THE LANDSCAPE OF PATENT AND PROPRIETARY MEDICINE VENDORS IN 16 STATES OF NIGERIA

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The Global Fund To Fight AIDS, Tuberculosis and Malaria | UCSF University of California San Francisco

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ACKNOWLEDGEMENTS

Society for Family Health, Nigeria

No 8 Port Harcourt Crescent
Off Gimbiya Street, Area 11, Garki, Abuja, Nigeria

Tel: +234 (0) 709 822 1445, +234 (0) 709 822 1447
Email: info@sfhnigeria.org
Website: www.sfhnigeria.org
Facebook: http://www.facebook.com/SFHNigeria
Twitter: @SFHNigeria http://twitter.com/SFHNigeria
Youtube: SFHNigeria http://www.youtube.com/user/SFHNigeria

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ACRONYMS

ACT	Artemisinin-based combination therapy
CQ	Chloroquine
CHEW	Community Health Extension Worker
FMOH	Federal Ministry of Health
iCCM	Integrated community case management
ITN	Insecticide-treated net
IUCD	Intra-uterine contraceptive device
J-CHEW	Junior Community Health Extension Worker
LGA	Local Government Area
LMICs	Low- and Middle-Income Countries
NAPPMED	Nigerian Association of Patent and Proprietary Medicine Dealers
NAFDAC	National Agency for Food and Drug Administration and Control
ORS	Oral rehydration salts
PCN	Pharmacists Council of Nigeria
PPMV	Patent and Proprietary Medicine Vendor
RDT	Rapid diagnostic test (for malaria)
SFH	Society for Family Health
SP	Sulphadoxine-Pyrimethamine
SMoH	State Ministry of Health
WHO	World Health Organization

Executive summary

Interventions implemented to reduce the burden of disease and mortality in sub-Saharan Africa increasingly include drug vendors as a channel for delivering basic healthcare services. In Nigeria, informal providers in the private healthcare sector, and in particular owner-operated drug shops called patent and proprietary medicine vendors (PPMVs), are an important source of health care. PPMVs are located close to communities and are often the first source of care for hygiene products, family planning, and treatment for child illnesses.

Given their geographic spread, market share, and accessibility, **PPMVs represent an important opportunity to increase access to high quality primary health care services in Nigeria.**

Maternal and child mortality in Nigeria, often due to preventable conditions such as postpartum haemorrhaging, diarrhoea, malaria, and pneumonia, remains high. A number of recent national health policies and initiatives aimed at reducing the burden of disease in Nigeria include PPMVs as primary health care providers. Yet, PPMVs oftentimes provide poor quality care; they often lack medical training and access to quality-assured diagnostic tools or essential medicines. PPMVs are also marginalised from the formal health system, preventing timely referrals.

A greater understanding of the role of PPMVs and the quality of care they provide is needed to inform national health initiatives that include PPMVs as providers of basic health services. To describe the distribution and basic characteristics of PPMVs across Nigeria, we conducted a census of all drug vendors in 16 states. The results of our census revealed several important policy points for expanding access to primary care services in Nigeria.

Key findings

- A large and distributed workforce of PPMVs, many of whom have formal health training, through which basic health services could be provided currently exists.
- Few PPMV shops register with the required regulatory agencies, which limits effective monitoring and oversight needed to ensure quality service provision.
- PPMV shops do not stock all the essential health commodities required for the treatment of common childhood illnesses, and commonly stock ineffective treatments.

EXECUTIVE SUMMARY CONTINUED

RECOMMENDATIONS

- PPMV shop owners with formal medical training may be better positioned to deliver basic primary care services, such as child health and family planning, and should be targeted for participation in health initiatives.
- Engaging NAPPMED in efforts to improve drug supply, training, and monitoring for PPMVs can improve regulatory compliance and service quality.
- Strengthening the regulatory and enforcement capacity for the PPMV sector, including registration with relevant agencies and streamlining regulatory processes across agencies, is necessary to improve the quality of care provided in PPMV shops.
- Policies guiding PPMV scope of practice must be revised to reflect best practice treatment guidelines to enable PPMVs to provide essential health commodities for the treatment of common illnesses.
- To improve the quality of medicines sold at PPMV shops, PPMVs must have expanded access to quality-assured supply chains for essential health commodities.

Given their geographic spread, market share, and accessibility, PPMVs represent an important opportunity to increase access to high quality primary health care services in Nigeria. To fully leverage the potential of this sector, PPMVs must be better integrated into the national health system. This should include harmonising national policies addressing PPMV practice; strengthening the training, monitoring, and enforcement of PPMV practice; improving PPMVs' integration into quality-assured supply chains; and building linkages between PPMVs and formal health facilities to enable greater continuity of care for communities.

Introduction

Efforts to scale-up essential health interventions in low- and middle-income countries (LMICs) have revealed a massive gap in available health professionals needed to deliver essential health services. [1,2]. The shortage of health workers is particularly severe in Sub-Saharan African (SSA) countries, despite the high burden of disease that many countries in the region face [3,4]. Increasingly, researchers, policymakers, and international agencies have issued calls to increase the size of their health workforce, and develop new strategies to strengthen cadres of workers [5]. Studies show that frontline health workers, including community-based health workers, can improve access to health services [6].

In SSA, drug vendors are essential frontline health providers. They are the first and dominant point of care for many communities, particularly in rural areas where formal health systems often have limited reach. For example, drug vendors provide between 15% and 83% of all child health services across SSA countries [7]. Recognising this, several countries in the region have begun to include drug vendors in national health interventions [8–10]. Training and regulating this sector, may offer a cost-effective approach for delivering community-based health programmes.

In Nigeria, integrating drug vendors could alleviate many health systems challenges by expanding health workforce capacity and increasing access to basic healthcare commodities and services. Nigeria has one of the highest disease burdens in the world [11]. For example, three preventable and treatable illnesses – malaria, pneumonia, and diarrhoea – cause nearly one million under-five child deaths in the country annually [12]. Drug vendors, known as patent and proprietary medicine vendors (PPMVs) are a dominant source of health care in the country. They are the main access points for a range of health commodities and services [13], and are sought out for health advice and diagnosis, particularly amongst poor and rural populations with limited access to formal health services [14–16].

PPMVs have operated legally in Nigeria for decades. However, only recently, have PPMVs been more formally integrated into national health strategies and guidelines, with a particular focus on the delivery of essential child health services and commodities [17–19]. The lack of reliable national data on the scale of the PPMV sector, as well as the practices, quality, and capacity of PPMV providers, stymies the effective development and implementation of these strategies. We conducted a census of all PPMV shops in 16 states to fill this data gap and better understand the PPMV sector in Nigeria. This report describes the results of our census and offers recommendations on how the PPMV sector may be better engaged to improve health service delivery in Nigeria.

Section 1 provides an overview of where PPMVs are situated in Nigeria's health system. Section 2 outlines the aims and methodology of the study. Section 3 presents the results of the census, describing the numbers, size, coverage, and commodities stocked in the PPMV sector. Section 4 provides policy implications and recommendations based on these data. Section 5 concludes the report. A directory of all PPMV shops found in the census is available in the Annex.

1. BACKGROUND

SCALE AND UTILISATION

In Nigeria, PPMVs are a main source of medicine for common health conditions. An estimated 200,000 PPMVs operated in the country as of 2005, far outnumbering the 2,639 retail pharmacies that were registered in the same year, and more than all other cadres of health workers in the country [20]. Unlike pharmacies which tend to be geographically concentrated in urban areas, PPMVs are more distributed across urban and rural areas [21].

National surveys show that PPMVs are the first source of care for 55% of cases of fever, 30% of cases of diarrhoea, and 8% of cases of cough occurring amongst children under five [22–24]. Community- and state-level studies of care-seeking behaviour similarly find that PPMVs are the first source of care for up to 55% of under-five child illnesses, and provide services for 35% to 55% of adults seeking malaria treatment [25,26]. PPMVs are a particularly important source of care in rural and lower income communities [15,16,27]. However, there is wide variation in the percentage of care-seeking that takes place at PPMVs across maternal and child health care services [22,28], as well as across geography for specific conditions (e.g. malaria) [25,29–31].

PPMV DESIGNATION

PPMVs are owner-operated drug retail outlets and operate legally in Nigeria. The Ministry of Health established them as a category of retailer to provide a source of medicine in communities with limited access to essential health commodities [32]. A PPMV is defined as "a person without formal training in pharmacy who sells orthodox pharmaceutical products on a retail basis for profit" [33]. Regulations permit PPMVs to sell a limited number of pre-packaged, over-the-counter medicines and medical products, but prohibit them from selling prescription medications (e.g. antibiotics) or conducting invasive medical procedures (e.g. injections) [34]. For reproductive health, PPMVs are permitted to sell condoms, oral contraceptive pills, and misoprostol for post-partum haemorrhage but are not allowed to prescribe or sell oral contraceptives to first-time contraceptive users or users experiencing complications [35]. Given these restrictions, PPMV licensure does not require formal training in medicine or pharmacy [36]. Rather, PPMVs may complete an apprenticeship with a senior PPMV before opening their own shop, and by convention are expected to have completed primary school [33]. In contrast, retail pharmacists must have a formal degree in pharmacy and are permitted to sell prescription medications [37].

REGULATION AND MONITORING

The Pharmacists Council of Nigeria (PCN) is the agency responsible for licensing and regulating both PPMVs and retail pharmacies [32]. In the case of PPMVs, the PCN took over this official regulatory role from the Ministry of Health in 2003. However, due to a number of financial and logistical barriers to registration and re-registration, few PPMV shops are registered with the PCN. PPMV practices are also overseen by a number of additional regulatory agencies; the Federal Ministry of Health (FMOH) is responsible for outlining PPMVs' scope of practice, and the National Agency for Food and Drug

Administration and Control (NAFDAC) monitors the compliance and quality of drugs sold at PPMV shops. In some states, PPMVs are also required to register with the State Ministry of Health (SMoH), which in turn participates in monitoring.

PPMVs more often register with their professional association, the National Association of Patent and Proprietary Medicine Dealers (NAPPMED). NAPPMED operates at multiple administrative levels, from the national body down to the state, Local Government Area (LGA), and ward levels [38]. NAPPMED conducts a number of support and oversight activities including monitoring visits, facilitating education and training sessions to disseminate information on proper PPMV practice (e.g. new products, dispensing guidelines), providing business and financial support to members, and serving as an intermediary between PPMVs and various regulatory agencies, including PCN, NAFDAC, and local police (e.g. protection from police harassment) [38,39]. However, NAPPMED's monitoring function is self-initiated and NAPPMED does not have a regulatory mandate.

In practice, monitoring of PPMV activities is inconsistent and weak. Regulatory agencies, such as PCN and SMoHs, lack the capacity to consistently monitor and enforce the regulations guiding PPMV practice. This is partly due to PPMVs not registering with these agencies, which limits effective oversight. Although NAPPMED has strong connections with individual PPMV shop owners as a result of near universal membership and an extensive network of state-, LGA-, and ward-level chapters, the association lacks the legal authority to enforce PPMV regulations. The strength of NAPPMED to effectively incentivise good behaviour amongst member PPMVs also varies widely across chapters.

QUALITY

Our recent systematic review of the literature on PPMV practices in Nigeria shows that PPMVs provide medicines and services for a wide variety of health needs, including malaria, respiratory infections, diarrhoea, common cough and cold, tuberculosis, and reproductive health [40]. However, the quality of these services is low. PPMV shop owners and workers generally have low health knowledge about proper treatment for common illnesses, such as malaria and diarrhoea [41–43], and poor health treatment practices [40].

PPMV shops commonly stock poor quality medicines (e.g. partial or repackaged doses [44], sub-standard formulations [45,46]). PPMV shop owners and workers also have poor drug dispensing practices, influenced by their low health knowledge and improper stocking practices. Drug sales often do not conform to recommended treatment guidelines [27,47–49], and it is common for PPMVs to sell inappropriate and ineffective medicines, as well as dispense incorrect doses of medicines. It is important to note, however, that customer demand for inappropriate treatment also contributes to PPMVs' dispensing practices [14,48,50–52].

Regulatory limitations and lack of training opportunities also impact the quality of care provided at PPMV shops. It is common for PPMVs to provide services they are legally prohibited from offering, for which they have not received any training, including injectable contraceptives [53], injectable antimalarials, [54] and dispensing antibiotics [55,56]. For example, while the majority of PPMV shops stock family planning commodities, few have received training on family planning methods [57], and therefore infrequently counsel customers on family planning options or usage [58,59], and are less likely than other family planning providers to inform customers about method options or side effects [57]. Similarly, PPMVs are not legally permitted to sell antibiotics or give injections, but commonly stock and dispense antibiotics [52,60] and administer injections [61,62] for child illnesses.

PPMVs WITHIN NATIONAL HEALTH STRATEGIES

Given the large number of PPMV shops, their presence in rural communities, and the acknowledged regulatory challenges, there is growing interest amongst policymakers and programme implementers in Nigeria to further engage PPMVs in the delivery of basic healthcare commodities and services. A number of recent national health initiatives and regulatory changes that explicitly address PPMVs serve as evidence of this growing interest. For example, in 2005, after the national treatment guidelines for uncomplicated malaria were revised to recommend artemisinin-based combination therapy (ACTs) rather than chloroquine as the first-line treatment [63], the Essential Medicines List was amended to allow PPMVs to sell ACTs [34].

