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The Gonococcal Antimicrobial Surveillance Program (GASP): A snapshot from Southern Africa

Dumisile Venessa Maseko

Centre for HIV and STIs
National Institute for Communicable Diseases,
National Health Laboratory Service,
Johannesburg, South Africa

1st Global Forum on Bacterial Infections

Antimicrobial Resistant Gonococci
Jet setters of the 21st Century?

A global problem needing a global solution

W.H.O. ACTS TO CURB A NEW STRAIN OF V.D.
By LAWRENCE K. ALTMAN Special to The New York Times
New York Times (1857-Current file): Jan 9, 1977; ProQuest Historical Newspapers pg. 27

W.H.O. ACTS TO CURB A NEW STRAIN OF V.D.

Laboratories Asked to Begin Tests To Detect a Type of Gonorrhea That Resists Penicillin

By LAWRENCE K. ALTMAN
Special to The New York Times

GENEVA, Jan. 8—In an urgent step to prevent the development of a major international health problem, the World Health Organization has asked laboratories throughout the world to begin tests to detect a new penicillin-resistant strain of gonorrhea.

Already, the new type of venereal disease has infected Americans in at least 15 states and people in 10 other countries, and it threatens to become the dominant type among the millions of cases of gonorrhea that occur each year throughout the world.

"The volume of air travel throughout the world and the limited surveillance for this organism to date [means] every area of the world must view this as a real or potential problem," the World Health Organization said in a statement sent to health officials in 150 countries that are members of the organization, and to thousands of scientists.

New York Times Jan 9 1977
Courtesy of J. Zenilman

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"The emergence and spread of drug-resistant pathogens has accelerated. Governments can make progress, working with health workers, pharmacists, civil society, patients, and industry. We all can plan and coordinate our response. We can expand surveillance efforts. We can improve drug regulatory and supply systems. We can foster improved use of medicines for human and animal health. We can actively prevent and control infections in health services and beyond. And, we must stimulate a robust pipeline for new antimicrobials, diagnostics and vaccines.

Drug resistance costs vast amounts of money, and affects vast numbers of lives. The trends are clear and ominous. No action today means no cure tomorrow. At a time of multiple calamities in the world, we cannot allow the loss of essential medicines – essential cures for many millions of people – to become the next global crisis".

Statement of WHO Director-General, Margaret Chan on World Health Day 2011.

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WHAT IS GASP?

GASP is the WHO's Gonococcal Antimicrobial Surveillance Programme

- Using networks of laboratories
- To collect isolates
- Test their resistance to antibiotics
- Ensure a successful implementation of an evidence-based response plan

WHY?

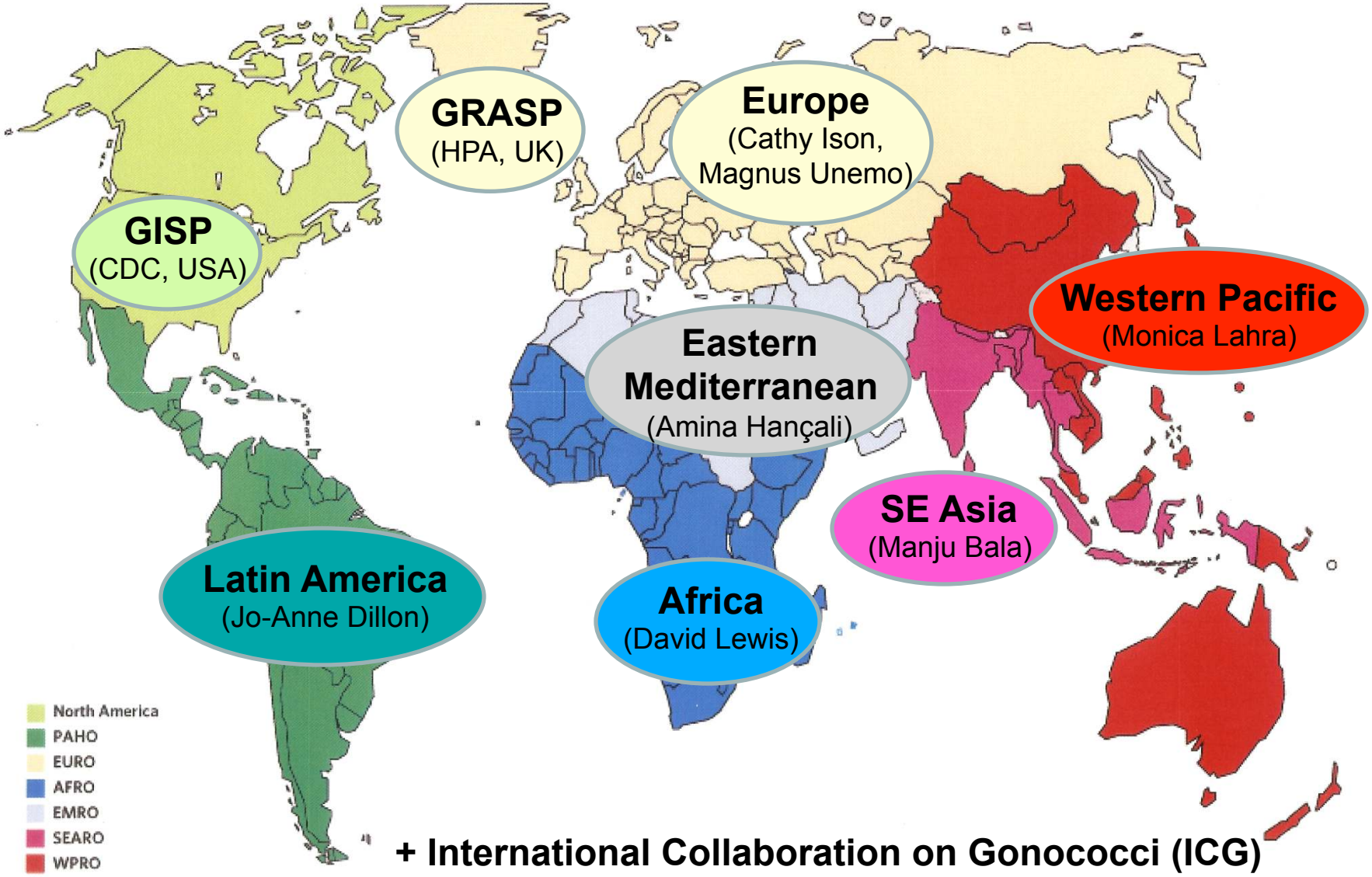
- To improve treatment
- To update standard treatment regimens

HOW?

- Reliable tests performed to high standards by trained staff, using proper reagents and employing quality control systems
- Data analysis and communication to effect updating of treatment guidelines

WHO Gonococcal Antimicrobial Surveillance Programme

GASP Regional Collaborators and Partners



+ International Collaboration on Gonococci (ICG)

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Africa – We Still Need More Data!

- Limited surveillance activity
- Few publications since 2000
- No data for many countries
- Sample sizes often small
- No Afro first-line Rx database
- MIC determination methods differ
- Lack of confirmation of results
- Technical difficulties – strain loss between sites and reference centres
- WHO initiative to enhance gonococcal resistance surveillance

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WHO-Afro GASP Planned Activities

Enhance clinical laboratory capacity for GC culture methods and antimicrobial testing

Enhance awareness of clinicians on the emergence of cephalosporin resistant gonococci and potential treatment failures

Clinical and laboratory training/support for prompt investigation of cephalosporin treatment failure cases

Guidance on effective management of patients and their sexual partners with treatment failure to cephalosporins

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Protocol training - Zimbabwe

