



Trends in Antimicrobial Resistance and antimicrobial prescription practices at Queen Elizabeth Central Hospital in Malawi



Background

- Bacterial infections remain major causes of morbidity and mortality Sub-Saharan Africa
 - Manifest as sepsis, septicaemia, respiratory tract infections, meningitis etc
- Underlying risk factors
 - Poor status of WASH
 - HIV
 - Malnutrition
 - Low birth weight

TABLE 3: LEADING CAUSES OF DALYS IN MALAWI, 2011

	Condition	% total DALYS
1.	HIV/AIDS	34.9
2.	Lower Respiratory Tract Infections	9.1
3.	Malaria	7.7
4.	Diarrhoeal Diseases	6.4
5.	Conditions arising during perinatal period	3.3
6.	Tuberculosis	1.9
7.	Protein Energy Malnutrition	1.6
8.	Road Traffic Accidents	1.5
9.	Abortions	1.4
10.	Hypertensive Heart Diseases	1.2

Strategies to Control Bacterial Infections in Malawi (1998-2016)

- General
 - WASH promotion
 - Breastfeeding promotion
 - Community Management of Acute Malnutrition
- Vaccination
 - DPT-HepB-Hib: 2002
 - PCV13: Nov 2011
 - Rotavirus: Nov 2012
- Antimicrobials
 - Decentralized use of antibiotics for ARI and STI Management
 - Use of prophylaxis in People Living with HIV (Cotrimoxazole, Isoniazid)
 - Antiretroviral Therapy: 2004
 - Wide use of ciprofloxacin (2002), ceftriaxone (2004) in hospitals

Challenges in the use of antibiotics

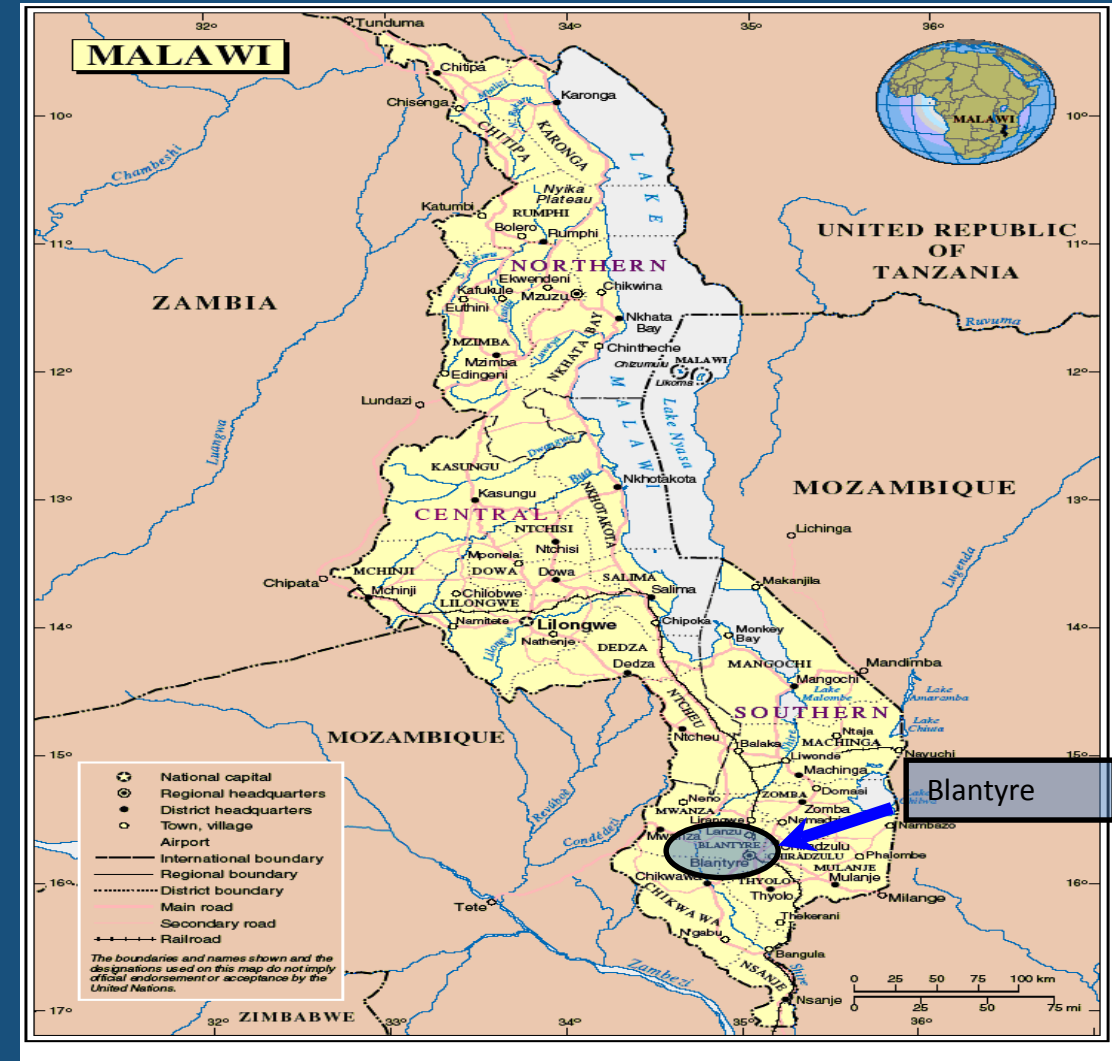
- Inaccurate clinical diagnosis (febrile illnesses)
 - non-malarial fever= antibiotics
- Poor prescription practices and sub-optimal adherence
 - Worse in private sector
- Limited laboratory diagnosis
- Concerns about antibiotic drug quality
- Unregulated use in the agricultural sector
- Poor surveillance: incidence, types and resistance of bacterial infections

