

Potential, limitations and feasibility of using data on import & local production and procurement for drug utilisation research

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Outline

- Aim
- Literature review
- Strengths and limitations
- Group work/discussion
- Conclusions and next steps

Background and aim

- Limited studies on national drug utilisation patterns in African countries
- To discuss the potential & limitations and the feasibility to use data on import & local production to study drug utilisation at national level in individual African countries
- To identify a few countries where a pilot could be conducted

Literature review

Literature review on medicines utilisation at national level 2013-2017 in Africa

8 studies on medicines utilisation at national level in Africa between 2013 and 2017 (May)

- 2 multicountry studies and 6 from South Africa
- 3 using health insurance data, 1 data from a corporate retail group, 1 IMS, 1 survey, 1 DHS + MICS data, 1 n/a
- 3 neurological conditions, 1 malaria, 1 HIV/AIDS, 1 cardio, 1 chronic conditions, 1 metabolism

Examples of national level studies on use of medicines in Africa - 1

Trends in antimalarial drug use in Africa (2013)

- Aim: To quantify the changes in common antimalarials, chloroquine (CQ) and sulphadoxine-pyrimethamine (SP), both over time and post policy change and to correlate measures of drug use and drug resistance
- Data sources: Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) on use of antimalarials in children under the age of five from 40 African countries between 1999 and 2011

