Out of Africa

Professor Adriano Duse, Johannesburg, South Africa
A Webber Training Teleclass

"OUT OF AFRICA"

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"Ex Africa semper aliquid nova"

Pliny the Elder (23-79 AD)

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"Ex Africa Semper Aliquid Nova"

- **Index case:**
  - **46y old anaesthetic assistant, private clinic in Johannesburg**
  - **2/11/96: ill with fever**
  - **5/11/96: severe headache**
  - **6/11 to 13/11: admitted, leukopaenia, thrombocytopaenia, deranged LFTs, deteriorating renal function - dialysis (13/11)**
  - **14/11: presumptive laboratory diagnosis of Ebola virus; definitively confirmed 15/11**
  - **16/11 to 22/11: T/F to JH ICU, critical condition, haemorrhaging, secondary nosocomial bacterial and fungal infections, large intracranial haemorrhage (22/11)**
  - **24/11/96: demised**

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Objectives Of Presentation:

- **Background information to South African hospitals**
- **Organisms that are "Out of Africa"**
- **MDR within the South African context with nosocomial / transnational / transcontinental spread**
- **Coping with limited resources – redefining the gold standard**
- **The good, the bad, and the ugly**
- **The way ahead for South Africa: a land of contrasts**
- **Conclusions**

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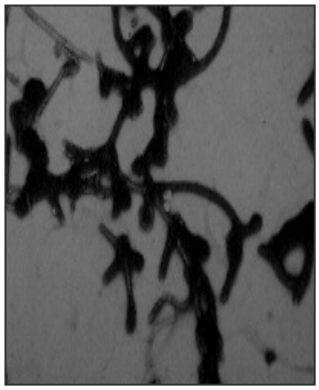



South African Public Health System, 2001 (source: M Hensher EU Consultant in Health Economics, DOH, SA)

- **Population: 45 170 000**
  - **Public Sector Dependent: 37 942 800**

Hospital type	#beds	Beds/1000 population
Tertiary	23 273	0.61
Regional	19 244	0.51
District	36 622	0.97
CH centres	456	0.01
Specialised hospitals	20 939	0.55
Total	100 535	2.65

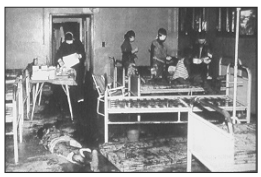
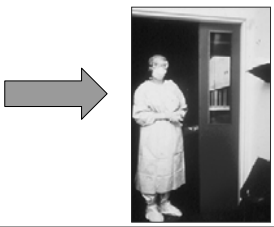
"Ex Africa Semper Aliquid Nova"

- **Primary case/source:**
  - **Very ill 40 y old doctor transported by air from Libreville, Gabon; admitted to private clinic on 27/10/1996**
  - **29/10/1996: Index case (anaesthetic assistant) exposed to large amount of his blood during CVC insertion and subsequent cleaning-up process**
  - **Unusual presentation - misdiagnosed as suffering from a polymyositis-overlap syndrome - given hydrocortisone - prompt improvement - discharged 11/11/1996**
  - **16/11/1996 traced to a convalescence home. Ebola titres >1/512 confirmed he was primary case**
- **Nosocomial implications: critical retrospective review of South African VHF infection control practices**

South African Public Health System, 2001 (source: M Hensher EU Consultant in Health Economics, DOH, SA)

Deaths & discharges= Admissions	# Admissions	Admission rate/1000 population
Tertiary	766 928	20.2
Regional	878 262	23.1
District	1 429 667	37.7
CH centres	22 723	0.6
Specialised hospitals	79 061	2.1
Total	3 176 640	83.7



1. South African Hospitals:

- **Groote Schuur Hospital (as at May, 2002):**
  - **OPD: 507 037**
  - **Acute beds: 1302**
  - **% Bed occupancy: 74.6%**
  - **Medical Staff: 644**
  - **Nursing Staff: 1450**
  - **Total Annual Expenditure: ~ R 662 m**
  - **In-patients: 40 640 / year**
- **Johannesburg Hospital (2002/2003 financial year)**
  - **In-patients: 68 315**
  - **Beds in use (mostly acute): 1281**
  - **% Bed occupancy: 92.7% (but in MAW = 317%; LW =149%; TICU = 126%)**
  - **Av hosp stay: 5.2 d**
  - **NI rate: 1.8 %**
  - **Nurse- to-patient ratio: 0.83**
    - **In ICUs = 1-1**
    - **In High Care = 1- 4**
    - **ICN = 4 for 1281 beds; also heavily involved in OHS**

South African Hospitals:

- **CH Bara Hospital (2001/2)**
  - **173 acres; GBR 1997!**
  - **Admissions: ~ 178 000 / year**
  - **OPD: 497 273**
  - **Total # beds: 3400 (currently 2600)**
  - **Bed occupancy: often up to 350 %**
  - **Total annual expenditure: R 767m**
- **Rob Ferreira Hospital (2001/2)**
  - **Admissions: 14619 / year**
  - **Total # beds: 271**
  - **Nurse-to-patient ratio: 1:12**
  - **ICU (4 beds): 1:1-2**

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Organisms First Discovered In Africa Of Nosocomial Importance: Viruses

- Lassa fever
- Marburg, Ebola viruses
- HIV 1 & 2
- Monkeypox virus

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2. Organisms that are "Out of Africa"