The Government of Nigeria has similarly committed to adding paediatric zinc and co-packaged zinc and oral rehydration salts (ORS) to PPMVs' list of approved medications as part of the national Essential Medicines Scale-Up Plan. The Plan also includes implementation of continuous education for PPMVs to improve care for common childhood illness [64]. PPMVs have also been listed as potential community-level implementers for the newly adopted national integrated Community Case Management (iCCM) guidelines [65], and have been included in a pilot project for home management of malaria under the National Malaria Strategic Plan [66]. The National Task Shifting and Sharing Policy issued in 2014 also calls for capacity building of community-oriented resource persons, including PPMVs, to provide treatment, counselling, and referral for some reproductive and maternal child health services. These policies represent a major step towards addressing the shortage of health workers needed to deliver essential health services.

2. STUDY AIMS AND METHODOLOGY

AIMS

To inform national health plans and policies for delivering quality-assured health services and commodities through PPMV shops, a greater understanding of the characteristics, stocking practices, and coverage of PPMVs is needed. This information will help to identify effective mechanisms for operationalising PPMVs' integration into these national initiatives and improving health service quality in the PPMV sector.

In 2013-2014, we conducted a census of all PPMV shops in 16 states in Nigeria to achieve the following objectives:

- Document the size and coverage of the PPMV sector
- Describe the basic characteristics of PPMV shops and their owners
- Assess the range of products that PPMV shops stock for priority health services, including malaria treatments, iCCM, and family planning

METHODS

The Society for Family Health and the University of California, San Francisco conducted the census. We designed the census to collect information about the basic characteristics of PPMVs and the health commodities stocked for all shops that could be located in the 16 selected states. Management and staff of Fazako Associates conducted the field work for this study.

STATE SELECTION

PPMV characteristics, and their roles in community health services provision, were thought to vary geographically as multiple cultural and socio-demographic factors influence care-seeking behaviour and thus shape how communities interact with PPMVs. For this reason, we selected states across northern and southern regions of the country.

TRAINING

We hired 140 field staff and six supervisors to complete the census. Field staff received a three-day training on the standard operating procedures, the survey protocol and data collection tools, and the use of the GPS receivers for spatial data capture.

2. STUDY AIMS AND METHODOLOGY CONTINUED

SURVEY ACTIVITIES

The main fieldwork was conducted in May 2013 with data verification and quality assurance continuing through March 2014. Two field staff were assigned to each LGA, and visited all PPMV shops that could be located in the LGA. PPMV shops were identified through existing lists of PPMVs (e.g. registration lists), discussion with the NAPPMED leadership to identify member shops, and by direct observation.

At each PPMV shop, staff noted the geographic coordinates, and administered a brief questionnaire to the head of the PPMV shop. Where the head of the shop was unavailable, field staff returned repeatedly until s/he was interviewed. The questionnaire included information on the shop registration, characteristics of the PPMV head (e.g. profession, educational qualification), and stocking practices for family planning, malaria, pneumonia, diarrhoea, and other related health commodities.

Two supervisors were assigned to each state, and provided support and oversight to the field staff, including monitoring data quality.

DATA MANAGEMENT AND ANALYSIS

Field supervisors were responsible for checking, coding, and storing completed questionnaires to ensure accuracy, consistency, and reliability. Data was entered using CSPro and SPSS. Statistical and spatial analyses were completed using SPSS, Stata, and ArcGIS.

3. Results

The results of the census are presented below. We first describe the distribution of PPMV shops across all surveyed states. We then discuss the basic characteristics of PPMV shops, including their educational qualifications. Finally, we provide information about the range of health commodities stocked at PPMV shops for the diagnosis, prevention, and treatment of the most common illnesses – malaria, diarrhoea, and pneumonia – as well as stocking practices for family planning commodities.

Size and distribution of PPMV shops in surveyed states

Shop distribution

PPMVs are plentiful **and may be more accessible than health facilities,** especially in the south.

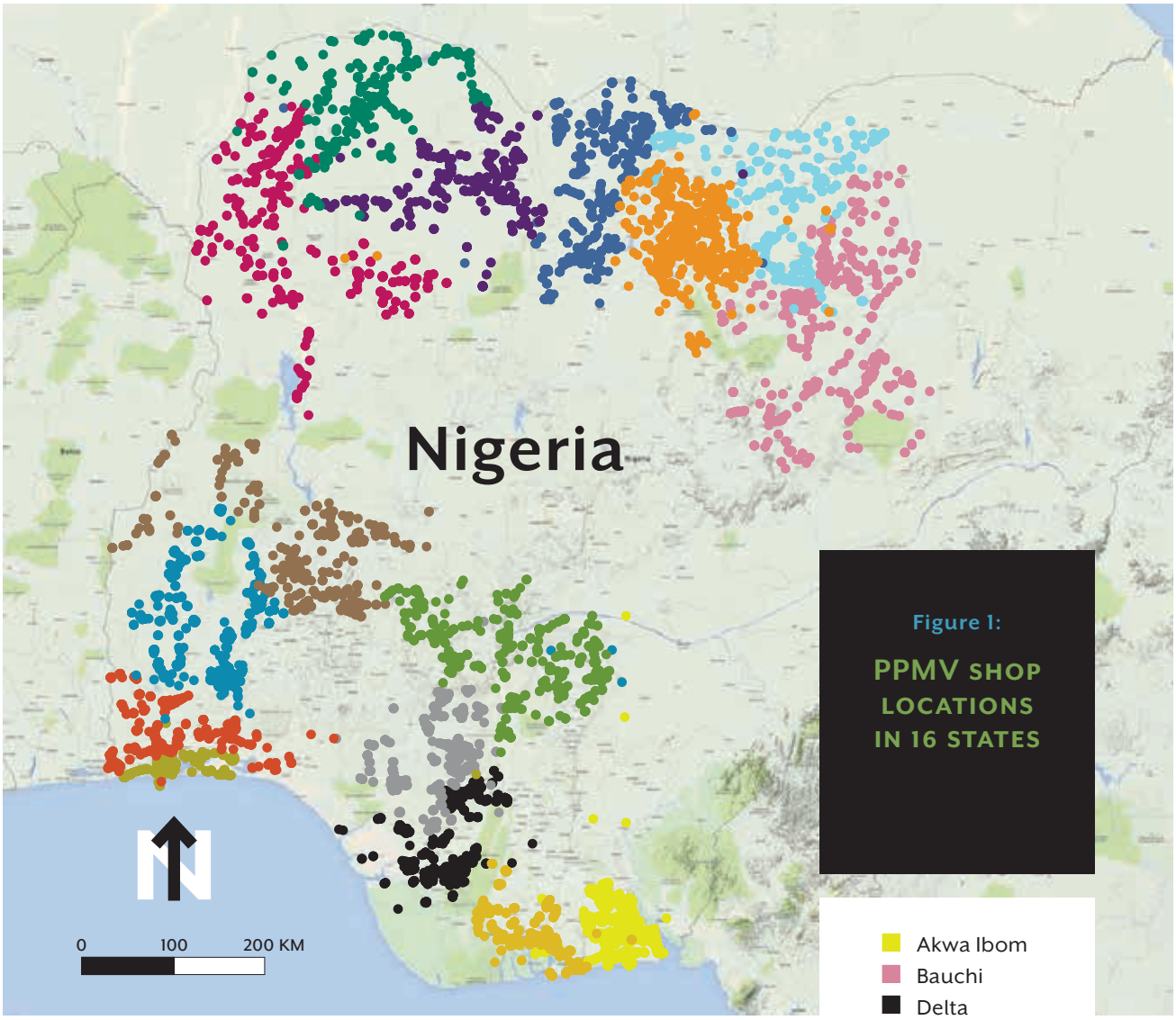


Figure 1:

PPMV SHOP LOCATIONS IN 16 STATES

The locations of all PPMV shops captured during the census are displayed in **Figure 1**, showing the widespread presence of PPMV shops throughout the country and in each state.

Table 1:

DENSITY OF PPMV SHOPS BY STATE

State	Number of shops	Population	PPMV shops per 100,000 population
Akwa Ibom	1,714	4,791,068	35.8
Bauchi	1,061	5,715,325	18.6
Delta	1,394	4,950,985	28.2
Edo	1,305	3,776,187	34.6
Jigawa	770	5,162,340	14.9
Kano	1,695	11,401,847	14.9
Katsina	1,522	6,916,641	22.0
Kebbi	934	3,889,673	24.0
Kogi	1,089	3,914,685	27.8
Kwara	1,001	2,831,204	35.4
Lagos	1,374	10,888,631	12.6
Ogun	1,271	4,529,907	28.1
Oyo	3,044	6,833,740	44.5
Rivers	918	6,337,318	14.5
Sokoto	728	4,414,410	16.5
Zamfara	822	3,937,996	20.9
Total	**20,642**	**43,639,568**	**23.7**

Note: Population data were retrieved from the 2006 census and adjusted for population growth by state to 2012

In total, 20,642 PPMV shops were identified across the 16 states selected for the census (Table 1). When standardised by population size, this is equal to an average of about 24 shops per 100,000 population. The density of PPMV shops ranges from less than 15 shops per 100,000 population (Jigawa, Kano, Lagos, Rivers) to over 30 shops per 100,000 population (Akwa Ibom, Edo, Kwara, and Oyo). Figure 2 shows the number of PPMV shops located across LGAs, standardised by population size.

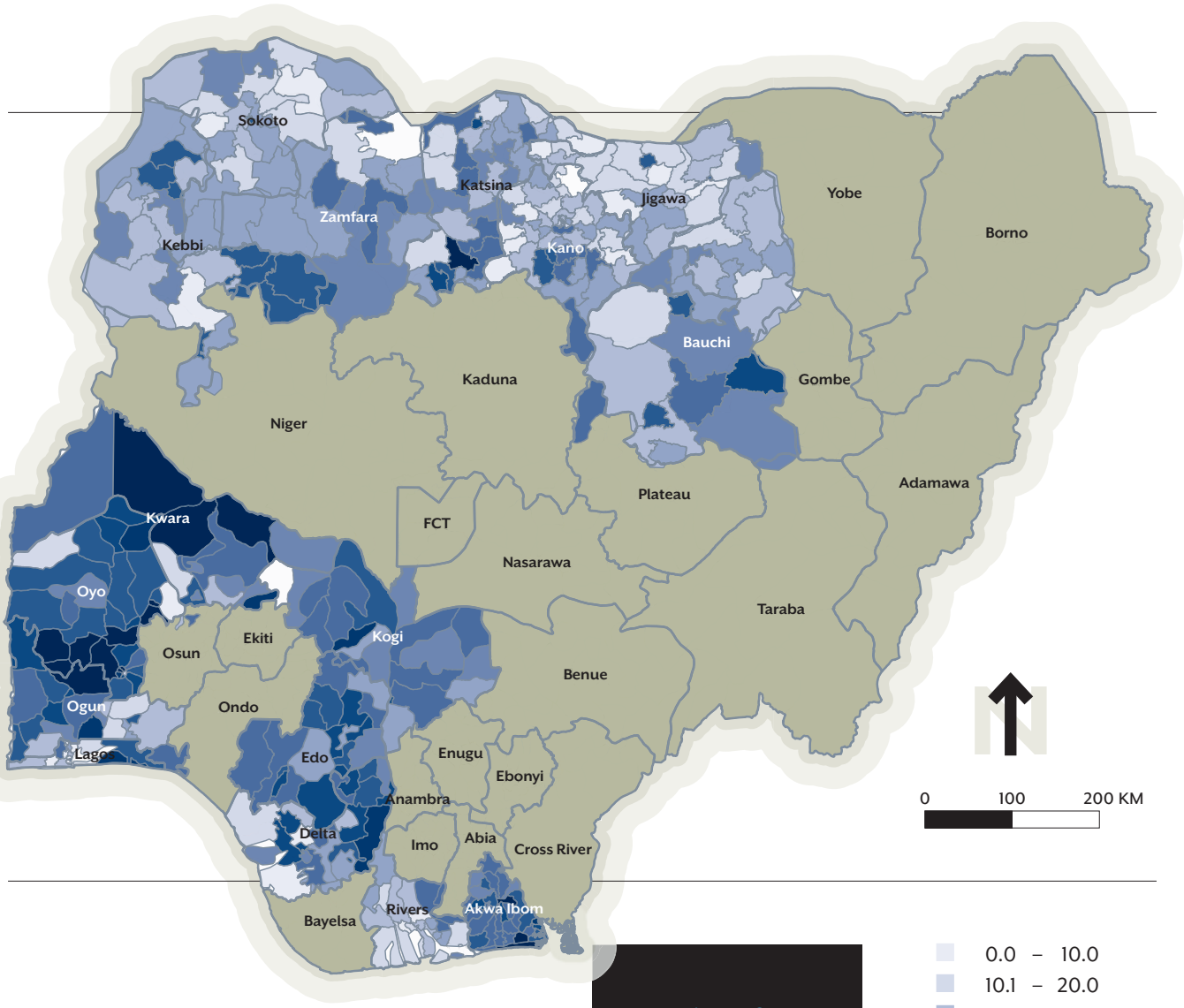


Figure 2:

DENSITY OF PPMV SHOPS BY LGA

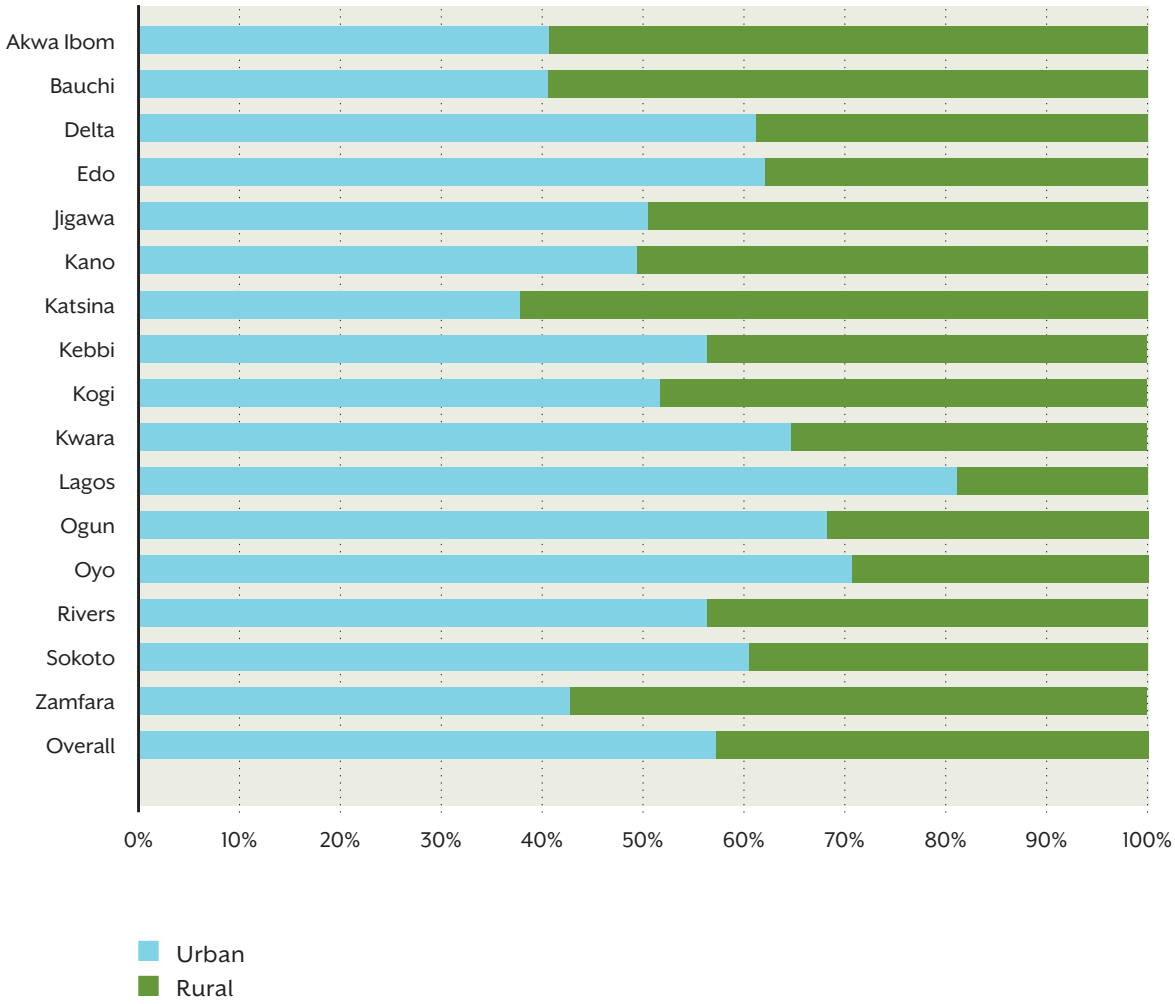
The density of PPMV shops was higher in southern Nigeria. There were on average 31 shops per 100,000 population across LGAs in the southern states and 19 shops per 100,000 population across LGAs in the northern states surveyed. In the southern states, the density of PPMV shops was higher than the density of public and private health facilities, including health posts/dispensaries, clinics, and hospitals (an average of 24 facilities per 100,000 population across LGAs in the same southern states) [67].

URBAN/RURAL COVERAGE

Overall, 43% of PPMV shops were located in rural areas (57% were in urban areas) (Figure 3). In some states, such as Akwa Ibom, Bauchi, Kano, Katsina, and Zamfara, over 50% of PPMV shops were located in rural areas.

PPMVs may be better positioned to reach rural populations with limited access to medicines.

Figure 3: PER CENT OF PPMV SHOPS ACROSS STATES BY LOCATION



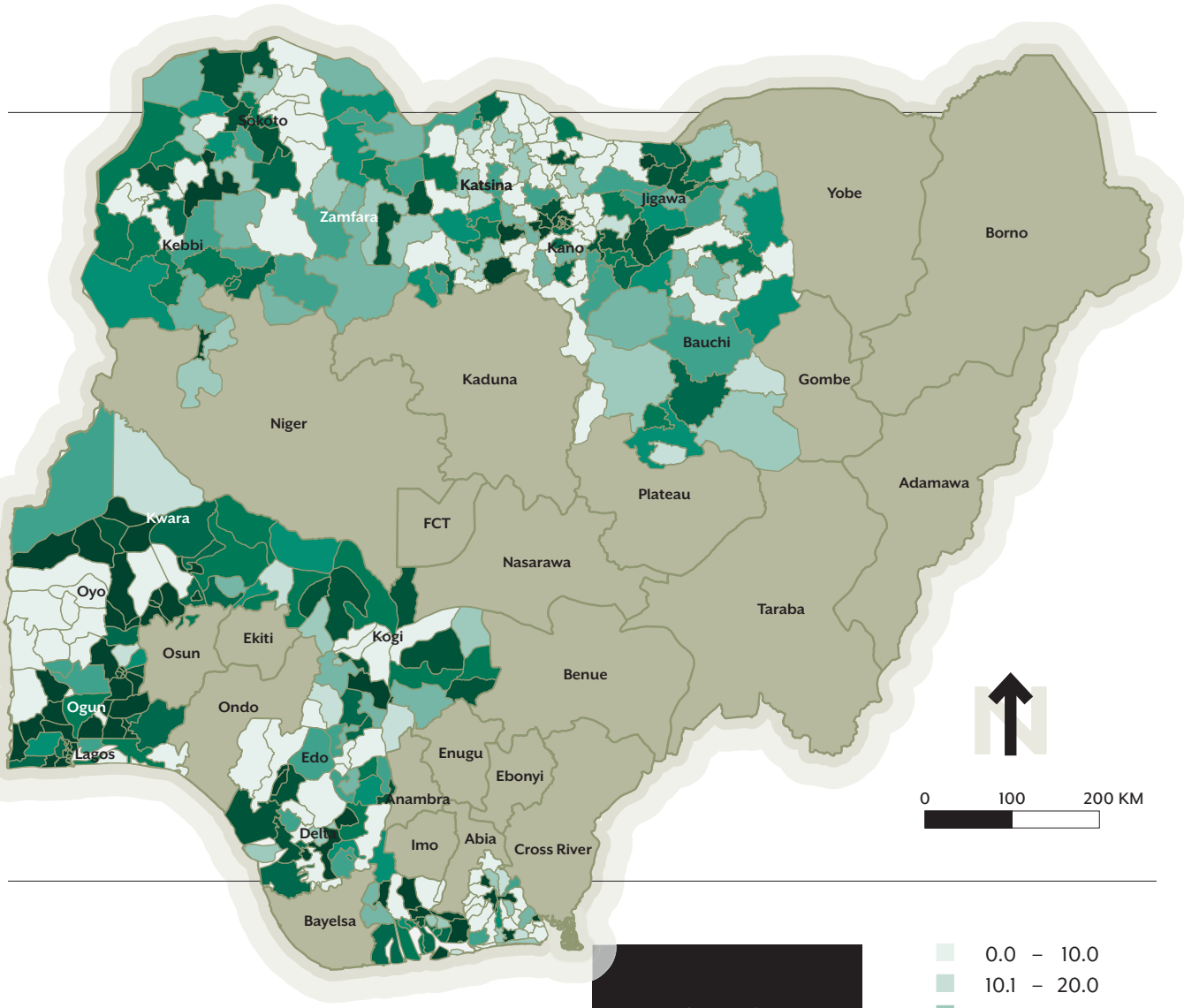


Figure 4a:

PER CENT OF PPMV SHOPS IN URBAN AREAS BY LGA

Figures 4a and **4b** show the percentage of PPMV shops located in urban and rural areas (respectively) by LGA. In many states, there is wide variation in the concentration of PPMV shops between urban and rural areas. A higher percentage of PPMV shops across the northern surveyed states were located in rural areas (an average of 47%) compared to the average across southern surveyed states (35%).

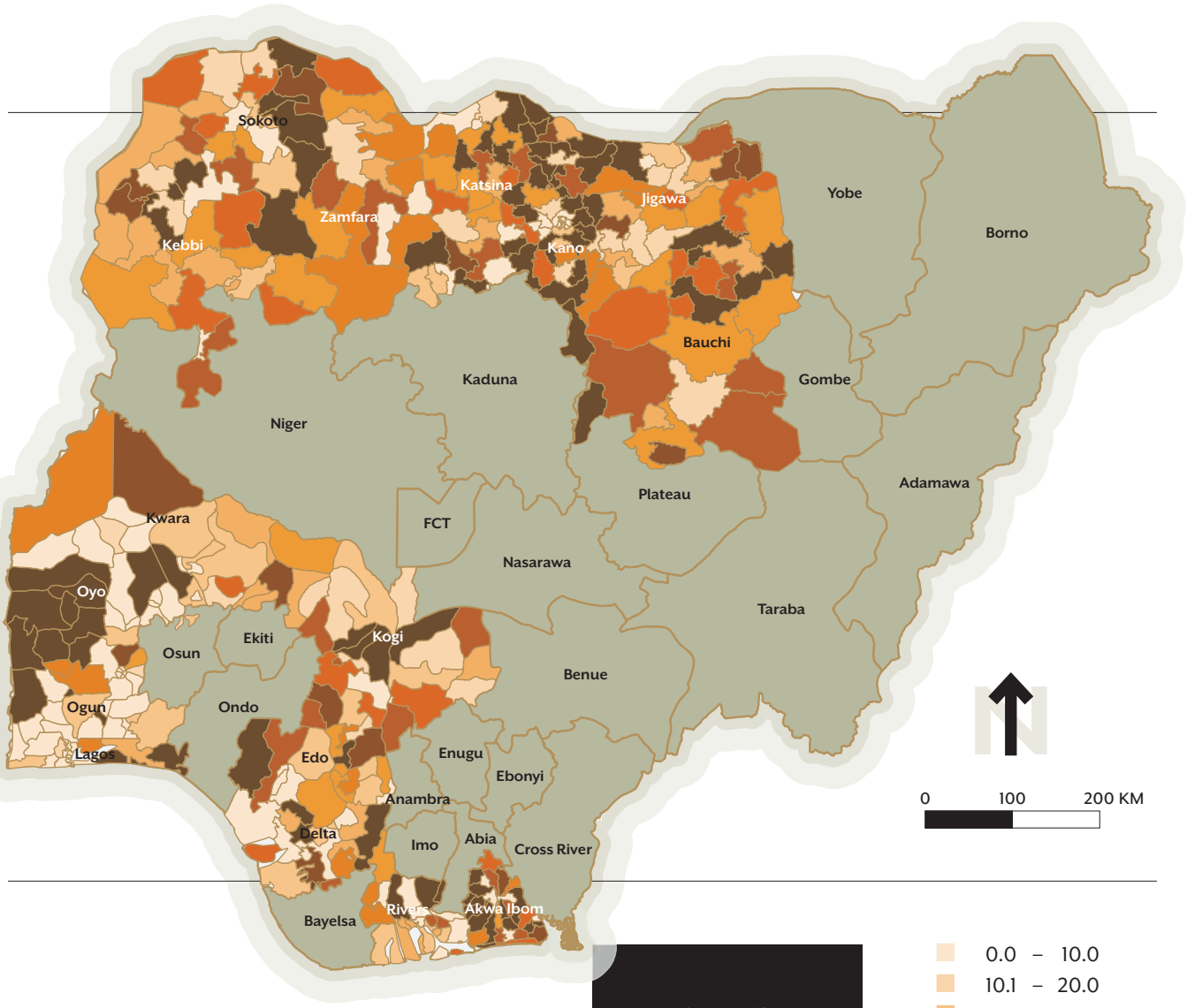


Figure 4b:

PER CENT OF PPMV SHOPS IN RURAL AREAS BY LGA

The presence of PPMV shops in rural areas, as well as the higher density of PPMV shops as compared to that of other health facilities, suggests that PPMVs are able to reach more remote populations that may not have easy access to other sources of medicines.