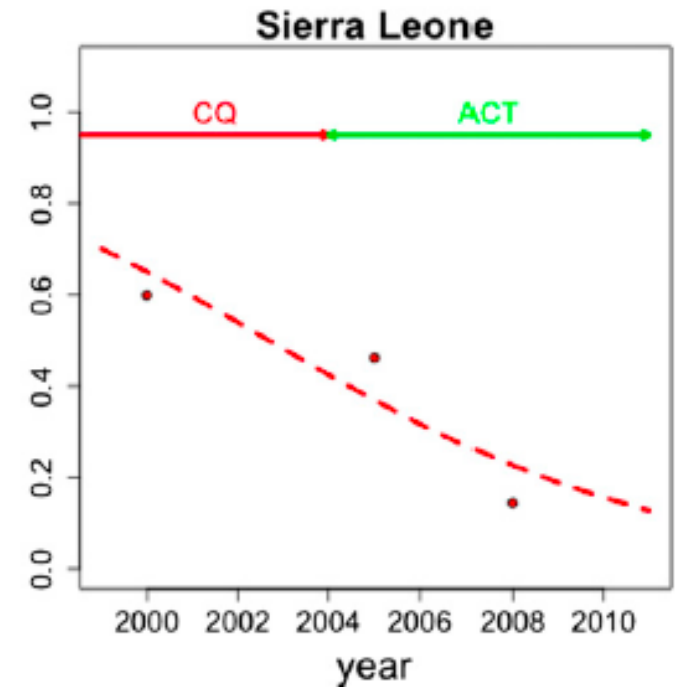
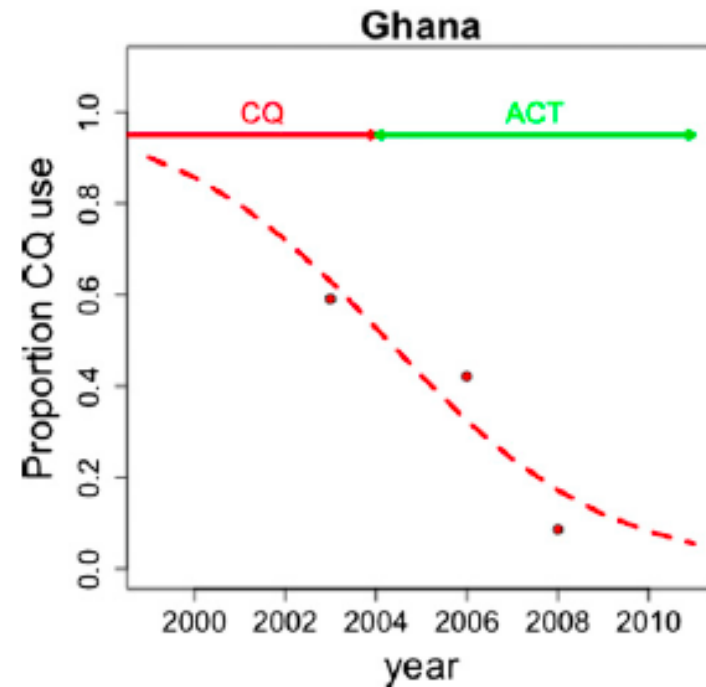
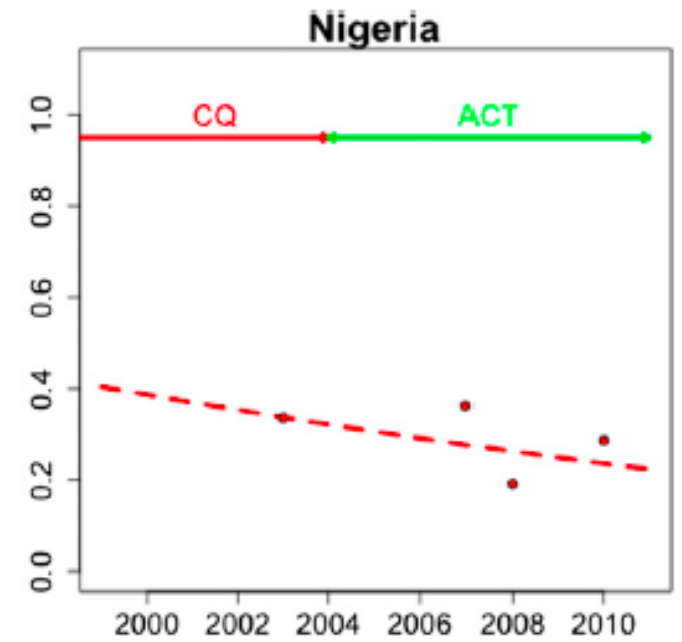
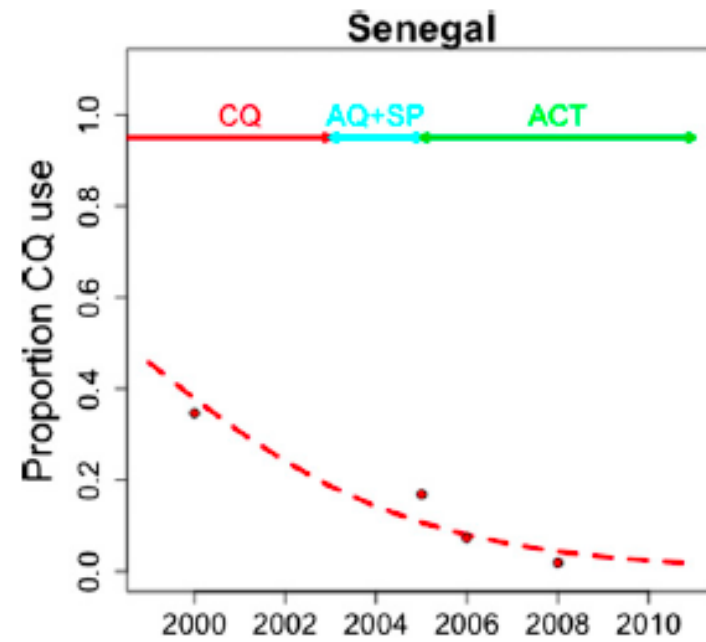
Examples of national level studies on use of medicines in Africa - 2

- Drug use aggregation. The sample-weighted number of children that received drug A in the j th survey (conducted in year t) in the i th country was calculated (Y_{ijA}).

$$Y_{ijA} = N_{ij} \left(\frac{\sum_{k=1}^{N_{ij}} W_{ijk} D_{ijkA}}{\sum_{k=1}^{N_{ij}} W_{ijk}} \right)$$

- N_{ij} is the number of respondents in survey j from country i , D_{ijkA} is the binary (1 = yes, 0 = no) response to taking drug A for the k th respondent in the survey, and W_{ijk} is the corresponding sampling weight for this respondent

- Mixed effects model predictions (red dashed line) for CQ use in Senegal, Nigeria, Ghana, and Sierra Leone.
- The duration of first-line policies for each country is indicated by the arrows across the top of each plot.
- The red dots represent the observed CQ use data.