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Organisms First Discovered In Africa Of Nosocomial Importance: Viruses

Agent	Properties and Nosocomial Transmission	Prevention / Treatment
Lassa virus	**Easily inactivated for safe lab tests (heat 56 C/30 mins; B-propionilactone; formalin; UV radiation** **Disinfection 0.5% phenolic; 10% hypochlorite; peracetic acid**	**Infection control (isolation; PPE: gloves, gowns, masks; avoid re-use of inadequately sterilised equipment)** **Ribavirin** **(Vaccine)**

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Examples Of Nosocomial Pathogens First Discovered In Africa, And/Or Spread On The African Continent, And/Or Exported "Out Of Africa"

- **Viruses:**
  - **Lassa fever**
  - **Marburg, Ebola viruses**
  - **Measles virus**
  - **HIV 1 & 2**
  - ***(WNF, RVF, Chikungunya, Wesselsbron* viruses)**
  - **Monkeypox**
- **Bacteria:**
  - **South African pneumococcal strains**
  - ***Salmonella* Johannesburg**
  - ***Salmonella* Isangi**
  - ***Shigella dysenteriae* type 1**
  - **African tick-bite fever [Rickettsiae]**
  - ***(M tuberculosis)***
- **Parasites:**
  - **African trypanosomiasis**
  - **(*Plasmodium* spp)**

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Organisms First Discovered In Africa Of Nosocomial Importance: Viruses

Agent	Properties and Nosocomial Transmission	Prevention / Treatment
MARBURG – 1967 (Germany & Yugoslavia exposed to imported african Green Monkeys (Cercopithecus aethiops captured in Uganda); **South Africa 1975, Zimbabwe (1975, 1982)** **Kenya (1980, 1987)**	**Shown to survive in semen of a convalescent patient for up to 83 d after disease onset; also isolated from anterior of eye of a convalescent patient with uveitis 80 days after disease onset**	**Infection control (isolation; PPE: gloves, gowns, masks; avoid re-use of inadequately sterilized equipment; sharps & waste disposal; handling of the dead)**

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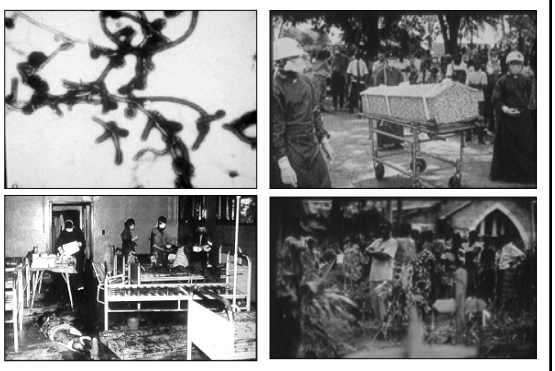
Out of Africa: Viruses

Agent EBOLA VIRUS	Properties And Nosocomial Transmission	Prevention / Treatment
(Filovirus) - EBO DRC (Zaire) Yambuku, DRC (1976) – 318 cases Kikwit, DRC (1995) – 316 cases; 25% of these were HCWs Gabon (1994-5, 1996) Gabon and DRC (2001-2) EBO Sudan (1976, 1979, Uganda 2000-1) EBO Reston (Virginia) (Philippines – 1989, 1990, 1992, Italy 1996) EBO Cote d'Ivoire (1994)	EBO v isolated from semen of convalescent 61 days after disease onset Finding of abundant viral antigens & particles in the skin of EHF: ? possible aetiologic role for contact transmission Contact with blood and high risk body fluids predominant mode of spread; ? touch, droplet, airborne particle, fomite Percutaneous exposure through unsterilised needles; laboratory accidents; person-to-person by direct physical contact or contact with blood, stool, vomitus **Viral survival in used syringes in excess of 7 d at tropical ambient temperatures (35 C) !**	Infection control (isolation; PPE: gloves, gowns, masks; avoid re-use of inadequately sterilized equipment; sharps & waste disposal; **handling of the dead**)

VHF Isolation Precautions

- Isolation of patient
- PPE
- Reinforcement of standard and contact precautions
- Safe disinfection of spills, equipment & supplies (enhanced with use of hypochlorite solutions)
- Disposal of sharps and contaminated waste by incineration/burial
- **Safe handling and burial of corpses**
- Education to families & communities re: prevention of VHF and care of patients



Out of Africa: Viruses

Agent HIV 1 & 2	Properties And Transmission	Prevention / Treatment
(Retrovirus) **Origin most probably African:** **HIV1- most likely SIV (Pan troglodytes troglodytes)** **HIV 2-almost certainly arose from SIV (sooty mangabey monkey)**	**Viability in syringes for up to 4 weeks!** *J Acq Immune Def Syndromes & Human Retrovirology 1999;20: 73-80* **Viable HIV-1rarely seen >21.25 h after death** **Viability of HIV in post mortem samples up to 11 days** *Lancet 1991;338:63* **(6-14 in other studies)** **Neck needle foreign bodies** *Archives of Pathology and Laboratory Medicine 2004;125(6):790-792* **Sharps & splash injuries** **Developing countries: re-use of single-use items; transfusions; plasmapheresis equipment; etc.**	**? Delay autopsy for 24h to markedly decrease infectivity** **[?Pre-autopsy X-rays … brr]** **Adequate sharps & waste disposal esp. single-use items** **PPE (gloves, visors, etc.)** **PEP**

