

# Antimicrobial resistance in Africa:

[http://www.tufts.edu/med/apua/about\\_issue/africahealth.pdf](http://www.tufts.edu/med/apua/about_issue/africahealth.pdf)

## WHO, The evolving threat of antibiotic resistance

<http://www.who.int/patientsafety/implementation/amr/publication/en/index.html>

[Tunis Med.](#) 2012 Oct;90(10):680-5.

## Resistance in Gram negative bacteriae: What is the current situation?

[Elhani D](#), [Elhani I](#), [Aouni M](#).

### Abstract

Emergence of antibiotic resistance put an end to the antibiotic miracle. According to recent review data, the number of cases of multiresistant bacteria, which are resistant to all antibiotics available, is increasing as well in the developed countries as in the developing countries. To face the emergence of these bacteria, it is necessary to evaluate the situation in Tunisian hospitals and act consequently. This review provide recent data on antibiotic resistance in Gram negative bacilli in Tunisian hospitals by focusing on some emergent resistances, which represent a daily challenge for the medical profession, such as extended spectrum beta-lactamases, carbapenem resistance, and fluoroquinolone resistance.

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### *Supplemental Content*

**LA TUNISIE MÉDICALE**  
المجلة الطبية التونسية

[Korean J Intern Med.](#) 2012 Jun;27(2):128-42. doi: 10.3904/kjim.2012.27.2.128. Epub 2012 May 31.

## Current epidemiology and growing resistance of gram-negative pathogens.

[Livermore DM.](#)

Source

## Abstract

In the 1980s, gram-negative pathogens appeared to have been beaten by oxyimino-cephalosporins, carbapenems, and fluoroquinolones. Yet these pathogens have fought back, aided by their membrane organization, which promotes the exclusion and efflux of antibiotics, and by a remarkable propensity to recruit, transfer, and modify the expression of resistance genes, including those for extended-spectrum  $\beta$ -lactamases (ESBLs), carbapenemases, aminoglycoside-blocking 16S rRNA methylases, and even a quinolone-modifying variant of an aminoglycoside-modifying enzyme. Gram-negative isolates--both fermenters and non-fermenters--susceptible only to colistin and, more variably, fosfomycin and tigecycline, are encountered with increasing frequency, including in Korea. Some ESBLs and carbapenemases have become associated with strains that have great epidemic potential, spreading across countries and continents; examples include *Escherichia coli* sequence type (ST)131 with CTX-M-15 ESBL and *Klebsiella pneumoniae* ST258 with KPC carbapenemases. Both of these high-risk lineages have reached Korea. In other cases, notably New Delhi Metallo carbapenemase, the relevant gene is carried by promiscuous plasmids that readily transfer among strains and species. Unless antibiotic stewardship is reinforced, microbiological diagnosis accelerated, and antibiotic development reinvigorated, there is a real prospect that the antibiotic revolution of the 20th century will crumble.

## Supplemental Content



[Lancet Infect Dis](#). 2010 Sep;10(9):597-602. Epub 2010 Aug 10.

# Emergence of a new antibiotic resistance mechanism in India, Pakistan, and the UK: a molecular, biological, and epidemiological study.

[Kumarasamy KK](#), [Toleman MA](#), [Walsh TR](#), [Bagaria J](#), [Butt F](#), [Balakrishnan R](#), [Chaudhary U](#), [Douthett M](#), [Giske CG](#), [Irfan S](#), [Krishnan P](#), [Kumar AV](#), [Maharjan S](#), [Mushtaq S](#), [Noorie T](#), [Paterson DL](#), [Pearson A](#), [Perry C](#), [Pike R](#), [Rao B](#), [Ray U](#), [Sarma JB](#), [Sharma M](#), [Sheridan E](#), [Thirunarayan MA](#), [Turton J](#), [Upadhyay S](#), [Warner M](#), [Welfare W](#), [Livermore DM](#), [Woodford N](#).

## Source

Department of Microbiology, Dr ALM PG IBMS, University of Madras, Chennai, India.

## Abstract

## BACKGROUND:

Gram-negative Enterobacteriaceae with resistance to carbapenem conferred by New Delhi metallo-beta-lactamase 1 (NDM-1) are potentially a major global health problem. We investigated the prevalence of NDM-1, in multidrug-resistant Enterobacteriaceae in India, Pakistan, and the UK.

## METHODS:

Enterobacteriaceae isolates were studied from two major centres in India--Chennai (south India), Haryana (north India)--and those referred to the UK's national reference laboratory. Antibiotic susceptibilities were assessed, and the presence of the carbapenem resistance gene bla(NDM-1) was established by PCR. Isolates were typed by pulsed-field gel electrophoresis of XbaI-restricted genomic DNA. Plasmids were analysed by S1 nuclease digestion and PCR typing. Case data for UK patients were reviewed for evidence of travel and recent admission to hospitals in India or Pakistan.

