# *Antimicrobial use in developing countries*

**WVA/WMA GLOBAL CONFERENCE ON ONE HEALTH**

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Madrid, Spain

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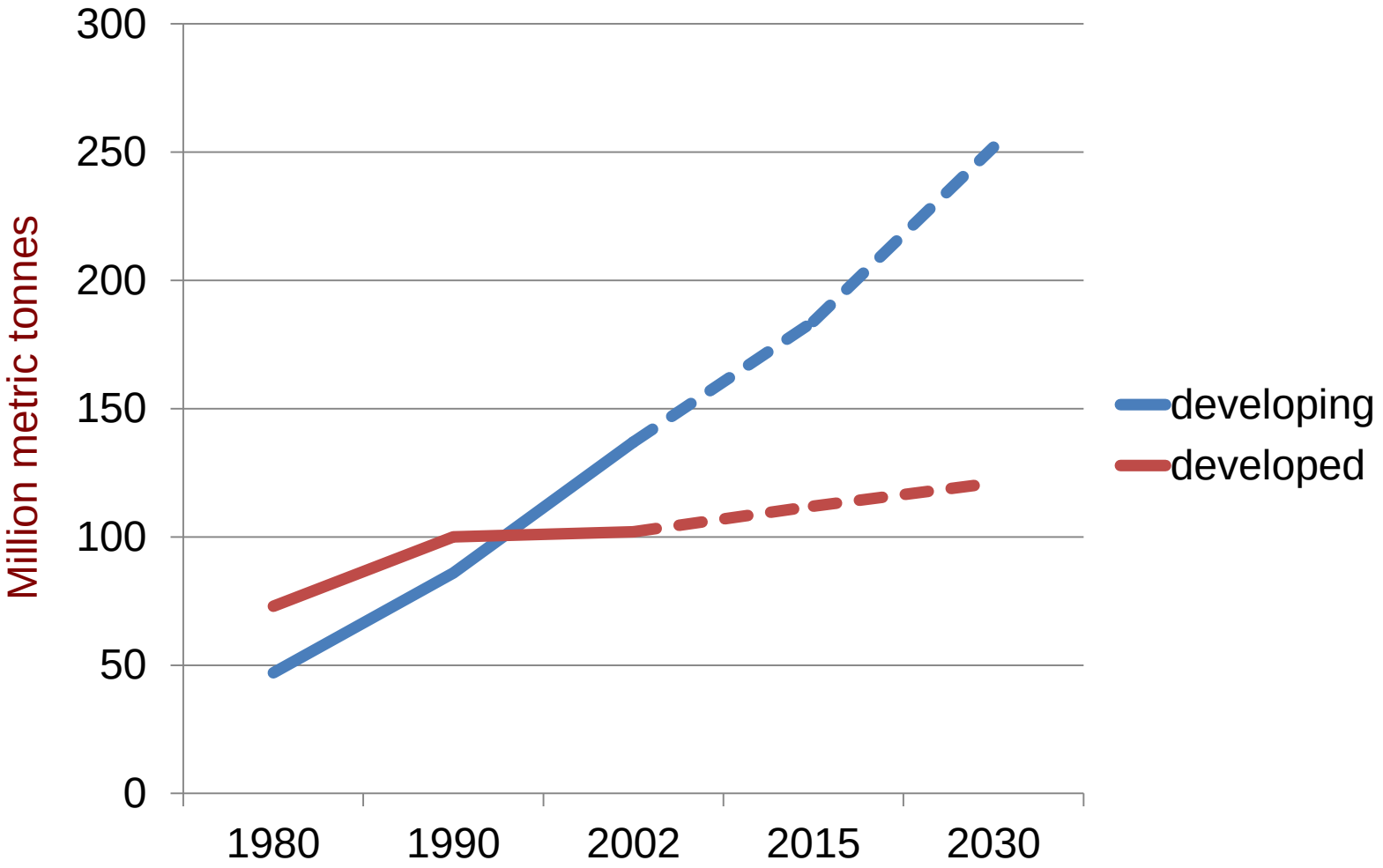
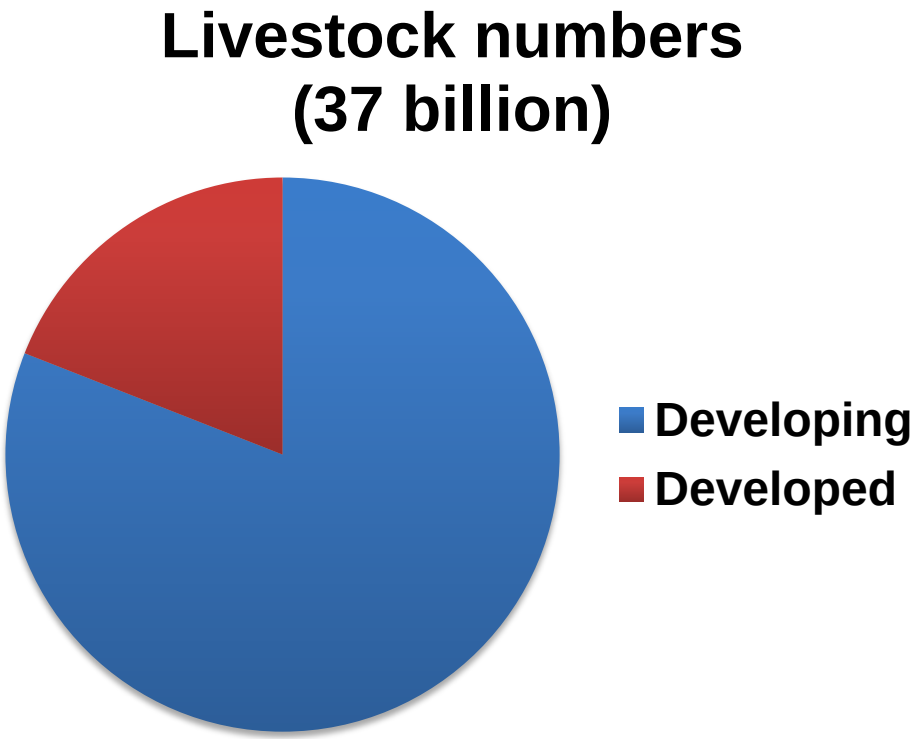
Demand for
antibiotic use