Laboratory training - Tanzania

Clinical training - Madagascar

Meeting to review Afro-GASP - Zimbabwe

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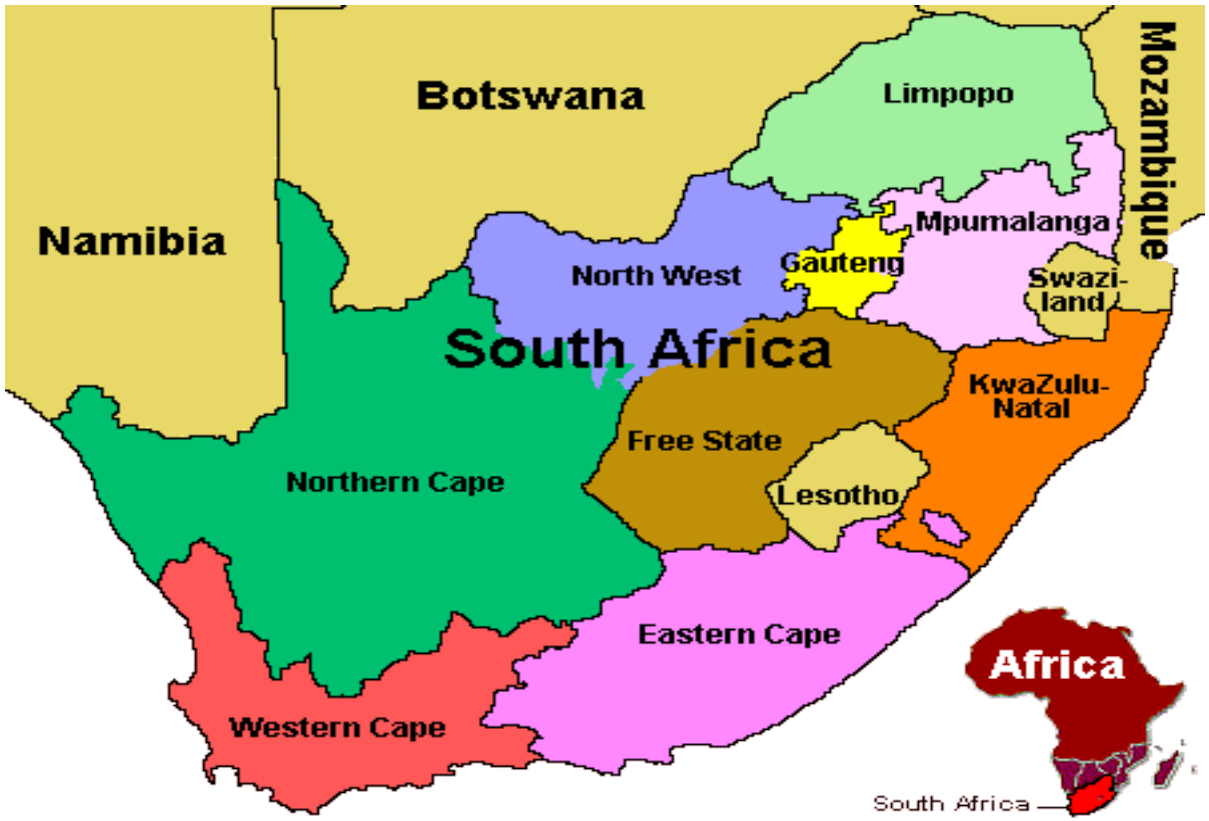
Surveillance in South Africa



GAUTENG: Since 2007

NORTHERN CAPE: 2006

MPUMALANGA: 2006

WESTERN CAPE: 2006 – 2007

FREE STATE: 2009

EASTERN CAPE: 2010

NORTH WEST: 2010 – 2011

LIMPOPO: 2010 – 2011

National Institute for Communicable Diseases

A Division of the National Health Laboratory Service

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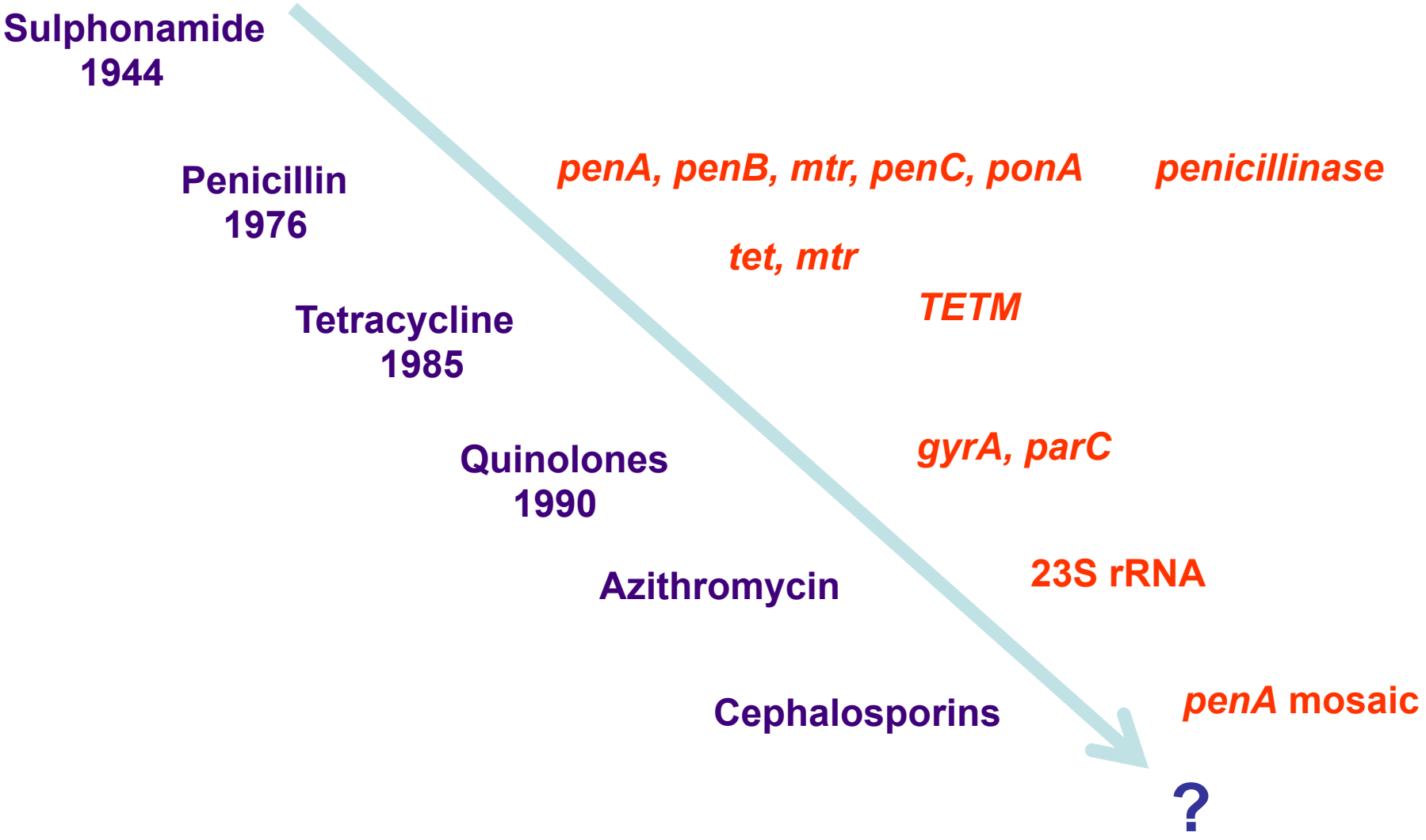
Treatment for gonorrhoeae



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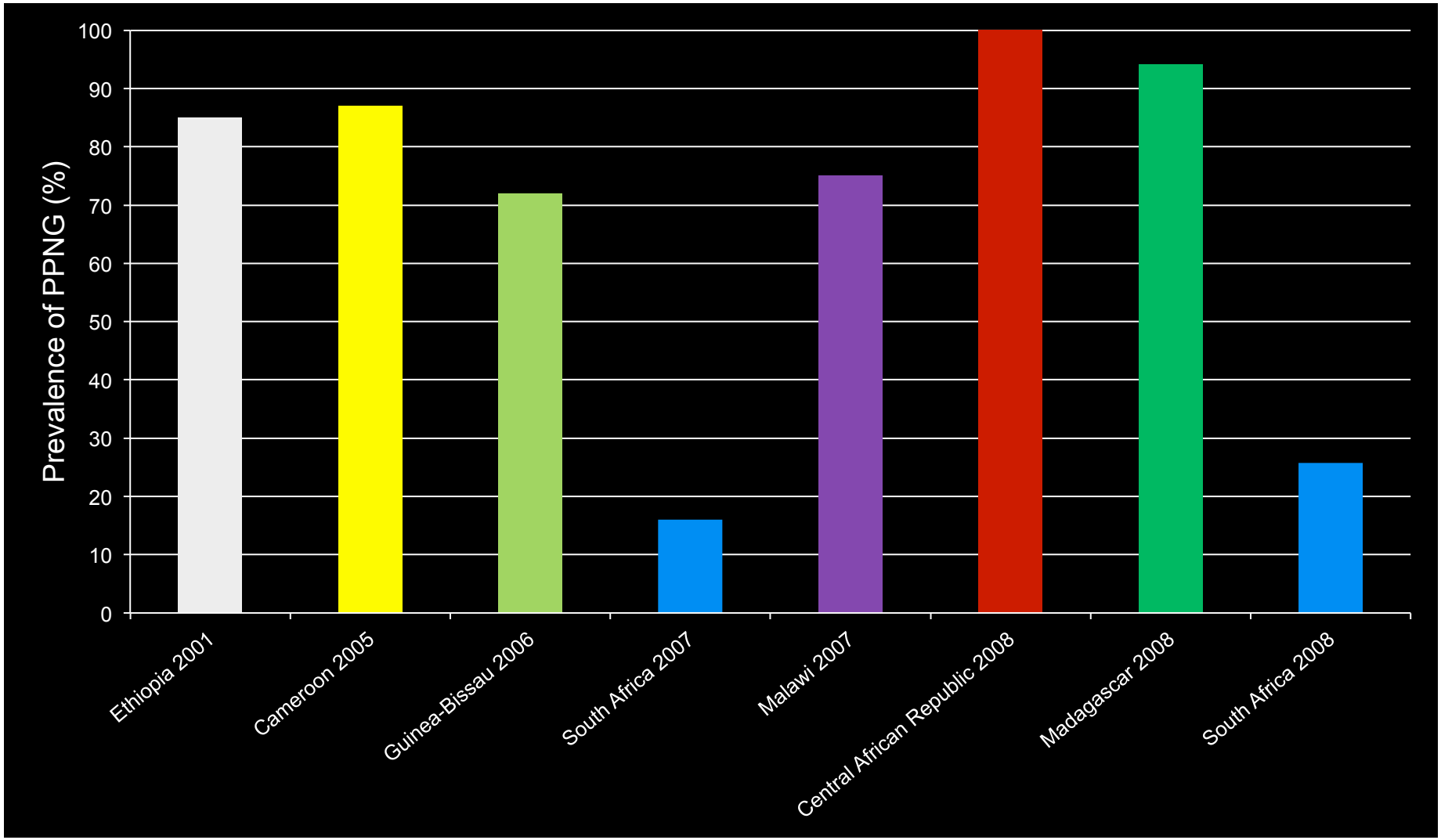
PPNG prevalence in Africa (2001-2008)