Out of Africa: Viruses

Agent CCHF VIRUS	Properties And Nosocomial Transmission	Prevention / Treatment
(Bunyavirus) **1930s: Soviet Union** **1968: Stanleyville Belgian Congo - (virus isolated)** **Widespread: E Europe, Asia, Middle east, China, all of Africa** **South Africa: First case diagnosed in 1981. Endemic. Cases seen annually! Tygerburg, South Africa (1996) – 16 ostrich abattoir workers**	**Virus labile: does not survive in dried blood, at high temperatures (cooking meat), pH<6** **Although survival <3d, 1 PM CCHF v survival of 9d.** **Transmission primarily zoonotic (tick bites) or animal blood exposures.** **Nosoc. transmission: surgeons, nursing staff, other HCWs: direct contact with blood, sharps injury, failure to observe barrier techniques. Airborne in hospital setting not a risk – during autopsy, yes !**	**Infection control** **isolation; PPE: gloves, gowns, masks; avoid re-use of inadequately sterilized equipment; sharps & waste disposal** **PEP: Ribavirin**

Organisms First Discovered Out of Africa: Viruses

Agent	Properties and Nosocomial Transmission	Prevention / Treatment
Monkeypox virus: **Occurs in rain forests of West & Central Africa** **-1970: Human infection first identified in DRC** **-1996-7: outbreak of human M/pox (88 cases)** **-2003: multistate outbreak in Illinois, Indiana, Wisconsisn (53 cases)** **MMWR 2003;52(23):537-40**	**Orthopox virus** **Transmission primarily zoonotic** **Person-to-person transmission relatively inefficient, but can't be excluded**	**Infection control** **(standard, contact, airborne precautions – till lesions crusted)** **Notification** **Post-exposure monitoring** **Veterinary measures** **www.cdc.gov/ncidod/monkeypox/infectioncontrol.htm**

3. MDR within the South African context with nosocomial / transnational / transcontinental spread

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MDR Shigellosis: the South African Experience

- Spread of MDR *Shigella dysenteriae* type 1 infection southwards to South Africa (in 1990s) from other parts of Africa (1970s-1980s) - epidemics in Mpumalanga and KZN
- Nosocomial transmission of MDR *Shigella dysenteriae* type 1 in chronic care psychiatric institution in Durban, South Africa
  - 4/10 patients died
  - IC measures halted outbreak

Pillay DG, et al. JHI 1997;37:199-205

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Organisms First Discovered In Africa Of Nosocomial Importance: Bacteria

- ***Salmonella* Isangi**
  - **First described in Stanleyville "Belgian Congo" – 1947**
  - **1999-2001: outbreak of ESBL -producing S Isangi in paediatric wards at CHB**
  - **March – Dec 2002:CHB Hospital : 60 cases of ESBL-producing S Isangi; 2 HCW colonised, no treatment**
  - **May 2002: 18 children at Lambano Baby Sanctuary, 1 death – children admitted either from CHB or from Natalspruit Hospital; 3 Caretakers colonised, eradication attempted on all 3**
  - **Interventions: IC procedure review and implementation, HCW education, ciprofloxacin administration**

Wadula et al: Poster, Joint Congress of HIV Clinicians, ID, IC, Travel Medicine, STD Societies and Veterinary and Public Health, 2-6 December 2001
Govender et al: Poster, 23rd ICC, Durban, South Africa, 7-10 June 2003

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Organisms First Discovered In Africa Of Nosocomial Importance: Bacteria

- **Salmonella Johannesburg**
  - **First isolated in Johannesburg, South Africa – identified by Kauffmann & Henning (1952)**
  - **SAIMR Annual Report 1966: alarming increase in incidence of S Johannesburg in Black patients from various hospitals**
  - **Rare serotype; tendency to produce chronic infection; Strain R to commonly used antibiotics (amp, kana, tet, chlor); apparently higher infectivity**
  - **? Introduced in Honk Kong via imported foods; S Johannesburg isolated from a dog imported from SA under quarantine in 1974 in HK**
  - **First detected in HK in 1971 (4 cases), 1972 (783), 1973 (1433), and 1974 (1411)**
  - **Caused hospital outbreak in Hong Kong in 1974 – in a paediatric general hospital (overcrowding, heavy environmental contamination, no apparent faecal carriage in HCWs): 115 cases (1 Aug - 30 Sept 1974) – 24 (20.9%) primary admission for G/E with S Johannesburg; 22 of remaining initially non-infected children acquired it nosocomially (24.2% cross-infection rate) *(J Hyg., Camb. (1977;78:113-119)***
  - **S Johannesburg was among the 20 most common salmonella serovars among Canadian registered commercial egg producing flocks (Epidemiol Infect 1991;106:259-270)**

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Anti-microbial Resistance Within The South African Context: *S pneumoniae*

- Successful global spread of Spanish serotype 23F pneumococcal clone (Spain ^{23F}-1) including to South Africa
- Two pneumococcal clones of serogroup 19A identified in South Africa (PIRP South Africa^{19A}-7, and MDR South Africa^{19A}-13)
- Unique PR serotype 6B clone has emerged locally in South Africa (South Africa^{6b}-8)