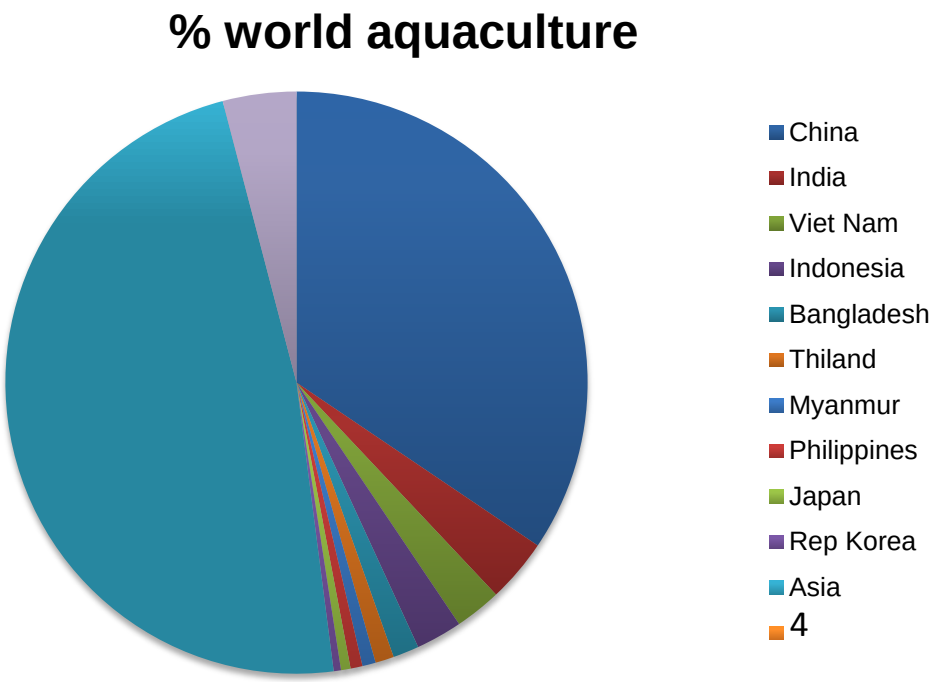
# Gains in meat consumption in developing countries are outpacing those of developed




FAO 2006

# Most livestock are in developing countries

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# Animal disease is a key constraint