Source: Flegg JA, Metcalf CJ, Gharbi M, Venkatesan M, Shewchuk T, Hopkins Sibley C, Guerin PJ, Trends in antimalarial drug use in Africa, *Am. J. Trop. Med. Hyg.*, 89(5), 2013, pp. 857–865

Examples of use of data on procurement in Africa - 1

An analysis of volumes, prices and pricing trends of the paediatric antiretroviral market in developing countries from 2004 to 2012

- Aim: To analyse volume and mean price per patient-year of donor purchased paediatric ARV formulations in 111 countries
- Data source: Global price reporting mechanism database (GPRD)
- The GPRM database contains information about prices and volumes of each individual transaction, dosage form and strength of formulations, manufacturers, procurement agents, destination countries, international commercial terms (INCOTERMS), and procurement dates obtained from 11 procurement organizations on a quarterly basis.

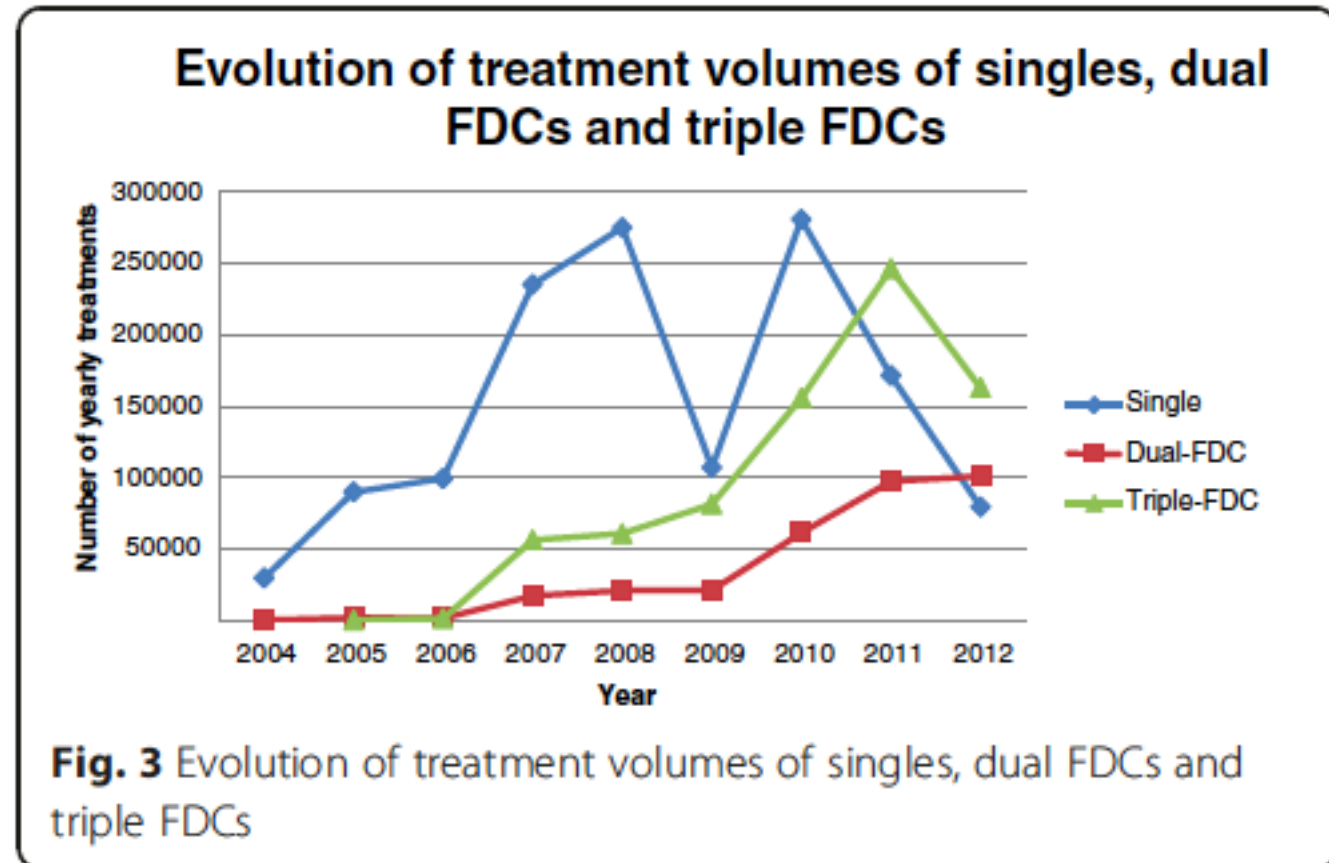
Examples of use of data on procurement in Africa - 2