PPMV SECTOR CHARACTERISTICS

SHOP REGISTRATION

Many PPMVs were not registered with the required regulatory bodies.

PPMVs are required to register with the PCN and, at times, also with the SMoH and the local government in which they operate. However, the majority of PPMV shops (over 80%) were registered with NAPPMED, the PPMV professional association (**Figure 5**).

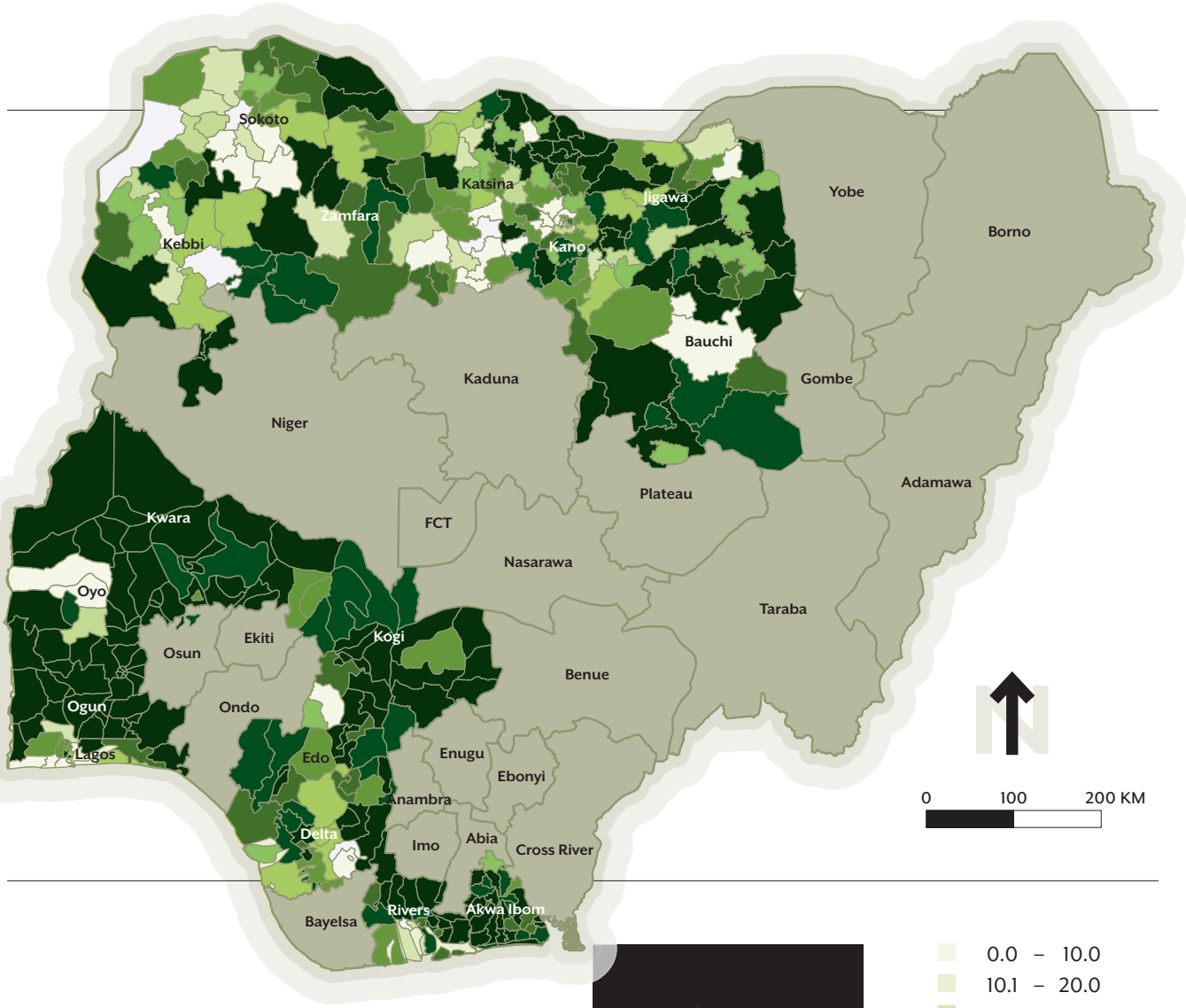


Figure 5:

PER CENT OF PPMV SHOPS REGISTERED WITH NAPPMED BY LGA

PPMVs register with the required regulatory bodies less frequently (Table 2). Fewer than 30% of PPMVs were registered with their LGA, and fewer than 15% were registered with either the PCN or their SMoH.

Table 2:

PER CENT OF PPMVS REGISTERED WITH AN ASSOCIATION

State	NAPPMED	PCN	SMoH	LGA
Akwa Ibom	89%	34%	2%	10%
Bauchi	72%	3%	10%	60%
Delta	73%	10%	1%	2%
Edo	79%	5%	1%	10%
Jigawa	81%	17%	10%	48%
Kano	57%	25%	35%	41%
Katsina	53%	4%	25%	47%
Kebbi	66%	17%	16%	42%
Kogi	90%	5%	13%	20%
Kwara	95%	2%	17%	15%
Lagos	55%	4%	0%	25%
Ogun	87%	5%	15%	33%
Oyo	92%	15%	0%	14%
Rivers	86%	3%	5%	17%
Sokoto	44%	27%	45%	45%
Zamfara	73%	13%	9%	59%
Total	**76%**	**12%**	**11%**	**27%**

EDUCATIONAL QUALIFICATION OF THE HEAD OF THE SHOP

Many PPMV shop owners have received formal health training.

Although PPMV shop owners are only legally required to have completed primary school, our census showed that the majority of shop owners have higher levels of educational attainment. The majority completed secondary (47%) or post-secondary education (37%) (Table 3).

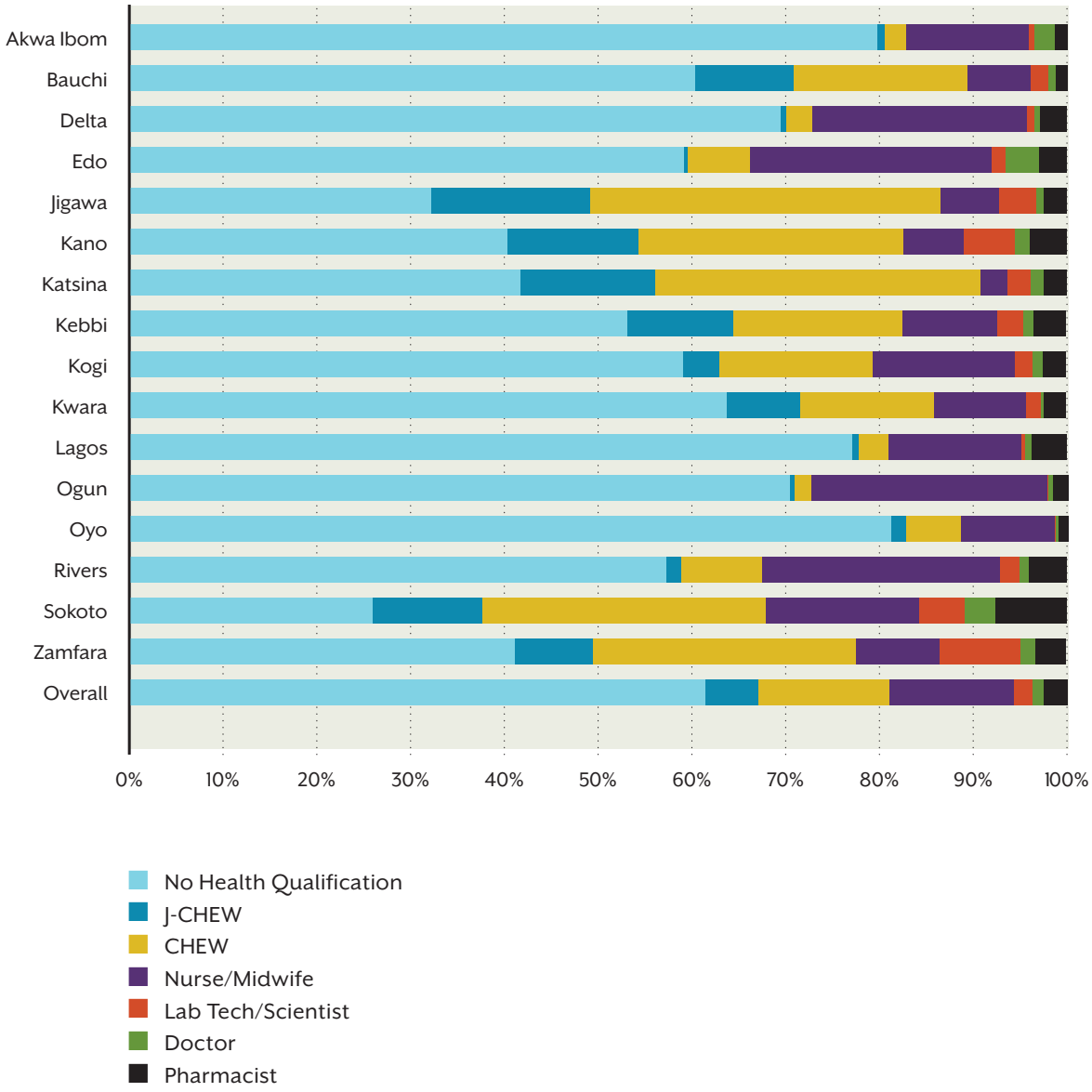
Table 3:
PPMV SHOPS CHARACTERISTICS BY LOCATION

	Urban	Rural	Overall
Highest educational attainment			
No school	0.8%	0.6%	0.7%
Primary	1.5%	2.5%	1.9%
Secondary	48.6%	45.7%	47.4%
Post secondary	34.3%	40.9%	37.1%
Tertiary	13.5%	9.3%	11.7%
Post graduate	1.3%	1.0%	1.2%
Health training			
No health qualification	63.3%	58.7%	61.4%
J-CHEW	3.8%	8.3%	5.6%
CHEW	10.5%	18.3%	13.7%
Nurse/midwife	15.8%	9.8%	13.3%
Pharmacist	3.3%	1.6%	2.6%
Lab tech/scientist	1.8%	2.3%	2.0%
Doctor	1.4%	1.0%	1.3%
Antimalarial drugs			
ACT	81.8%	78.3%	76.5%
SP	85.6%	79.1%	78.9%
Chloroquine	58.8%	57.3%	55.4%
Monotherapy	75.4%	64.1%	67.2%
ITN	7.1%	2.6%	5.0%
RDT	3.6%	4.4%	3.8%
ORS	86.4%	82.2%	80.6%
Zinc tablets	17.1%	11.4%	14.0%
Amoxicillin	72.7%	66.2%	66.6%
Family planning			
Male condom	73.4%	54.9%	65.5%
Female condom	7.1%	5.3%	6.3%
Oral contraception	58.7%	47.8%	54.1%
Injectable contraception	20.0%	17.3%	18.9%
Emergency contraception	29.9%	17.0%	24.4%
IUCD	2.1%	1.3%	1.8%
Water treatments			
Fluid	39.5%	19.3%	24.4%
Powder	4.5%	3.0%	3.6%

3. RESULTS CONTINUED

In addition, over a third of the PPMV shop owners surveyed (39%) reported having received some form of health training, with training levels ranging from Community Health Extension Workers (19%) to nurses and midwives (13%), pharmacists (3%), lab technicians/scientists (2%), and doctors (1%).