Surveillance of Blood Stream Infections (BSI) in Blantyre Malawi

- Since 1998, Queen Elizabeth Central Hospital, Malawi has been conducting surveillance for BSI & AMR

- Context:

- Government-owned tertiary hospital
- 1,000 beds (occupancy higher)
- 10,000 admission per year (Medical & Paediatric wards)
 - From Blantyre district & Southern Malawi
- Blantyre
 - Pop: ~1m,
 - HIV prevalence: ~18%



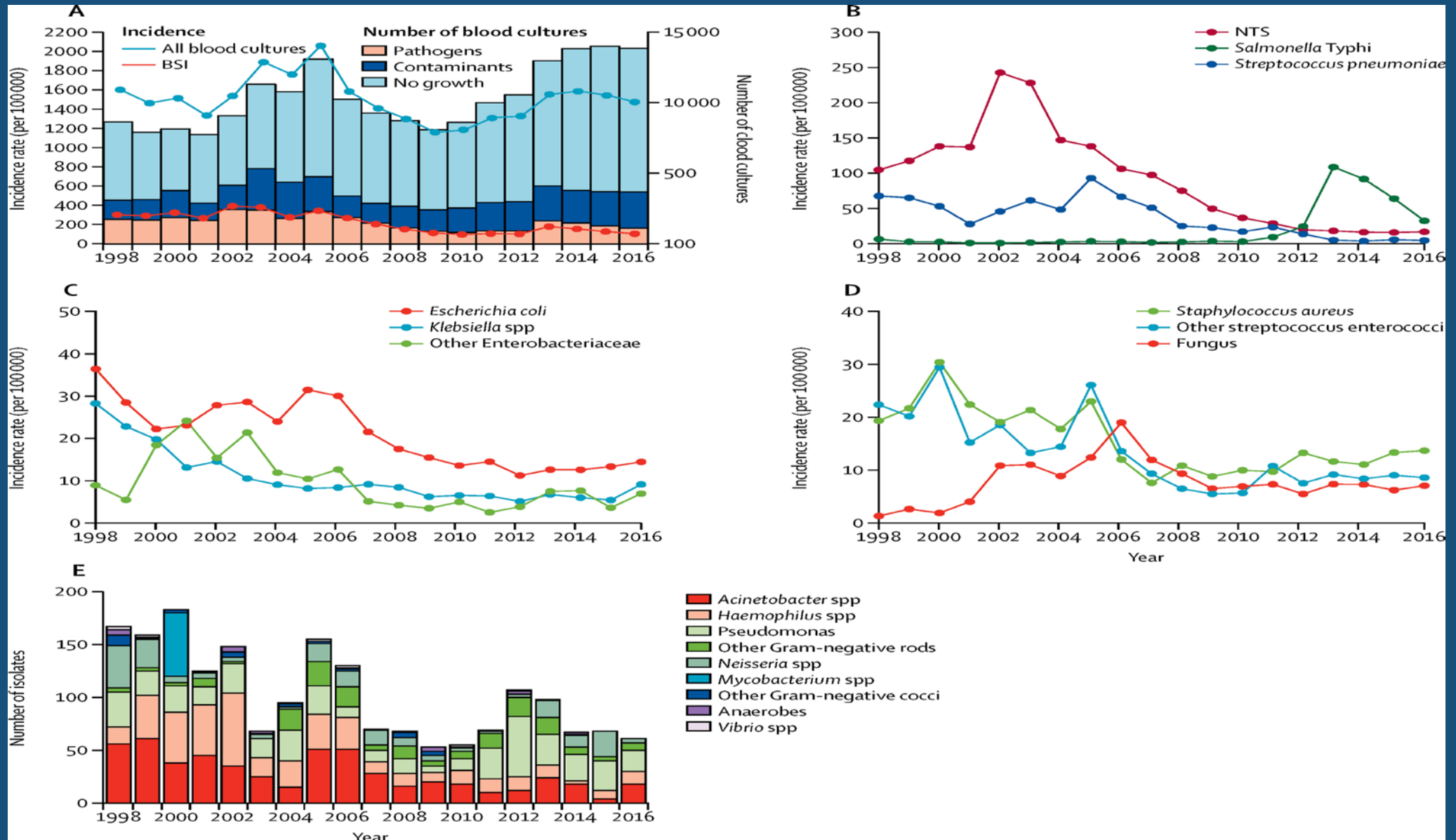
Characterizing BSI

- Surveillance sites (24/7 blood culture)
 - Adult Medical Ward
 - All admitted with fever
 - Pediatric Ward
 - Children admitted with non-focal febrile illness & malaria negative
 - critically ill
- ~200,000 blood cultures since 1998
 - Manual culture prior to 2000, thereafter BacT/Alert automated system
 - Disc Diffusion antimicrobial susceptibility test
 - ampicillin, chloramphenicol, cotrimoxazole, ceftriaxone, ciprofloxacin & gentamicin
 - Some Gram-ve: erythromycin & tetracycline
 - Cefoxitin resistance from 2010
 - ESBL screening: cefpodoxime disc since 2007