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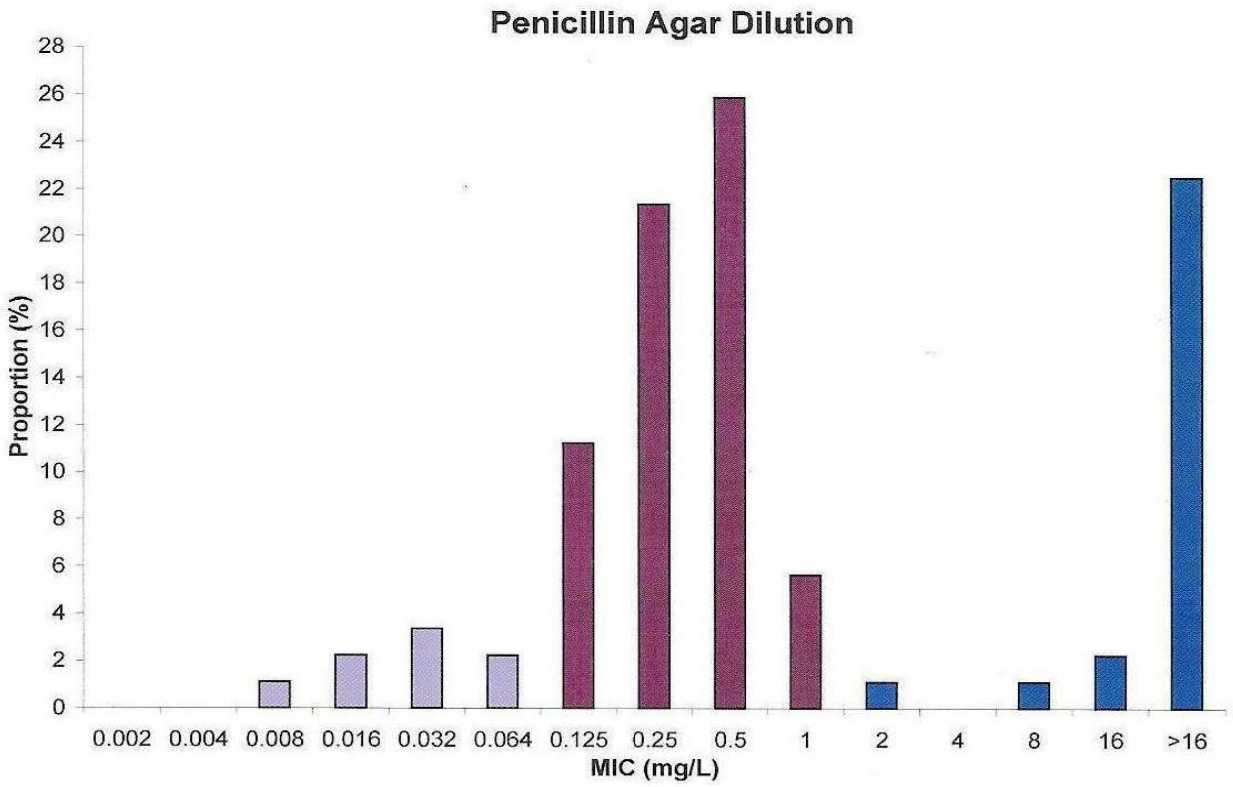
Penicillin Resistance in South Africa (2008)



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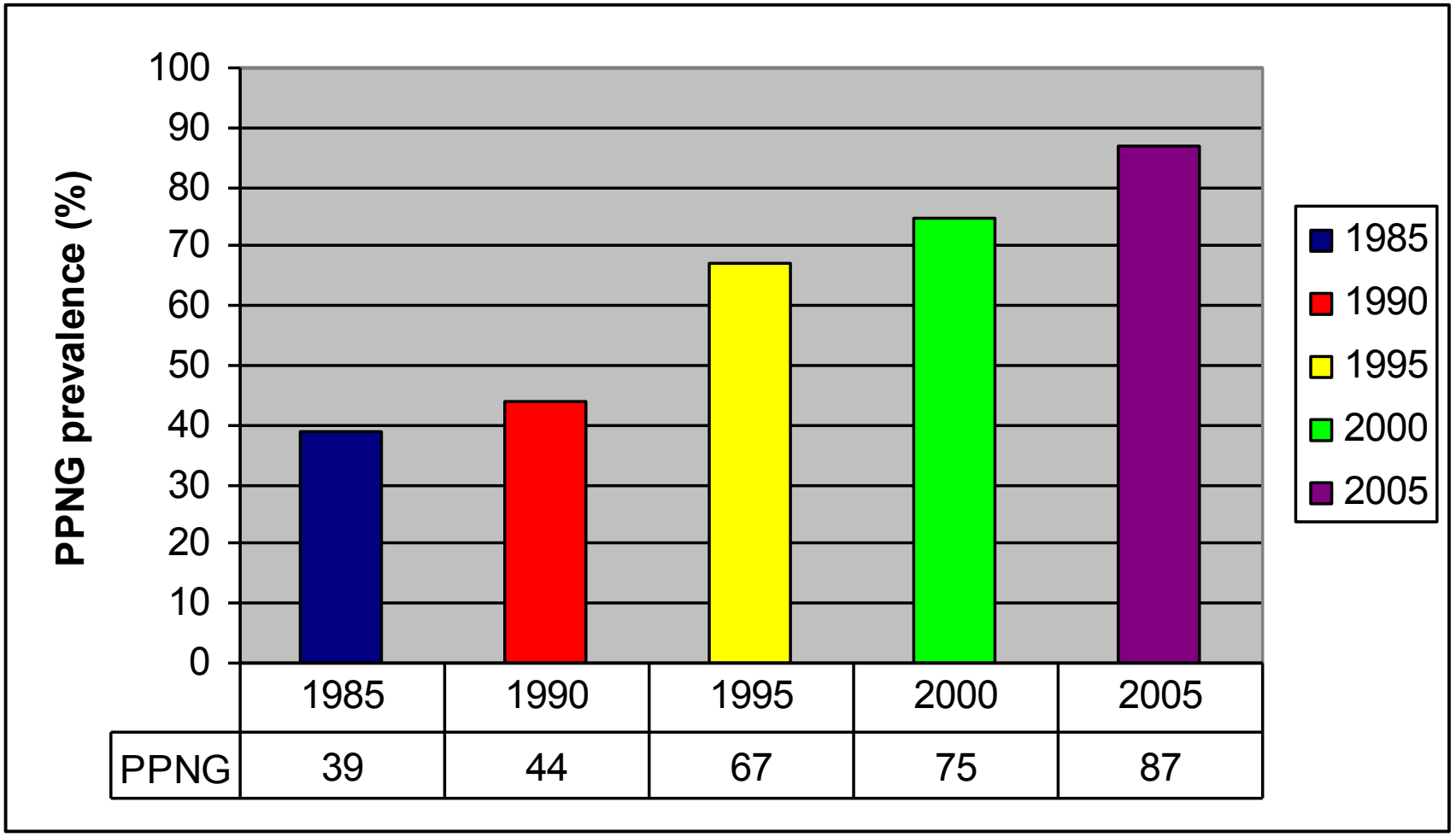
Rise in PPNG - Cameroon (1985-2005)



	1985	1990	1995	2000	2005
PPNG	39	44	67	75	87

Source: Manuel de formation des prestataires de soins sur la prise en charge syndromique des IST au Cameroun. Ministry of Public Health, April 2007