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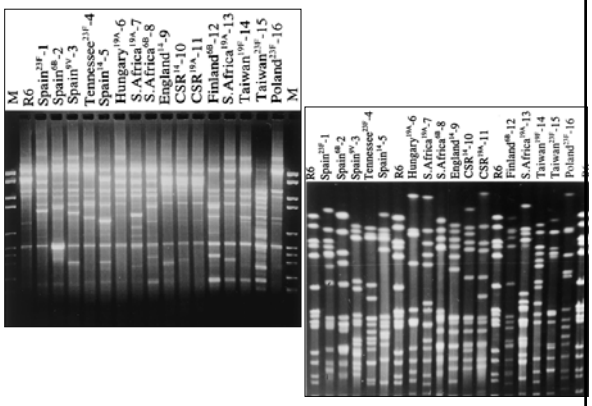

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Nosocomial Acquisition Of Pneumococci In Childern

Carriage status	Total # of carriers	Distribution of pneumococci among carriers (%)		
		Pen S	PIRP	P(H-L)R
On admission	53	29 (55)	17 (32)	7 (13)
Persistent	28	9 (32)	8 (29)	11 (39)
Acquired	17	3 (18)	13 (29)	20 (44)

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Pneumococcal Disease: The South African Experience

- **Examples of dissemination through migration:**

  Klugman et al. Cluster of an erythromycin-resistant variant of the Spanish multiply resistant 23F clone of S pneunomiae in South Africa. Eur J Clin Microbiol Infect Dis 1994;13(2):171-4

  McGee L, et al. Spread of the Spanish multi-resistant serotype 23F clone of S pneumoniae to Seoul, Korea. Microb Drug Resist 1997;(3):253-7
- **Pneumococcal Epidemiology Network (PMEN) - established 1997 under auspices of the International Union of Microbiological Societies**

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Pneumococcal Disease: The South African Experience

- ***Crewe-Brown et al . S pneumoniae: Blood Culture Isolates from Patients with and without HIV infection: Alterations in Penicillin Susceptibilities and in Serogroups or Serotypes. CID 1997;25:1165-72***

  – NI: 15/457 cases

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Pneumococcal Disease: The South African Experience

- Nosocomial transmission:

  Effect of Hospitalisation on Carriage of Pneumococci Among 100 South African Children

  Koornhof HJ, et al. CID 1992;15:84-94

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Tuberculosis: The South African Experience

- **Community to Hospital**
- **Nosocomial transmission**
  - **patient-to-patient**
  - **patient-to-HCW**
- **Hospital to Community:**
  - **Intrafamilial spread in 4 families of MDR-TB from patients treated at Sizwe Hospital**

  Woolf M, 1988, Presented at ID Congress, Sandton, South Africa

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Tuberculosis: The South African Experience

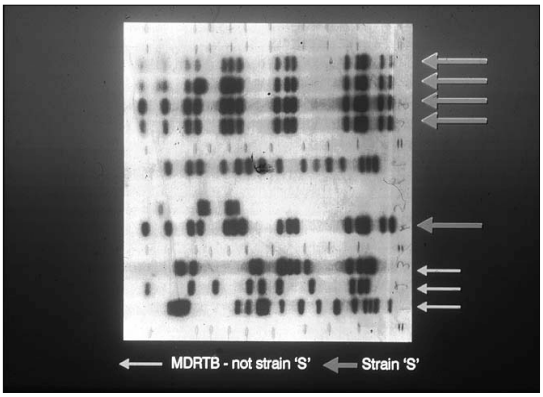
- **Nosocomial transmission:**
  - **patient-to-patient:**

Sacks L, et al. Comparison of Outbreak and Non-outbreak-related MDR-TB Among HIV-Infected Patients in a SA Hospital. CID 1999;29:96-101

  - **patient-to-HCW:**

Balt E, et al. Nosocomial transmission of TB to HCWs in Mpumalanga. SAMJ

Wilkinson D, et al. Nosocomial transmission of TB in Africa documented by RFLP. Transactions of Royal Society of tropical Medicine and Hygiene 1997;91:318

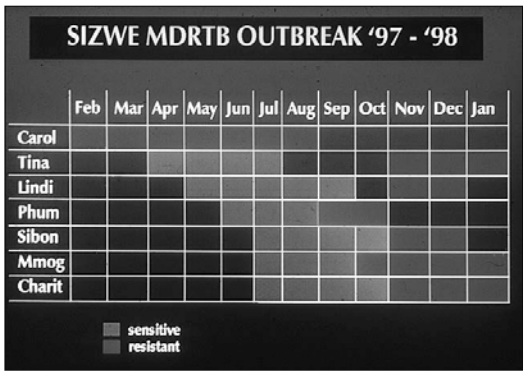


SIZWE HOSPITAL MDRTB OUTBREAK
STRAIN 'S'

- 7 HIV positive patients
- Initial hospital admission: sensitive MTB (6 pts)
- Nosocomial acquisition of MDRTB - 6 drug resistance
- Virulent in vitro
- Atypical clinical presentation
- Rapidly fatal

Control Of Nosocomial Tuberculosis:

- **Early identification and rapid diagnostic work-up**
- **Prompt initiation of airborne precautions; remember respiratory procedures & therapy! Differs according to available resources**
- **Prompt initiation of anti-tuberculous drugs**
- **Monitor adequacy of therapy**
- **Staff screening and OHS issues**
- **Notification**



Disease: African Tick-Bite Fever

- **Rickettsial infections: *R africae* & *R conorii***
- **Transmitted by ticks**
- **1992: Kelly et al isolated *R africae* from a patient in Zimbabwe *(Lancet 340:982-983)***
- **Exported from southern Africa [& Guadeloupe] to US 1997 *(Am J Trop Med Hyg 1999;60(5):865-7;* France 1998 *(CID 1998;27(2):316-23);* France 2001 *(NEJM 2001;344(20);1504-10)* Italy 1999 *(EJCMID 2002;21(2): 133-6)* Norway 2003 *(CID 2003;36(11):1411-7)***

... And many more ...

