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September 2015

INCLUSIVE BIOECONOMY PROGRAMME ISSUE PAPER 002/2015

Improving the Supply Chains for the Health Sector: What Role for locally manufactured and imported medicines and medical supplies in Kenya

Joan Kariuki, Mercy Karimi Njeru, Watu Wamae and Maureen Mackintosh

An Issue Paper from the *Industrial Productivity, Health Sector Performance and Policy Synergies for Inclusive Growth* (IPHSP) research project

African Centre for Technology Studies (ACTS)
Inclusive Bioeconomy Series no. 002/2015

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Inclusive Bioeconomy Issue Paper Series

1. Local Supply Chains for Medicines and Medicinal Supplies in Kenya: Understanding the Challenges

2. Improving the Supply Chains for the Health Sector: What Role for Locally Manufactured and Imported Medicines and Medical Supplies in Kenya?

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ACTS PRESS

2015

ACTS Special Issue Papers are circulated in order to stimulate or to inform policy debate on critical issues. They have been reviewed by the ACTS' Publication Review Committee. They represent the views of individual authors and do not necessarily reflect the views of ACTS.

Published in Kenya in 2015 by Acts Press,
P.O. Box 45917, 00100, Nairobi Kenya
United Nations Avenue, Gigiri Court 49
Tel: +254 20 712 68 94/95; +254 710 60 72 10
E-mail: info@acts-net.org
Website: www.acts-net.org

Cataloguing-in-Publication Data

Improving the supply chains for the health sector: What role for locally manufactured and imported medicines and medical supplies in Kenya?/ Joan Kariuki, Mercy Karimi Njeru, Watu Wamae and Maureen Mackintosh.—Nairobi, Kenya :
Acts Press, 2015

(African Centre for Technology Studies (ACTS)
Inclusive Bioeconomy Programme Working Paper 002/2015)

ISBN 9966-41-182-6

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Abstract

This Issue Paper presents some findings on research on supply within Kenya from local manufacturers to the health system. It compares the sourcing of local supplies and competing imports within the public, private and faith-based sectors of health care. Finally, it presents perceptions of Kenyan health sector actors at all levels on the extent to which improved local manufacturing supplies could help to increase access to essential medicines and medical supplies within Kenya.

The evidence presented here was collected as part of a research project entitled *Industrial Productivity and Health Sector Performance* (www.iphsp.acts-net.org).This was a collaborative research project undertaken by the African Centre for Technology Studies (ACTS), Nairobi; REPOA, Dar es Salaam; and The Open University, UK. The project aims to identify opportunities for improved local industrial supply of medical products to strengthen Kenyan and Tanzanian health system performance.

Keywords: essential medicines, local production, medical supplies, supply chains, Kenya

Acknowledgements

We thank the DFID-ESRC (UK) Growth Programme [ESRC grant number ES/J008737/1] which provided funding for this project. We thank participants at Policy Dialogue workshop entitled 'Improving the Supply Chain for the Health Sector: What Role for Local Manufacturing?' Dar es Salaam, June 2013, and participants at the High Level Round Table entitled "Improving health sector performance in Kenya and Tanzania: Is there a future for the local manufacturing industry?", for their comments on project findings.

We thank Kenya Medical Research Institute (KEMRI) for supporting the project and leading data collection from health facilities and shops, and Kenyatta Hospital for providing research Ethics clearance. The authors especially thank Dr. Yeri Kombe for his support and introductions that facilitated research access. We appreciate the insights and skills of our research staff, especially Lilian Nyandieka and Richard Mutisya, and also the NVivo coding skills of Christine Ruschak. Finally, the authors are grateful to the respondents at the health facilities and shops visited for their time and kind collaboration. The contents of this Issue Paper are the sole responsibility of the authors, and do not represent the views of the DFID or ESRC.

1. Introduction

Shortages and unaffordability of essential commodities are persistent causes of exclusion and poor quality health care in low income Africa (WHO 2011). This Issue Paper reports further findings from an independent research project on *Industrial Productivity and Health Sector Performance* (www.iphsp.acts-net.org): collaborative research by the African Centre for Technology Studies (ACTS), Nairobi; REPOA, Dar es Salaam; and The Open University, UK. The project investigated the supply chains of essential medicines and medical equipment and supplies from local industries and from imports into the health systems in Kenya and Tanzania, using in-depth case studies in four districts in each country. The central objective of this study was to identify opportunities for improved local industrial supply of medical products to strengthen Kenyan and Tanzanian health system performance.

Kenya is the largest manufacturer of medical products within East Africa, and an important source of supply of medical commodities for the region. This paper builds on Issue Paper 1, "Local Supply Chains for Medicines and Medical Supplies in Kenya: Understanding the Challenges" (Kariuki et al 2015), to examine supply chains within Kenya from local manufacturers and importers to the health sector, and the perceptions by health sector informants of the scope for improved supplies from locally based producers to raise levels of availability. After a brief background (Section 2) the paper outlines methods (Section 3). Section 4 then describes new findings on the pattern of locally made vs. imported supplies in the different health sector supply chains in Kenya, and the views of health sector respondents on the scope and potential implications of increasing local supplies.