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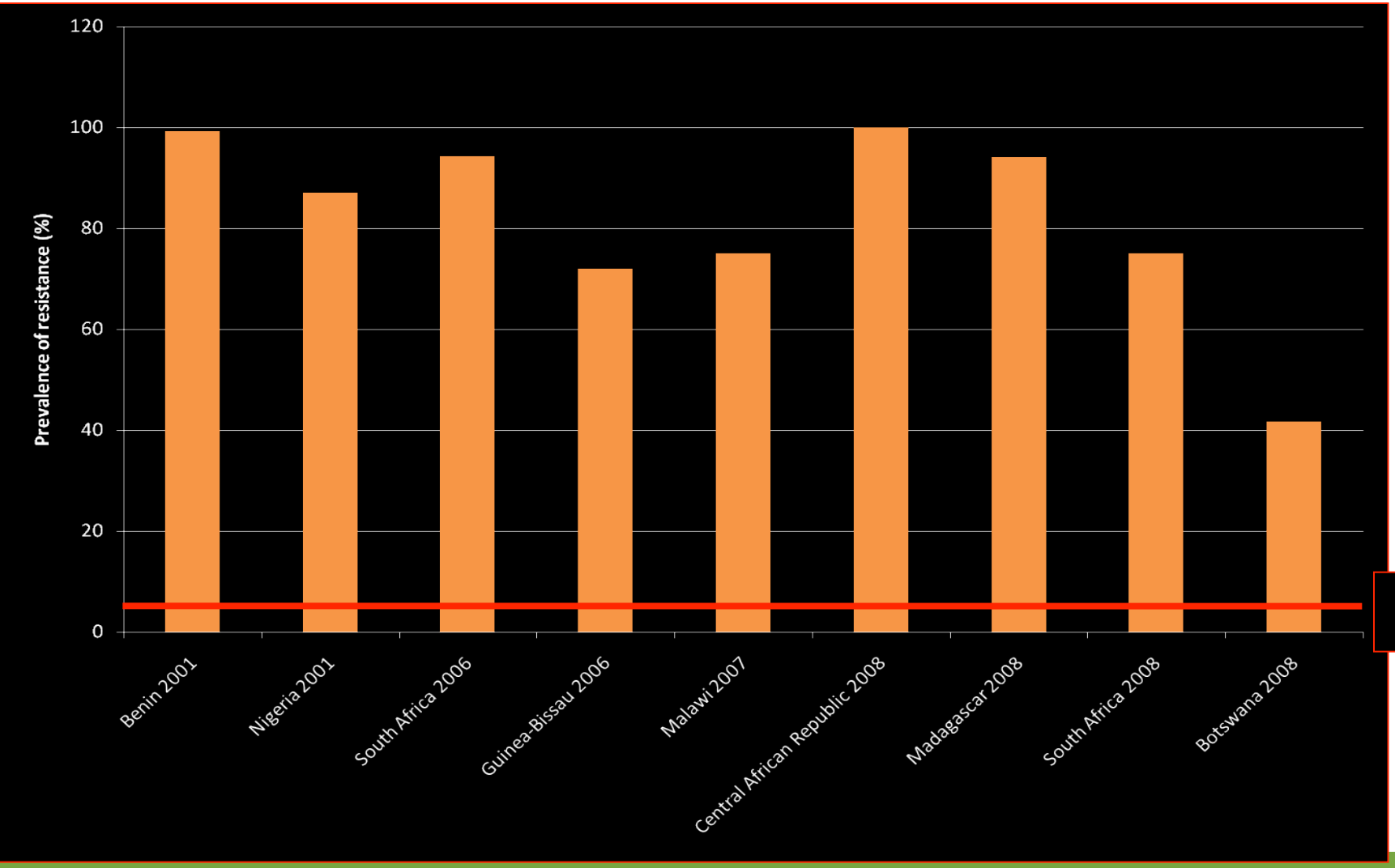
Tetracycline Resistance (2001-2011)



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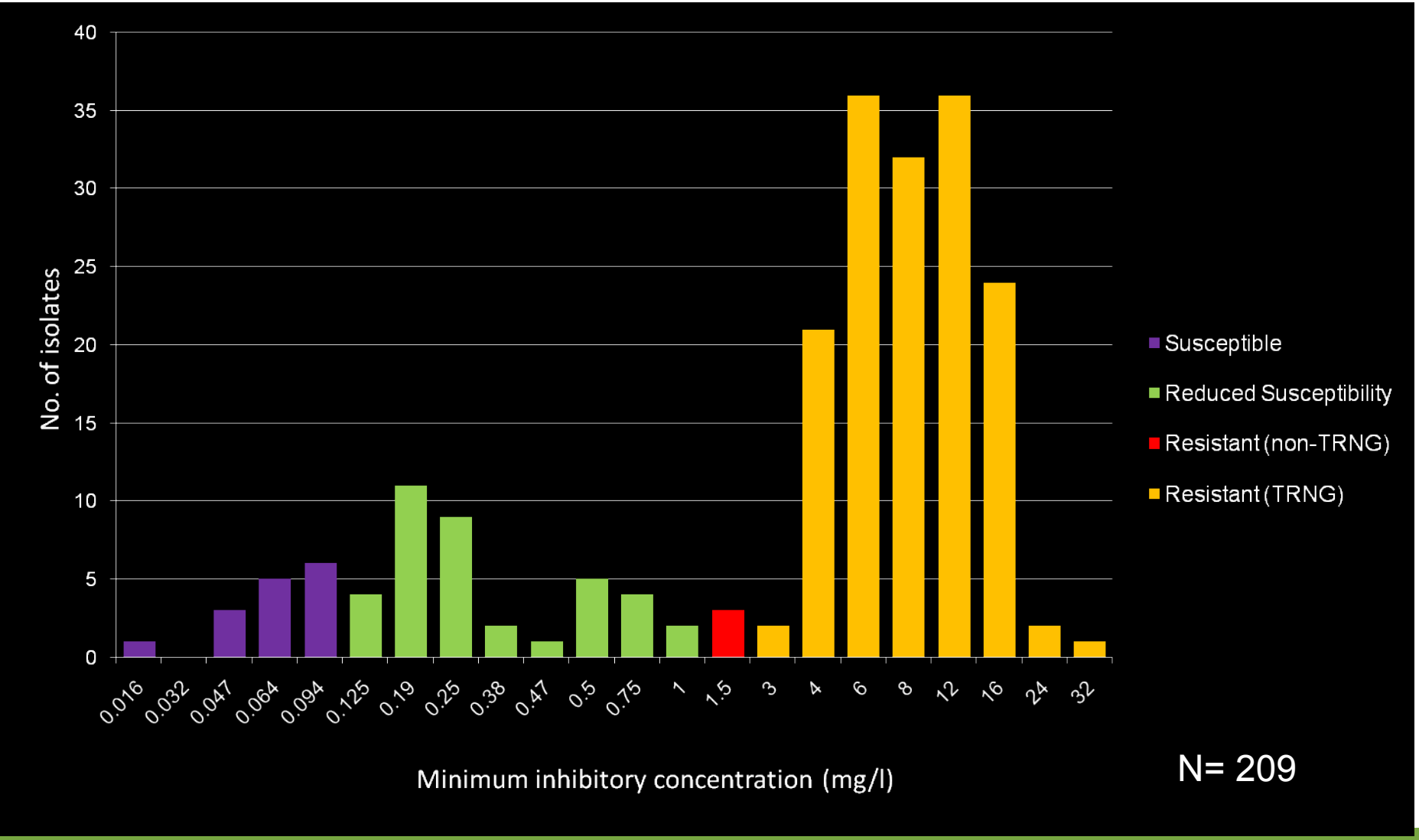
TRNG Prevalence in South Africa (2008)