- For each of the 21 ARV single formulations the authors calculated the quantity per year (QTY) and price per year (PTY) using WHO ARV dosing recommendations for a 10 kg child*:

$$QTY = \frac{\text{(number of units purchased)}}{\text{[(units used in daily treatment) } \times \text{ (365)]}}$$

and

$$PTY = \text{(unit price US)} \times \text{(units used in daily treatment)} \times \text{(365)}.$$



*2004– 2005 dosing based on WHO 2002 guidelines, 2006– 2009 dosing based on WHO 2006 guidelines, and 2010– 2012 dosing based on WHO 2010 guidelines

Examples of use of data on import and local production in Africa

- Medicines for Malaria Venture (MMV) is collaborating with partners to **consolidate data** regarding the flow of malaria medicines at national levels and to help health authorities **routinely analyse** such data
- Country-level information is being collected in Zambia on the importation and local manufacturing of all pharmaceuticals, including value and volume. The routine data entry and analysis of this information will allow monthly market trends information to be sent to the Ministry of Health, MMV and IMS Health.
- In June 2016, MMV concluded a three-year sub-project in collaboration with IMS, with support from Tess Development Advisors, that has enabled the Uganda National Drug Authority to complete the development of a system for monitoring pharmaceutical flows at a national level that is comparable to Zambia's

Examples of use of data on import and local production in the WHO European Region

- The WHO antimicrobial network (WHO EURO initiative covering countries which are not part of the European Surveillance of Antimicrobial Consumption Network)
- Most countries and areas participating in the WHO AMC Network use import data (from customs records and declaration forms) as the source of information on antimicrobial consumption.
- These are supplemented with sales records from market authorization holders or local manufacturing estimates where there is local pharmaceutical manufacturing.
- In some cases, data from wholesalers are used.

Table 3.1 Sources of data used for consumption estimates (2011–2014)

Country or area	Years of data	Health care sector coverage	Data sources for consumption estimates
Albania	2011–2014	Total care	- Import records
Armenia	2011–2014	Total care	- Import records - Sales records from local manufacturers
Azerbaijan	2011–2014	Total care	- Import records
Belarus	2011–2014	Total care	- Import records - Sales records from local manufacturers
Kyrgyzstan	2011–2014	Total care	- Import records - Sales records from local manufacturers
Montenegro	2011–2014	Total care	- Import records
Republic of Moldova	2011–2014	Total care	- Import records - Sales records from local manufacturers
Serbia	2011–2014	Total care	- Sales records from marketing authorization holders
Tajikistan	2011–2014	Total care	- Import records - Certification records
Turkey	2011–2012 2013–2014	Outpatient Total care	- IMS Health - Wholesaler records from pharmaceutical track and trace system
Uzbekistan	2011–2014	Total care	- Import records
Kosovo (in accordance with Security Council resolution 1244 (1999))	2011–2014	Total care	- Import records

Definitions used in the WHO AMC report

- The report distinguishes between consumption and use data
- **Consumption data:** estimates from import of wholesaler data, aggregated health insurance data where no information is available on the patients receiving the medicines -> proxy for use
- **Use data:** estimates from patient-level data

Advantages of using data on import and local production to study use of medicines

- National level coverage
- Longitudinal analysis
- Data on all medicines legally imported or locally produced (no therapeutic group restrictions)
- Routinely collected
- Enables to study the extent to which medicines supply is aligned with national burden of disease and, to some extent, clinical guidelines though no patient-level data available

Limitations of using such data for studies on use of medicines

- Not all medicines legally imported and locally produced may be used in a given year
- Some medicines may be illegally imported and thus not recorded
- If export of locally produced medicines is not recorded, local production statistics will not accurately reflect what may be consumed in the country
- No patient level data
- No subnational breakdown

Group work/discussion

- Discuss the extent to which the outlined limitations (and other not listed) apply in your country
- Feasibility of accessing such data in your country
- Possibility to triangulate import and local production data with other data sources

Thank you!

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