Early findings from this project were presented at a Policy Dialogue workshop in Dar es Salaam, Tanzania in June 2013. Findings from the project as a whole were presented in a workshop in Nairobi, Kenya in September 2014, and a workshop in Dar es Salaam in November 2014. Presentations from these events are available on the project website http://iphsp.acts-net.org/publications/presentations

2. Background

Globally between1.3 and 2.1 billion people, are estimated not to have access to the essential medicines they need while In Africa, It is estimated that about 267million people (15% of the world total) lack access to essential medicine, leading to loss of life from preventable diseases and increased poverty.(WHO,2004)In healthcare systems, the pharmaceutical supply chain is often a hidden element, with complex pathways between the medicine leaving the manufacturer and being dispensed to the patient (Yadav, 2010).In many African countries the flow of pharmaceutical goods in the public sector is managed through a multi-level distribution system, starting from a state-run central medical stores and distributing medical supplies via district or regional medical stores to hospitals and lower level facilities. Private supply chains generally involve many importers and distributors, and in Kenya, there is also a large non-profit faith-based wholesaler/distributor, the Mission for Essential Drugs and Supplies (MEDS).

A supply chain analysis traces the route products take from a supplier to customers, and the different organisations and individuals involved in that process (Kariuki et al 2015). The full supply chain for a product includes input flows that occur upstream of production (the technology, both physical and knowledge-related, to make a final product) and downstream, as the final product is distributed to the customer) (Mentzer et al., 2001). An analysis of supply chains therefore involves studying the role of all groups of actors and actions involved from the time a product is scheduled for production to the time it gets to the end user (UNICEF (2009).

Supply chain management focuses on how to efficiently procure, manufacture, transport, warehouse, and distribute a good or service at the "right measure, to the precise place, and at the expected time, so as to reduce system wide costs while satisfying service level requirements." The various stages in a supply chain are interlinked through movement of information, product and funds. The healthcare supply chain consist of producers of medical products buyers of the products and providers like hospital pharmacies and intermediaries like insurers HMOs and payers (Burns, 2002). This framework tends to depicts supply chains as linear processes from production, through purchase and logistics. However evidence from this project shows a complex structure. From the project data, supply of medicine and other medical and other essential supplies goes through various paths: examples include direct supply to state hospitals by donors through vertical programs, and supply of the same items to private hospitals by importers who also serve as distributers and wholesalers who also serve as retailers.

The complex path of medicine, medical supply and other non medical supply before getting the end user also comes with additional cost implications at every stage. Studies done earlier have confirmed that supply chain is not only complex but also costly (Shreta et.al 2015; Johns B, et al 2006; Rosen JE et al 2013; Huff-Rousselle M, 2002) In Kenya, multiple stakeholders including donors, government agencies, and international organizations are responsible for different aspects of the supply chain.

In Kenya, medicines and medical supplies' wholesaling is done by public, non-profit and private commercial wholesalers; these supply chain channels are outlined, and challenges explored, in Kariuki et al (2015). As that paper explains, the research reported here was undertaken before the devolution to the Counties of decision making on purchasing for the public sector. This paper examines the extent to which each type of supply chain sources medicines from local suppliers and from importers, with the aim of gauging from health sector perspectives the scope for improved local manufacturing and distribution of local products to improve access to essential medicines and supplies.

3. Methodology

This study employed mixed methods, Quantitative data collection used lists of 'tracer' essential medicines and other essential equipment and supplies to the health sector; qualitative in-depth interviews explored reasons for differential sourcing of supplies in different supply chains.

The study was conducted in three counties from December 2012 to March 2013. The counties were selected purposively to represent a wide range of income and health outcomes. They included two predominantly rural counties: District 1 on the Coast, with low incomes and poor health indicators, and District 2 in the Rift valley bordering Tanzania, which is rural, fairly remote, but not as poor as the Coastal district. The urban Districts 3 and 4, both in Nairobi, included one with relatively high incomes (District 4) selected to capture the higher end of the private health sector, and one with much lower incomes (District 3). The study was conducted at health facilities and drug distribution shops, including district hospitals, health centres, dispensaries and clinics whereas shops included pharmacies and drug shops: 34 health facilities and 21 shops were sampled (Table 1).

Table 1 Level of facility/ type of shop, by district

Level / type of facility or shop	District 1 Rural Coastal	District 2 Rural Remote	District 3 Nairobi Lower income	District 4Nairobi Higher income	Total
Hospital	2	2	3	5	12
Clinic /medical centre	2	1	1	2	4
Health Centre	2	2	2	2	8
Dispensary	2	3	3	0	8
Pharmacy	3	2	4	4	14
Drug shop	3	3	2	0	7
Total	14	13	15	13	55

Source: all tables are from project data unless otherwise stated. Where percentages are used, numbers may not add to 100 because of rounding.

The study included facilities in all sectors, government, private and faith based. The 58 interviewees included those in-charge of facilities, medical and nursing personnel, pharmacists in pharmacies and hospitals, procurement officers in larger hospitals, and drug shop owners and sales personnel. The semi-structured interview questionnaire included social-demographic questions, and an interview guide tailored to capture information on experiences, successes and challenges of medical supply chain. Quantitative data was collected on availability and source of a set of "tracer" essential medicines and supplies. These were all basic essentials, and are listed in Appendix Tables A1 and A2; for each item, the questions asked included manufacturer and country of manufacture where these data could be obtained. It was at times difficult to establish when and where some of the equipment were manufactured as most of the equipment especially in public health institutions was too old and had no supporting documentation. Some information was provided in the qualitative interviews, though on occasions the research team was not allowed into the laboratory for visual verification.