Fayemiwo *et al.*, Sex. Transm. Dis. 2011;**38**:329-333

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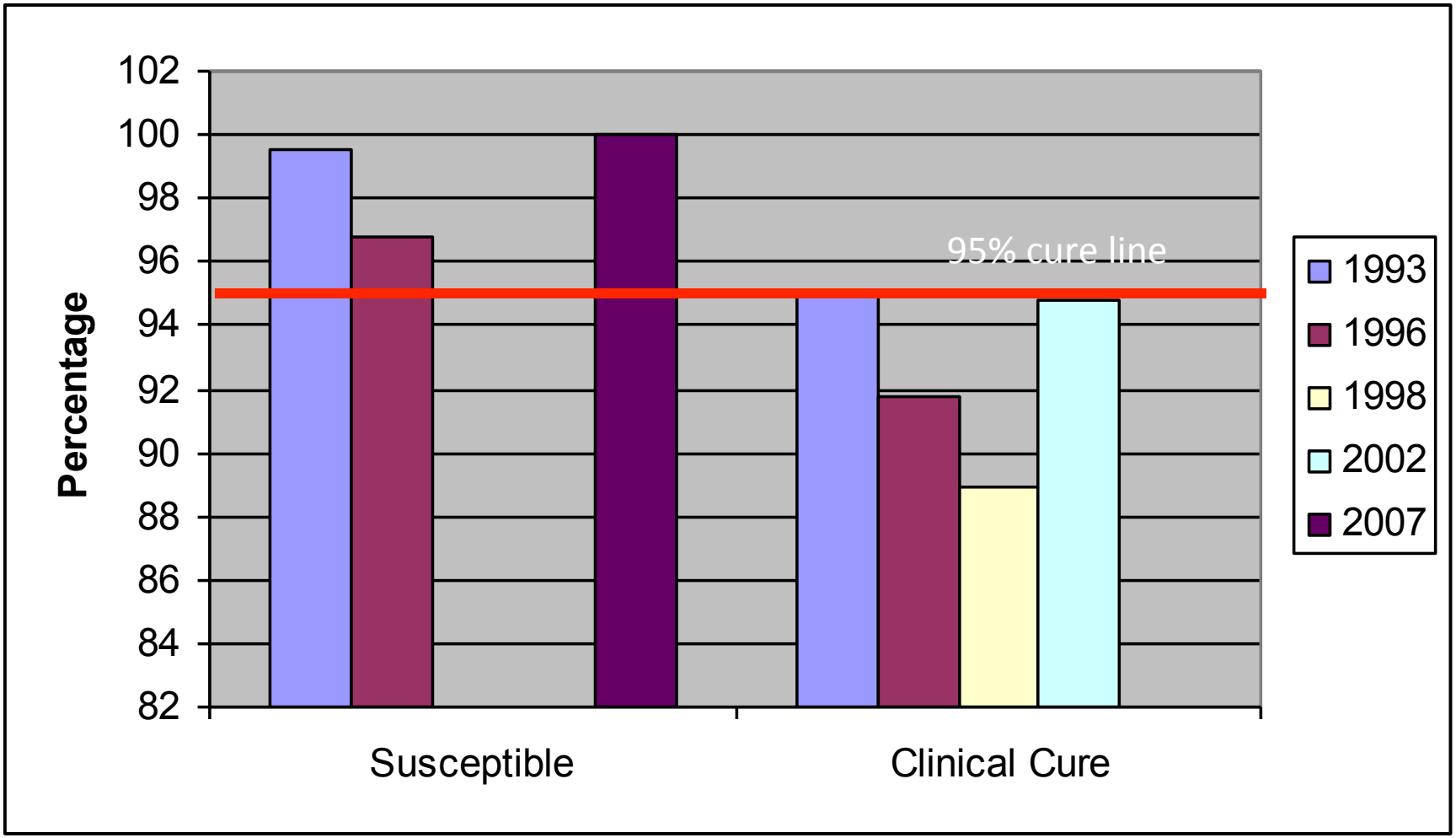
Gentamicin use in Malawi (1993-2007)



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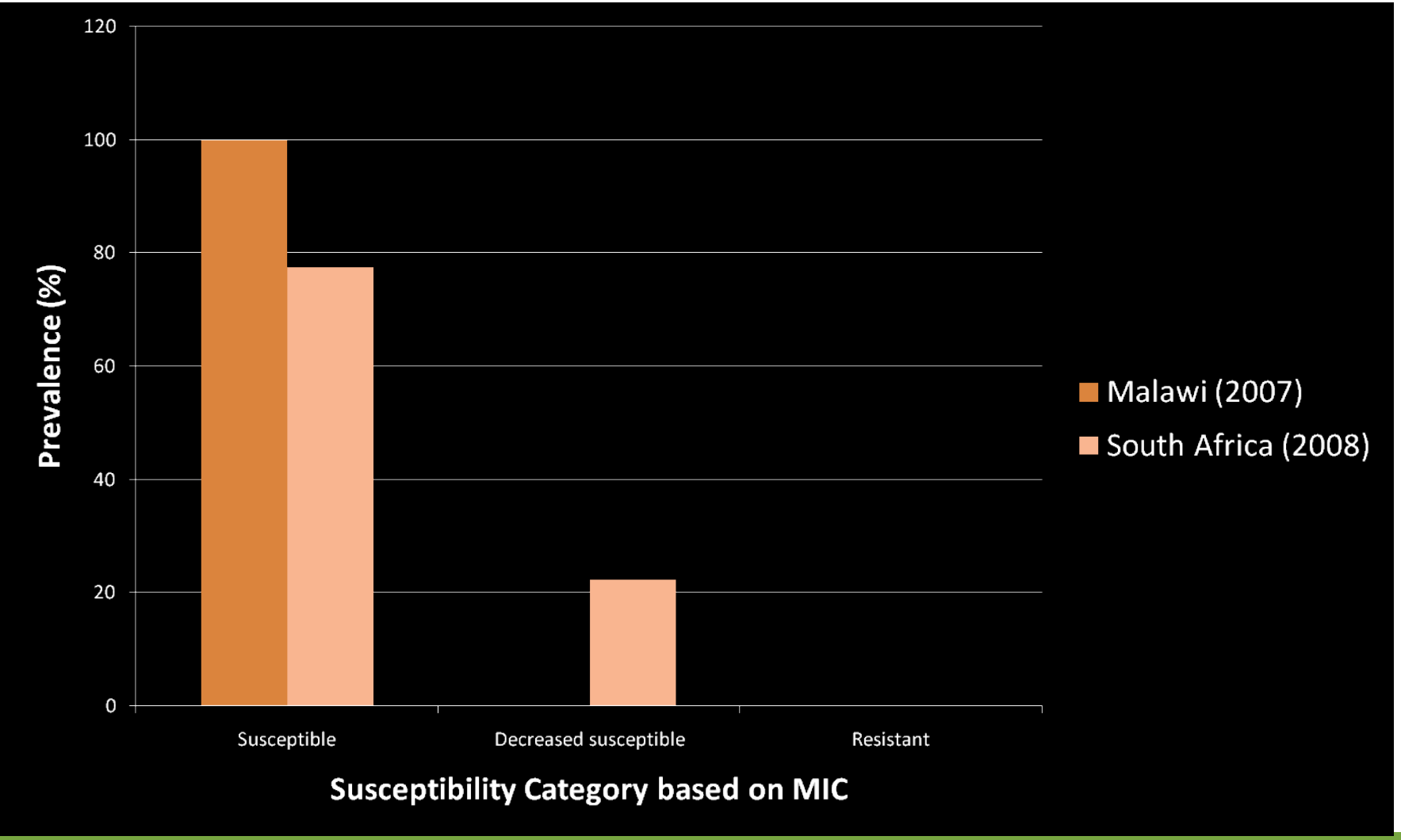
Gentamicin (2001-2011)



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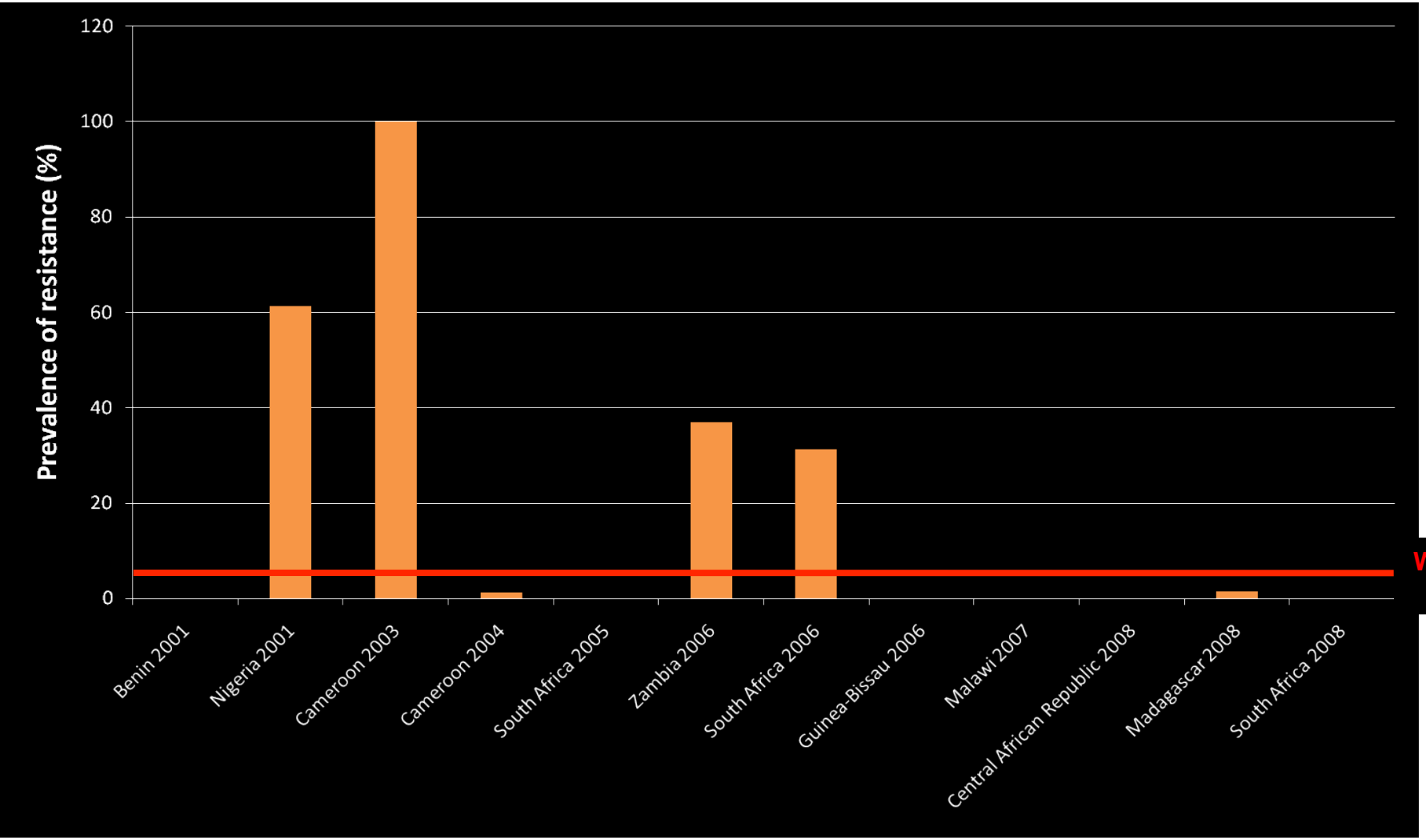
Spectinomycin (2001-2011)