Disease: Malaria

- **Travellers to endemic areas**
- **Airport malaria**
- **Runway malaria**
- **Taxi rank malaria**
- **NI: gloves (2001); multi-dose heparin vials (2000); IV therapy-apparatus, transfusions (1997); syringes (1950); laboratory-acquired**

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Gram Positive South African bacterial foes:

Staphylococci:

MRSA: 25% of 2815 patient's blood cultures (1 Jan – 31 Dec 2000, NASF); 34% of 2171 patient's blood cultures (Jan Dec 2001, NASF) –
vs. SENTRY study *(AAC 2002 46(3):879-881):* 40.4% of 94 patient's blood cultures) in 1998-9

Mupirocin R: SENTRY *(Tunridge J, et al. Poster C2-1123, 42nd ICAAC, 2002, California) :* 64% of 130 blood culture isolates

hGISA: JH 2.9% of 175 isolates – first isolate described in *1998: SAMJ 2000; 90(11):1113:* CHB 1.7% of 175 isolates; HJ 50% of 10 isolates)

CoNS: JH Jan 1999 – July 2001:

1225 isolates collected; 6% clinically significant – of these, 91.9% from blood cultures and 8.1% from CVC tips: 79% *S epidermidis* & 10.8% *S haemolyticus:* rest were other CoNS

Teicoplanin R: 1.4% (MIC 32 mg/ml)
Teicoplanin IR:29.7% (MIC 16 mg/ml)

Vancomycin R: 0%
Vancomycin IR:4.1% (MIC 8-16mg/ml)

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Disease: Malaria

- Nosocomial infection in South Africa:
  - NSI-related *Plasmodium falciparum* malaria resulting in death of a phlebotomy nurse in late 1990s. Source patient: confirmed *P falciparum* malaria. Nurse: diagnosis initially missed; mismanaged when diagnosis eventually made; died ~3 weeks post NSI

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Gram Positive South African Bacterial Foes:

Streptococci:
- **MDR pneumococci**
- **MDR enterococci &VRE (J Clin Micro 2000 38(2):905-909: prevalence study in 4 hospitals: *E faecium* - 4 van A, 10 van B, 6 van C1) – clonal persistence and spread**
  JHI 2000;44(4): 294-300
  J Clin Micro 2000;38(2): 905-909
- ***E faecalis* van A: 2 isolates (1 in 2002, and 1 in 2003)**

MDR-TB:
- **new patients: 1.8%**
- **re-treated cases: 6.7%**

***C difficile:* grossly underestimated**

Opportunists:

***Bacillus* spp**

Paenicacillus popillae:
1998: RSA221 – clinical isolate with *van A* gene – MIC > 256 and 32 to vanco and teico respectively; but ORFs 1&2 from Tn 1546 absent from this isolate

B lentus:
1999: RSA208 – none of the glycopeptide R determinants of *E faecalis* detected

***Corynebacterium* spp**

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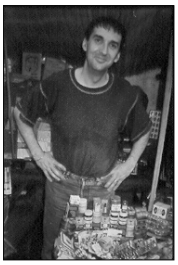
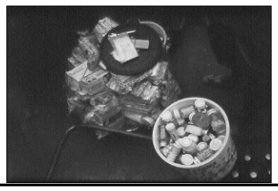
Antimicrobial Misuse:





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Spread Of Resistant Clones Of GRE

- **Clonal spread of *van*A and *van*B strains within different hospitals**
- **Interhospital spread**
- **Persistence of one *E.faecium van*A strain within hospitals**

Von Gottberg et al. Epidemiology of glycopeptide-resistant enterococci colonizing high-risk patients in hospitals in Johannesburg, Republic of South Africa. J Clin Microbiol 2000;38:905-909

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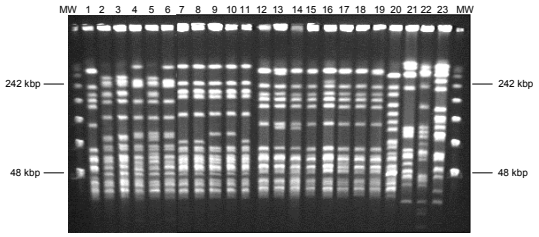
Spread Of Resistant Clones Of GRE

- Garden City 7-11
- Milpark 12-13,19
- JHB Gen 14
- Morningside 15
- Arwyp 16-17
- Mulbarton 18



Lane 1-6 *E. faecium* isolates from hospital S1, Lane 7-11 *E. faecium* isolates from hospital P1, Lane 12-13 *E. faecium* isolates from hospital P2, Lane 14-19 *E. faecium* VanA isolated from S1 in 1997 and four private hospitals in 1998, Lane 20 *E. faecium* VanA ATCC 51559, Lane 21-22 *E faecalis* Van A isolates from S1 and S2, Lane 23 *E faecalis* Van A ATCC51299