More detailed information on data collection and analysis for this study is provided in Kariuki et al (2015). Scientific and ethical approvals were obtained from Kenyatta National Hospital Ethical Review Board prior to conducting the study. Before conducting the interviews, the purpose of the study was explained and it was made clear that participation in the study was voluntary and that the identity of the respondents would remain confidential.

4. Findings

Since the main objective of the project was to identify opportunities for improved local industrial supply of commodities to strengthen health system performance, an important research objective was to establish the extent to which the health system currently relied on local producers, and the challenges that health sector actors perceived in procurement from of local manufactures. We compare and contrast here the findings on supply chain organisation of local products and imports, including patterns of supply of commodities from within Kenya and outside, and the variety of sources and channels for imports by type of product. We also report health sector actors' views on the quality and availability of essential items from local suppliers, and the extent to which local supplies could be improved including policies to overcome perceived challenges.

4.1 Sourcing of essential medicines, by country of manufacture and health sector

As noted above, supply chains are complex, with a number of layers or stages. We can track the country of origin of the "tracer" essential medicines that we found on the shelves of facilities and shops through two stages. These medicines are all on the essential drugs list, and they include anti-malarials, antibiotics, anti-pain medication, anti-worms, antivirals, HIV medication, oxytocin to reduce haemorrhage, and some medication for chronic conditions including diabetes and hypertension (Appendix Table A1).

Table 2 shows the origin of these tracer medicines by wholesale sector: according to whether they had been supplied to the sampled facilities and shops by the public wholesaler (KEMSA), by the non-profit wholesaler (MEDS), or by private wholesaler/importers.

Table 2: Country of origin of tracer medicines, by wholesale source sector (%)

Country of origin	Wholesale sector		
	Public (KEMSA)	Faith-based (MEDS)	Private wholesalers
Kenya	54	76	33
Other African	0	0	5
India/Pakistan	30	11	32
China	8	1	4
EU/Switzerland	3	6	22
Other	5	6	4
Total	100	100	100

As Table 2 shows, the Mission for Essential Drugs and Supplies (MEDS) appeared to be particularly successful in sourcing essential medicines locally: 76% of the tracer medicines supplied by MEDS that were found in the facilities interviewed had been sourced locally. We report below qualitative information on MEDS' purchasing and supplies. Just over half of the traced medicines supplied by the public sector wholesaler were found to be locally manufactured, while only a third of those sourced by private wholesalers were local products.

Table 2 also shows that the dominant supplier of these basic medicines from outside Kenya was India (Pakistan was only a small supplier). China was found to be a relatively small supplier of these basic formulations, though it is a large supplier of the Active Pharmaceutical Ingredients (APIs) used to make these medicines locally. The private wholesalers had procured and supplied more of these medicines from European sources, to supply the higher income markets in Kenya.

As Kariuki et al (2015 Table 4) showed, the public sector health facilities at the time of the study had obtained the bulk of their tracer medicines from KEMSA, while the private shops and facilities had obtained almost all of these medicines from private wholesalers. However, the sources of medicines in faith-based facilities were shown to be varied, with 44% obtained from the faith-based wholesaler MEDS, just over one third from private wholesalers, and the rest from the public sector (KEMSA).

As a result, the pattern of origin of these medicines by sector where they were finally used – by facilities – or sold over the counter by shops was rather different (Table 3).

Table 3: country of origin of tracer medicines, by sector where they were used or sold (% of all tracers by sector)

Country of origin	**Sector of use or final sale**		
	Public facilities	**Faith-based facilities**	**Private facilities / shops**
Kenya	56	56	32
Other African	0	1	6
India/Pakistan	29	26	31
China	8	4	4
EU/Switzerland	2	6	24
Other	5	7	3
Total	100	100	100

The pattern of private sector sourcing is similar at the retail and facility as at the wholesale level, with the relatively high reliance on European sources being reinforced (compare Tables 2 and 3). However, the fact that the public sector sourced also from MEDS increased its reliance somewhat on local products at the facility as compared to wholesale level, while the diverse sources of faith-based facilities' tracer medicines meant that the reliance of the faith-based sector on imports was greater at the facility than the wholesale level.

4.2Sourcing of essential medical supplies and equipment, by country of manufacture and health sector.

We can summarise a parallel set of findings from our data the manufacturing origin of "tracer" items of supplies and equipment. These items include basic equipment such as microscopes

and stethoscopes, essential medicinal supplies including gloves and syringes and needles, some laboratory supplies such as reagents, and basic cleaning and "hotel" supplies including bed sheets and disinfectant (Appendix Table A2). The origin of these items (which as noted above were harder to trace to their origins) was distinctly different by category of supplies (Table 4). The "other" countries are mainly Korea, Japan and the United States; these countries supplied much of the equipment registered as directly donated (not purchased with donated funds), along with European donors. Only around 30% of these medical supplies and equipment came from Kenya across all wholesale sectors. China rather than India stands out as the main Asian source for these items.