Figure 6: PPMV SHOP OWNER HEATLH QUALIFICATION



3. RESULTS CONTINUED

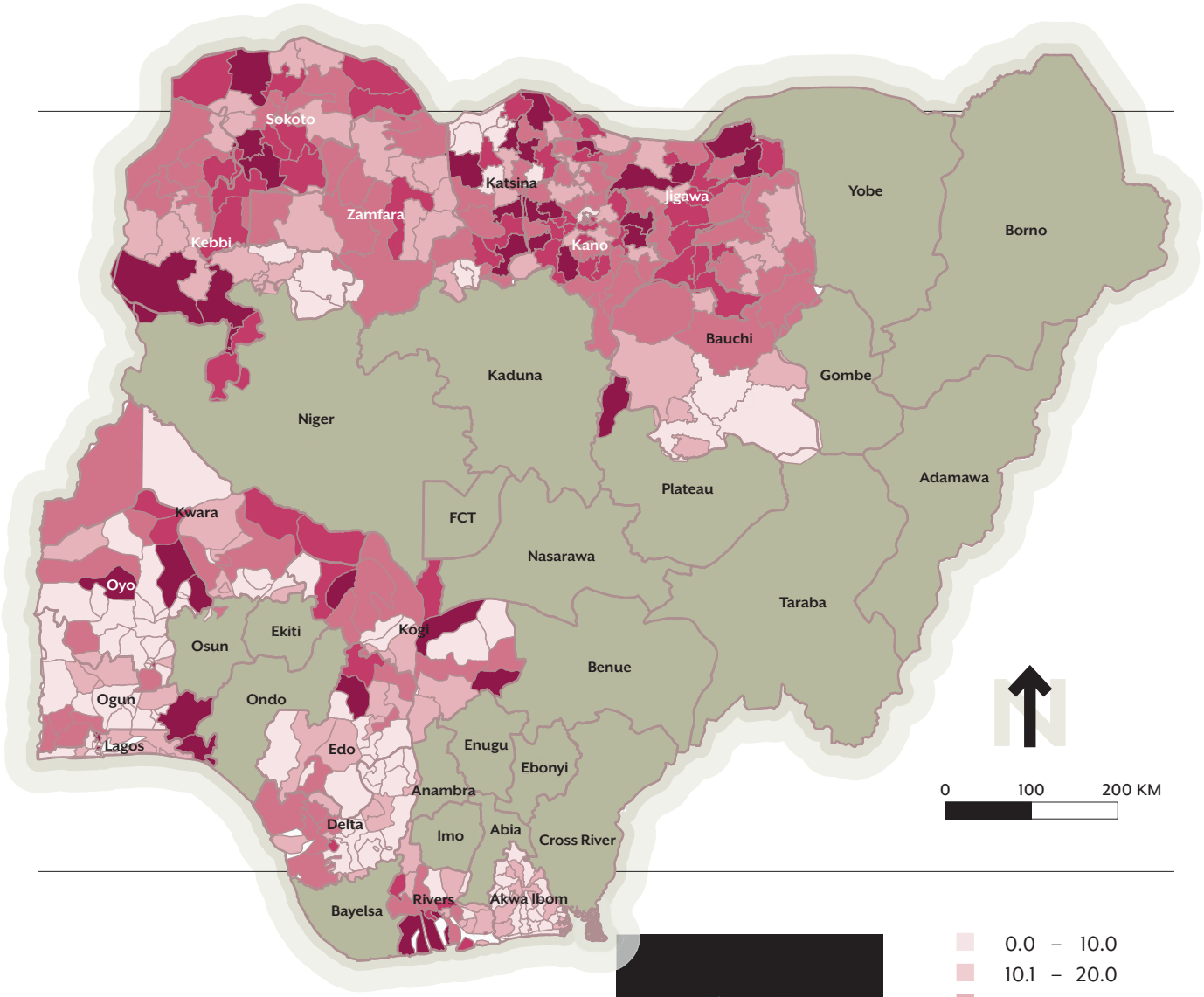


Figure 7:

PER CENT OF PPMV SHOP OWNERS WITH HEALTH TRAINING

A higher percentage of PPMV shop owners in the northern states had formal medical training (53%) than PPMV shop owners in the southern states. Oyo, Akwa Ibom, and Lagos states had the lowest percentage of formally trained PPMV shop owners (19%, 20%, and 23%, respectively). In comparison, Kano, Jigawa, and Sokoto had the highest percentage of formally trained PPMV shop owners (60%, 68%, and 74% respectively). PPMVs in rural areas also had higher percentages of medically-trained shop owners (63%) than their urban counterparts (59%).

HEALTH COMMODITIES IN STOCK ON THE DAY OF SURVEY

In order for PPMV shops to serve as an effective source of medicines, it is necessary that they stock the basic essential medicines required to treat common illnesses. The percentage of PPMVs that stocked these essential health commodities varied widely by commodity type, as well as by rural and urban location. Overall, PPMVs more commonly stocked the recommended treatments for malaria than for pneumonia and diarrhoea. However, there is room for improvement in the coverage of essential medicines across all three illnesses.

The percentage of PPMVs that stocked essential health commodities **varied widely by commodity type, as well as by rural and urban location.**

MALARIA COMMODITIES

ACTs are now the recommended first-line treatment for malaria in Nigeria. The majority of PPMVs, 76%, stocked ACTs; however, there was wide variation across states. In some states, such as in Bauchi, Kano, and Akwa Ibom, the percentage of PPMV shops that stocked ACTs was high, while other states, such as in Kwara and Kogi, the percentage was much lower (**Figure 8**).

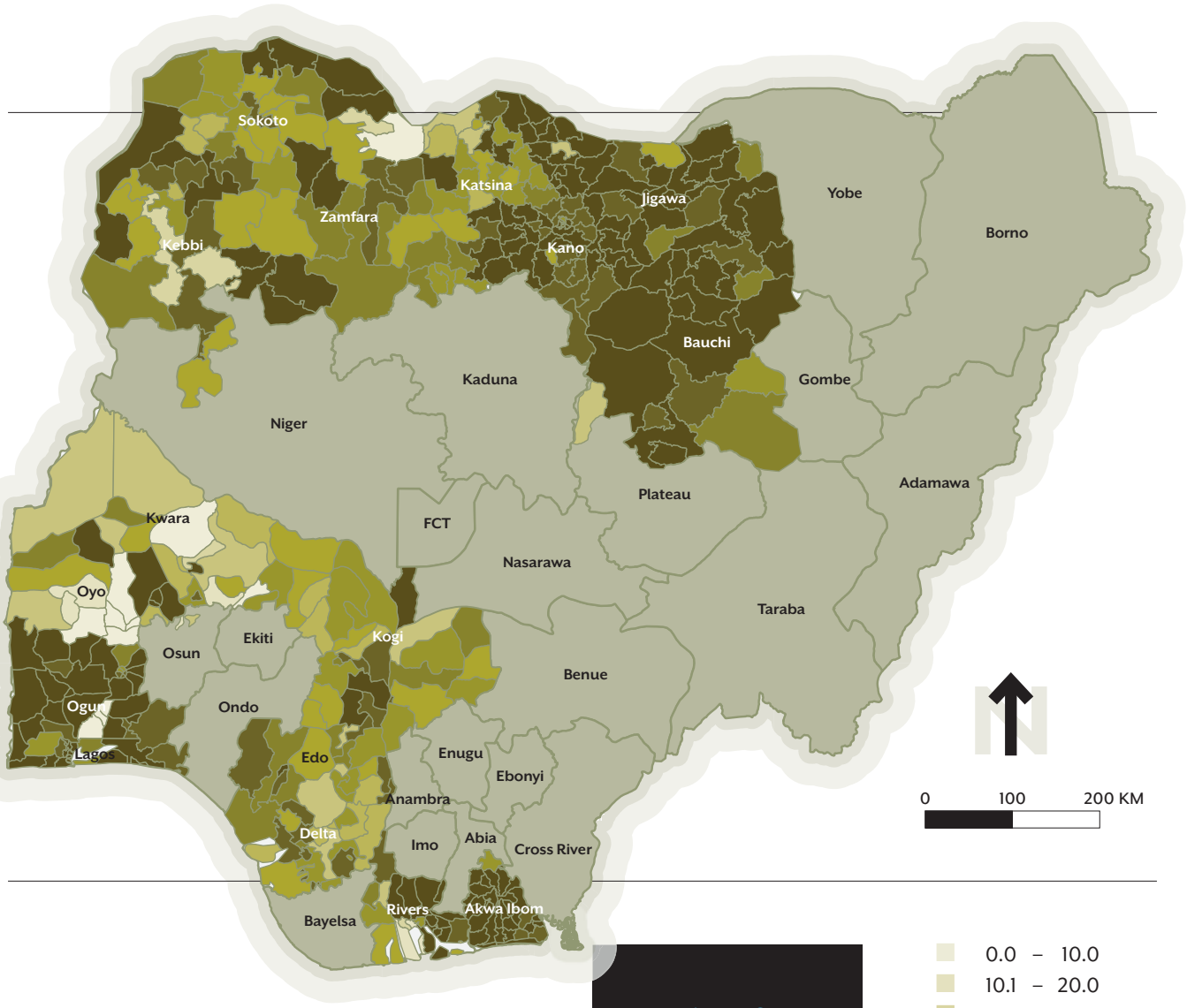


Figure 8:

PER CENT OF PPMV SHOPS STOCKING ACTS BY LGA

Nonetheless, there is room for improvement in stocking ACTs. Relatively few PPMV shops, approximately 25% of those surveyed, stocked ACTs from the Affordable Medicines Facility-malaria programme, suggesting that there are opportunities to increase PPMV access to ACT supply chains and increase ACT distribution.

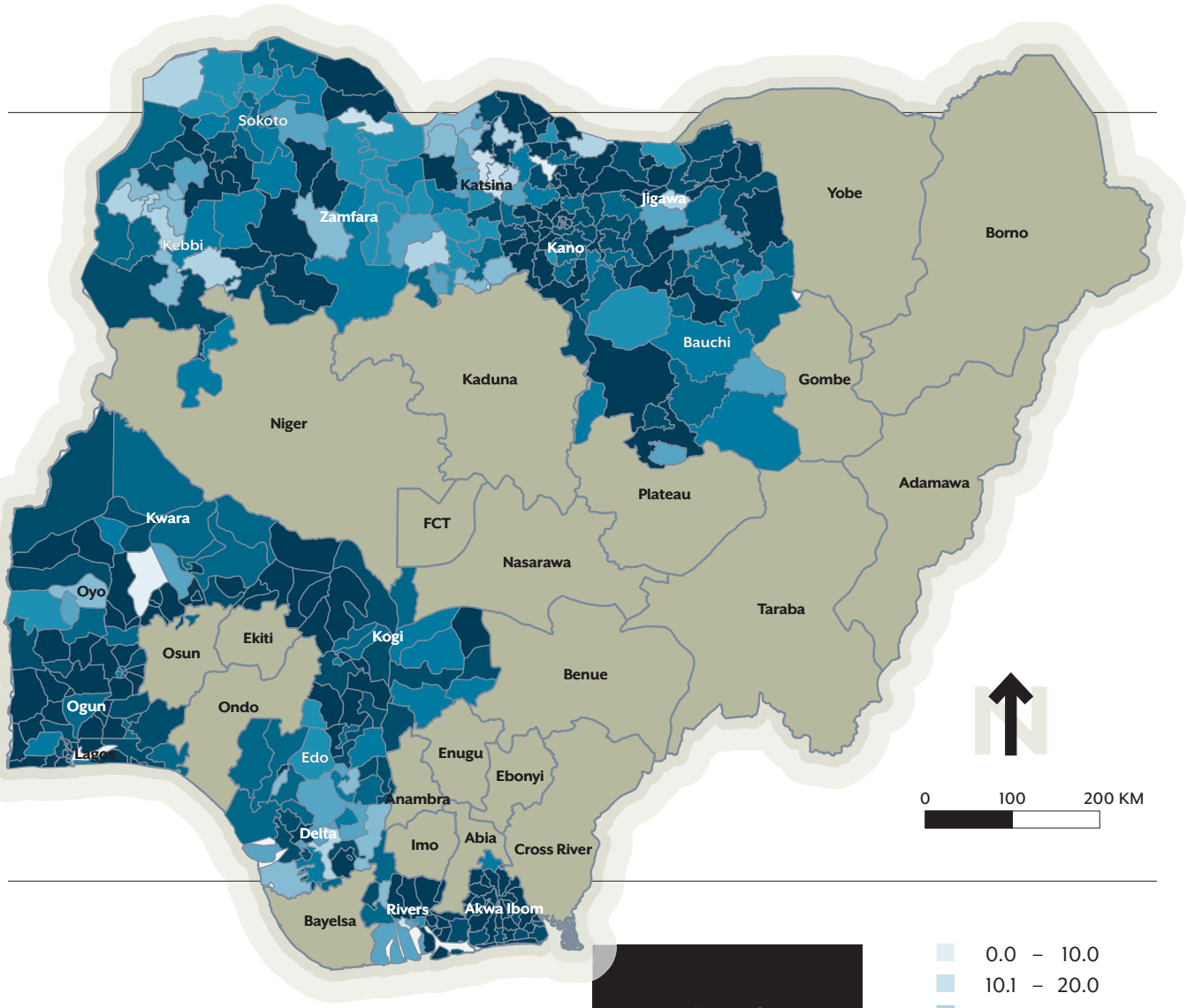


Figure 9:

PER CENT OF PPMV SHOPS STOCKING SULPHADOXINE-PYRIAMETHAMINE BY LGA

Although many PPMV shops carried ACTs, the majority also stocked non-recommended malaria treatments, including sulphadoxine-pyrimethamine (79%) (Figure 9), chloroquine (55%) (Figure 10), and artemesinin-based monotherapies (67%) (Figure 11).