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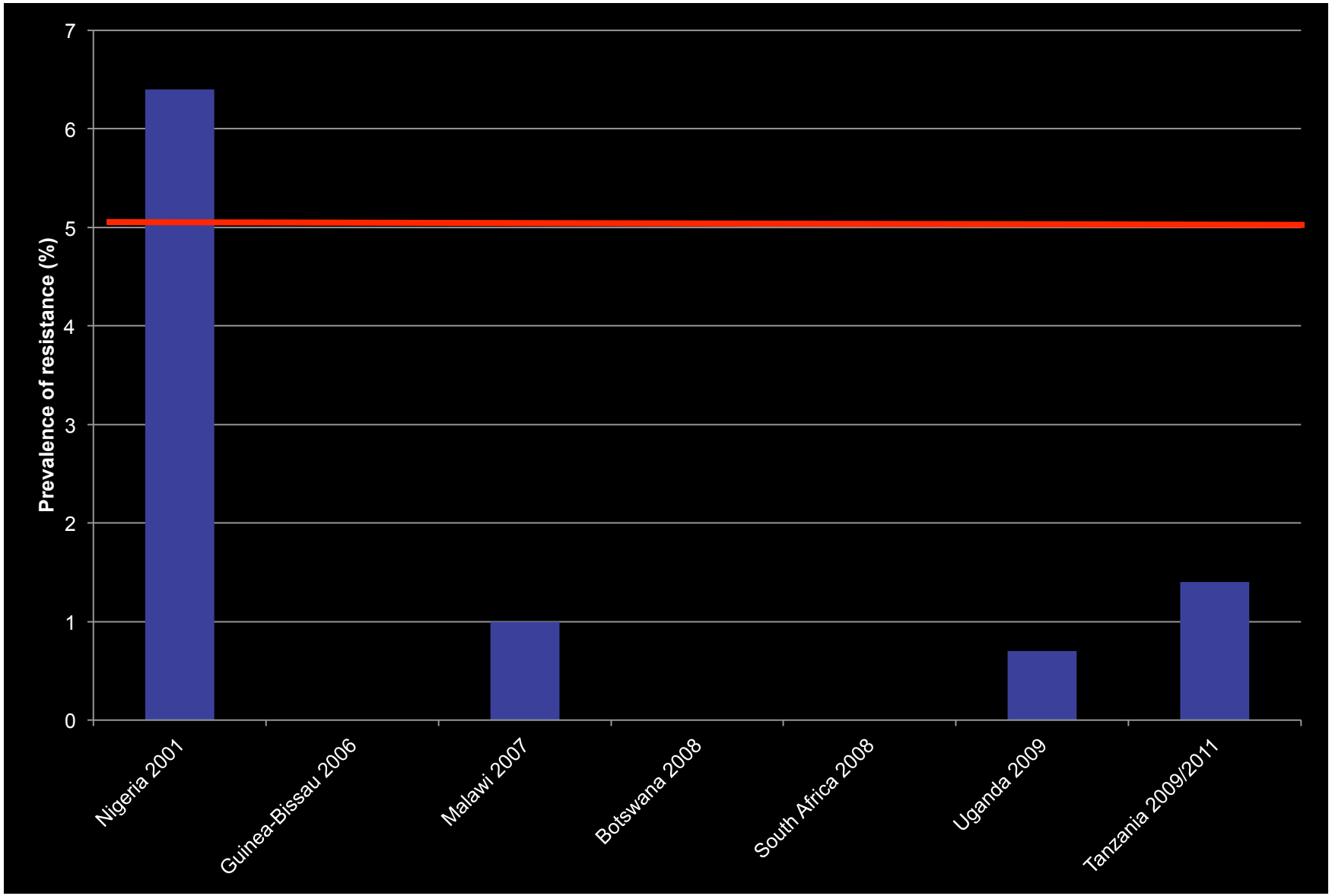
Azithromycin (2001-2011)



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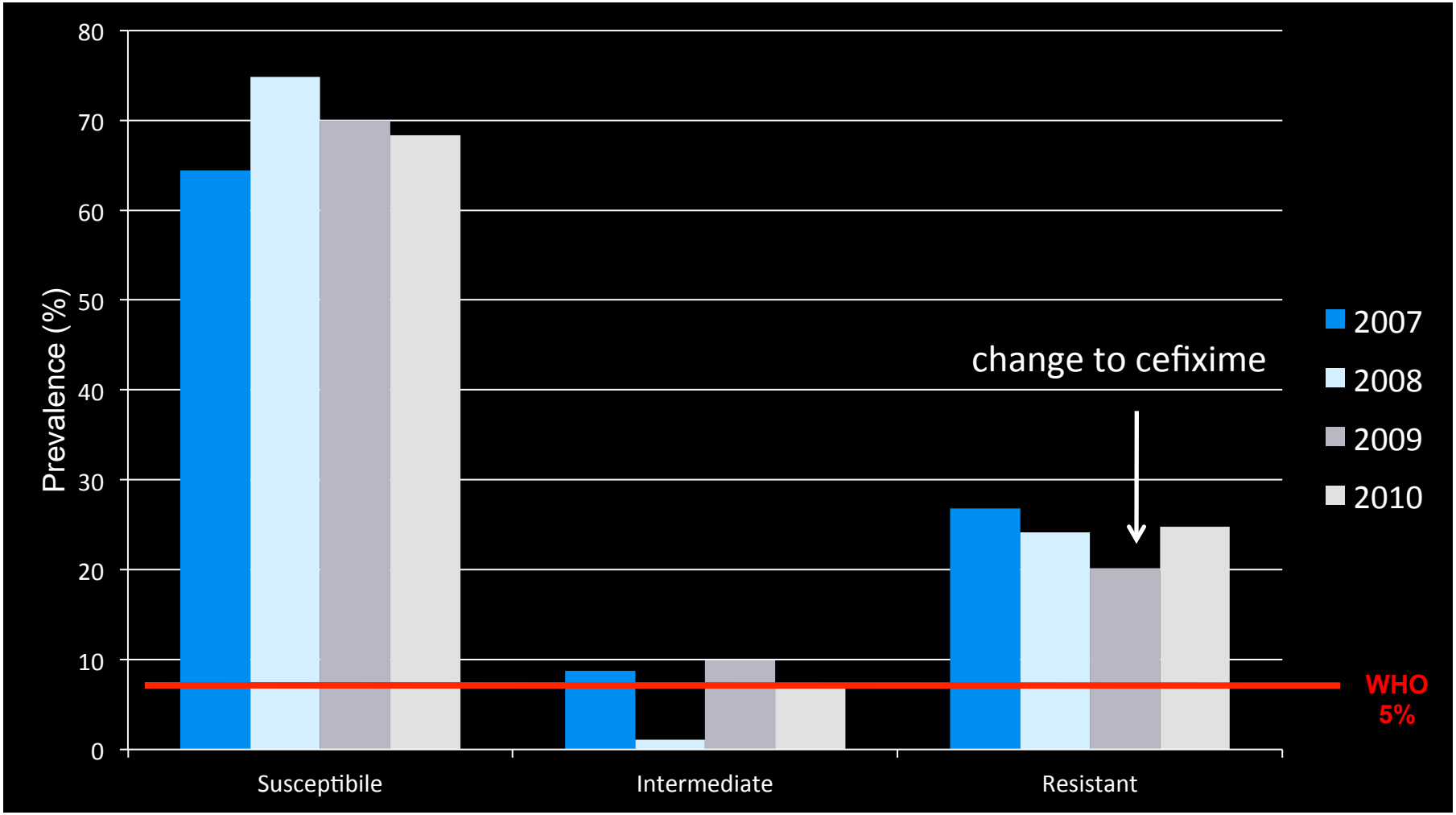
Ciprofloxacin Resistance in South Africa (2007-2010)