Table 4: Country of origin of other tracer commodities by wholesale source sector %)

Country Category	Wholesale sector			
	Public (KEMSA)	Faith-based (MEDS)	Donation	Private wholesalers
Kenya	32	27	7	30
South Africa	2	0	0	3
India	3	0	7	2
China	20	20	20	19
EU	26	16	30	17
Other	17	37	37	29
Total	100	100	100	100

As Kariuki et al (2015: Table 5) showed, the public sector facilities interviewed had obtained only 65% of these tracer items from the public wholesaler (KEMSA); 15% of the equipment items in public facilities for which the origins could be traced were purchased from private wholesalers, and 15%, largely equipment items, were directly donated. The faith-based facilities had obtained just over a third from MEDS, a third from private wholesalers, 20% from KEMSA and the rest from donations, while the private facilities and shops again relied almost entirely on private wholesalers. The manufacturing origin of these items at facility/retail level turned out to be very similar across sectors (Table 5).

Table 5: Country of origin of other tracers by sector where they were used or sold (% of all tracers by sector)

Country Category	**Sector of use or final sale**		
	Public facilities	**Faith-based facilities**	**Private facilities and shops**
Kenya	27	29	32
South Africa	0	1	4
India	2	1	2
China	19	15	19
EU	24	21	20
Other	28	33	24
Total	100	100	100

The rest of this paper discusses explanations and implications of these patterns.

4.3 Manufacturing in Kenya of medicines and other health care supplies

Kenya has the most developed pharmaceutical industry in East Africa and exports to the region (Simonetti et. al., 2015; Wamae and Kariuki Kungu 2014). The industry in Kenya has the capability to manufacture not only capsules and tablets, but also creams, syrups and suspensions, and injectables and intravenous fluids. The last two are technically more demanding to manufacture because they require sterile manufacturing conditions, while among tablets, combination tablet manufacture requires technical upgrading from basic tablet manufacturing technology.

Table 8 shows the pattern of sourcing of the different types of medicine. Among the most basic formulation technologies, tablets and capsules, nearly half had been sourced from Kenya, plus two thirds of the creams and 39% of syrups (for childhood illnesses). It is notable that over 70% of IV fluids were also locally produced. In all, Kenyan firms had produced 24 of the 29 products traced in this study. However the items requiring the more complex technologies of combination tablets (arthemeter and lumefantrine, AL, the first line anti-malaria treatment) and the injectables (injectable penicillin, quinine, oxytocin and morphine) were predominantly imported, despite the existence of capability to manufacture these technologies locally (Table 8, see also Wamae and Kariuki2014).

Table 7: Tracer medicines: type of product technology, by country of origin (%)

Country of origin	**Type of product**					
	Tablet/ capsule	**Combined tablet**	**Syrup**	**Cream**	**Injectable**	**IV fluid**
Kenya	48	1	39	62	16	71
Other African	5	1	4	0	1	0
India/Pakistan	26	50	21	30	40	24
China	3	3	0	0	32	0
EU/Switzerland	16	18	34	6	10	2
Other	2	27	2	2	0	2
Total	**100**	**100**	**100**	**100**	**100**	**100**

The main "other" supplier of the combination anti-malarial AL was the USA, the main European supplier of AL was Switzerland (the home of the originator brand owner, Novartis). The data show that there is domestic market space for increased local supply, and suggest that the main obstacles are competition from Asian producers, preferences for European suppliers for some items (see further below), and donors' and wholesalers' sourcing decisions. Among manufacturers in Kenya, the two firms recorded most frequently as producers of these medicines were Universal and Cosmos. Other firms that manufactured these items included Laboratory and Allied, Regal, Elys and Infusion Medicare. Infusion Medicare produced the IV fluids sourced in Kenya; the injectables and basic tablets and capsules were widely sourced across the above firms; however the chronic disease medications had been predominantly sourced from the manufacturers Cosmos and Universal.

A comparable summary of country sources by type of product can be given for the other tracer health care supplies (Table 9). It is notable that India was not an important supplier of any of these health care supplies. As Table 9 shows, almost all of the equipment items were imported, largely from high income country suppliers. The equipment was the most challenging category of manufactures in this tracer list. The main countries of origin of these items, including microscopes,

stethoscopes, glucometers and blood pressure machines (Appendix 2) were Germany, the USA, Japan and China, followed by South Korea and Taiwan.

Table 6 : Type of other health care supplies, by country of origin (%)

Country of origin	**Type of supplies**			
	Equipment	**Medical supplies**	**Laboratory supplies**	**Other essentials**
Kenya	1	38	17	73
Other African	0	1	2	9
India/Pakistan	1	3	1	0
China	20	28	4	0
EU/Switzerland	32	19	25	8
Other	47	12	50	9
Total	**100**	**100**	**100**	**100**

Manufacturers in Kenya had produced a larger proportion, over one third, of the medical supplies recorded. These included gloves, syringes and needles, bandages, microscope slides and alcohol and hydrogen peroxide for wound cleaning. At least one Kenyan manufacturer was identified as a source for each of these items; however the supplies traced were predominantly imported from China or other mainly high income countries. The main Kenyan manufacturers recorded for this category of products included Cosmos, Revital, Alpha Medical, Diarim and OSS Chemie (Kenya). In the 'other' category of countries (Table 9), Malaysia is notable as a supplier of gloves.

