

GARP ACTIVITIES IN KENYA

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Global
Antibiotic
Resistance
Partnership

CDDEP THE CENTER FOR
Disease Dynamics,
Economics & Policy
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GARP-Kenya Situation Analysis

Status of Conditions Related to Antibiotic Resistance 2010

Report Organization

- I. Health System Overview and Disease Profile**
- II. Supply Chain for Essential Drugs and Antibiotics**
- III. Antibiotic Resistance in Key Pathogens Affecting Humans and Animals**
- IV. Antibiotic Use in Human Health and Agricultural Production**
- V. Legislative Framework and Regulatory Environment**
- VI. Interventions and Their Potential Impact**

Key Findings: Health System and Disease Profile

- **Poor health and economic indicators (*46.6% of the population lives under \$1 per day, life expectancy at around 50 years, childhood mortality rate at 120/1,000 live births*).**
- **Major regional disparities in health and economic performance.**
- **Despite national policy documents prioritizing health in rhetoric, spending on the sector remains extremely low (*4.3% of GDP spent on health, per capita spending at \$6.20USD*)**
- **Health system financing is primarily dependent on household out-of-pocket expenditures , collected through cost-sharing mechanisms (*53.1% of the health budget from households v. 29.6% from the government*)**
- **Due to stock-outs, geographic barriers, and cost-sharing policies, essential drugs are widely inaccessible (*60% of the population does not have access to essential medications*)**

Key Findings: Health System and Disease Profile

- Top 5 causes of mortality in Kenya are infectious diseases.
- Malaria and HIV/AIDS pose the greatest burden
- Malnutrition underlies over half of all inpatient morbidity
- Mortality profile for the country: HIV/AIDS (38%), respiratory infections (10%), diarrheal diseases (7%), TB (5%), malaria (5%)
- Pneumonia (20%) and diarrheal diseases (16%) are the second and third leading causes of death in children under the age of 5 years.
- HIV and malaria account for 15% and 14% of deaths, respectively.
- *Bacterial disease burden*: Estimates on the burden of bacterial pneumonia and diarrhea cases in children exist, but data on adults remains scanty.

Key Findings: Antibiotic Supply Chain and Prices

- **Basic structures necessary for implementing national drug policies and management are in place, enforcement remains incomplete**
- **Pharmaceutical management in the public sector lacks critical performance data to function**
- **Poor drug quality control and chronic stock-outs are the largest issues affecting the supply chain of essential drugs, including antibiotics (e.g. *public sector supply chain only meeting 21% of client demand, over 30% of the drugs tested by the quality control laboratory failed standards*)**
- **More research is needed on the mark-ups applied to antibiotics along the supply chain, their profitability to different types of distributors, and their affordability to different types of consumers/patients.**

Key Findings: Antibiotic Resistance

- **Without a national surveillance system, data are limited to hospital-based assessments and sentinel studies, mainly covering respiratory and enteric pathogens.**
- **Pneumonia: Patients empirically treated with penicillin and cotrimoxazole as first-line agents are at a high risk of treatment failure and chloramphenicol use in young children is increasingly compromised by resistance. Ampicillin and erythromycin remain viable substitutes.**
- **Second-line alternatives such as ceftriaxone and co-amoxiclav, however, are unaffordable for most Kenyans and not available in the majority of health facilities in the country.**
 - **Spn: cotrimoxazole (57%), chloramphenicol (26%) in children; cotrimoxazole (51-54%) and doxycycline (24.2%) in adults**
 - **Hib: 40% of isolates MDR in children (amoxicillin and chloramphenicol or cotrimoxazole); chloramphenicol alone (44%), cotrimoxazole (62%) in children, but high efficacy of chloramphenicol and ampicillin in adults (95% and 93% susceptibility, respectively)**

Key Findings: Antibiotic Use

- **Little data exists on antibiotic use in the humans - covers a period in which the country was suffering from an economic downturn and health crisis (1997-2001).**
 - Penicillins are the most commonly prescribed antibiotics (31% of average antibiotic consumption), 67.5% of which are broad-spectrum variety
 - Average consumption during study period was 20.21 DDD/1,000 people a day
- **Single study reports on antibiotic use in livestock and agricultural production (1995-1999).**
 - Mean antibiotic use for the five-year study period was 14,594 kilograms (+/- 1,457 kgs) per year.
 - Tetracycline, the most popular antibiotic among veterinarians and farmers, accounts for 54.65% (7, 975kg) of average antibiotic use.
 - Antibiotic use in poultry alone accounted for 20% of mean consumption per year (2,906 +/- 127 kg). The rest was shared among large animals (cattle, sheep, pigs, and goats) (10, 989 +/- 357 kg) or combined use in both large animals and poultry (699 +/- 427kg).
 - Antibiotics are typically used for therapeutic (90.30%) and prophylactic (9.67%) purposes.