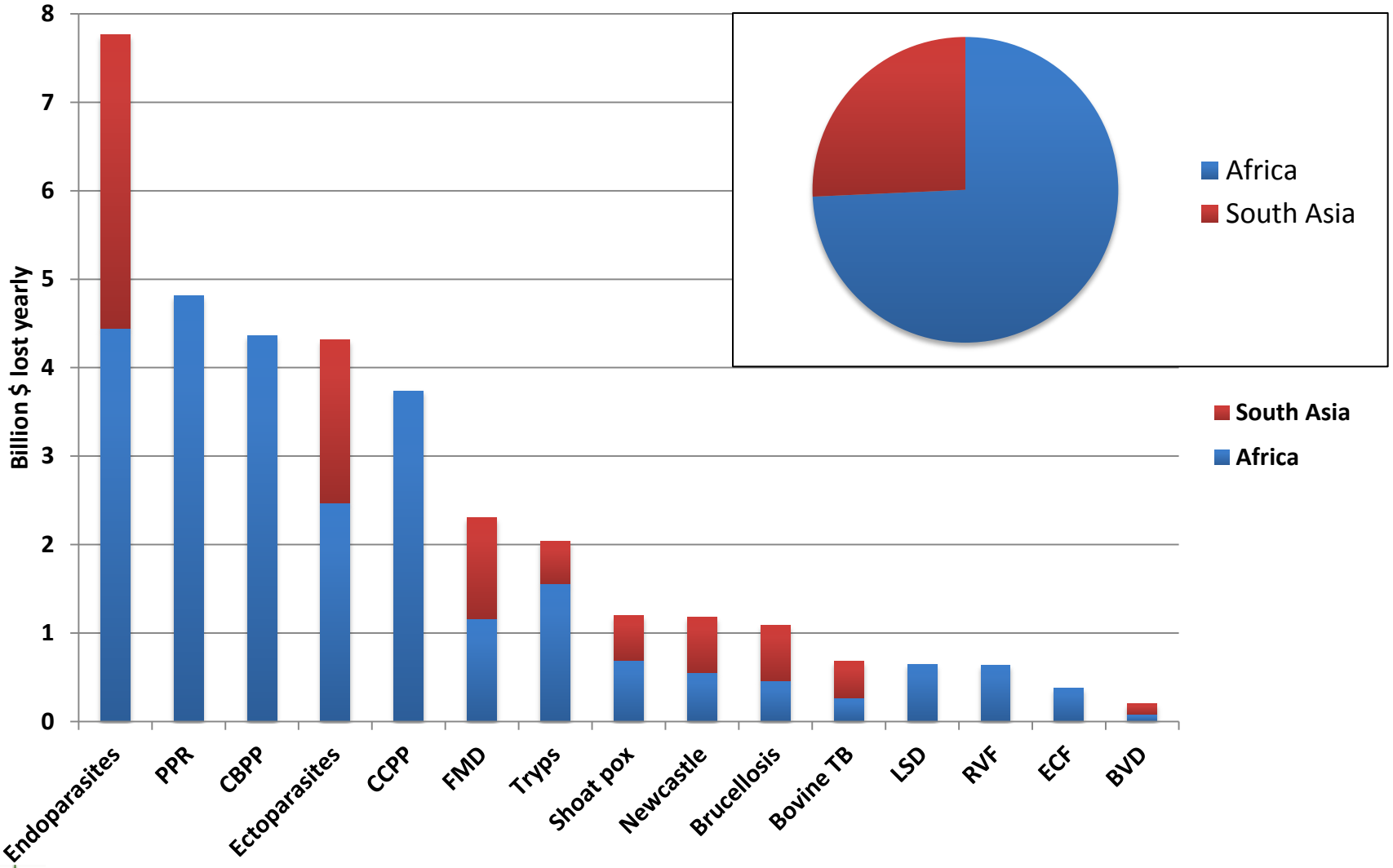
- Animal disease is a key constraint:
  Remove it and animal productivity increases greatly
- As livestock systems intensify in developing countries, diseases may increase

Annual mortality of African livestock
( Around half due to preventable or curable disease )

| | Young | Adult |
|---|---|---|
| Cattle | 22% | 6% |
| Shoat | 28% | 11% |
| Poultry | 70% | 30% |