## FINDINGS:

We identified 44 isolates with NDM-1 in Chennai, 26 in Haryana, 37 in the UK, and 73 in other sites in India and Pakistan. NDM-1 was mostly found among *Escherichia coli* (36) and *Klebsiella pneumoniae* (111), which were highly resistant to all antibiotics except to tigecycline and colistin. *K. pneumoniae* isolates from Haryana were clonal but NDM-1 producers from the UK and Chennai were clonally diverse. Most isolates carried the NDM-1 gene on plasmids: those from UK and Chennai were readily transferable whereas those from Haryana were not conjugative. Many of the UK NDM-1 positive patients had travelled to India or Pakistan within the past year, or had links with these countries.

## INTERPRETATION:

The potential of NDM-1 to be a worldwide public health problem is great, and co-ordinated international surveillance is needed.

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## Comment in

- [New Delhi metallo-β-lactamase 1](#). [Lancet Infect Dis. 2010]
- [Balkan NDM-1: escape or transplant?](#) [Lancet Infect Dis. 2011]
- [NDM-1: a local clone emerges with worldwide aspirations](#). [Future Microbiol. 2011]
- [Balkan NDM-1: escape or transplant?](#) [Lancet Infect Dis. 2011]
- [Urgent need for formal medical training in infectious diseases in India](#). [Lancet Infect Dis. 2011]
- [New Delhi metallo-β-lactamase 1](#). [Lancet Infect Dis. 2010]
- [New Delhi metallo-β-lactamase 1](#). [Lancet Infect Dis. 2010]
- [Global spread of New Delhi metallo-β-lactamase 1](#). [Lancet Infect Dis. 2010]
- [Global spread of New Delhi metallo-β-lactamase 1](#). [Lancet Infect Dis. 2010]
- [New Delhi metallo-β-lactamase 1](#). [Lancet Infect Dis. 2010]
- [Generic antibiotics, antibiotic resistance, and drug licensing](#). [Lancet Infect Dis. 2010]
- [New Delhi metallo-β-lactamase 1](#). [Lancet Infect Dis. 2010]
- [New Delhi metallo-β-lactamase 1](#). [Lancet Infect Dis. 2010]

- [Global spread of New Delhi metallo- \$\beta\$ -lactamase 1](#). [Lancet Infect Dis. 2010]
- [Global spread of New Delhi metallo- \$\beta\$ -lactamase 1](#). [Lancet Infect Dis. 2010]
- [Global spread of New Delhi metallo- \$\beta\$ -lactamase 1](#). [Lancet Infect Dis. 2010]
- [Global spread of New Delhi metallo- \$\beta\$ -lactamase 1](#). [Lancet Infect Dis. 2010]
- [New Delhi metallo- \$\beta\$ -lactamase 1](#). [Lancet Infect Dis. 2010]

## Supplemental Content



[Sex Transm Dis.](#)

2012 Oct;39(10):813-821.

# Retrospective Analysis of Antimicrobial Susceptibility Trends (2000-2009) in *Neisseria gonorrhoeae* Isolates from Countries in Latin America and the Caribbean Shows Evolving Resistance to Ciprofloxacin, Azithromycin and Decreased Susceptibility to Ceftriaxone.

[Starnino S](#), [Galarza P](#), [Carvallo ME](#), [Benzaken AS](#), [Ballesteros AM](#), [Cruz OM](#), [Hernandez AL](#), [Carbajal JL](#), [Borthagaray G](#), [Payares D](#), [Dillon JA](#); [GASP-LAC Working Group](#).

## Source

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Buenos Aires, Argentina; ¶Centro Departamental de Vigilancia, Información y Referencia, La Paz, Bolivia; ||Fundção Alfredo da Matta, Manaus - Amazonas, Brazil; \*\*Instituto de Salud Publica, Santiago, Chile; ††Instituto Nacional de Salud, Bogotá, Colombia; ‡‡Instituto de Medicina Tropical "Pedro Kouri", Ministerio Salud Publica, Habana, Cuba; §§Instituto Nacional de Salud, Lima, Perú; ¶¶Facultad de Química, Universidad de la Republica, Montevideo, Uruguay; and |||Instituto Nacional de Higiene "Rafael Rangel" Caracas, Venezuela.

## **Abstract**

### **BACKGROUND:**

The emergence of resistance and treatment failures to third generation cephalosporins prompted the revitalization of the global Gonococcal Antimicrobial Surveillance Program (GASP) to ensure that information regarding trends of the antimicrobial susceptibility of *Neisseria gonorrhoeae* isolates is up-to-date. Accordingly, former and potential GASP participants in Latin America and the Caribbean were contacted to reinstate the GASP network in the region and to undertake a retrospective analysis of the antimicrobial susceptibility of *N. gonorrhoeae* isolates between 2000 and 2009.