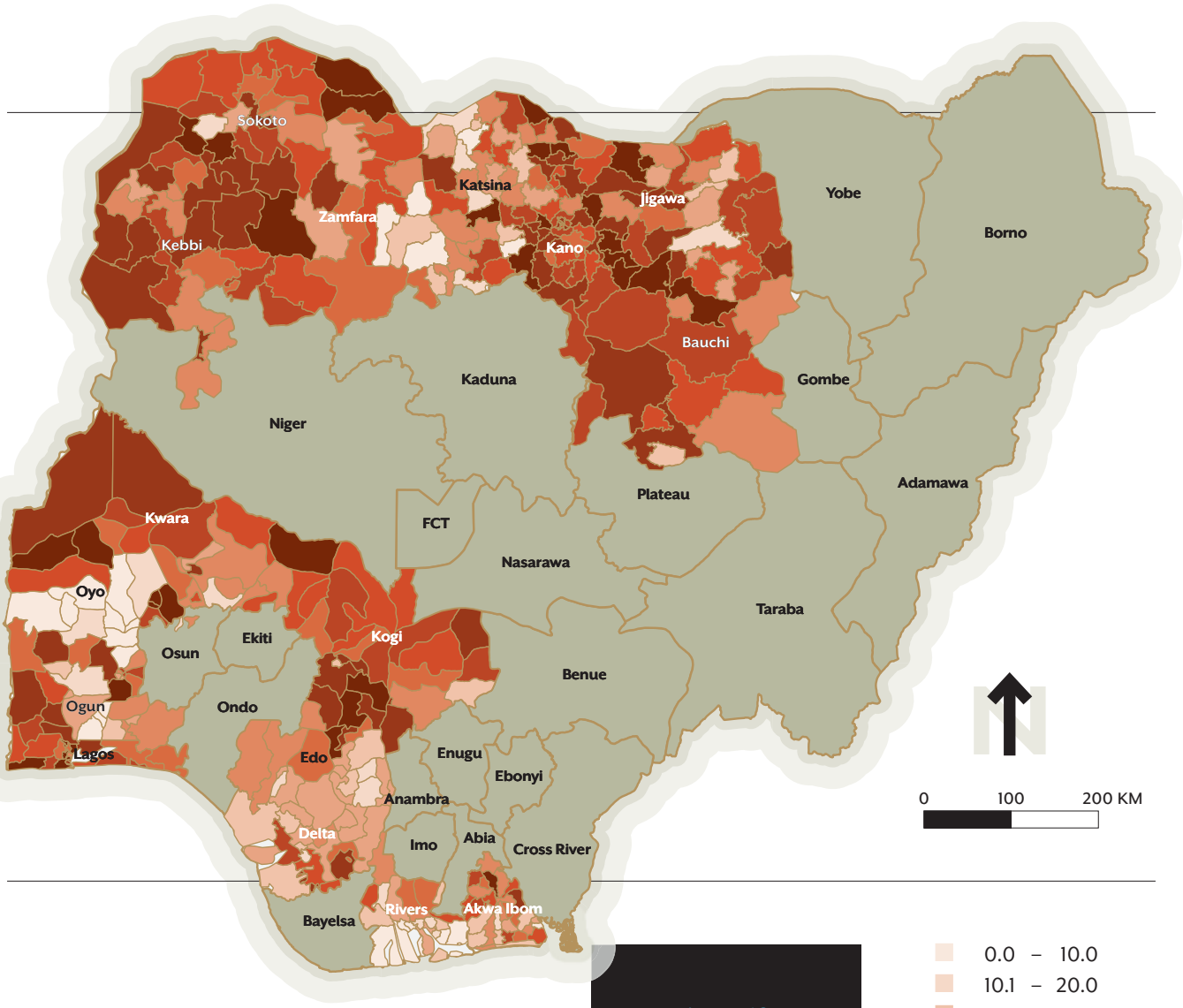


Figure 10:

PER CENT OF PPMV SHOPS STOCKING CHLOROQUINE BY LGA

Although no longer recommended as the first-line treatment for uncomplicated malaria, chloroquine is still widely available.

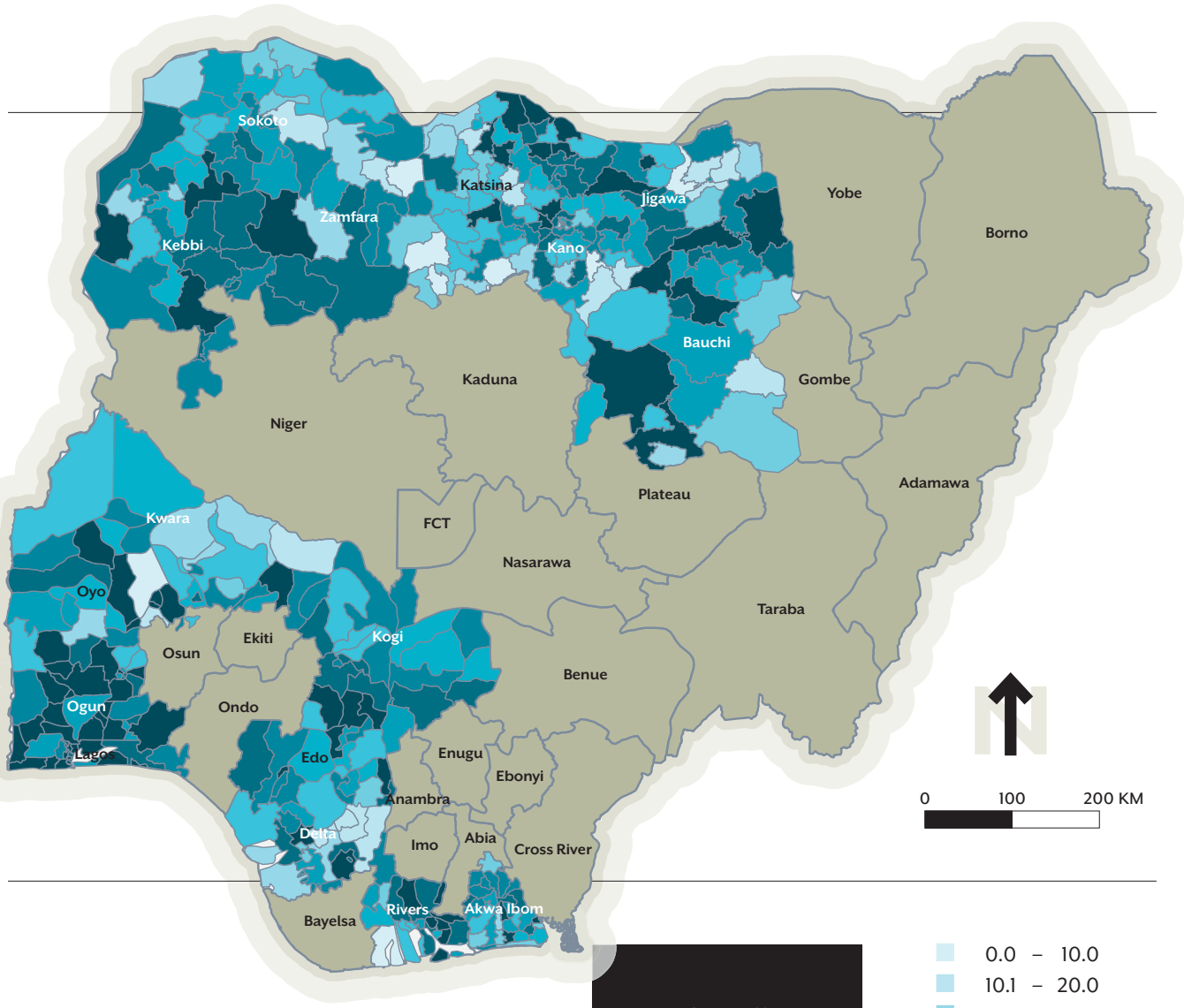


Figure 11:

PER CENT OF PPMV SHOPS STOCKING ARTEMISININ-BASED MONOTHERAPIES BY LGA

Reducing the stocking and sale of ineffective malaria medicines is equally important to increasing the sale of ACTs to improve the quality of PPMV practice for malaria treatment.

iCCM COMMODITIES

Integrated community case management (iCCM) of childhood illness is an approach to expand community-based access to treatment for pneumonia, diarrhoea, and malaria. In Nigeria, the iCCM policy enables PPMVs to serve as iCCM providers alongside public sector community health workers. The proper diagnosis and treatment for these three illnesses requires iCCM providers to stock a number of commodities, including rapid diagnostic tests for malaria (RDTs), ORS and zinc, and dispersible amoxicillin.

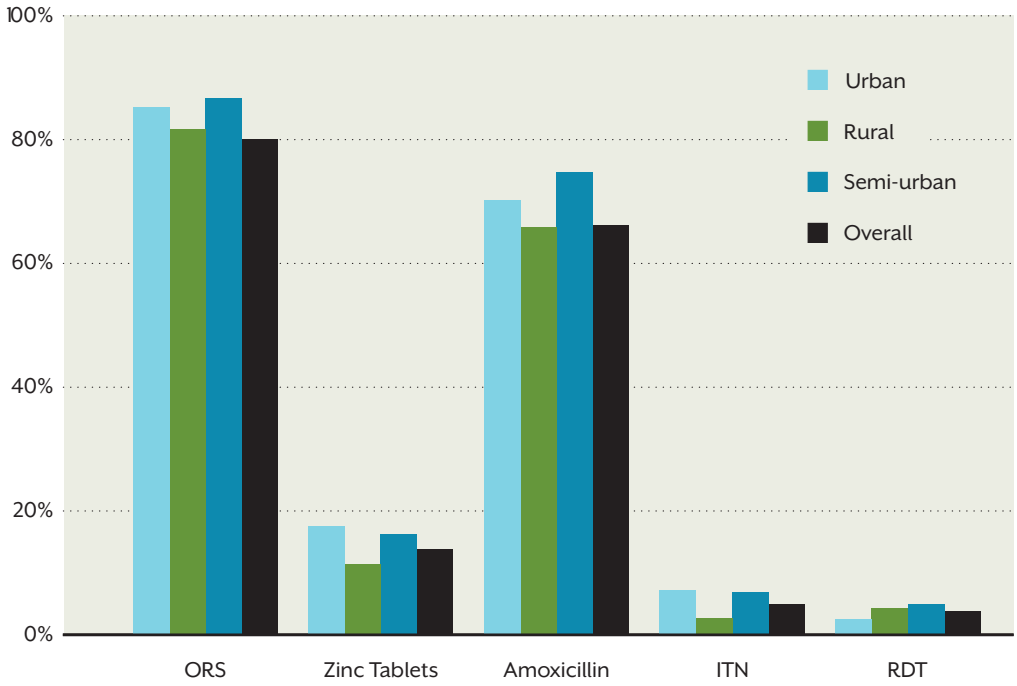
Few PPMV shops stock the necessary medicines to treat childhood malaria, diarrhoea, and pneumonia.

In general, PPMV shops did not stock many of the commodities required to provide effective iCCM services. For example, only 5% of PPMV shops surveyed stocked insectiside-treated bed nets, and only 4% stocked RDTs. It is important to note, however, that the latter is likely the result of a restriction prohibiting PPMVs from administering RDTs during the time that this study took place.

The majority of PPMV shops (81%) stocked ORS, however only 14% carried zinc tablets. ORS and zinc is now the recommended treatment for diarrhoea, indicating that there is a need to ensure that PPMV shops have reliable access to zinc tablets or co-packaged ORS/zinc.

Figure 12:

PER CENT OF PPMV SHOPS STOCKING iCCM COMMODITIES



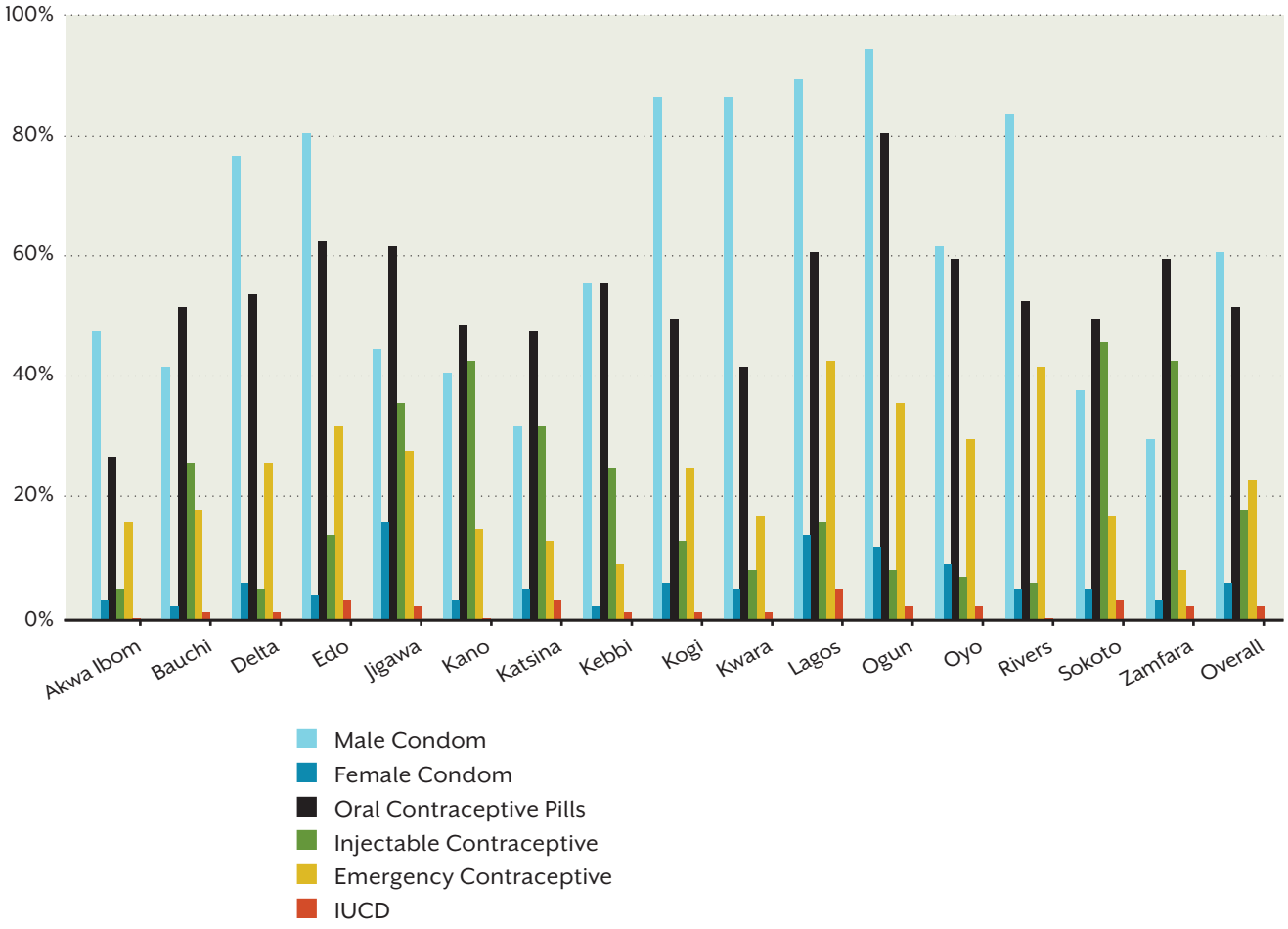
67% of PPMV shops also carried amoxicillin. However, it is unknown how many PPMV shops carried the correct formulations for children. At present, paediatric amoxicillin dispersible tablets, the recommended product for paediatric pneumonia is only now coming onto the market.