*Otte & Chilonda, IAEA*

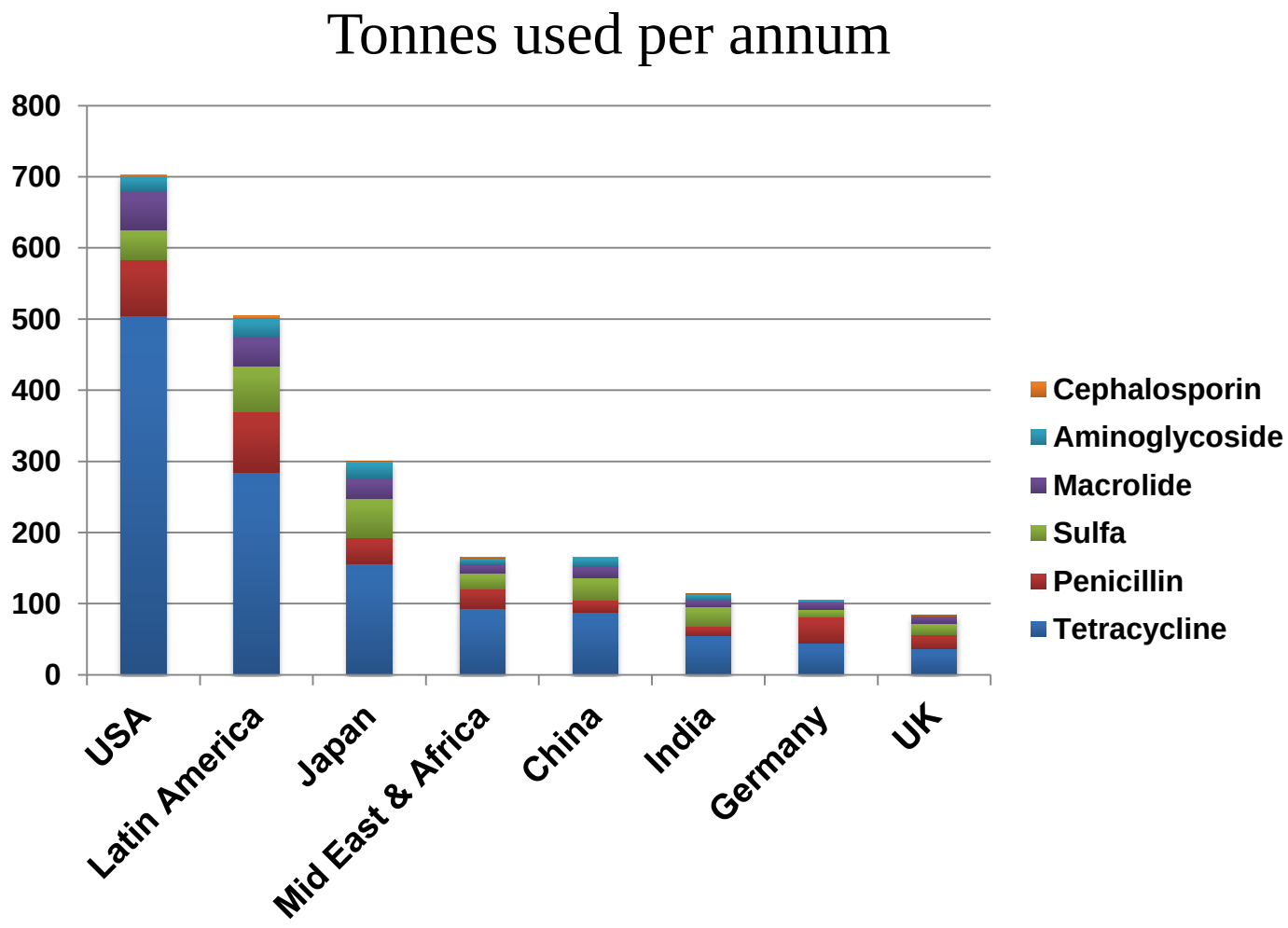
# Livestock in developing countries suffer a high burden of preventable disease