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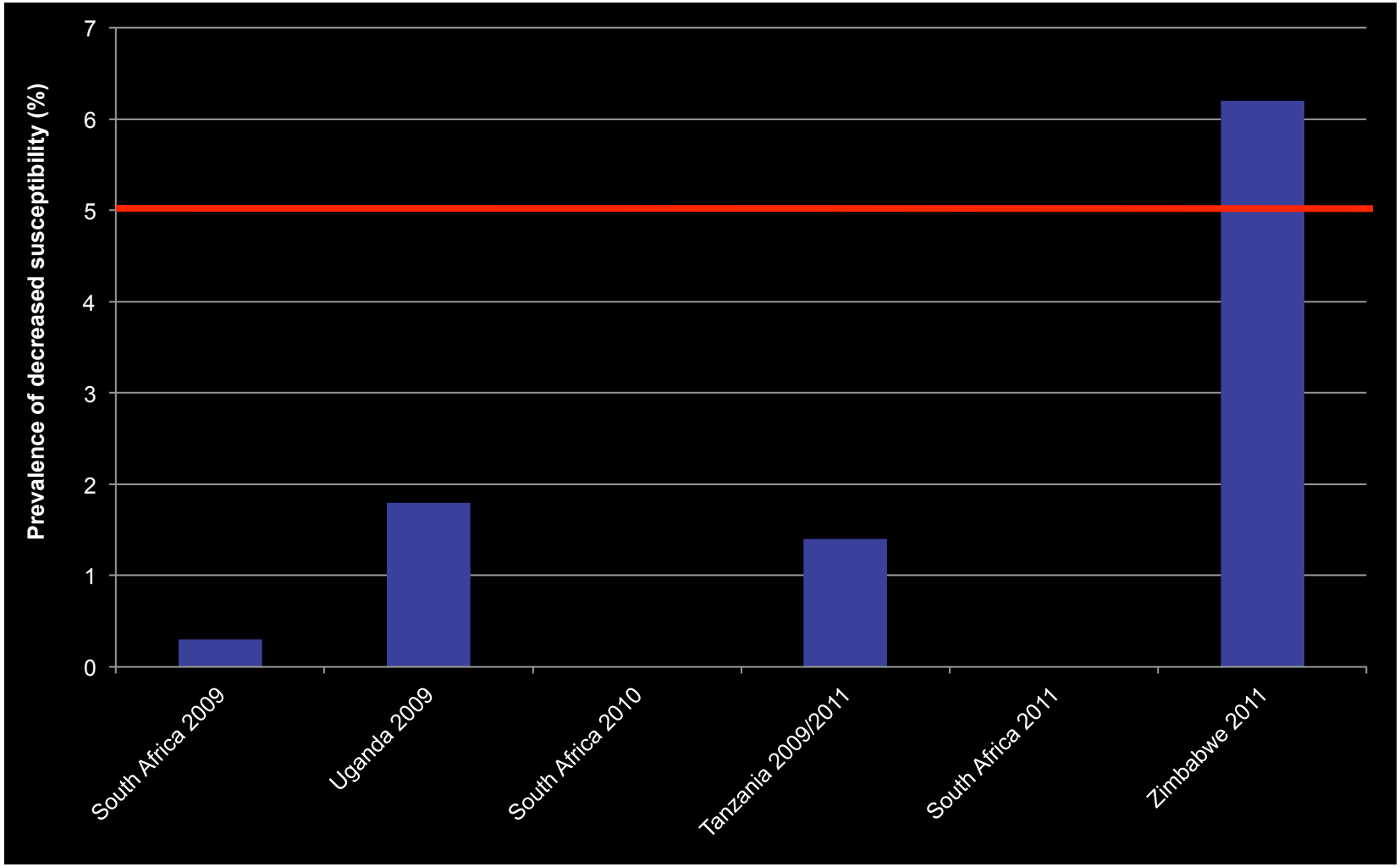
Decreased susceptibility to Cefixime (2009-2011)



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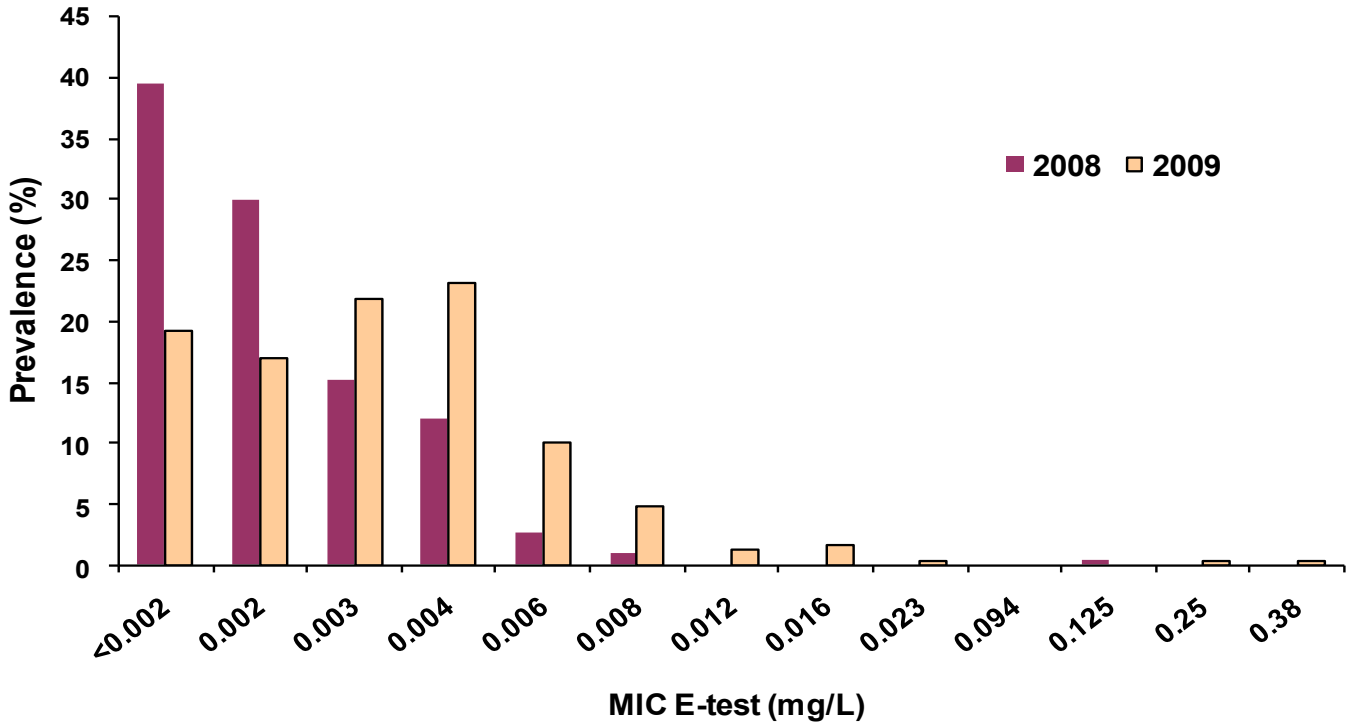
Ceftriaxone MIC Drift

	Year of survey			
	2008		2009	
Antibiotic	Ciprofloxacin	Ceftriaxone	Ciprofloxacin	Ceftriaxone
No. of gonococcal isolates screened	286	286	304	304
No. (%) of susceptible isolates	214 (75%)	286 (100%)	213 (70%)	303 (99.7%)
No. (%) of reduced susceptible isolates	3 (1%)	0 (0%)	21 (7%)	1 (0.3%)
No. (%) of resistant isolates	69 (24%)	0 (0%)	70 (23%)	0 (0%)



Ceftriaxone MIC drift among isolates from 2008 compared to 2009

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Antimicrobial susceptibility (E test)		NAMIBIA 2007				ZIMBABWE 2011	
		Windhoek N = 66		Oshakati N = 52		Harare N = 64	
Ciprofloxacin	Susceptible	59	89.4%	27	51.9%	55	85.9%
	Intermediate	4	6.1%	0	0.0%	4	6.3%
	Resistant	3	4.5%	25	48.1%	5	7.8%
Kanamycin	Susceptible	N/A	N/A	N/A	N/A	62	96.9%
	Intermediate	N/A	N/A	N/A	N/A	0	0%
	Resistant	N/A	N/A	N/A	N/A	2	3.1%
Ceftriaxone	Susceptible	64	97.0%	51	98.1	62	96.9%
	Decreased susceptible	2*	3.0%	1**	1.9%	2*	3.1%
Cefixime	Susceptible	N/A	N/A	N/A	N/A	60	93.8%
	Decreased susceptible	N/A	N/A	N/A	N/A	4*	6.2%