### **METHODS:**

Eleven countries participated in this retrospective analysis reporting on the susceptibility of *N. gonorrhoeae* isolates to up to 6 antibiotics as well as national treatment guidelines over the period. Antimicrobial susceptibility determination was carried out using combination of agar dilution and disk diffusion (Clinical Laboratory and Standards Institute) or Etest. Antimicrobial susceptibility data from each country were aggregated and analyzed for antimicrobial resistance trends in the region.

### **RESULTS:**

More than 11,400 *N. gonorrhoeae* isolates were tested for antimicrobial susceptibility: 6 countries tested *N. gonorrhoeae* over the entire period and 5 countries tested sporadically. Decreased susceptibility to ceftriaxone was reported from 1 country (7 isolates, MICs >0.25 µg/ml) in 2007. No resistance to spectinomycin was reported. From 2000 to 2009, aggregated ciprofloxacin resistance increased from 2% (19/784) to 31% (311/1015) in 9 countries and azithromycin resistance increased from 6% (39/646) to 23% (225/962) in 4/6 reporting countries. Overall, resistance to penicillin and tetracycline decreased from 35% (441/1241) to 26% (258/975) and from 60% (476/792) to 35% (323/931), respectively. In 2009, resistance to gentamicin (3%, 4/122), chloramphenicol (5%, 6/120), and ofloxacin (2%, 6/120) was reported from 1 country.

### **CONCLUSIONS:**

The report of ceftriaxone-resistant isolates coupled with the emergence and spread of resistance to ciprofloxacin and azithromycin in Latin America and the Caribbean in the 2000s indicates the importance of active surveillance of *N. gonorrhoeae* antimicrobial susceptibility to determine antimicrobial resistance emerging trends so as to promptly inform and guide the development of effective treatment options for gonococcal infections.

# Trends in antifungal drug susceptibility of *Cryptococcus neoformans* isolates obtained through population-based surveillance in South Africa in 2002-2003 and 2007-2008.

[Govender NP](#), [Patel J](#), [van Wyk M](#), [Chiller TM](#), [Lockhart SR](#); [Group for Enteric, Respiratory and Meningeal Disease Surveillance in South Africa \(GERMS-SA\)](#).

[Collaborators \(64\)](#)

## Source

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## Abstract

*Cryptococcus neoformans* is the most common cause of meningitis among adult South Africans with HIV infection/AIDS. Widespread use of fluconazole for treatment of cryptococcal meningitis and other HIV-associated opportunistic fungal infections in South Africa may lead to the emergence of isolates with reduced fluconazole susceptibility. MIC testing using a reference broth microdilution method was used to determine if isolates with reduced susceptibility to fluconazole or amphotericin B had emerged among cases of incident disease. Incident isolates were tested from two surveillance periods (2002-2003 and 2007-2008) when population-based surveillance was conducted in Gauteng Province, South Africa. These isolates were also tested for susceptibility to flucytosine, itraconazole, voriconazole, and posaconazole. Serially collected isolate pairs from cases at several large South African hospitals were also tested for susceptibility to fluconazole. Of the 487 incident isolates tested, only 3 (0.6%) demonstrated a fluconazole MIC of  $\geq 16 \mu\text{g/ml}$ ; all of these isolates were from 2002-2003. All incident isolates were inhibited by very low concentrations of amphotericin B and exhibited very low MICs to voriconazole and posaconazole. Of 67 cases with serially collected isolate pairs, only 1 case was detected where the isolate collected more than 30 days later had a fluconazole MIC value significantly higher than the MIC of the corresponding incident isolate. Although routine antifungal susceptibility testing of incident isolates is not currently recommended in clinical settings, it is still clearly important for public health to periodically monitor for the emergence of resistance.

## Supplemental Content



# **Outbreaks, persistence, and high mortality rates of multiresistant *Pseudomonas aeruginosa* infections in a hospital with AIDS-predominant admissions.**

[Gomes MZ](#), [Machado CR](#), [da Conceição Mde S](#), [Ortega JA](#), [Neves SM](#), [Loureço MC](#), [Asensi MD](#).

## **Source**

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## **Abstract**

### **INTRODUCTION:**

Authors have reported increased incidence of multiresistant *Pseudomonas aeruginosa* (MR-PA) infections worldwide over the last decade. Researchers have proposed multifaceted approaches to control MR-PA infections, but none have been reported in the acquired immunodeficiency syndrome (AIDS) setting.

### **OBJECTIVE AND METHODS:**

Herein we report the impact of a multifaceted intervention for controlling MR-PA over five years in a hospital with AIDS-predominant admissions and describe the clinical characteristics of MR-PA infection in our patient population. The clinical outcomes of infected patients and molecular characteristics of the isolated strains were used as tools for controlling MR-PA infection rates.