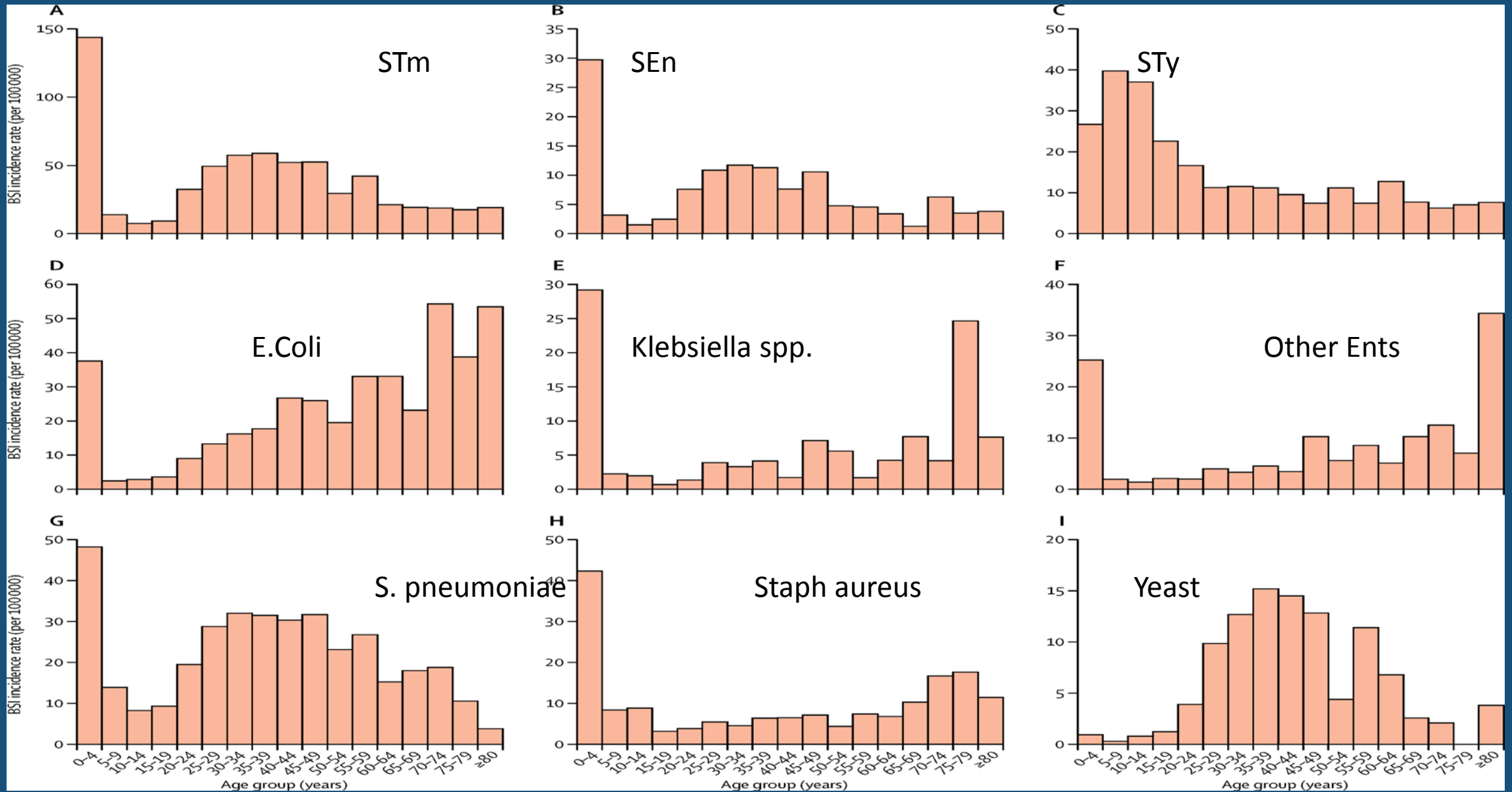
MLW at Queen's Hospital, Blantyre, Malawi



