinin combination therapies (ACT) as first-line treatments between 2002-2005.

We examine contemporary challenges to ensuring malaria treatment with quality-assured (QA) ACT using national antimalarial market survey trend data collected by the ACTwatch project.

DEFINITIONS

QA ACT
ACTs: 1) granted WHO prequalification; 2) in compliance with the Global Fund Quality Assurance Policy and appear on the Global Fund list of approved pharmaceutical products for procurement; or 3) granted regulatory approval by the European Medicines Agency.

Non-QA ACT
All ACT non-tablet formulations as well as tablets that are not quality-assured according to the criteria above.

nAT
Antimalarials that do not contain an artemisinin active ingredient. These include but are not limited to sulfadoxine-pyrimethamine (SP), quinine, chloroquine and amodiaquine.

AMT
Artemisinin monotherapy including artemether, artesunate, dihydroartemisinin and arteether. Oral AMT includes tablets and suspensions. Non-oral AMT includes powder and liquid injections as well as suppositories. Oral AMT is banned in all study countries, and non-oral AMT medicines are typically indicated for management of severe malaria.

METHODS

Repeat cross-sectional malaria medicine outlet surveys were conducted between 2009-2014 in Benin, the DRC, Kenya, Madagascar, Nigeria, Tanzania, Uganda and Zambia. A census of public and private outlets with potential to distribute antimalarials was conducted among a representative sample of administrative units. A drug audit documented product information, retail price and amount distributed to consumers in the past week for all antimalarials in stock (Table 1).

Table 1. Sample Summary

		Screened (N)	Antimalarial audit complete/eligible (N/N)	Antimalarials audited (N)
Benin	2009	1,670	844/844	5,233
	2011	2,897	1,239/1,363	8,990
DRC, Kinshasa	2009	2,368	766/766	8,437
	2013	3,364	932/962	12,291
Kenya	2010	13,913	1,888/1,950	8,434
	2011	11,386	1,855/1,871	9,606
Madagascar	2010	6,769	2,414/2,414	5,587
	2011	10,041	2,371/2,409	7,234
	2013	10,149	1,756/1,765	6,101
Nigeria	2009	5,456	2,113/2,163	21,031
	2011	7,939	1,486/1,509	13,469
	2013	5,148	1,714/1,735	14,469
Tanzania	2010	3,120	624/676	5,544
	2011	3,701	787/787	9,701
Uganda	2010	11,153	2,410/2,497	14,437
	2011	16,207	3,138/3,195	20,330
	2013	7,932	3,308/3,333	19,809
Zambia	2009	3,840	442/442	1,783
	2011	5,436	781/791	3,355
	2014	5,878	980/984	5,064

ACTwatch uses drug audit sheets to collect product information, reported distribution in the previous week, and retail price for each antimalarial in stock. Product and distribution information is used to calculate relative market share using the adult equivalent treatment dose as the unit of analysis.

2015 Nigeria Outlet Survey

RESULTS

- QA ACT availability increased significantly in recent years with the exception of persistent low availability in the DRC (Figure 1). Increases in QA ACT market share relative to nAT varied widely across countries (Figure 3).

- Availability of non-QA ACT has emerged in recent years and non-QA ACTs were capturing approximately 10 percent or more of the relative antimalarial market share during the most recent survey in the the DRC, Nigeria, Uganda and Zambia (Figure 3).

- In all contexts, the vast majority of antimalarial-stocking private sector outlets including pharmacies, drug shops, and retailers continue to stock and distribute the nAT SP. In contrast, SP availability is relatively lower and declining in the public sector where national guidelines stipulate use for intermittent preventive therapy during pregnancy (IPTp) (Figure 2).

- While the relative antimalarial market share for the public versus private sector varies across countries, relative public/private market share remained stable over time within a number of contexts over time. However, trends suggest a decline in private sector relative market share in recent years in Zambia, and an increase in Tanzania and Uganda (Figure 4).

- Private sector QA ACT price has declined in recent years however QA ACT remains 3-5 times more expensive than SP in all countries with the exception of Kenya and Madagascar where QA ACT is slightly more expensive than SP (Figure 6).