### **RESULTS:**

Significant temporary decrease of new infections was achieved after intervention, although a high level of diagnostic suspicion of nosocomial infection was maintained. We obtained 35 *P. aeruginosa* isolates with multiresistant profiles from 13 infected and 3 colonized patients and 2 environmental samples. Most of the patients (94%) were immunocompromised with AIDS (n = 10) or HTLV-1 infections (n = 5). Of the followed patients, 67% had persistent and/or recurrent infections, and 92% died. We observed differences in the antibiotic-resistance pattern of MR-PA infection/colonization during two outbreaks, although the genetic profiles of the tested strains were identical.

### **CONCLUSIONS:**

Therefore, we concluded that early multidisciplinary interventions are essential for reducing the burden caused by this microorganism in patients with AIDS. Prolonged or suppressive



antibiotic-based therapy should be considered for MR-PA infections in patients with AIDS because of the persistence characteristic of MR-PA in these patients.

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## **Supplemental Content**

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[J Health Popul Nutr.](#) 2010 Aug;28(4):318-26.

# **Bacterial bloodstream infections in HIV-infected adults attending a Lagos teaching hospital.**

[Adeyemi AI](#), [Sulaiman AA](#), [Solomon BB](#), [Chinedu OA](#), [Victor IA](#).

## **Source**

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## **Abstract**

An investigation was carried out during October 2005-September 2006 to determine the prevalence of bloodstream infections in patients attending the outpatient department of the HIV/AIDS clinic at the Lagos University Teaching Hospital in Nigeria. Two hundred and one patients--86 males and 115 females--aged 14-65 years were recruited for the study. Serological diagnosis was carried out on them to confirm their HIV status. Their CD4 counts were done using the micromagnetic bead method. Twenty mL of venous blood sample collected from each patient was inoculated into a pair of Oxoid Signal blood culture bottles for 2-14 days. Thereafter, 0.1 mL of the sample was plated in duplicates on MacConkey, blood and chocolate agar media and incubated at 37 degrees C for 18-24 hours. The CD4+ counts were generally low as 67% of 140 patients sampled had < 200 cells/microL of blood. Twenty-six bacterial isolates were obtained from the blood samples and comprised 15 (58%) coagulase-negative staphylococci as follows: *Staphylococcus epidermidis* (7), *S. cohnii cohnii* (1), *S. cohnii urealyticum* (2), *S. chromogenes* (1), *S. warneri* (2), *S. scuri* (1), and *S. xylosus* (1). Others were 6 (23%) Gram-negative non-typhoid *Salmonella* spp., *S. Typhimurium* (4), *S. Enteritidis* (2); *Pseudomonas fluorescens* (1), *Escherichia coli* (1), *Ochrobactrum anthropi* (1), *Moraxella* sp. (1), and *Chryseobacterium meningosepticum*. Results of antimicrobial susceptibility tests showed that coagulase-negative staphylococci had good sensitivities to vancomycin and most other antibiotics screened but were resistant mainly to ampicillin and tetracycline. The Gram-negative organisms isolated also showed resistance to ampicillin, tetracycline, chloramphenicol, and septrin. This study demonstrates that coagulase-negative staphylococci and non-typhoidal *Salmonellae* are the most common aetiological agents of bacteraemia among HIV-infected adults attending the Lagos University Teaching Hospital,



Nigeria. The organisms were resistant to older-generation antibiotics often prescribed in this environment but were sensitive to vancomycin, cefotaxime, cefuroxime, and other new-generation antibiotics.

## ***Supplemental Content***



[Trop Med Int Health](#). 2010 Jun;15(6):697-705. Epub 2010 Apr 9.

# **Septicaemia in a population-based HIV clinical cohort in rural Uganda, 1996-2007: incidence, aetiology, antimicrobial drug resistance and impact of antiretroviral therapy.**

[Mayanja BN](#), [Todd J](#), [Hughes P](#), [Van der Paal L](#), [Mugisha JO](#), [Atuhumuza E](#), [Tabuga P](#), [Maher D](#), [Grosskurth H](#).

## **Source**

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## **Abstract**

### **OBJECTIVES:**

To describe the incidence and aetiology of septicaemia, and antimicrobial drug resistance in HIV-infected and uninfected individuals, and the impact of antiretroviral therapy (ART) on septicaemia.

### **METHODS:**

Between 1996 and 2007, we followed up a rural population-based cohort of HIV-infected and uninfected participants. The aetiology and incidence of septicaemia, and antimicrobial drug resistances were determined. ART became available in 2004, and its impact on the incidence of septicaemia was examined.