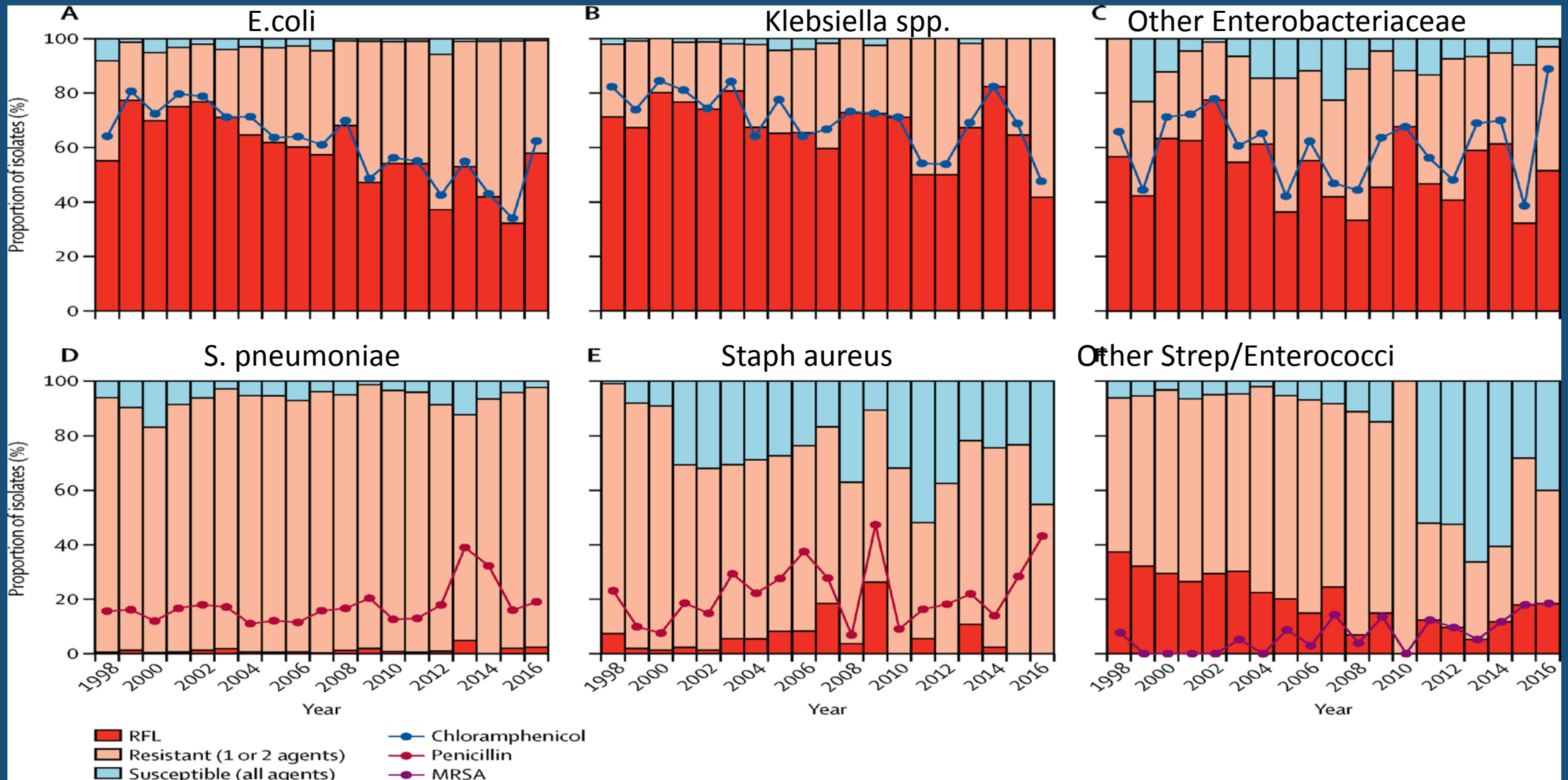
Trends in bloodstream infection at QECH, 1998–2016