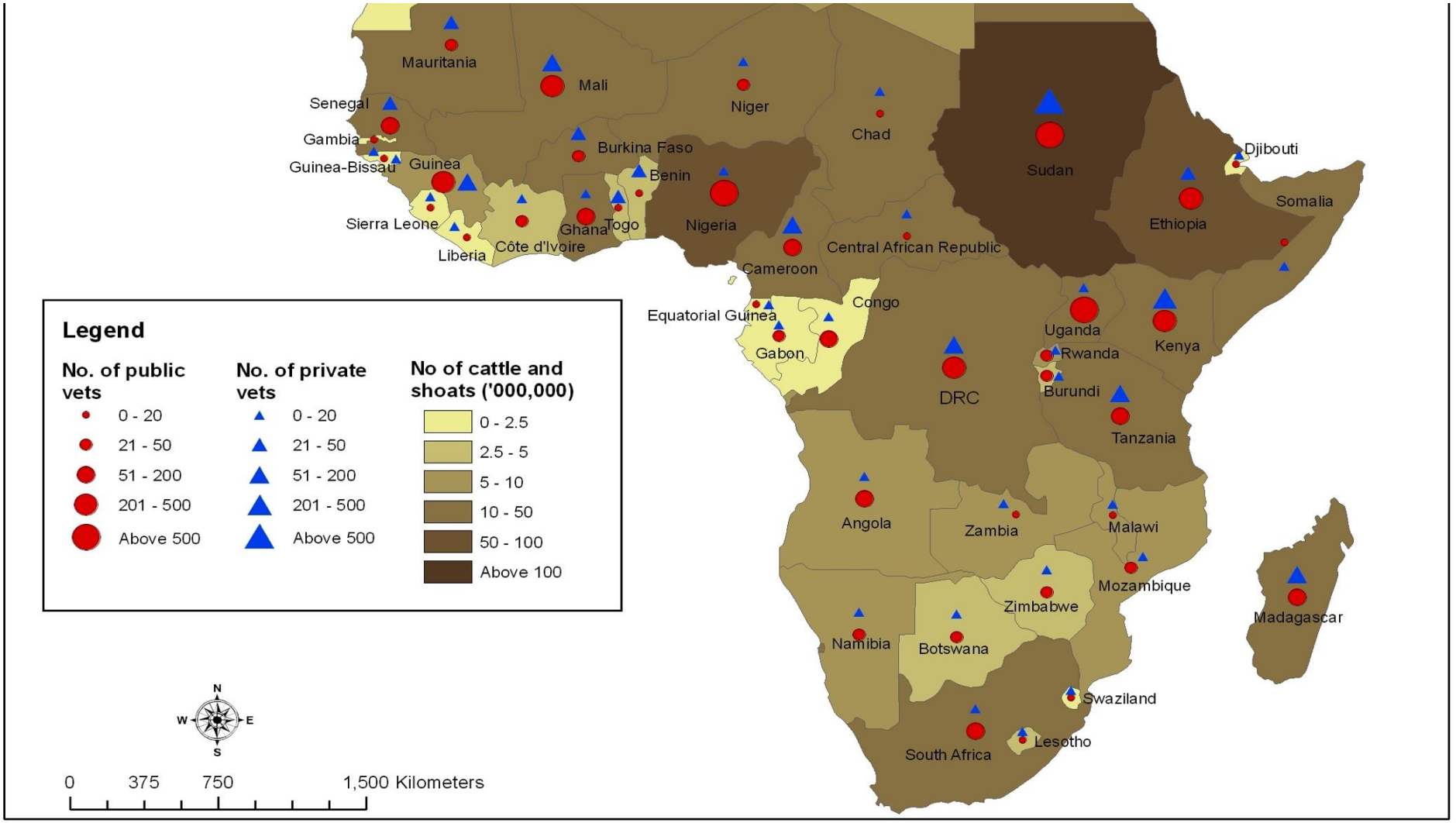

*Estimates from BMGF*

# Livestock drug use

# What drugs are used?

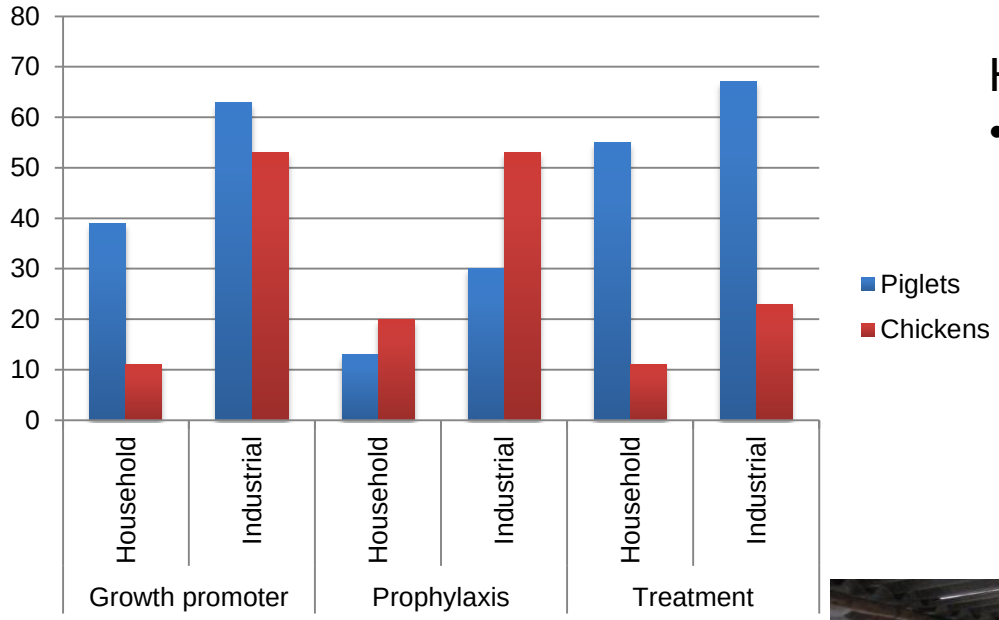


# Who uses drugs?



# How are drugs used, west Africa?

# How are drugs used, Vietnam?




Human drugs

- In one commune, 75% of children medicated by parents each year

Livestock farmers

- 45 antibiotics from 10 classes
- 100% industrial farmers treat themselves; 60% of household farmers

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# How are drugs used, India?

2001, India became the world's leading milk producer.