### **RESULTS:**

The overall septicaemia incidence (per 1000 pyrs) was 32.4 (95% CI 26.2-40.6) but was only 2.6 (95% CI 1.3-6.2) in HIV-negative patients and 67.1 (95% CI 53.4-85.4) in HIV-positive patients not on ART. Among those on ART, the overall incidence was 71.5 (95% CI 47.1-114.3), although it was 121.4 (95%CI 77.9-200.4) in the first year on ART and 37.4 (95%CI

18.9-85.2) in the subsequent period. Septicaemia incidence was significantly associated with lower CD4 counts. The commonest isolates were *Streptococcus pneumoniae* (SPN, n = 68) and *Non-typhi salmonellae* (NTS, n = 42). Most SPN isolates were susceptible to ceftriaxone and erythromycin, while resistance to cotrimoxazole and penicillin was common. All NTS isolates were susceptible to ciprofloxacin, but resistance to cotrimoxazole and chloramphenicol was common.

## CONCLUSIONS:

Septicaemia incidence was higher in HIV-infected than in HIV-uninfected participants, and it remained high for some time among those who started ART. Starting ART earlier at higher CD4 counts is likely to lead to lower septicaemia incidence. Both SPN and NTS, the commonest isolates, were resistant to most commonly available antimicrobials. Blood culture laboratory surveillance systems to monitor antibiotic susceptibility and inform treatment guidelines are needed in Africa.

## *Supplemental Content*



[Rev Argent Microbiol.](#) 2012 Jan-Mar;44(1):3-9.

# Disease caused by non-tuberculous mycobacteria: diagnostic procedures and treatment evaluation in the North of Buenos Aires Province.

[Imperiale B](#), [Zumárraga M](#), [Gioffré A](#), [Di Giulio B](#), [Cataldi A](#), [Morcillo N](#).

## Source

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## Abstract

- Non-tuberculous mycobacteria (NTM) have emerged as pathogens frequently associated to HIV co-infection. The aims of this study were to describe the clinical importance of NTM in patients from the North of Buenos Aires Province and the drug-susceptibility patterns in relation with the therapy used. A total of 23,624 clinical specimens were investigated during the period 2004-2010. Ziehl-Neelsen stain and cultures were used for diagnosis. Molecular and biochemical tests were performed to identify the mycobacteria. TB and mycobacterioses cases were 2 118 and 108 respectively. Sixteen NTM species were found: *Mycobacterium avium* and

Mycobacterium intracellulare as the main causative agents. Infections produced by more than one species at the same time were confirmed (4 cases). Macrolides and fluoroquinolones were the most active in vitro drugs. Treatment evaluation showed that 68.0 % of the cases completed the therapy, 20 % died; and 12 % were relapses. The cases in which the treatment outcome was evaluated received an individual tailor-made therapeutic scheme including those drugs showing in vitro activity and presumed in vivo usefulness. More than a quarter of the patients had HIV co-infection and the majority of the deaths were associated

## **Supplemental Content**

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[MMWR Morb Mortal Wkly Rep.](#) 2011 Jul 8;60(26):873-7.

# **Cephalosporin susceptibility among Neisseria gonorrhoeae isolates--United States, 2000-2010.**

[Centers for Disease Control and Prevention \(CDC\).](#)

## **Abstract**

*Neisseria gonorrhoeae* is a major cause of pelvic inflammatory disease, ectopic pregnancy, and infertility, and it can facilitate human immunodeficiency virus (HIV) transmission. Emergence of gonococcal resistance to penicillin and tetracycline occurred during the 1970s and became widespread during the early 1980s. More recently, resistance to fluoroquinolones developed. Resistance was documented first in Asia, then emerged in the United States in Hawaii followed by other western states. It then became prevalent in all other regions of the United States. In Hawaii, fluoroquinolone resistance was first noted among heterosexuals; however, resistance in the United States initially became prevalent among men who have sex with men (MSM) before generalizing to heterosexuals. This emergence of resistance led CDC, in 2007, to discontinue recommending any fluoroquinolone regimens for the treatment of gonorrhea. CDC now recommends dual therapy for gonorrhea with a cephalosporin (ceftriaxone 250 mg) plus either azithromycin or doxycycline. This report summarizes trends in cephalosporin susceptibility among *N. gonorrhoeae* isolates in the United States during 2000-2010 using data from the Gonococcal Isolate Surveillance Project (GISP). During that period, the percentage of isolates with elevated minimum inhibitory concentrations (MICs) to cephalosporins ( $\geq 0.25$   $\mu\text{g/mL}$  for cefixime and  $\geq 0.125$   $\mu\text{g/mL}$  for ceftriaxone) increased from 0.2% in 2000 to 1.4% in 2010 for cefixime and from 0.1% in 2000 to 0.3% in 2010 for ceftriaxone. Although cephalosporins remain an effective treatment for gonococcal infections, health-care providers should be vigilant for treatment failure and are requested to report its occurrence to state and local health departments. State and local public health departments should promote maintenance of laboratory capability to culture *N. gonorrhoeae* to allow testing of isolates for cephalosporin resistance. They also should develop enhanced surveillance and response protocols for gonorrhea treatment failures and report gonococcal treatment failures to CDC.