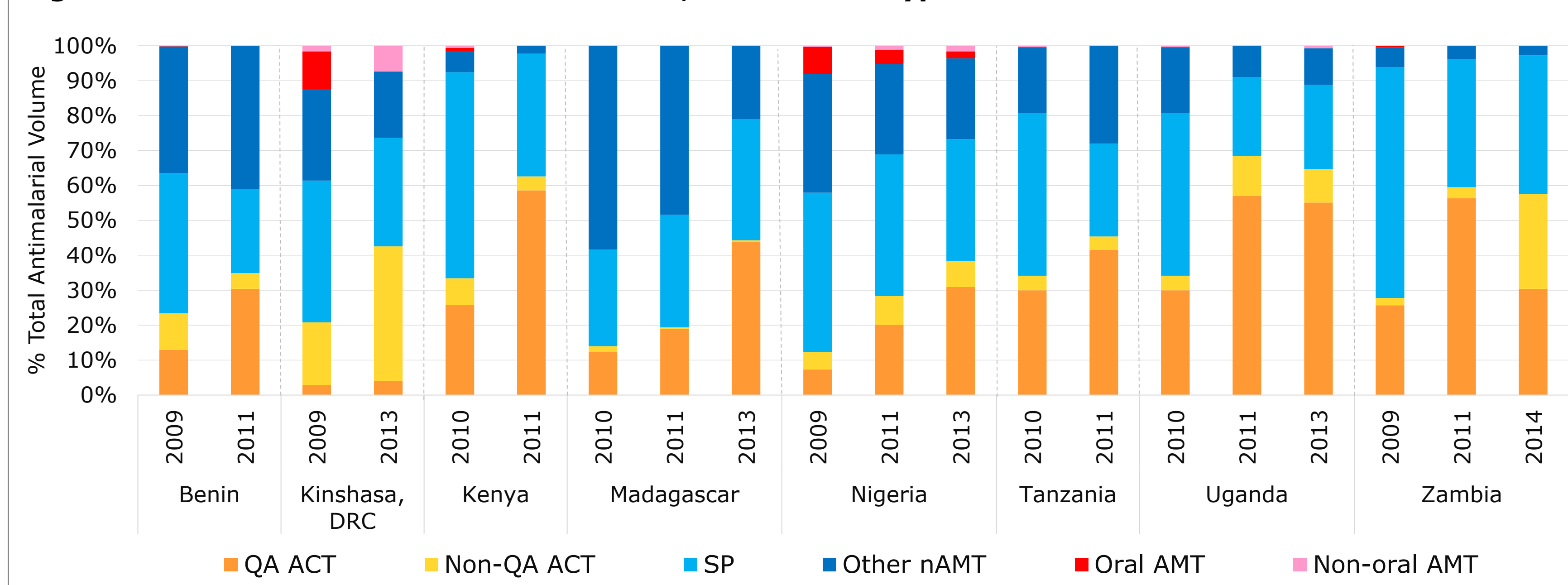**Figure 3. Relative antimalarial market share, antimalarial type**