Indian cows and buffaloes produced 135 million tons of milk in 2013

BRICS countries accounted for 76% of global increase in antibiotic consumption 2000-10

Prescription not needed

Pilot in Assam found 87% of milk samples from cows had aminoglycoside residues- but only two farmers could name an antibiotic containing this

New project studying antimicrobial residues in peri-urban dairy, aiming at doing a risk assessment

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# Veterinary antibiotic usage among dairy farmers in the largest milk producing state of Punjab, India

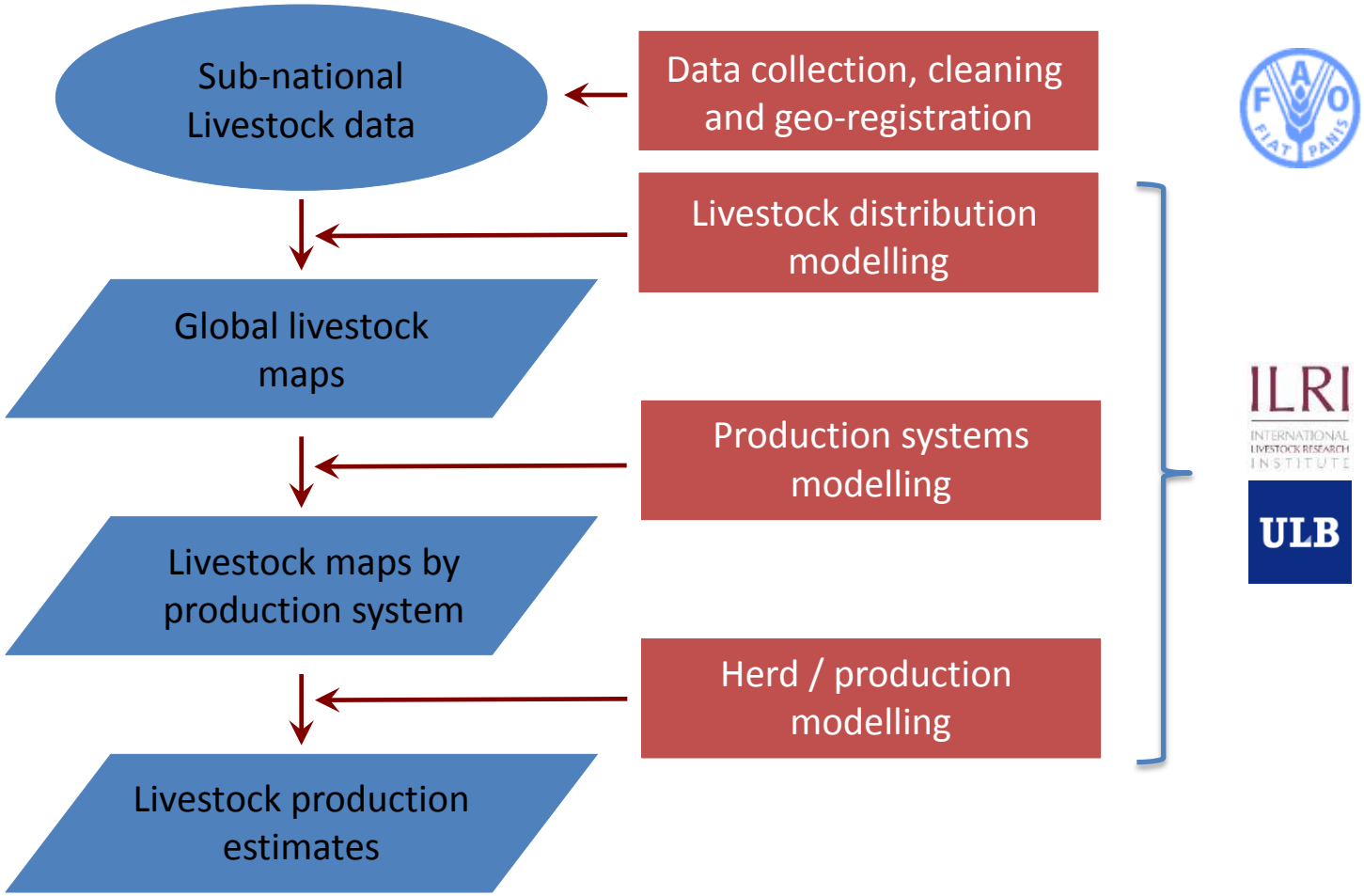
| Class of antibiotic | % farms using antibiotic |
|---|---|
| Tetracyclines | 83% |
| Fluoroquinolones | 73% |
| Beta lactams | 47% |
| Cephalosporins | 47% |

- All farmers give antibiotics to treat disease
- Some reported used for prophylaxis or to treat perceived “weakness” in animals
- At least 20% use 5 or more antibiotics on the farm
- All small farms reported using 3 antibiotics or less

- FQ residues were found at levels 3 to 8 times the MRL (100 ppb), and TC residues at levels 3 to 10.5 times the MRL (100 ppb).
- More often in farms selling to branded companies than in farms selling to local supply


How much antibiotic is used in developing countries?