Laboratory supplies traced had also been predominantly imported. Most test kits were imported, large suppliers including the USA, Japan and Canada, in a pattern likely to be influenced by donors. The largest Kenyan supplier recorded was Unilabs, producing Giemsa stain and emulsion oil for laboratories.

Finally, Kenyan manufacturers were producing most (73%) of the other essential items traced (Table 9) with a further 9% coming from elsewhere in Africa. These were the simplest manufactured products in the study (Appendix table A2), and their manufacturing origin was often hard to trace. The most frequent Kenyan producers of the disinfectants and detergents registered were OSS Chemie (Kenya) and Universal; Diarim had supplied plasticised bed sheeting.

4.4 Users' and customers' views of locally produced medicines vs. imports

The qualitative interviewing for this project in facilities and shops asked systematically for experience of the locally produced medicines and supplies, including availability, quality, price, and the responses of users and consumers to prescription and sale of local products.

In the private sector, those interviewed were responsible for selecting the products procured from private wholesalers, so they had some, though limited, influence over the source of medicines procured, depending on the choices available in local wholesalers' stocks (Kariuki et al 2015). The faith-based and public facilities' interviewees were in a similar position if buying from private wholesalers and retailers, but when procuring from MEDS or KEMSA, were reliant on those wholesalers' decisions about procurement.

The approach to local vs. imports in procurement by private facilities and shops varied sharply according to their clientele. Those serving higher income patients and customers were responding to a preference for European and other high income sources of medicines, which were associated with higher quality. Private pharmacies in particular were responding to patients' preferences. There was general agreement that "most people associate low pricing with low quality" (*Private hospital, District 4*).In the same generally better-off Nairobi district, a pharmacy respondent said preference for European drugs was general among their customers:

> Yeah, most clients actually have problems with drugs made in Kenya. Most of them would want drugs/products from outside and actually products from outside Africa, they are more comfortable. (*Pharmacy District 4)*

One drug shop respondent summarised a common experience from customers with some spending power:

> …. we normally stock according to the people's standards … there are still some people who come and ask me, "This is from which country?" If you say India, they tell you "No". They will tell you they want from the European Countries…. Kenyan and Indian-made they don't like….. They say drugs from India and Kenya are imitations. (*Drug shop, District 2*)

However, a private pharmacy in the same district contrasted the local market to a more up-market Nairobi area:

> …… a determinant of what to stock is that this market [in District 2]is not an up-market, people go for cheap drugs. So if you go through the stock that I have, the high end generics and the branded drugs are very little. But the generics are very fast moving …. This kind of market does not have people who will come and tell you they want original Amoxil and that is why I stock more than 90% generic. … We have another branch of ours in Nairobi … and there it is opposite. The branded ones account for about 80% because if you tell someone that this drug costs Ksh.200/= they will tell you that must be an ineffective drug. They talk in terms of thousands [of Kenyan shillings]. (*Pharmacy District 2*)

A pharmacy in District 3 confirmed that customers cared about the origin of medicines and that the choice depended on spending power:

> …they are very specific, most of the customers they inquire [about] origin and if they are able to buy, they prefer to buy the original ones [the original brand]. Mostly, they don't like the Indians …..... the best example is amoxil … they prefer the original from UK, and some people are not able to buy that one, they may not afford, so they go for the generic ones .. but if they have money they would buy the original (*Pharmacy District 3)*

Some ethnic groups were characterised as particularly resistant to buying Kenyan medicines. White clients were said to prefer European or US drugs, as were clients of Somali origin:

> Yeah, nowadays they know. Like I have a Somali client and two others who will not take any medicine that is either not from the UK, South Africa or Germany. They tend to believe that products which come from Germany, UK, Switzerland and South Africa are of higher quality compared to the generics that come from India and Kenya.'(*Pharmacy District 2*)
>
> … but you know … the Somalis when they come to the dispensary and we prescribe to them some drugs, they ask where is it from, is it from USA, so for them, they want specific drugs from specific countries .... so they like those imported ones. But for the locally made, the Somalis, they don't like.' (*Faith based hospital District 4)*

Similarly, another hospital reported a preference for medicines and equipment of Middle Eastern origin.

One faith-based hospital respondent was finding these preferences frustrating:

> I can't say we have any preferences [for country of origin] but most of the medicines come from India…. as long as they work I don't think I really have a problem. Though the patients believe that medicines from European countries and from USA are much better than those manufactured locally or from India. …. Some of the patients believe that a church organization is sponsored by outside countries, and they believe that the medicines come from outside. (*Faith-based hospital District 2*)

The main reason for choosing Kenyan or other African medicines was thus reported to be price; they were consistently much cheaper than European and US medicines. One respondent said:

> By the way the locally manufactured drugs are cheap and the people who go for them are the health facilities in upcountry …. for mission hospitals, clinics, district hospitals and local pharmacists in upcountry, they really support local manufacturers. (*Private hospital District 4)*

Some respondents noted that there were reliable local producers and the prices were competitive:

> 'I would not say that the local manufacturers are not good enough. There are some local products and even some local companies which do very good work. .. most institutions in Kenya …. now prefer getting the local antibiotics rather than from Europe. If you get a local company which passed the test by KEBS [the Kenyan regulator] and the quality assurance is good, and you get the [price] difference per capsule is about Ksh.30/= it is wiser to go for the local one because at the end of the day the molecules are the same. (*Private hospital District 3*)