QA ACT · Non-QA ACT · SP · Other nAMT · Oral AMT · Non-oral AMT

Figure 1. QA ACT availability, among outlets with at least 1 antimalarial in stock
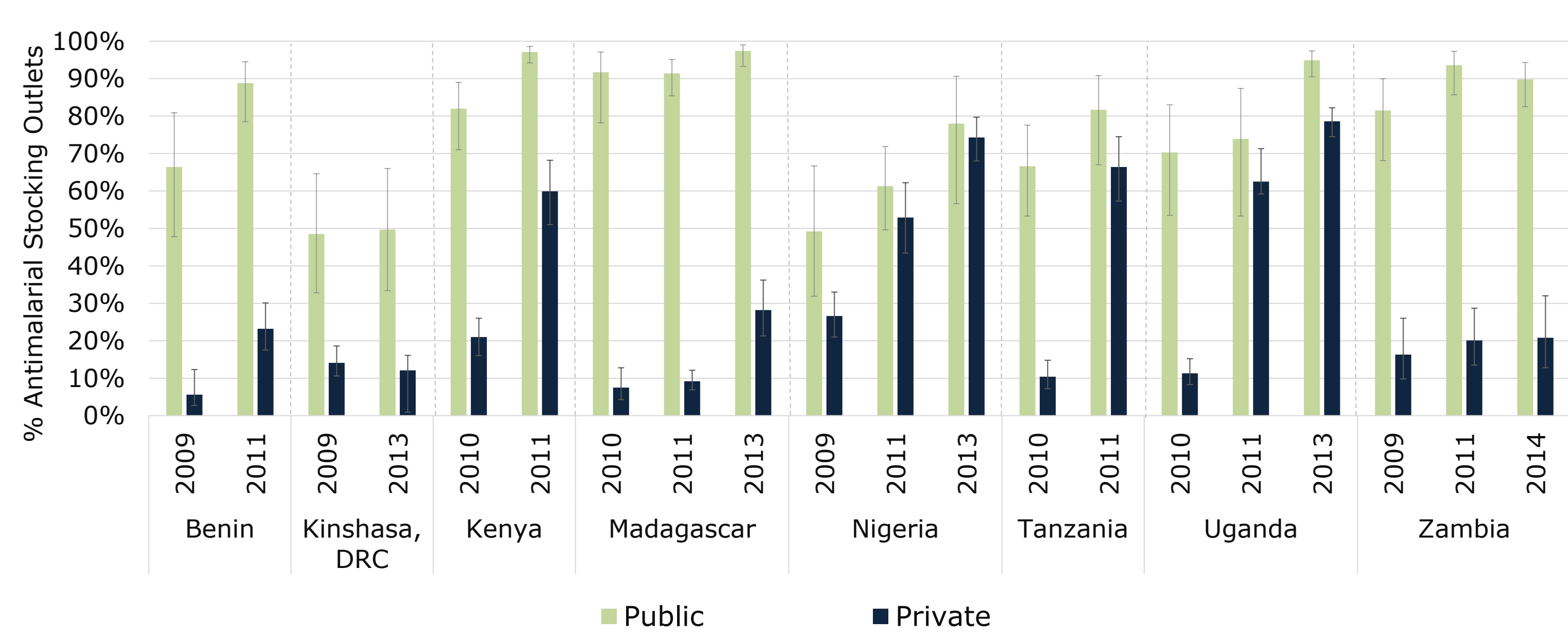
Public · Private

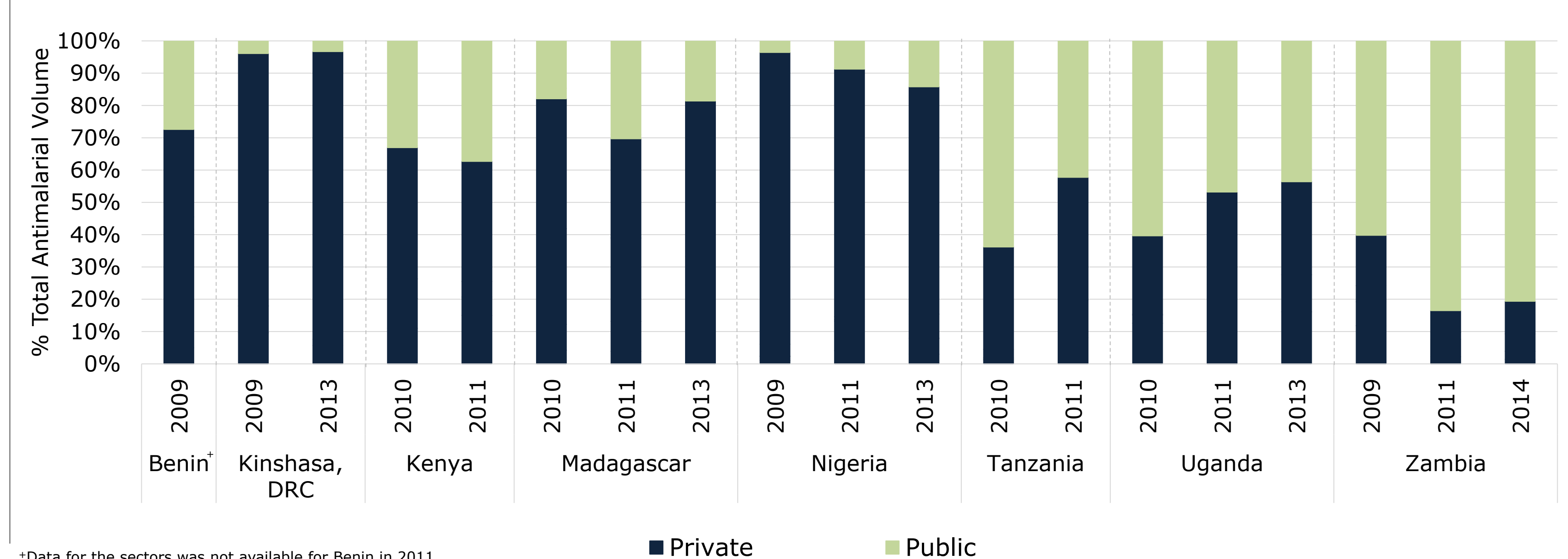**Figure 4. Relative antimalarial market share, public and private sector**