FAMILY PLANNING PRODUCTS

Across the states surveyed, 85% of PPMVs stocked at least one family planning product, ranging from a low of 61% in Katsina to over 95% in Akwa Ibom, Lagos, Ogun, and Oyo. Male condoms were the most common family planning product stocked, followed by oral contraceptive pills (Figure 13).

The majority of PPMV shops stocked family planning products.

Figure 13: PER CENT OF PPMV SHOPS STOCKING FAMILY PLANING PRODUCTS BY STATE



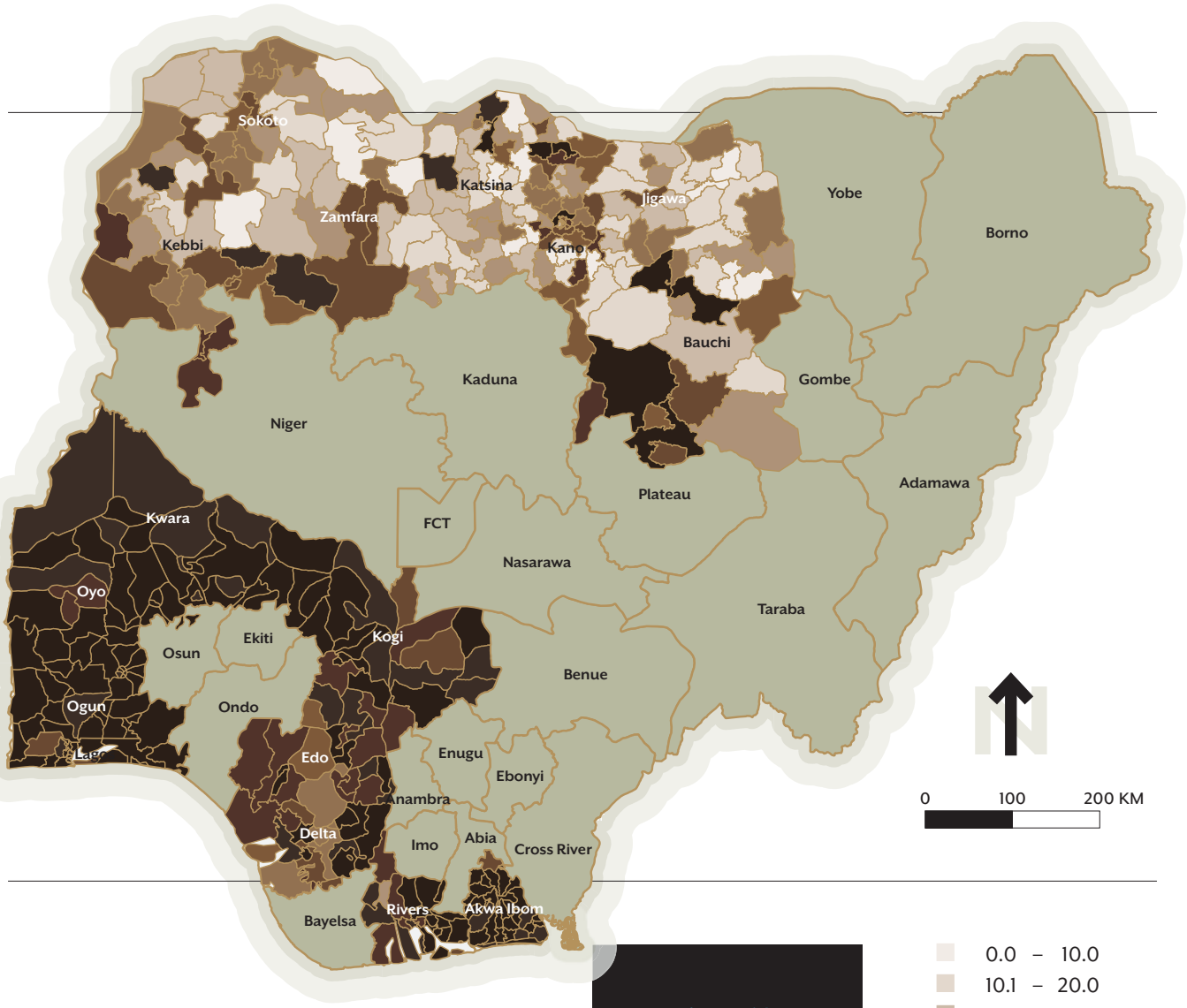


Figure 14:

PER CENT OF PPMV SHOPS STOCKING MALE AND FEMALE CONDOMS

Although many PPMV shops stocked family planning products, the types of products offered varied widely across LGAs. Figure 14 shows the percentage of PPMVs that stocked condoms (male or female) in each LGA. Male condoms were more common; 76% of PPMV shops stocked male condoms but only 10% stocked female condoms. The percentage of PPMV shops that stocked condoms was higher in southern states.

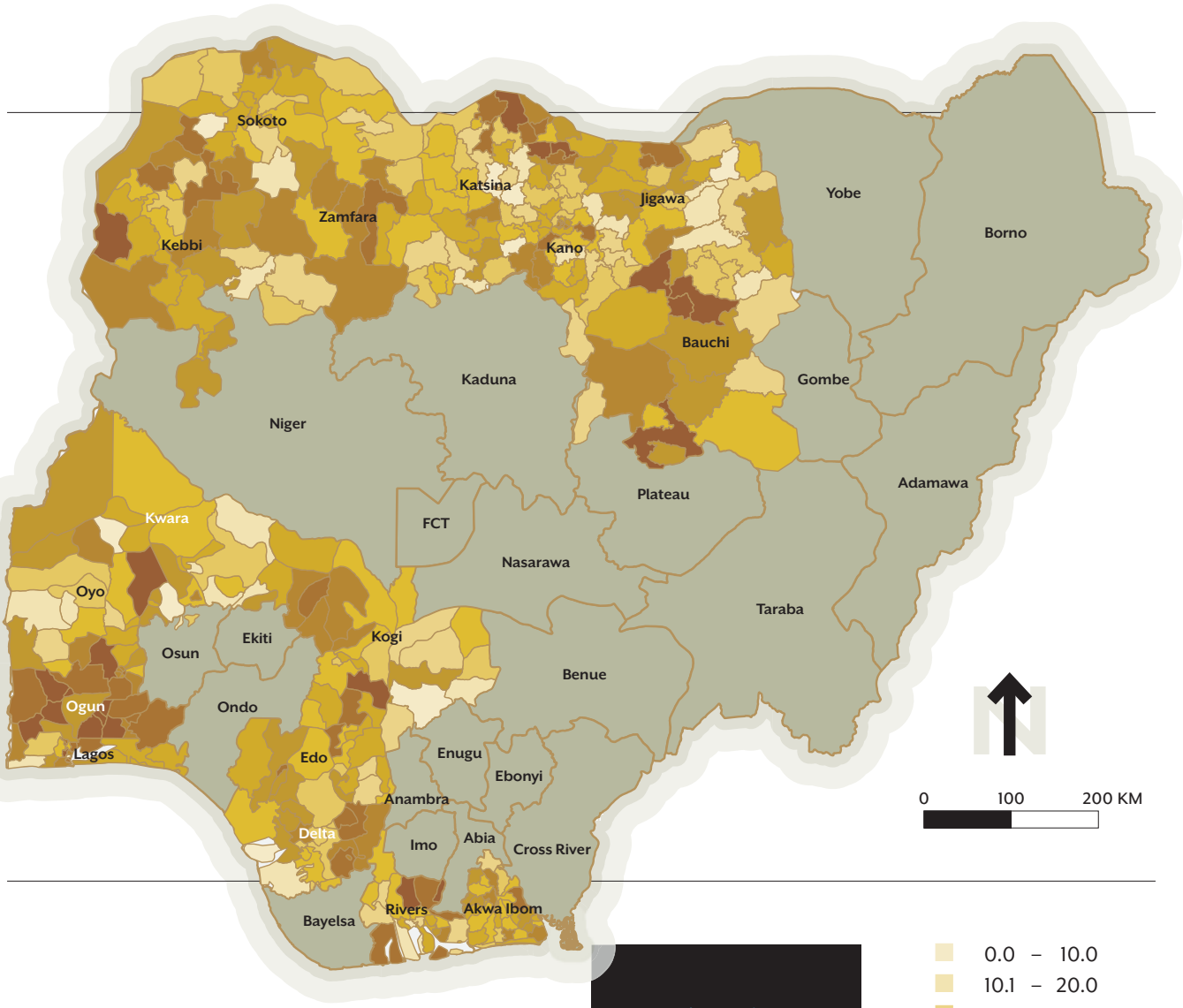


Figure 15:

PER CENT OF PPMV SHOPS STOCKING ORAL CONTRACEPTIVE PILLS

Figure 15 shows the wide variation in the stocking of oral contraceptive pills. Overall, 54% of PPMV shops surveyed stocked oral contraceptive pills. Unlike with condoms, the percentage of PPMV shops that stocked pills was higher in the northern states than in the south.

3. RESULTS CONTINUED

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Nearly one quarter of PPMV shops (24%) stocked emergency contraceptives (e.g. Pregnon EC, Postinor-2). PPMVs also provided family planning products that were outside of their legal scopeof practice; 19% stocked injectable contraceptives, (e.g. Noristerat, Depo Provera, Norigynon) (Figure 16). PPMV shops in the northern states were more likely to stock injectable contraceptives than those in the southern states. The states of Kano, Jigawa, and Katsina had the highest percentages of PPMV shops carrying injectable contraceptives (43%, 36%, and 32% respectively).

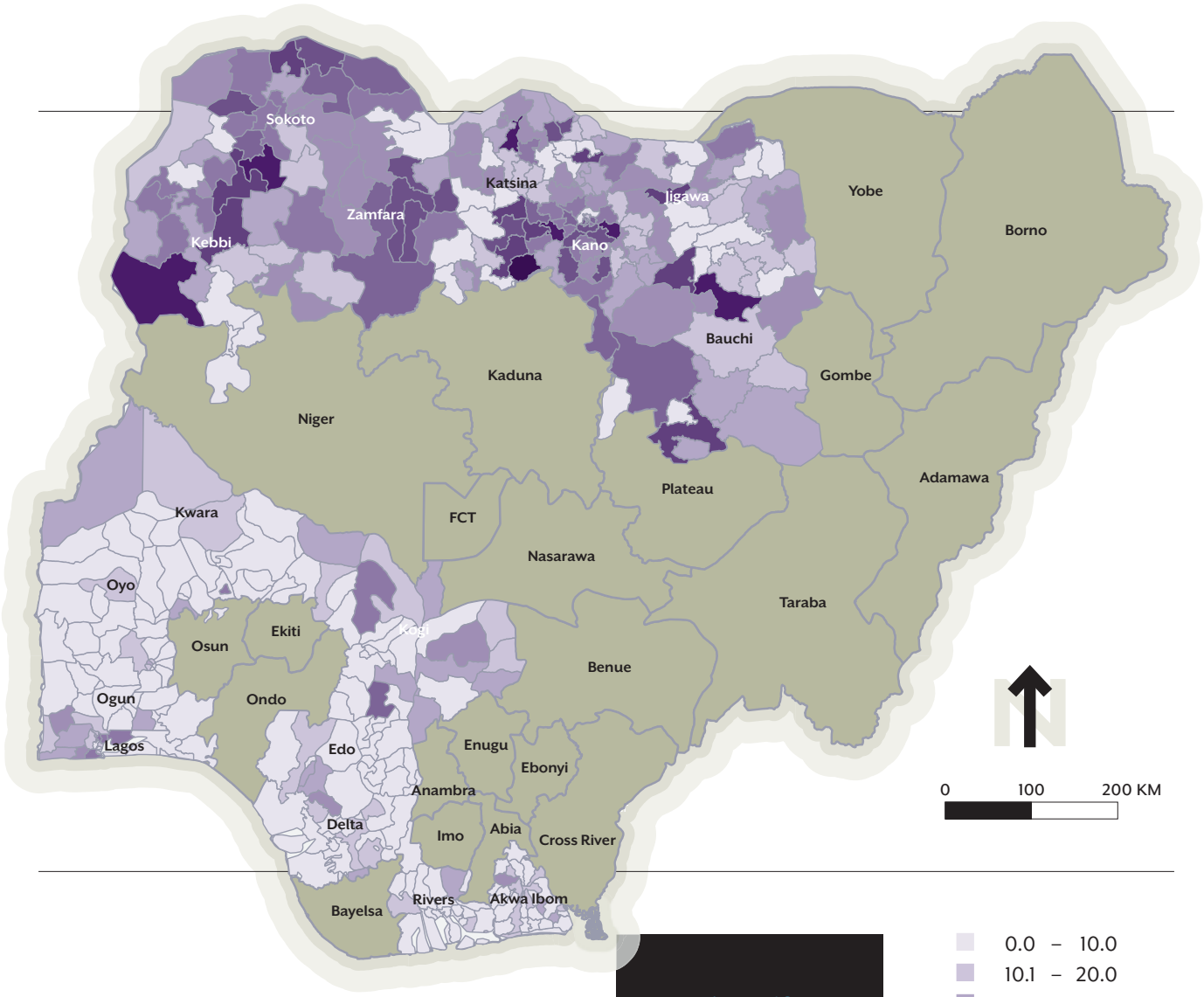


Figure 16:

PER CENT OF PPMV SHOPS STOCKING INJECTABLE CONTRACEPTIVES

In addition, stocking of family planning products varied according to the presence or absence of formal health training of the shop owner (Table 4); PPMV shops with owners that had health training were more likely to stock injectable contraceptives than shop owners that did not have health training (28% and 14% respectively). Stocking of injectable contraceptives was similar across urban and rural areas.

Table 4:

STOCKING OF INJECTABLE CONTRACEPTIVES BY HEALTH TRAINING OF PPMV SHOP OWNERS AND SHOP LOCATION

Health qualification	Did not stock injectable contraception	Stocked injectable contraception
No health training	85.6%	14.4%
Health training	72.2%	27.8%
Location		
Urban	79.2%	20.8%
Rural	81.1%	18.9%
Overall	**80.9%**	**19.1%**

WATER PURIFICATION SYSTEMS

The minority of PPMV shops stocked water purification systems. Overall, 24% of PPMV shops stocked liquid water treatments (e.g. Water Care, Water Guard, Water Safe) and 4% stocked powder treatments (e.g. PUR) (Table 5).

Table 5:

STOCKING OF WATER PURIFICATION SYSTEMS BY STATE

State	Liquid	Powder
Akwa Ibom	29%	5%
Bauchi	16%	3%
Delta	21%	0%
Edo	34%	2%
Jigawa	19%	3%
Kano	9%	3%
Katsina	5%	3%
Kebbi	9%	2%
Kogi	16%	1%
Kwara	8%	0%
Lagos	53%	9%
Ogun	61%	15%
Oyo	31%	1%
Rivers	21%	4%
Sokoto	28%	5%
Zamfara	8%	4%
Overall	**24%**	**4%**

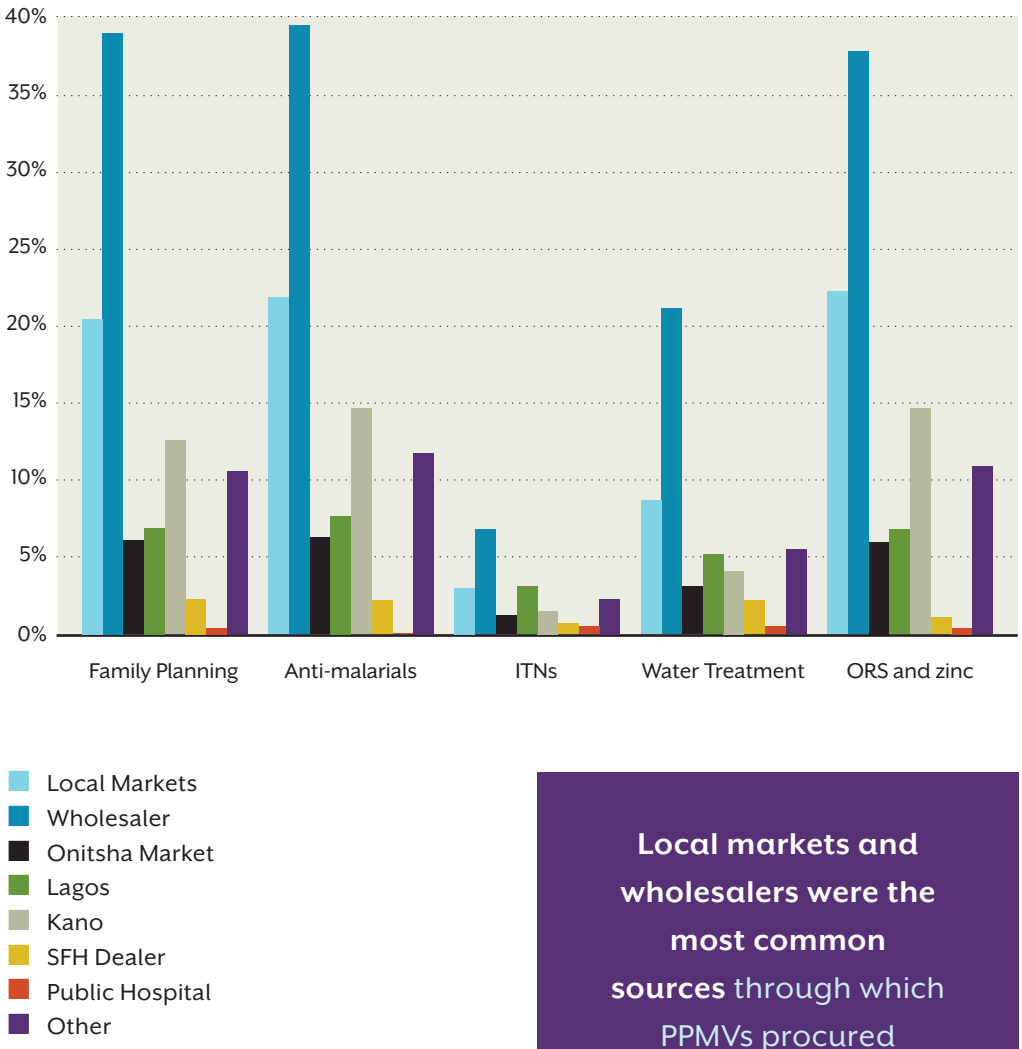
Stocking of water purification treatments ranged from a low of 8% in Katsina to a high of 76% in Ogun. PPMV shops in urban areas were more likely to stock water purification systems than their rural counterparts.

COMMODITY PROCUREMENT SOURCES

PPMV shops obtained their health commodities from a number of different sources, including wholesalers, local markets, hospitals, medical detailers, and other PPMV shops (Figure 17). Across product types, local markets and wholesalers were the most common sources through which PPMVs procured health commodities.

Figure 17:

PER CENT OF PPMV SHOPS PROCURING COMMODITIES FROM DIFFERENT SOURCES



Local markets and wholesalers were the most common sources through which PPMVs procured health commodities.

4. RECOMMENDATIONS

Our census findings indicate that there is a large and distributed workforce of drug vendors, many of whom have formal health training, through which basic health services could be provided. Although previous studies raise concerns about the poor knowledge, drug stocking, and drug dispensing practices of PPMVs, our findings point to the value of working with this sector to improve the provision of accessible essential health services and commodities. To effectively leverage this sector, we offer the following recommendations for implementing existing national health strategies and developing additional health policies addressing the PPMV sector:

1. Target qualified PPMVs:

Although the law requires PPMVs to have only primary education, we find that the majority of PPMVs have higher levels of education. More importantly, over one-third of PPMVs have received formal medical training as community health workers, midwives, nurses, and doctors. Formally trained PPMVs may be better positioned to offer higher quality services, including better diagnosis and treatment of illnesses. Therefore, we recommend that these qualified PPMVs be prioritized for participation in health interventions.

2. Reconcile PPMV scope of practice with best practice treatment guidelines for maternal and child health:

PPMVs are legally prohibited from offering several essential health commodities for the diagnosis and treatment of childhood illnesses. Although limiting the scope of practice of PPMVs is necessary to ensure the safety of services provided, in some cases, these scope of practice guidelines prevent PPMVs from offering higher quality services. For example, the quality of malaria case management may significantly improve if PPMVs routinely conduct malaria rapid diagnostic tests before dispensing ACTs [69,70]. Recent pilot studies show that PPMV shop owners are capable of safely conducting RDTs [10]. And since January 2015, PPMVs officially registered with PCN are granted premission to conduct RDTs [71].

Our census confirms the findings of smaller studies indicating that PPMVs commonly stock medicines and provide services they are legally prohibited from offering, including selling antibiotics. This raises many quality concerns as PPMVs do not receive training in the proper use of these medicines, and are unlikely to have access to quality-assured supply chains for these products. Expanding the PPMV medicine list to include essential medicines, in particular dispersible amoxicillin for pneumonia treatment, may also improve the quality of medicines sold at PPMV shops.

3. Strengthen monitoring and quality assurance mechanisms:

Currently, formal regulatory agencies such as the PCN have limited capacity to effectively train and monitor PPMVs. In addition, there is lack of clarity among both PPMVs and regulatory agencies about the functions of each agency. Streamlining the regulatory mechanisms for PPMVs, including strengthening the oversight capacity of national enforcement agencies, is necessary to effectively engage PPMVs to deliver on public health goals. This should include efforts to increase the registration of PPMVs with the relevant regulatory agencies. Experience from other countries, such as the Accredited Drug Dispensing Outlets programme in Tanzania, has shown that formally integrating drug vendors into the health system through accreditation and monitoring can effectively increase access to affordable, quality medicines and services in rural areas [10].

4. Harmonise policies on PPMV scope of practice:

Currently, there is a lack of clarity about the legal role and scope of practice for PPMVs. New national health policies guiding PPMV practice do not always align with existing policies on PPMV scope of practice or the essential medicines list. This creates challenges both for enforcement agencies, as well as for PPMVs in determining which services they can or cannot provide. In order for PPMVs to provide the full range of services they are expected to offer under these new policies and guidelines, changes are required to align the many policies that guide PPMV practices. For example, the 2014 National Task Shifting and Sharing Policy calls for capacity building amongst community-oriented resource persons – including PPMVs – to provide treatment, counseling, and referral for some reproductive and maternal child health services. This change could rapidly expand access to essential health services, but will first require updates across policies to ensure consistency, and facilitate processes for training, monitoring, and enforcement.

5. Engage NAPPMED in training and monitoring:

NAPPMED is the organisation with the strongest connection to PPMVs, as well as the greatest capacity to provide regular training, monitoring, and quality assurance activities. Further, the self-regulatory and peer-mentoring activities that NAPPMED has carried out have wide acceptability amongst PPMVs. These functions could be formalised and enhanced to improve both training for PPMVs and regulatory enforcement for quality assurance. This would require that NAPPMED be recognised as a formal regulatory body for the PPMV sector, and their capacity and role in monitoring and enforcement strengthened.

6. Build stronger supply chains for PPMV procurement:

To ensure that PPMVs can offer high quality health services, it is essential that they have access to quality-assured and consistent supply chains for essential health commodities and medicines. Enabling PPMVs to access existing public and private sector supply chains for medicines, such as ACTs and dispersible amoxicillin, has the potential to significantly reduce the stocking of inadequate or substandard drugs.

5. Conclusions

PPMVs make up a crucial piece of the Nigerian health system. Their widespread distribution throughout the country, and their significant role in providing services for children's health, family planning, and common illnesses make them a potentially powerful sector for expanding access to essential health services. There are concerns about and challenges to fully incorporating PPMVs into the health system including the poor quality of services provided by PPMVs, lack of training, inappropriate dispensing and treatment practices, and poor stocking of the commodities. At the same time, there are many promising opportunities for better leveraging the potential of this sector. Our census shows that a significant percentage of PPMVs have formal medical training, a background that can facilitate the provision of a broader range of higher quality services. In addition, the PPMV professional association, NAPPMED can play an important role in training PPMVs and monitoring their practices, a function that can be built upon to improve compliance and quality assurance. Finally, the Government of Nigeria is moving in the right direction by explicitly addressing the role of PPMVs in new national health policies, but additional efforts are needed to effectively implement public health programmes.

To build on the capacity of the PPMV sector and the promising recent health policy changes, we recommend that PPMVs continue to be integrated into the formal health sector through training, monitoring, and supply chain activities, and that the role of NAPPMED be recognised and expanded. We further recommend the continued harmonisation and alignment of national health policies to clarify and expand the role of PPMVs in community health services, and to strengthen the monitoring capacity of relevant national agencies. Taken together, these steps have the potential to dramatically increase access to high quality primary health care services throughout the country.

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