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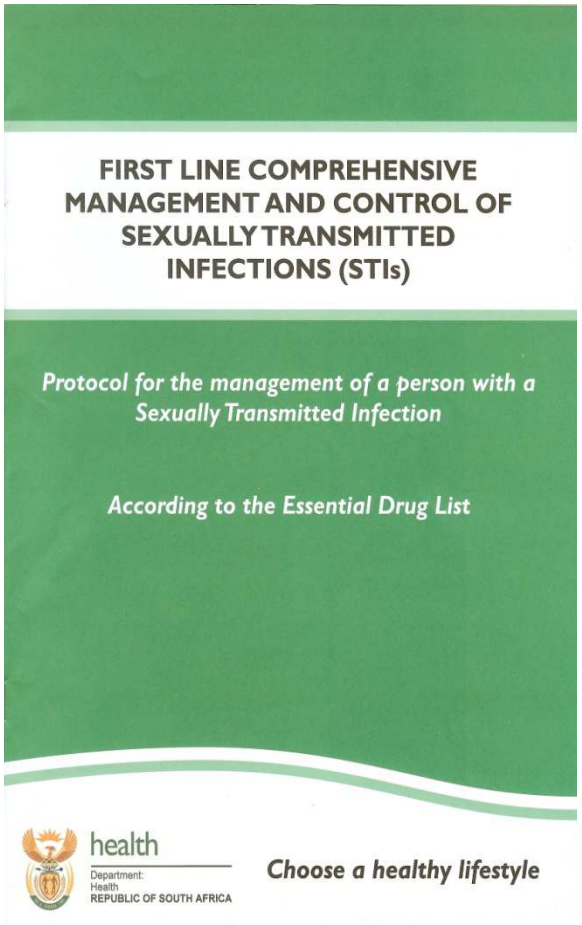
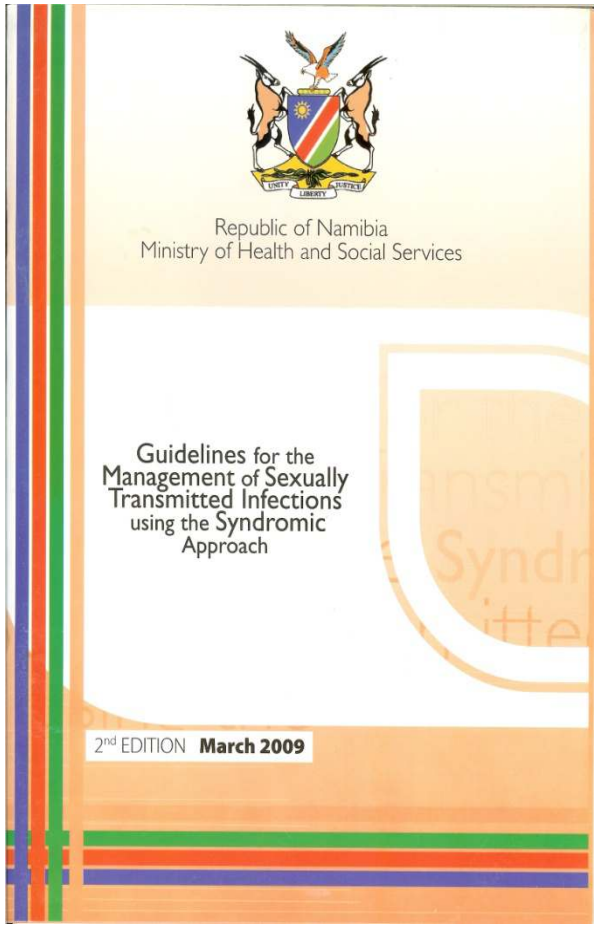
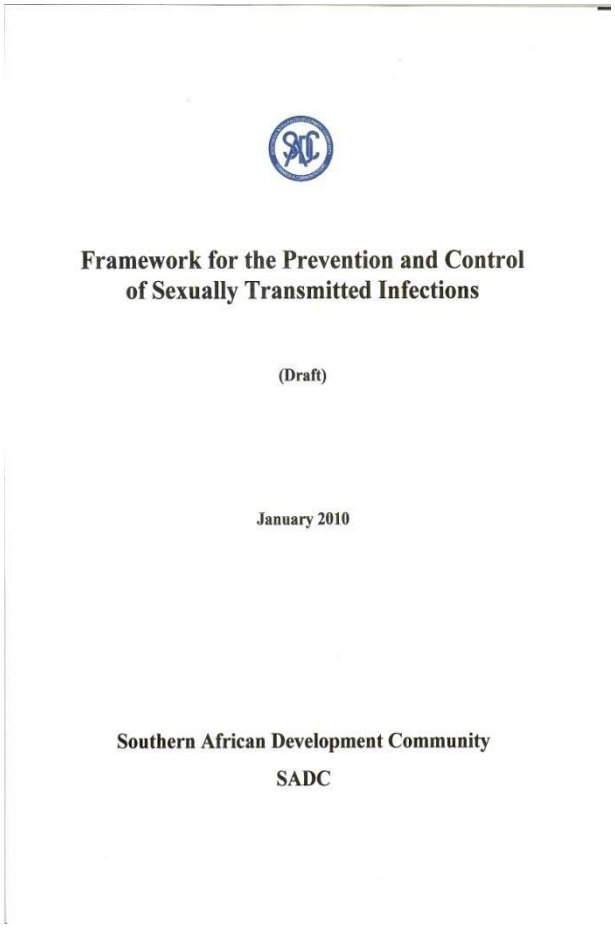
New Surveillance-Driven Guidelines



South Africa (2008)



Namibia (2009)



SADC Region (2010)

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Afro-GASP Encountered Challenges - I

- **Specimen collection** – loss of skill by nurses trained in syndromic management, need for ethical and other committee approval, costs for these approvals, lack of appreciation by national health ministries that these surveys should be a routine part of syndromic management
- **Media preparation** – problems with obtaining reagents, media QC and contamination
- **AMR testing** – deskilled laboratory staff following implementation of syndromic management, lack of skills retention in public health laboratories, lack of training opportunities
- **Contamination** - after primary *N. gonorrhoeae* isolation/identification and/or during the AMR testing process, lack of attention to repeat Gram staining, lack of appreciation of the need to repeat spurious results
- **Stocking** – lack of access to -70^{o}C freezers, inadequate volumes of bacteria, use of old bacterial cultures, failure to do this in duplicate, use of only one freezer to store specimens, electrical power cuts and lack of generators

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Afro-GASP Encountered Challenges - II

- **Transport of Specimens** – high rate of loss of gonococci in transit, unable to confirm potentially important findings
- **Quality Control** – until recently, lack of a regional approach in terms of quality control (new WHO control strains, setting up of EQA programme)
- **Reference Laboratory Support** - lack of *N. gonorrhoeae*-competent laboratories in the region at present, need for training and skills development, laboratories still being asked to send their stains out of Africa for EQA exercises and specialised molecular resistance testing
- **Funding** - lack of funding remains a key challenge, competition with other non-STI HIV prevention activities, loss of interest in STIs by donor funding agencies post-ACV trials
- **In-country Commitment** - lack of national prioritisation to support GASP activities, slow action in terms of changing national STI treatment guidelines
- **Leadership** – Limited leadership in the Afro Region to support the GASP programme and to engage in dialogue with National Health Ministers

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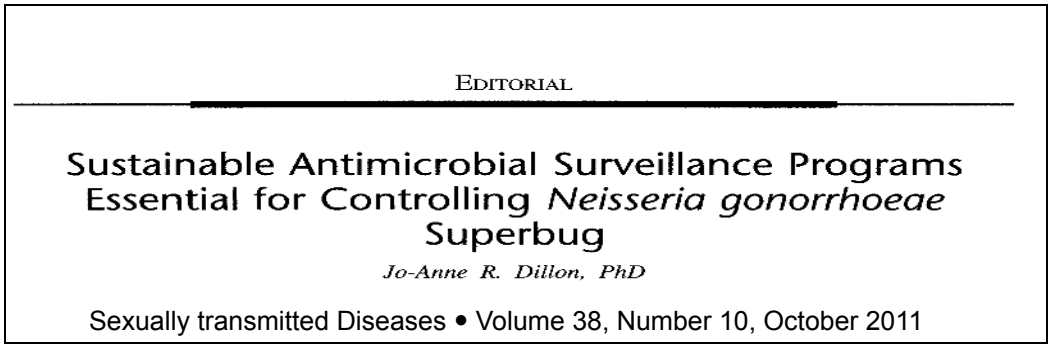
Conclusions - I

- Many countries have little or no recent data and gonococcal antimicrobial resistance - there is also a paucity of recent data in the literature
- Cephalosporins, azithromycin, spectinomycin and gentamicin remain reliable agents based on most recent survey-derived data
- Quinolone resistance has increased markedly in Southern and East Africa and there are also recent data to suggest resistance is occurring in West Africa
- Historically observed rapid evolution of macrolide and spectinomycin resistance suggests that these agents should be kept as 2nd/3rd line options for specific treatment of gonococcal infections in Africa
- Availability of spectinomycin is in limited supply/absent in most of Africa
- Concern exists over the development within, or importation into, Africa of gonococci with decreased susceptibility to cephalosporins in the near future
- As part of an integrated gonorrhoea control strategy, it is important to perform/establish/ support regular quality-controlled surveillance among cultured *Neisseria gonorrhoeae* isolates to monitor antimicrobial resistance

Conclusions - II

- For GASP to be sustainable there should be national buy-in and prioritisation of the surveillance activities
- Good feedback through annual reporting and meetings
- Maintenance of motivated staff in the programme
- Engage donors and governments for sustainable funding



EDITORIAL

Sustainable Antimicrobial Surveillance Programs Essential for Controlling *Neisseria gonorrhoeae* Superbug

Jo-Anne R. Dillon, PhD

Sexually transmitted Diseases • Volume 38, Number 10, October 2011

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Thank you!