In addition there were some positive preferences reported from users and customers for Kenyan as compared to Indian medicines among the cheaper options available. A private dispensary in District 2 commented that their customers preferred Kenyan brands of antibiotics for children. Certain Kenyan firms were reported to have built up a reputation for quality in the eyes of customers: a pharmacy in District 2 noted that customers sometimes requested products specifically from Cosmos and from Dawa, both local manufacturers. In District 4, a faith-based health centre respondent commented: "we have also come to learn that our patients also appreciate the products from Cosmos." Finally, in the District 2 area up by the Tanzanian border, furthermore, Tanzanian customers would also specifically request products of Tanzanian firms with which they were familiar, and which sold more cheaply than Kenyan products in that area. It is thus possible for Kenyan manufacturers to build up brand recognition and trust. What would it take, according to health sector respondents, to strengthen those brands?

4.5 Quality challenges for Kenyan manufacturers

Respondents mentioned a number of challenges for Kenyan manufacturers. In interviews with facility professionals, several local firms were mentioned as producing reliable products. One was Universal, of which one respondent said " they are making very good competitive drugs, good quality, well packaged, well priced (*Faith-based dispensary District 1)*. In another facility, a clinician commented about their pharmacist that "she tells me those from Cosmos, they are good

drugs " (*Faith-based dispensary District 3).*One pharmacy stated "I am very much comfortable with all the products made in Kenya".

Asked about quality of local products, many respondents mentioned problems of packaging. Some local firms, including Universal, Cosmos, Regal and Elys were mentioned by different respondents as packing medicines well, including, in one case, child-resistant closures. However others were criticised for poor packaging. One private pharmacy respondent commented:

> 'Local manufacturers have always failed in terms of packaging …..They should improve on their design department and packaging. Once a product is local but well packaged, it would be so easy to convince [buyers]. Look at that Panadol from GSK, it is all made in Kenya and the packaging is good. But if you see another product you might think that it is fake. (*Pharmacy District3*)

There were some detailed complaints about this problem:

> You see, like some syrups are brought and they are already leaking. (*Pharmacy District 4)*
> … you get them out of the box and the packaging is coming out. You display them and they are fading. You go to open the bottle and it [the top] falls off. (*Pharmacy District 2)*

The last respondent went on to say that customers judged quality of these firms' products by the packaging:

> Sometimes even the packaging influences their choices…. Some people will just look at the packaging and say it is of poor quality.*(Pharmacy District 2)*

A different pharmacy in the same district made the same point:

> ... the value of the drug in the market is determined by the packaging if it is good. If the packaging is good it would be easier to market the drug and sell it as well. It is easier even for me to purchase the drug from distributer or wholesaler.*(Pharmacy District 2)*

Others also agreed:

> When you do a packaging and then another person also does the same packaging with a material which is not very presentable and even the seals are not there, it would be very hard for you to convince someone you are selling the same medicine. Packaging tells a lot in terms of quality and also in appearance of the medicines. (*Private hospital District 4*)

Packaging furthermore influenced the choice of local supplier by hospital buyers:

> We use local paracetamol tablets but we prefer ones in strips, as opposed unpackaged ones. (*Private hospital District 1)*

The issues of packaging, presentation and marketing were therefore linked. Several respondents emphasised that the local firms needed to improve their marketing, to help to build up trust in their branded generics by local patients and consumers:

> They [local manufacturers] need to do marketing, they need to … assure people of the quality. How I don't know. And may be just even the branding because people just like things which look of good quality..... For example if somebody just comes with [an] acidity condition here and I am trying to sell an anti-acid drug which they have heard about from the local

> radio, it would be easy for me to convince them to buy that particular drug as opposed to one which came from outside.'(*Pharmacy District3*).

Some of the local firms were recorded as marketing actively: Dawa for example was recorded as, sending sales representatives to promote their products to facilities, and a local pharmacy noted that they had to amend their stocks as a result:

> [The medical representatives] tend to influence the prescribers around. You see a sudden change, you see various prescriptions with a brand name, and then they tell the clinicians to tell the patients not to accept any substitute. So you have to react very fast when you get a certain brand and sometimes when you do not have it you have to work very hard to bring it the following day and adjust the stock.

The private wholesalers however played a key role in decision making. One pharmacy noted that the injectables offered by their main wholesaler were now from China. Private and faith based facilities buying laboratory reagents relied on the sourcing decisions of a relatively small group of wholesalers specialising in these items:

> We source laboratory items mainly from Nairobi. There are two or three suppliers who provide microbiology items like reagents and other laboratory chemicals. (*Private hospital District 1*)

Laboratory supplies were linked to the type of equipment used, so facilities did not necessarily select the cheapest:

> We are very particular about reagents. We do not put emphasis on prices, so we do not go for cheaper substitutes. This supplier from Germany has good machines. …We stick to this supplier, though there are cheaper alternatives, we do not go for those. (*Private hospital District 1)*

There were number of complaints about the quality of locally made equipment items. One public sector respondent said:

> Even the BP [blood pressure] machines we had and have worn out were locally made but the ones we were brought by [a donor] are made in Britain and they are okay. (*Public health centre District 4)*.