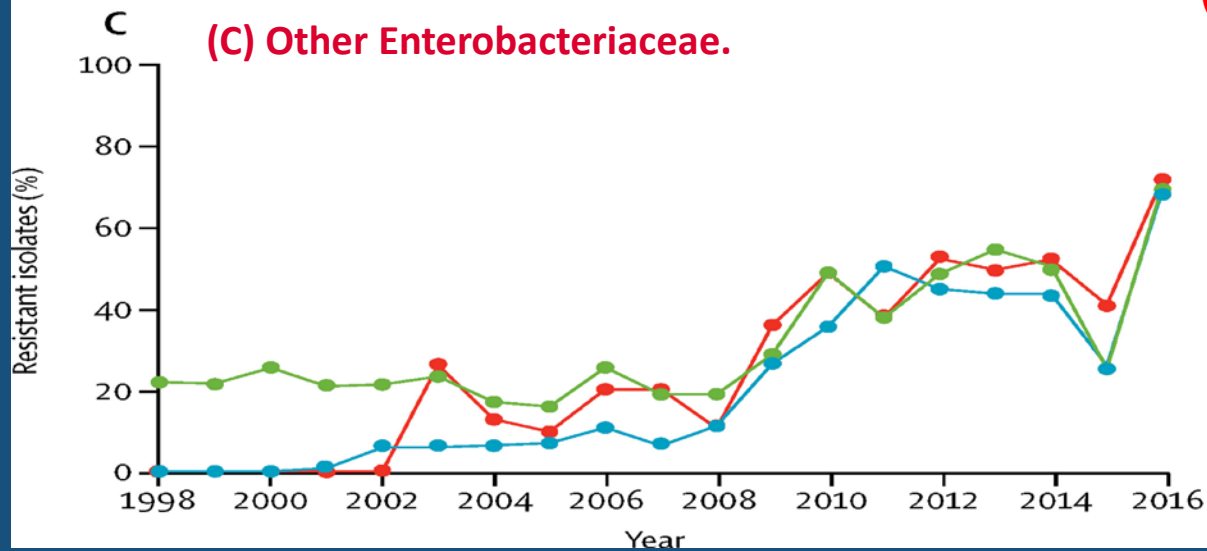
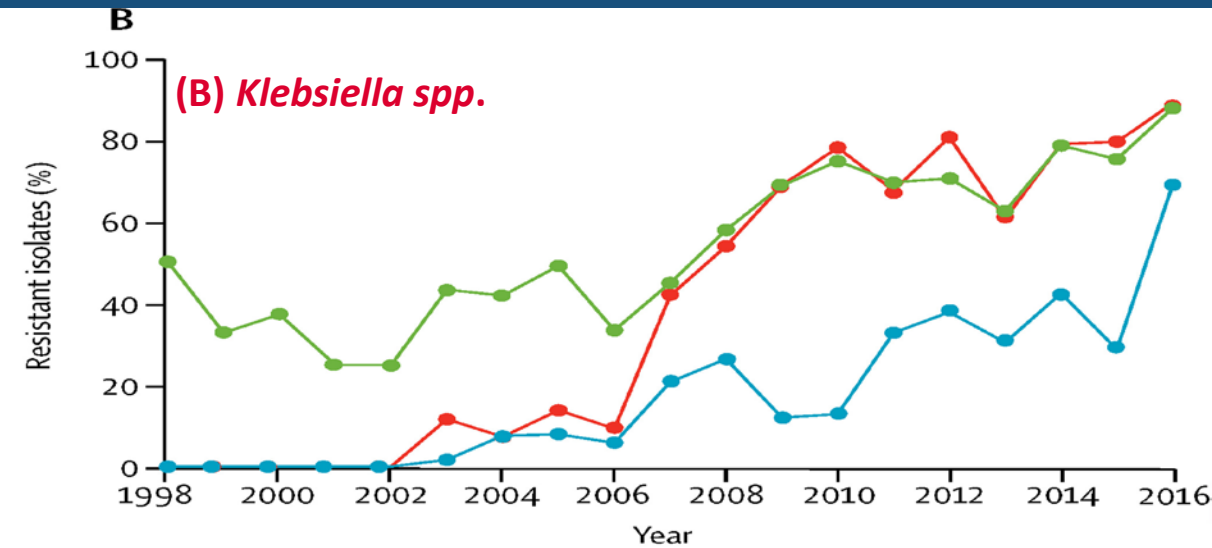