## Supplemental Content



[Antimicrob Agents Chemother.](#) 2011 Aug;55(8):3882-8. Epub 2011 May 23.

# Emergence of quinolone resistance and cephalosporin MIC creep in *Neisseria gonorrhoeae* isolates from a cohort of young men in Kisumu, Kenya, 2002 to 2009.

[Mehta SD](#), [Maclean I](#), [Ndinya-Achola JO](#), [Moses S](#), [Martin I](#), [Ronald A](#), [Agunda L](#), [Murugu R](#), [Bailey RC](#), [Melendez J](#), [Zenilman JM](#).

## Source

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## Abstract

We evaluated antimicrobial resistance in *Neisseria gonorrhoeae* isolated from men enrolled in a randomized trial of male circumcision to prevent HIV. Urethral specimens from men with discharge were cultured for *N. gonorrhoeae*. MICs were determined by agar dilution. Clinical and Laboratory Standards Institute (CLSI) criteria defined resistance: penicillin, tetracycline, and azithromycin MICs of  $\geq 2.0$   $\mu\text{g/ml}$ ; a ciprofloxacin MIC of  $\geq 1.0$   $\mu\text{g/ml}$ ; and a spectinomycin MIC of  $\geq 128.0$   $\mu\text{g/ml}$ . Susceptibility to ceftriaxone and cefixime was shown by an MIC of  $\leq 0.25$   $\mu\text{g/ml}$ . Additionally, PCR amplification identified mutations in *parC* and *gyrA* genes in selected isolates. From 2002 to 2009, 168 *N. gonorrhoeae* isolates were obtained from 142 men. Plasmid-mediated penicillin resistance was found in 65%, plasmid-mediated tetracycline resistance in 97%, and 11% were ciprofloxacin resistant (quinolone-resistant *N. gonorrhoeae* [QRNG]). QRNG appeared in November 2007, increasing from 9.5% in 2007 to 50% in 2009. Resistance was not detected for spectinomycin, cefixime, ceftriaxone, or azithromycin, but MICs of cefixime ( $P = 0.018$ ), ceftriaxone ( $P < 0.001$ ), and azithromycin ( $P = 0.097$ ) increased over time. In a random sample of 51 men, gentamicin MICs were as follows: 4  $\mu\text{g/ml}$  ( $n = 1$ ), 8  $\mu\text{g/ml}$  ( $n = 49$ ), and 16  $\mu\text{g/ml}$  ( $n = 1$ ). QRNG increased rapidly and alternative regimens are required for *N. gonorrhoeae* treatment in this area. Amid emerging multidrug-resistant *N. gonorrhoeae*, antimicrobial resistance surveillance is essential for effective drug choice. High levels of plasmid-mediated resistance and increasing MICs for cephalosporins suggest that selective pressure from antibiotic use is a strong driver of resistance emergence.

## Supplemental Content



[J Health Popul Nutr.](#) 2010 Oct;28(5):443-9.

# Monitoring antimicrobial susceptibility of *Neisseria gonorrhoeae* isolated from Bangladesh during 1997-2006: emergence and pattern of drug-resistant isolates.

[Ahmed MU](#), [Chawdhury FA](#), [Hossain M](#), [Sultan SZ](#), [Alam M](#), [Salahuddin G](#), [Alam A](#), [Nessa K](#), [Nahar S](#), [Shama-A-Waris](#), [Alam A](#), [Rahman M](#).

## Source

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## Abstract

Gonorrhoea is one of the most common sexually transmitted infections (STIs) in developing countries, and the emergence of resistance to antimicrobial agents in *Neisseria gonorrhoeae* is a major obstacle in the control of gonorrhoea. Periodical monitoring of antimicrobial susceptibility of *N. gonorrhoeae* is essential for the early detection of emergence of drug resistance. In total, 1,767 gonococcal strains isolated from males and females (general population and those with high-risk behaviour) from different parts of Bangladesh were studied during 1997-2006. Minimum inhibitory concentrations of penicillin, tetracycline, ciprofloxacin, ceftriaxone, spectinomycin, and azithromycin for the isolates were determined by the agar dilution method. Isolates resistant to three or more antimicrobial agents are considered multidrug-resistant. The prevalence of plasmid-mediated penicillinase-producing *N. gonorrhoeae* (PPNG) and plasmid-mediated tetracycline-resistant *N. gonorrhoeae* (TRNG) was determined. Nine percent of the isolates were resistant to ciprofloxacin in 1997 compared to 87% in 2006. Multidrug-resistant *N. gonorrhoeae* have emerged in 1997, and 44% of the strains ( $n = 66$ ) isolated during 2006 were multidrug-resistant. Forty-two percent of the isolates in 2006 were both PPNG- and TRNG-positive compared to none in 1997. The rapidly-changing pattern of gonococcal antimicrobial susceptibility warrants the need for an antimicrobial susceptibility-monitoring programme, and periodical analysis and dissemination of susceptibility data are essential to guide clinicians and for successful STI/HIV intervention programme

## Supplemental Content



[J Clin Microbiol.](#) 2010 May;48(5):1753-7. Epub 2010 Feb 24.