*Data for the sectors was not available for Benin in 2011

Private · Public

Figure 2. SP availability, among outlets with at least 1 antimalarial in stock
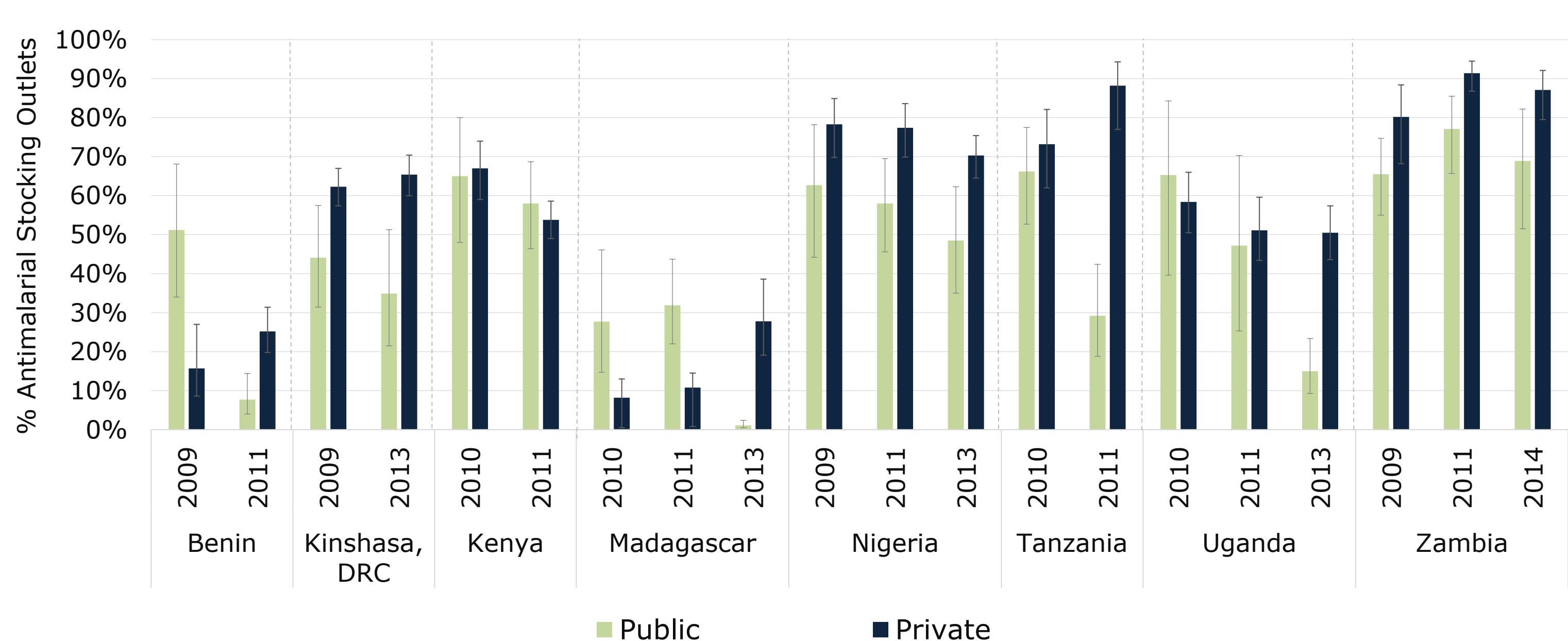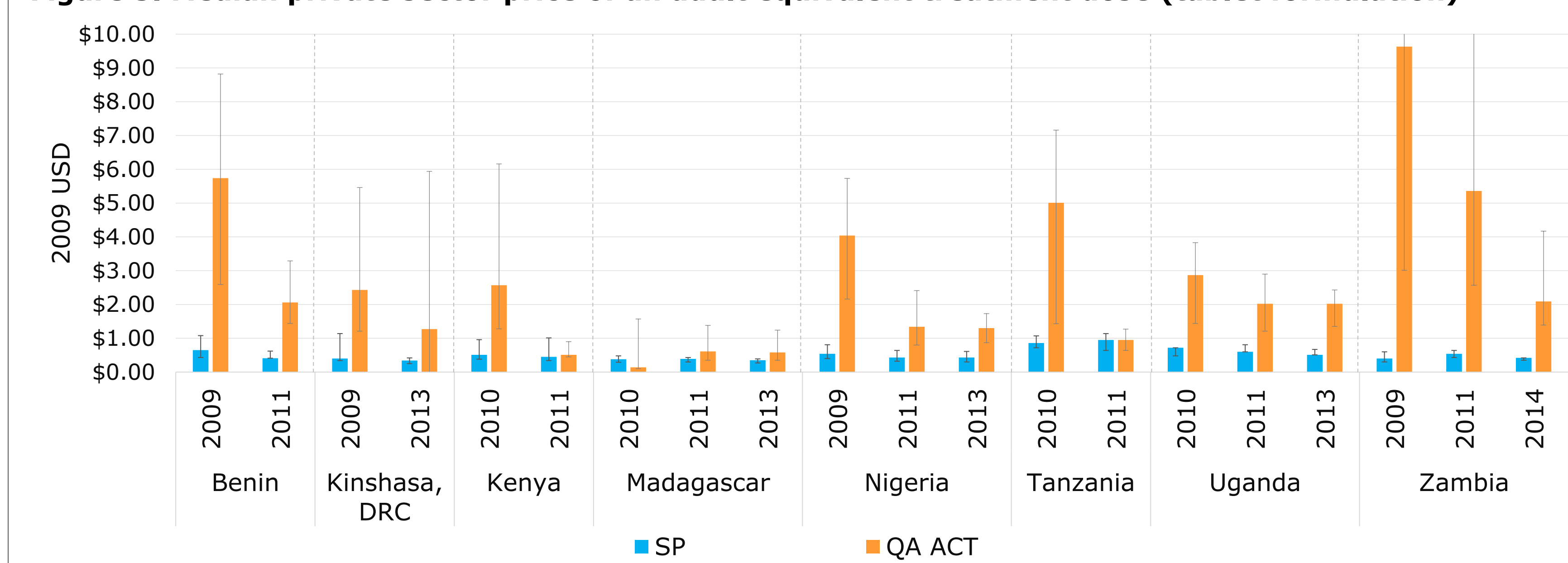

Public · Private

Figure 5. Median private sector price of an adult equivalent treatment dose (tablet formulation)

SP · QA ACT

DISCUSSION

- One decade after shifts in national malaria treatment guidelines to ACT across sub-Saharan Africa, challenges to QA ACT uptake persist. These include recent emergence of numerous non-QA ACTs; availability and widespread use of SP for case management; and the relatively high cost of QA ACT treatment despite implementation of large-scale subsidy schemes targeting the public and private sectors.

- The presence and extent of each of these challenges varies across national contexts highlighting the importance of national assessments and tailored strategies.

- Across country contexts in sub-Saharan Africa, improving malaria case management coverage requires addressing readiness and performance of private sector providers.