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Challenges of reducing AMR:

QUALITY HEALTH CARE; ECONOMICS (VESTED INTERESTS); NATIONAL, GLOBAL CONCERNS…

PREVENT TRANSMISSION — I C

RESTRICT/ OPTIMIZE USAGE — AMR

COMMUNITY
HOSPITAL
AGRICULT/ VETERINARY

SURVEILLANCE: LOCAL, NATIONAL, GLOBAL

COSTING; EFFICACY; ACCOUNTABILITY/RESPONSIBILITY; RESEARCH

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Gram Negative South African Bacterial Foes:

Enterobacteriaceae:

ESBL+ *E coli*: 3.7% of 1544 patient's blood cultures (1 Jan – 31 Dec 2000, NASF); 2.4% of 1578 patient's blood cultures (Jan Dec 2001, NASF) – vs. SENTRY study (Bell J, et al. Poster C2-314, 42nd ICAAC, 2002, California): 3.2% of 126 patient's blood cultures) in 1998-2001

ESBL+ *Klebsiella*: 15.2% of 1417 patient's blood cultures (1 Jan – 31 Dec 2000, NASF); 32.4% of 1345 patient's blood cultures (Jan Dec 2002, NASF) – vs. SENTRY study (Bell J, et al): 54% of 13 patient's blood cultures) in 2001

Paeds Infect Dis J 1999;18(11):963-7

Enterobacter cloacae

ESBL *Salmonella* Isangi, as discussed previously

Other Gram negatives:

Pseudomonas

***Acinetobacter:* Jan – March 2002, cluster of pan-R *Acinetobacter baumanii* detected. Phenotypically identical, but 2 genotypes on PFGE – 1 genotype on stethoscope and hands of HCW as well**

De Jong, et al. Submitted to JHI

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4. The Good, The Bad, And The Ugly, and

5. Coping With Limited Resources – Redefining The Gold Standard

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Approaches to Antimicrobial Resistance:

- **Shorter courses, higher doses?**
- **Cyclic usage**
- **Prudent usage**
- **Education: prescriber, consumer**
- **Novel antimicrobial agents**
- **Novel therapeutic strategies:**
  - **Immunomodulation**
  - **Novel vaccines**
  - **Probiotic therapy**
  - **Improved technology esp. medical devices**
- ***BACK TO THE BASICS: INFECTION CONTROL !!***

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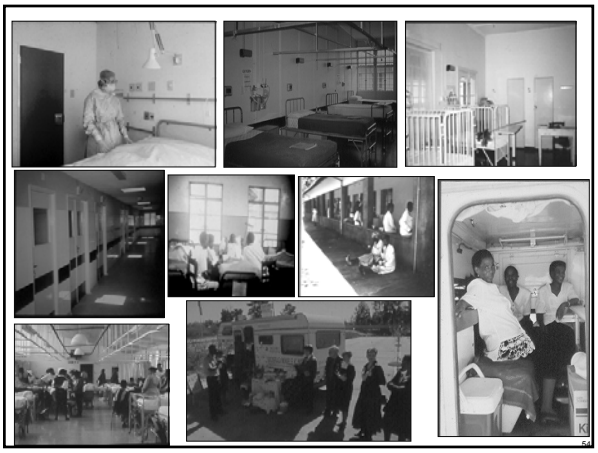

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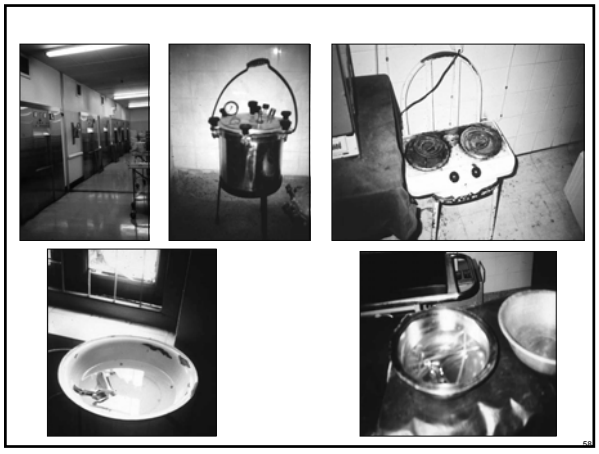
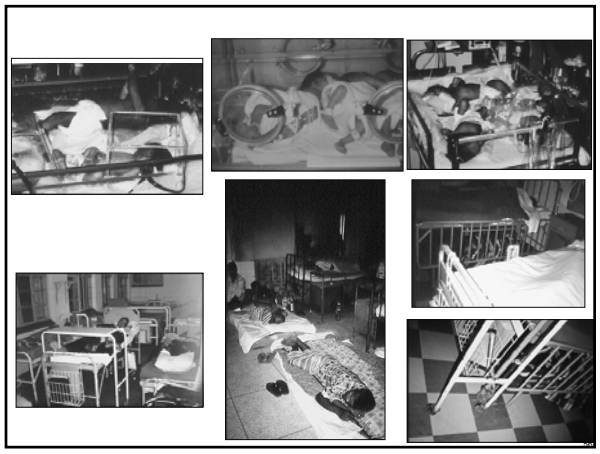
Out of Africa