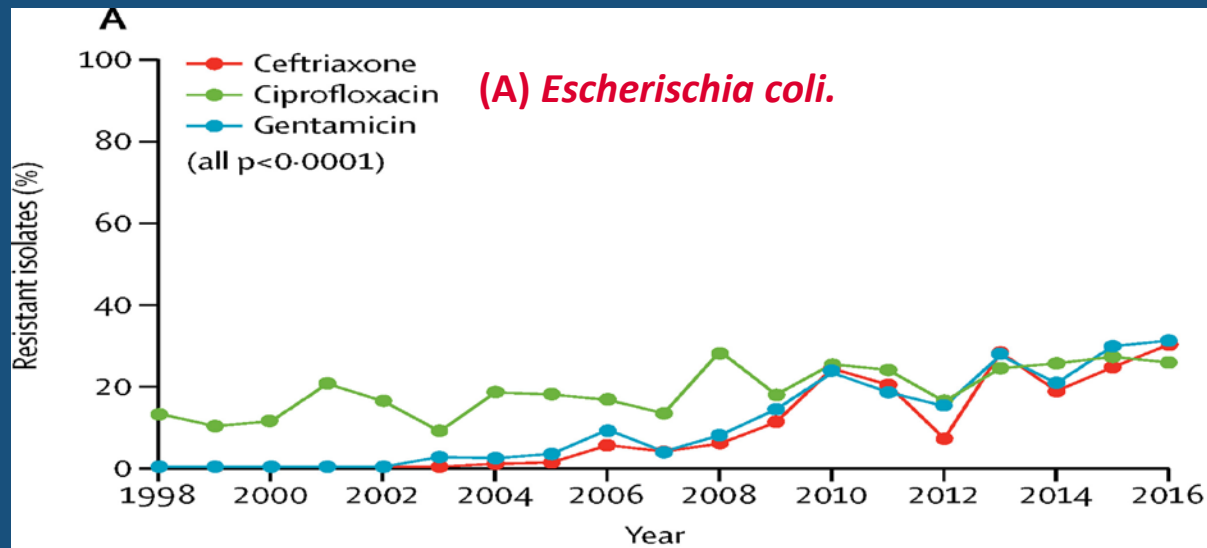
Estimated minimum incidence rates of BSI by age