# Staphylococcus aureus antimicrobial susceptibility of abscess samples from adults and children from the Kaleida Health System in western New York State, 2003 to 2006.

[Hsiao CB](#), [Dryja D](#), [Abbatessa L](#), [Patel PH](#).

## Source

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## Abstract

*Staphylococcus aureus* is the most common etiologic agent of skin abscesses. The regional rate of methicillin-resistant *S. aureus* (MRSA) abscesses may reflect the prevalence of local community-acquired MRSA (CAMRSA). A retrospective study was conducted to compare the antimicrobial susceptibility patterns of *S. aureus* isolates recovered from abscesses from 2003 to 2006 from patients at hospitals of the Kaleida Health System in western New York. *S. aureus* susceptibility information was obtained from a Vitek Legacy system, and the location and source of each isolate were identified. EpiInfo software was used to analyze the antimicrobial susceptibilities of all isolates and the trends in the rates of MRSA. A total of 2,848 *S. aureus* abscesses were identified by the Kaleida Health Clinical Microbiology Laboratory. Of those, 978 *S. aureus* abscess events occurred in four hospitals, including three adult facilities (547 episodes with 62 cases of bacteremia) and one children's facility (431 episodes with 2 cases of bacteremia). The MRSA rates in adults increased from 56% (2003) to 71% (2006), and that in children increased from 26% (2003) to 64% (2006). Of the MRSA isolates in the children's samples, more than 92% were susceptible to clindamycin. Of the MRSA isolates in the adult samples, 50% were susceptible to clindamycin in 2003 and 2004, whereas greater than 75% were susceptible in 2005 and 2006. The increased rates of MRSA abscesses with susceptibility to clindamycin may reflect the high prevalence level of CAMRSA in the western New York community. The variations in *S. aureus* susceptibilities could serve as an indicator of the changing resistance patterns within a broad urban community.

## Supplemental Content



[Jpn J Infect Dis.](#) 2009 Nov;62(6):467-70.

# Prevalence of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* in HIV-seropositive patients and gonococcal antimicrobial susceptibility: an update in Thailand.

[Srifeungfung S](#), [Roongpisuthipong A](#), [Asavapiriyant S](#), [Lolekha R](#), [Tribuddharat C](#), [Lokpichart S](#), [Sungthong P](#), [Tongtep P](#).

## Source

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## Abstract

We surveyed the rate of chlamydial and gonococcal infections among human immunodeficiency virus (HIV)-seropositive patients in Thailand as well as the current status of antimicrobial resistance of *Neisseria gonorrhoeae* and determined the prevalence of penicillinase-producing *N. gonorrhoeae* (PPNG) in Thailand. A total of 1,158 endocervical swabs from 824 HIV-seropositive patients were collected to detect both organisms by Gen-Probe. The prevalences of chlamydial and gonococcal infection were 9.7 and 1.3%, respectively. Susceptibility of 122 gonococcal isolates to 6 drugs was determined by the disk diffusion method. None of the isolates was susceptible to penicillin or tetracycline. With respect to fluoroquinolones, more than 90% of the isolates were resistant to ciprofloxacin and ofloxacin. No gonococcal isolate with resistance to cefotaxime and ceftriaxone was detected. Among the 122 isolates, 83.6% or 102 isolates were PPNG, and most (79.5%) of these 122 isolates were further identified as PPNG plus tetracycline-resistant *N. gonorrhoeae*, with only 4.1% being PPNG alone. All of the 102 isolates identified as PPNG contained the bla(TEM) gene. We then performed a preliminary molecular study and identified, for the first time in Thailand, a PPNG isolate producing beta-lactamase and containing the bla(TEM) gene which was identical to the beta-lactamase TEM protein of *Salmonella enterica* identified as TEM-135.

## Supplemental Content



[BMC Infect Dis.](#) 2012 Mar 21;12:67. doi: 10.1186/1471-2334-12-67.

## Bacterial infections in Lilongwe, Malawi: aetiology and antibiotic resistance.



[Makoka MH](#), [Miller WC](#), [Hoffman IE](#), [Cholera R](#), [Gilligan PH](#), [Kamwendo D](#), [Malunga G](#), [Joaki G](#), [Martinson F](#), [Hosseinipour MC](#).

## Source

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## Abstract

### BACKGROUND:

Life-threatening infections present major challenges for health systems in Malawi and the developing world because routine microbiologic culture and sensitivity testing are not performed due to lack of capacity. Use of empirical antimicrobial therapy without regular microbiologic surveillance is unable to provide adequate treatment in the face of emerging antimicrobial resistance. This study was conducted to determine antimicrobial susceptibility patterns in order to inform treatment choices and generate hospital-wide baseline data.