Many facilities bought basic cleaning items in supermarkets, but a private hospital expressed a strong preference for one manufacturer with a Kenyan presence:

> We buy detergents for the laundry, sterilizing chemicals and others, all from Ecolab. We tried some other companies also but Ecolab is the most expensive but it is the best. (*Private hospital District 1)*

In the private facilities, respondents said the equipment was largely imported from high income sources, mainly Europe, but as in the faith-based sector, there was also a reliance on donations:

> …. somebody at a university in Germany, where I had also visited, they offered to give me a microscope. Very nice one, neat, very good quality, and because, they remove the medical supplies from their chain, after three years or so it was relatively new.*(Private clinic, District 1)*

One faith-based facility relied on a Middle-Eastern donor for large items such as X-ray machines:

> Those ones we import because we would not be able to afford to buy .... they come as a donation.(*Faith-based clinic, District 4)*

4.6 Potential of local manufacturers to improve local supplies

Two interlinked questions asked systematically of all respondents was their perception, first, of the trends in local and imported supplies availability and prices, and second, the scope, if any, for local manufacturers to contribute to improving supplies of essential medicines and supplies in the Kenyan health sector. The question about trends was focused on understanding perceptions of the extent to which range of goods, availability and price competitiveness of imports and local products had been changing. The question on potential contribution followed on from this background.

Most interviewees indicated that there has been an increase in market availability of pharmaceuticals and other supplies in the current years compared to a few years back. This was perceived to be an increase in both imports and locally produced items. Many interviewees particularly from the private sector were positive about the increased availability of supplies in the market. Both prices and range were perceived to have improved:

> I think there are more generics available now than before and I think the medicines have become slightly cheaper .... than before and some of the branded companies have made, aah, second generation things there which is cheaper (*Private hospital District 1*)
> The increment has been there and what it has done is to bring competition. To me it is a plus to our side, in terms of pricing and in terms of variety' (*Private hospital District 4*)

Another private hospital had a system of prequalifying suppliers through an application process; however this respondent doubted whether the range on offer was really expanding:

> There is a lot of growth and the market is flooded. Like we did our prequalification in January and there was an overwhelming response. But they are supplying the same products and they are generics. (*Private hospital District 4*)

A pharmacist had noted that local producers were expanding their range, and attributed this to an expanding export market in the region:

> 'Yes you find that there is growth, because there are manufacturers who used to manufacture like three products, but now they are manufacturing like fifteen. I think the market is also big, like South Sudan, Rwanda, Congo; they all depend on the supply from Kenya. There is high demand and the pricing is also fair' (*Pharmacy District 2*)

There was considerable agreement that the competition between imports and local manufactures had increased, with new external suppliers also entering the market:

> I can say for local manufacturers, there are new companies that are coming up but the imports have also improved. There are new products from different companies from outside. (*Pharmacy District 2*)

This respondent also thought prices had fallen somewhat for basic medicines and had become more affordable for patients. Wholesaler competition was thought also to have increased. A faith-based health centre in District 3 commented that an increase in suppliers of some items had meant that they could negotiate on prices in a way that had not been possible when they had relied on one wholesaler. This perception of rising competition and falling prices was a widely held but not universal view; a minority of respondents thought locally produced medicines had become less affordable.

So could local manufacturers improve the situation further, and if so, what was needed to encourage and facilitate this? No respondents took a negative view of this possibility, and several noted the potential wider economic benefits of local supply:

> … I think we should give capacity to the local manufacturers. There are a lot of benefits, for example, that is how the pharmaceutical industry in India grew you'll create employment by virtue of them manufacturing in this country. (*Private Pharmacy District 3)*

This respondent went on to point out that it is easier to identify and correct sub-standard production locally, but emphasised that local producers did need to improve their quality standards.

This was a common theme in these discussions. There were a number of arguments for improved regulation, as a way to ensure quality and help to improve the quality and reputation of local products. One pharmacist interviewed had previously worked in a local manufacturing plant with poor standards, not meeting Good Manufacturing Practice, and had been influenced in his attitude to local producers by the experience: he felt there was a need for more stringent regulation.

Some respondents, as noted above, identified firms that had improved sharply in recent years, and felt the government should do more to support them. Here is a detailed example of this argument:

> The government should give these local producers and manufacturers an incentive. And there should be some subsidies in some other things like the materials that they use. The plants, the sterilization plants they use. If the government can come in 3 – 5% in that way, I believe the local pharmaceutical manufacturers would be far much better. And in three to four years I believe Kenya can even be one of the leading countries in Africa in terms of pharmaceutical manufacturing..... In our local manufacturing units I believe there is a tremendous improvement. (*Private hospital District 4*)

Other potential benefits noted from more local supply included shorter supply chains and faster response from suppliers to changing requirements.