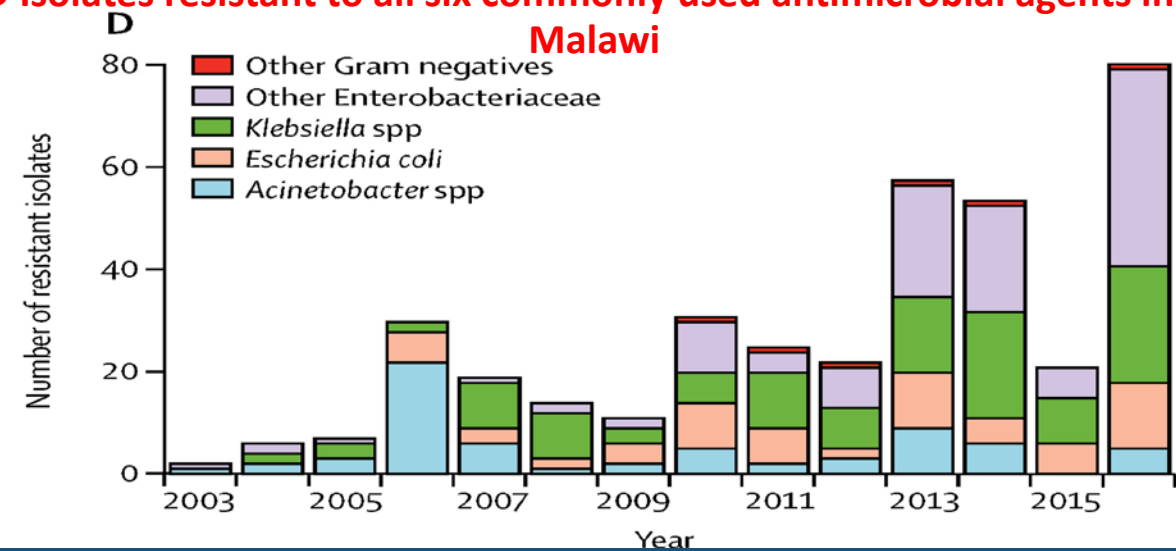
% of isolates Resistant to First-Line (RFL) antimicrobials



Trends in resistance to 2nd-line antimicrobial agents



(D) Isolates resistant to all six commonly used antimicrobial agents in Malawi



Conclusions

- Overall decline in BSI over last 20 years
 - Likely related to sustained improvement of health in population
- Note spike E. coli and Klebsiella BSI in older patients
- Emergence of locally untreatable gram negatives
- BSI and AMR surveillance should be replicated at sentinel sites in Malawi*but need affordable and accurate diagnostics*