# Livestock distribution and production

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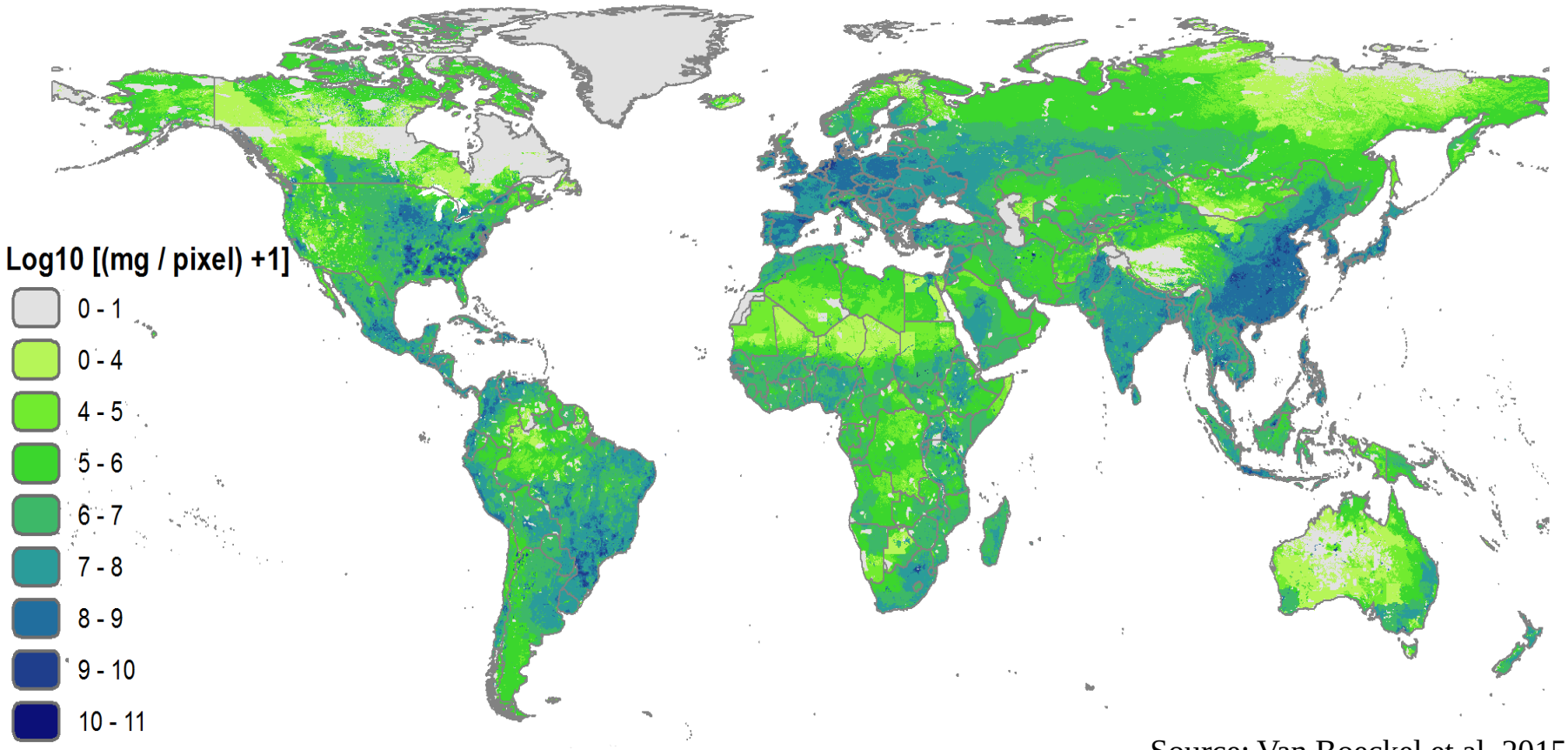
# Global antimicrobial use in food animals

(mg per 10km pixel)

- Total consumption in the livestock sector in 2010 estimated at 63,151 tons
- Global antimicrobial consumption will rise by 67% by 2030