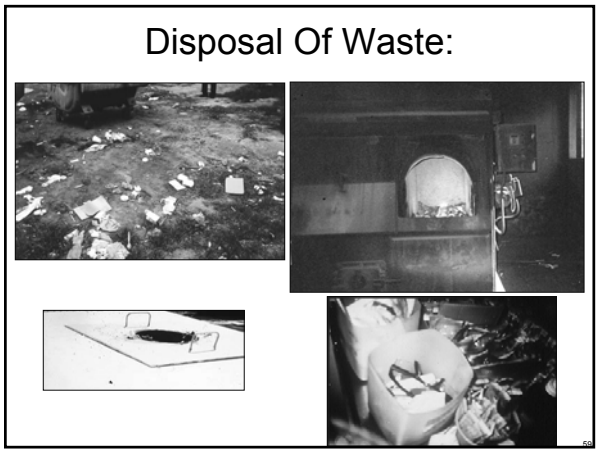
Professor Adriano Duse, Johannesburg, South Africa

A Webber Training Teleclass

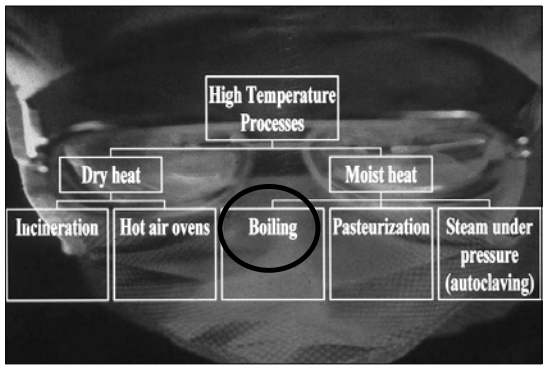


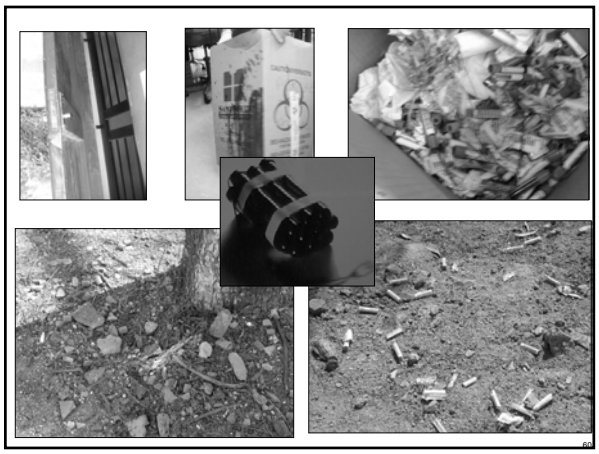


Disposal Of Waste:



Delivery of Sterile Supplies: Sterilization, Disinfection, and Waste Disposal:





Determining rates of NIs in South Africa:

- **Nosocomial infection prevalence study**
  - **Initial pilot study to involve 2 academic, 2 non-academic provincial, and 2 private hospitals**
  - **Once potential problems identified and resolved, proceed with a strategy for a National Nosocomial Infection Prevalence Survey**
- **Study will look at major nosocomial infection categories to include: urinary tract, lower respiratory tract, bloodstream, & surgical site infections. NNIS/CDC HAI criteria used**
- **Method: training -> manual completion of appropriate questionnaires using NNIS/CDC definitions by trained personnel -> submission of these to Division of HEIC (NHLS & Wits School of Pathology -> optical scanning of questionnaires -> capture of data into database (Formic) -> export of data into an appropriate statistical package e.g. Epi Info, SPSS -> analysis of data -> feedback; institutional confidentiality**

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Data collection form 1-General parameters:

- Patient demographics
- Medical risk factors
- Surgical risk factors & other invasive procedures
- Device-related risk factors
- Antibiotic and non-antibiotic therapy during admission

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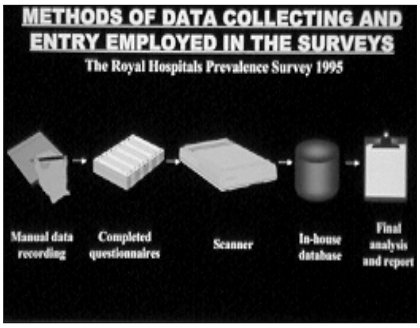
Surveillance:



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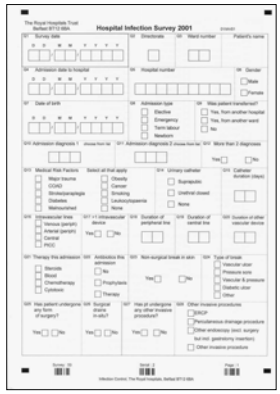

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Why automated data entry (ADE) using manual questionnaires & optical scanning?