Public sector respondents felt that they had no influence over manufacturing sources of supply, but some felt that improved local purchasing by KEMSA might improve their supplies shortages:

> If they [local manufacturers] can start supplying KEMSA instead of KEMSA getting drugs from outside, that would even make us get supplies more quickly.*(Public hospital District 2)*

One made a more elaborate argument about economic feedback from local production including to the public sector:

> …if these items are manufactured locally, government will be able to tax to get tax out of it and they will be able to run the facilities … so it will add up to improved healthcare for the citizens … if you are using the raw materials from the farmer, like cotton, government will get tax out of that, will get employment from the same factory, now the cost of sourcing these items will be very cheap, and at the end of the day we will get value for money which will serve the public, which is the common man. (*Public hospital District 3)*

There was a widespread view that Kenya had the capacity to produce more and better:

> They [local manufacturers] should also try to manufacture the brands which we import, using their knowledge; Kenyans are knowledgeable people…. I think they should be trained on that [improved quality] and then they can do it themselves. We do not have to depend on the West. (*Public health centre District 4)*

5. Concluding discussion

The data from this product show that Kenyan firms have technical capability to produce a wide range of essential health care supplies including pharmaceuticals and other supplies. However, the local firms are supplying only a small market share, estimated at 25% of the domestic market for pharmaceuticals (Wamae and Kariuki 2014). Our data suggest the market share of local producers of reagents and other medical supplies also leaves substantial room for growth in locally manufactured supplies.

A number of key perceptions of health sector buyers and users of medicines and medical supplies provide suggestions for firms and policy makers. The focus of these respondents on the need for improved quality was widespread, and backed up by a common perception that some local manufacturers have sharply improved quality and that others could also do so. A number of respondents emphasised the need for better marketing and communication, one public facility commenting that they "did not know" the local firms.

Wholesalers play a key role in the competition between local and imported commodities. Some large private and FBO facilities could influence manufacturing sources of supply for their orders, but smaller facilities and shops depended on wholesalers' stocking decisions. As Tables 2 and 4 suggested, MEDS, the faith-based wholesaler, was particularly successful at sourcing medicines, but not other supplies, from local manufacturers. Later interviewing for this project (Mackintosh et al 2015) showed that this local sourcing of medicines was the result of a system of local tendering for supplier lists that allowed MEDS to build up working relationships with local manufacturers able to meet quality hurdles at a reasonable (not necessarily the lowest) price.

KEMSA, the public wholesaler, on the other hand, obtained most of its pharmaceutical supplies from price-focused international tendering (Mackintosh et al 2015). Given the decentralisation reforms recently in force, there may be scope for KEMSA and MEDS, while competing for the custom of public and faith-based health facilities, also to cooperate e.g. in carrying out inspections of manufacturer's site and wholesalers or laboratory quality analysis thereby reducing cost. A significant part of healthcare cost is the supply chain component, so improving healthcare supply chains is essential not only in financial terms, but also because of the fact that it impacts so many people. Research such as this project is essential in understanding the current supply chain of healthcare systems (see also Kariuki et al 2014) both from local production and import, and to point out opportunities that can be utilized while addressing the weakness in the chain

Perhaps the most important message for local firms from the data and interviews presented is the widespread perception among health sector actors that some local manufacturers have sharply "raised their game" recently, and that several have a good reputation with buyers and the wider public. This is a basis for further development in the industrial sector, development which, as both these and late industrial interviews confirm, also requires further active government support (Simonetti et al 2015).

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Appendix

Table A1 List of tracer medicines

Artemether + Lumefantrine (AL/Alu: adult); 120+20mg

Artemether + Lumefantrine (AL/Alu: child); 120+20mg

Sulfadoxine + Pyrimethamine; (SP) 500+25mg

Quinine; 600mg/2ml

Amoxicillin (adult); 250mg/ 500mg

Amoxicillin syrup (child); 125mg/5ml

Benzyl penicillin 5000000IU (5MU)

Ciprofloxacin 250mg/ 500mg

Atenolol; 50mg/100mg

Paracetamol; 500mg

Diclofenac; 50mg/ 100mg

Morphine 50mg/ 100mg per ml

Tenofovir + Lamivudine (combination); 300+150mg

Nevirapine; 200mg

Lopinavir/ Ritonavir 200mg/50mg

Zidovudine; 300mg

Oxytocin; 10 iu& 5iu per ml

Metronidazole; 200mg/400mg

Fluconazole; 50mg/ 150mg/ 200mg

Albendazole; 200mg/ 400mg

Mebendazole; 100mg

Omeprazole 20mg/ 40mg

Clotrimazole cream; 1%

Ketoconazole 50mg

Amitriptylline; 25mg

Metformin 500mg or 850mg

Metformin 500mg or 850mg

Chlorphromazine;25mg; 100mg

Loperamide hydrochloride 2mg

Normal saline and 5% Dextrose (IV fluid)

Table A2 List of other tracer commodities

Thermometer

Blood Pressure Machine

Microscope

Slides (for the microscope)

Stethoscope

Foetoscope for midwifery

Glucometer

Strips (for the glucometer)

Weighing scales (for pediatrics)

CD4 machine

Sharps box

Clinical gloves

Gauze bandages

Crepe bandages

Syringes and needles

Hydrogen peroxide (H2O2)

Alcohol/Spirit for wound cleaning

Disinfectants (Hibitane or Savlon)

Mackintoshes/ plasticised sheeting

Bed net

Bed sheets

Mop or broom

Detergents

Urine test strips

Pregnancy test strips

Giemsa stain

Emulsion oil

Widal reagent

African Centre for Technology Studies (ACTS)
P.O. Box 45917, Nairobi, Kenya
Tel: (254-2)710 60 72 10
E-mail: info@acts-net.org
Website: www.acts-net.org
ISBN 9966-41-182-8