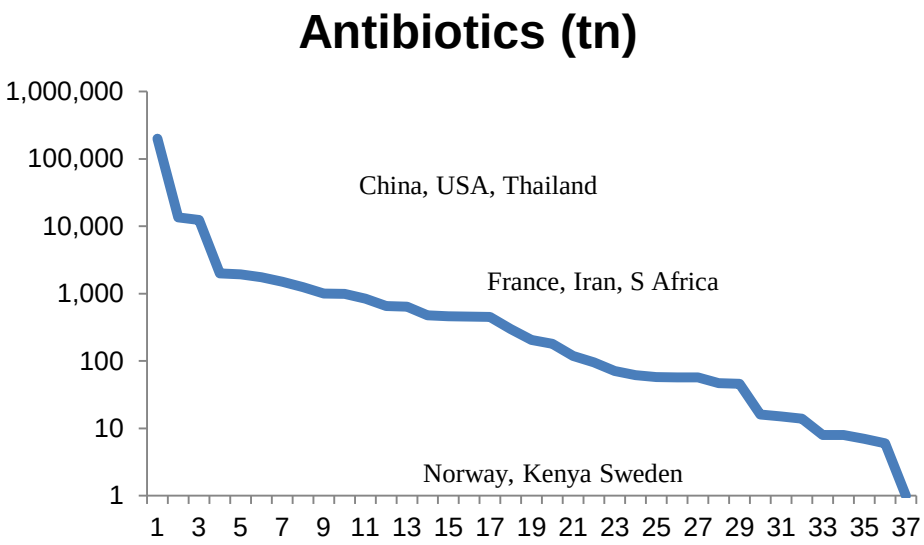


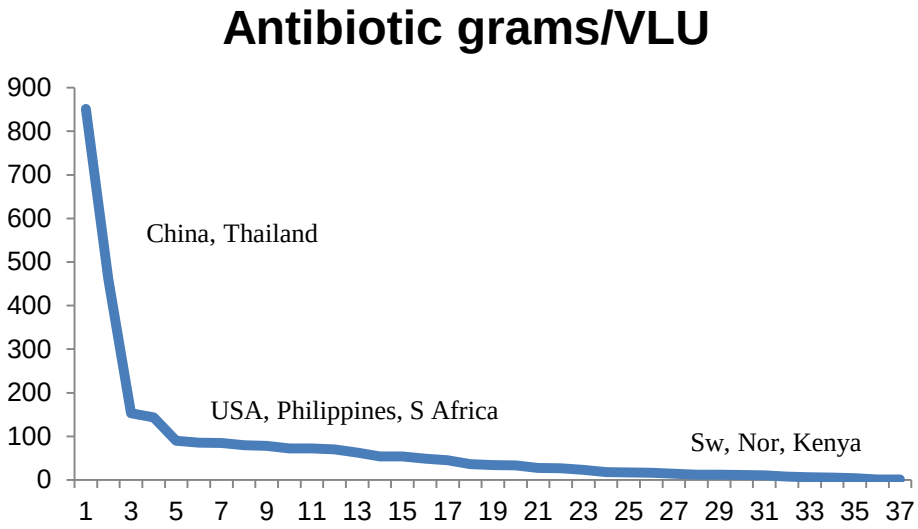

Source: Van Boeckel et al. 2015

# Global antimicrobial use in food animals

(mg per 10km pixel)

- Total consumption in the livestock sector in 2000s estimated at 400,000 tonnes




Source: Grace,. 2015

# Antibiotic residues and Antimicrobial resistance

# Antimicrobial resistance

| Population | Disease type / pathogen | Antimicrobial Resistance | |
|---|---|---|---|
| | | **Older %** | **Newer %** |
| Free-ranging pigs, Kenya | Animal (salmonella) | 37 (ampi) | 4 (cipro) |
| Urban dairy, Ethiopia | Zoonoses (NTS) | 100 (ampi) | 0 (cipro) |
| SH chicken, Nigeria | Zoonosis (S. aureus) | 100 (ampi) | 0 (cipro) |
| Intensive chicken, China | Zoonosis (E coli) | 88 (ampi) | 17 (gent) |
| Cockles, Malaysia | Zoonosis (NCV) | 68 (ampi) | 0 (cipro) |
| Salads, shops Nigeria | Zoonoses (Listeria) | 93 (ampi) | 4 (cipro) |
| Cow dung, India | Zoonoses (E. coli) | 71 (ampi) | 43 (cipro) |

- Lack of awareness & concern
- Lack of surveillance
- Lack of alternatives
- Poor integration between medical & vet sectors
- Presence fake & substandard drugs

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# Rational drug use for informal sector

| | | |
|---|---|---|
|  |   Ntura ba ani cikɛ misi 2 foroko dennin |  Ntura ba ani cikɛ misi 25ml |
|  |   Ntura ni ani cikɛ misi 1,5 foroko dennin |  Ntura ni ani cikɛ misi 20ml |
|  |  Misi san fila 1 foroko dennin |  Misi san fila 10ml |
|  |  Misi deni 0,5 foroko |  Misi deni 5ml |



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# Results

Improvements in knowledge

Change in practice

- Less under-dosage
- Higher use prophylactics
- No increase in drug use

Better clinical outcomes

- Fewer failures (halved)
- Fewer side affects

# More research 4 development responses

- ‘One Health’ approaches and ‘Rational Drug Use’ for both people and animals
- Delivery systems for dispersed farmers: CAHW; franchises
- Surveillance systems to detect drug resistance
- Pro-poor packaging / marketing (e.g., smaller packages, thermostable)
- Development of vaccines for Newcastle disease, East Coast fever
- Rapid diagnostics for residues and AMR
- Quality assurance for veterinary medicines

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# Policy responses

## Vietnam

- One health task force
- Situational analysis
- Policy workshops
- Member of regional initiatives
- Compliance international norms (export only)
- National Action plan

## Kenya

- One health taskforce
- Global partnerships
- Situational analysis
- Compliance: export only

# Acknowledgements

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