- **System accessible to all HCFs – once questionnaires completed, sent to centralized data processing unit -> cost effective; rapid feedback**
- **Patient-based, not isolate-based**
- **ICN at cold interface; not in office / laboratory**
- **Improved speed & accuracy of data entry; substantial cost savings [Infect Control Hosp Epidemiol. 1997 Jul; 18(7):486-491]**
  - **22-fold productivity increase cf. manual data entry (MDE) with validation**
  - **Saving of $ 0.63 [~ R 4.12] per questionnaire in clerical time**
  - **After validation, error rate of < 0.2 errors / 1000 responses (ADE) vs. 12.4 errors / 1000 responses (MDE)**

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Data collection forms 2 & 3:

- **HAI–specific information**
- **Isolate information including AMR**

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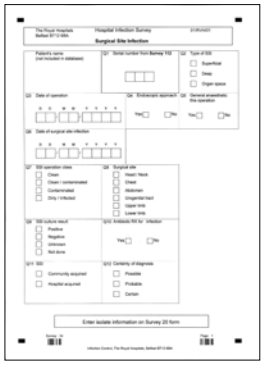
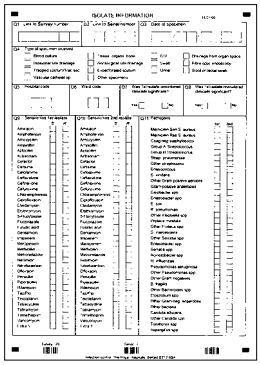
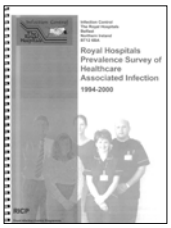


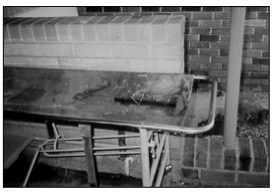


Where Water Is Scarce…

HISC Collaborators …

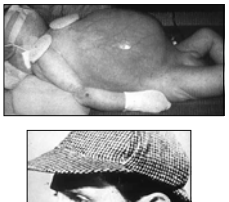


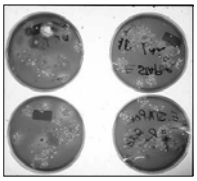
Forging enduring friendships …



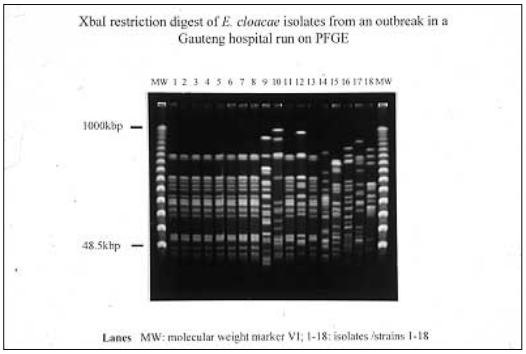
Important considerations:

- **Logistical hurdles … identification of data collectors (? mandate from DoH), training, validation of training, funding, etc.**
- **Project will yield a CRUDE analysis of prevalence of HAIs – this is what DoH wants & requires. The critical importance of risk factor analysis in assessment of HAIs is fully acknowledged, but will have to be addressed – with more focused surveillance and fine-tuning - at a later stage**
- **Motivator for infection control "political buy-in" from health authorities and administrators**
- **Being a prevalence survey, results only represent a "snap-shot" of HAIs at one point in time**
- **Hospital-wide surveillance will not be sustainable!**
- **As did the NNIS system in 1999, once the above objectives have been achieved, the hospital-wide approach must be dropped in favor of more focused (targeted), and comparable, surveillance components e.g. adult & pediatric ICU, surgical infections, high-risk nurseries**





Van Nierop, et al. J Clin Micro 1998; 36(10): 3085-7



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6. The Way Ahead For South Africa: A Land Of Contrasts:

- **Back to basics !!**
- **Genetic requirement for "common sense"**
- **Practicable surveillance for NIs**
- **Waste disposal**
- **Re-defining the gold standard, with appropriate validations and risk-assessments**
- **Education; road shows**
- **Critically review screening of carriers; environmental IC issues**
- **Understanding culture and behaviours of those seeking alternative healers**
- **Control and monitoring of drug resistance (NASF)**

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Arguments for Alcoholic Hand Disinfection:

Rotter, ML. JHI(2001)48(Suppl A): S4-S8

- **Strongest and fastest activity against a broad spectrum of organisms**
- **More effective than soap and water in reducing the # of transient viable organisms on hands**
- **If well-formulated, less hand irritation and dryness than hand-washing with soap and water**
- **Economy in time of application**
- **Useful where water not available (rural areas)**

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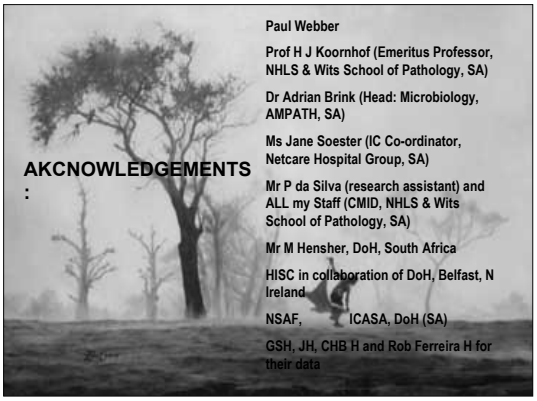

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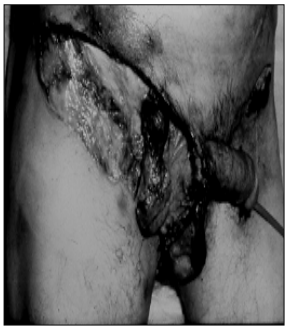
Circumcision-related Sepsis:

- **Outbreak of *S pyogenes* infections following ritual circumcisions**
- **Same razor blade used for multiple procedures**
- **Solution: agreement with Trad. Healer that sterile, single-use blades would be provided**
- **Outcome: no further cases**



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