### METHODS:

Culture and susceptibility testing was performed on various specimens from patients presenting with possible infectious diseases at Kamuzu Central Hospital, Lilongwe, Malawi.

### RESULTS:

Between July 2006 and December 2007 3104 specimens from 2458 patients were evaluated, with 60.1% from the adult medical service. Common presentations were sepsis, meningitis, pneumonia and abscess. An etiologic agent was detected in 13% of patients. The most common organisms detected from blood cultures were *Staphylococcus aureus*, *Escherichia coli*, *Salmonella* species and *Streptococcus pneumoniae*, whereas *Streptococcus pneumoniae* and *Cryptococcus neoformans* were most frequently detected from cerebrospinal fluid. *Haemophilus influenzae* was rarely isolated. Resistance to commonly used antibiotics was observed in up to 80% of the isolates while antibiotics that were not commonly in use maintained susceptibility.

### CONCLUSIONS:

There is widespread resistance to almost all of the antibiotics that are empirically used in Malawi. Antibiotics that have not been widely introduced in Malawi show better laboratory performance. Choices for empirical therapy in Malawi should be revised accordingly. A microbiologic surveillance system should be established and prudent use of antimicrobials promoted to improve patient care.

## ***Supplemental Content***



[Rev Inst Med Trop Sao Paulo](#). 2012 Jan-Feb;54(1):17-24.

# Oral colonization by yeasts in HIV-positive patients in Brazil.

[Junqueira JC](#), [Vilela SF](#), [Rossoni RD](#), [Barbosa JO](#), [Costa AC](#), [Rasteiro VM](#), [Suleiman JM](#), [Jorge AO](#).

## Source

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## Abstract

### INTRODUCTION:

In HIV-infected patients, colonization of the oral cavity by potential pathogenic yeast may lead to development of systemic fungemia. We evaluated the prevalence of yeast in the oral cavity of Brazilian HIV-positive patients and verified whether or not the species characterized were enzymatically active. Furthermore, the species identified were tested for their susceptibility to antifungal treatment.

### METHODS:

Patient saliva and oropharyngeal candidiasis samples were collected from 60 seropositive HIV patients and identified by the API20C system. Enzymatic activity was evaluated by the production of proteinase and phospholipase. Susceptibility to antifungal treatments were determined using the broth microdilution method.

### RESULTS:

the most commonly isolated species were *C. albicans* (51.56%) followed by non-*albicans* *Candida* species (43.73%), *Trichosporon mucoides* (3.12%) and *Kodamaea ohmeri* (1.56%). Oral colonization by association of different species was observed in 42% of the patients. Enzymatic activity was verified in most of species isolated, except for *C. glabrata*, *C. lusitaniae* and *C. guilliermondii*. Resistance to Fluconazole and Amphotericin B was observed in isolates of *C. albicans*, *C. glabrata*, *C. parapsilosis*, *C. krusei*, and *K. ohmeri*.

### CONCLUSION:

HIV-positive patients are orally colonized by single or multiple species of yeast that are occasionally resistant to Fluconazole or Amphotericin B.

## Supplemental Content

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available at [Scielo.org](http://Scielo.org)

[Sante](#). 2009 Oct-Dec;19(4):217-25. Epub 2010 Feb 26.

# [Education for self-administered antibiotic therapy: a pragmatic and ethical alternative for the treatment of STDs for the street youth of Kinshasa in the Democratic Republic of the Congo (RDC)].

[Article in French]

[Leyka MB](#), [Baum PM](#), [Diadié M](#), [Kiyombo M](#), [Mupenda B](#).

## Source

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## Abstract

All healthcare providers decide in someone else's place, for someone else. In doing so, they take their place in a long long tradition, that of medical paternalism. Patients are treated as children, incapable of making decisions about themselves. How then are we supposed to deal with patients like the street children of the Democratic Republic of the Congo, who are not part of our health-care system, who refuse care and prescriptions? Their refusal of caregivers forces us to seek strategies to dispel the conflicts, adapt ourselves to the situation (self-medication, drug sales outside of dispensaries, etc.), but especially to rethink the relation between caregivers and patients. This does not mean abandoning the authoritarian patriarchal model for total relativism; the use of drugs such as antibiotics is and must remain surrounded by all the precautions necessary to avoid the further development of resistance; it does mean training and informing. The task facing us is that of health education and promotion, a long and continuous process, centered on patients and integrated with their care, aimed at making them capable of managing their disease. This procedure is part of a pragmatic approach: beyond the asymmetry involved in any relationship of power, it is essential to establish informed confidence, to look for adhesion and not constraint. Only this pragmatism can incite young people with sexually transmitted diseases (STDs) to use modern medicine and comply with the dosage instructions. Effective treatment of STDs is, according to WHO, one of the most powerful weapons in the battle against AIDS transmission.

## Supplemental Content