Key Findings: Antibiotic Use

- **Irrational dispensing of antibiotics at retail pharmacies and formal health care facilities.**
- **Over 94% of pharmacies interviewed in Nairobi indicated a willingness to negotiate antibiotic treatment protocols to meet the financial needs of clients.**
- **Case management in health care facilities is often not in line with national treatment guidelines.**
 - **Study on pediatric care in district hospitals found high levels of overdosing with chloramphenicol and under-dosing with gentamicin in young children.**
 - **73% of antibiotics used in newborns at the major referral hospital were used longer than indicated and 42% of antibiotics were used without investigation (diagnosis of bacterial infection or antibiotic susceptibility test).**
 - **74% of antibiotics used in newborns at the referral hospital were not correctly prescribed (either dosage, drug choice, or indication for antibiotic treatment).**

Key Findings: Antibiotic Use

- **Patient self-medication at retail pharmacies and consumer demand for specific antibiotics prescribed during past illness or known to stop particular symptoms (*i.e. up to 1/3rd of the population uses retail pharmacies as their first point of care, with a large majority of clients demanding specific drugs*)**
- **Large discrepancies between knowledge and practice of antibiotic dispensers, possibly driven by fear of bad outcomes, patient demand and unavailability of alternative treatments.**
- **Majority of livestock producers live in remote areas and lack access to professional veterinary services. Thus, they resort to treating animals themselves, frequently applying inappropriate dosages and mixing drugs in a manner not indicated by national guidelines.**
- **The impact of economic incentives in prescribing and purchasing of antibiotics in human health and agricultural production are largely unknown.**

Key Findings: Regulatory Environment and Policy

- **Laws and policies are in place to manage antibiotics, but government regulation is not effective nor enforced.**
- **National health policy exists yet only 30% of the population can access essential medicines.**
- **The annual operational plan of the Ministry of Health prioritizes improved adherence to clinical guidelines, utilization of data and surveillance information by healthcare decision-makers, and enforcement of public health standards. But none of the service delivery indicators or targets includes access to effective antibiotics or antibiotic management.**
- **National treatment guidelines for major infectious diseases are missing from the majority of health facilities.**
- **Department of Veterinary Services, measures to enforce antibiotic policies and monitor antibiotic use in agricultural and livestock production are hampered by inadequate financial and human resources and ill-equipped laboratories.**

GARP proposed pilot projects in Kenya

Health, socioeconomic and cultural factors in antibiotic use, and sales levels, in a Nairobi slum.

- **Subgrant under negotiation with CDC-KEMRI ; PI Cara Winters**
- **Study will collect the first such data outside the formal medical care system in Kenya.**
- **Location in Kibera, a slum adjacent to Nairobi.**
- **Data: Sales volume data from pharmacies twice per month for one year**
- **interviews with consumers.**

Patterns of drug resistance in bacteria from slaughtered food animals and relationship to husbandry practices.

- **Subgrant executed with KEMRI (PI: Sam Kariuki).**
- **Meat samples from abattoirs near Nairobi, and from retail shops will be sampled for bacteria.**
- **Tested for sensitivity to commonly-used antibiotics.**
- **Followback study will investigate husbandry practices and their socioeconomic correlates, at the farms of origin.**

A survey of the prices and volume of antibiotics sold in the private, public and mission healthcare sector.

Subgrant ready to be executed (PI: Germano Mwabu, University of Nairobi).

- 1) prices patients pay for antibiotics at public, private and mission sector hospitals in Kenya;**
- 2) wholesale prices at which suppliers acquire the product by wholesaler sector, including private and public wholesalers such as MEDS;**
- 3) volume of specific antibiotics purchased and sold in the public, private, and mission health care sectors;**
- 4) the national pattern of antibiotic importation over three years (2007-2009) - volume and inflation-adjusted prices of each type of antibiotic.**

Antibiotic quality in Kenya

**Project under discussion with Jayesh
Pandit, Pharmacy and Poisons Board.**

Conclusion

- **Estimate that by year end we will have pilot data compiled and analysed**
- **Feed into policy decision on actionable points for Ministry of Health, Ministry of Agriculture and Fisheries and other stakeholders in Government and NGOs with interest in preservation of effectiveness of available drugs.**