

**Antibiotic Resistance Pattern of Blood and CSF Culture Isolates
At
NHLS Academic Laboratories
(2005)**

***Streptococcus pneumoniae* (SP) Blood Culture Isolates**

| NHLS Laboratories | Total isolates | Penicillin intermediate resistant SP | Penicillin resistant SP | Cefotaxime resistant SP |
|---|----------------|--------------------------------------|-------------------------|-------------------------|
| Chris Hani Baragwanath Hospital | 336 | 16% | 21% | 0.6% |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 109 | 60% | 1% | 0% |
| Green Point | 43 | 14% | 0% | 0% |
| Groote Schuur Hospital | 144 | 30% | 1% | 1% |
| Johannesburg Hospital | 214 | 30% | 0.5% | 0% |
| Pretoria Academic Hospital | 98 | 32% | 14% | 0% |
| Tygerberg Hospital | 31 | 42% | 3% | 0% |
| Universitas Hospital | 46 | 35% | 7% | 2% |

MICs for CSF isolates were used to determine the resistance of penicillin and cefotaxime because some isolates were from meningitis patients.

Penicillin MIC:

≤ 0.06mg/l = susceptible

0.12 – 1 mg/l = intermediate resistant

≥ 2mg/l = resistant

Cefotaxime MIC:

≤ 0.5mg/l = susceptible

1 – 2 mg/l = intermediate resistant

≥ 4mg/l = resistant

***Streptococcus pneumoniae* CSF Culture Isolates**

| NHLS Laboratories | Total isolates | Penicillin intermediate resistant SP | Penicillin resistant SP | Cefotaxime resistant SP |
|---|----------------|--------------------------------------|-------------------------|-------------------------|
| Chris Hani Baragwanath Hospital | 136 | 24% | 10% | 0% |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 6% | 17% | 0% | 0% |
| Green Point | 26 | 15% | 0% | 0% |
| Groote Schuur Hospital | 24 | 21% | 0% | 0% |
| Johannesburg Hospital | 29 | 10% | 0% | 0% |
| Pretoria Academic Hospital | 19 | Not Available* | 11%* | 0% |
| Tygerberg Hospital | 7 | 14% | 0% | 0% |
| Universitas Hospital | 28 | 29% | 4% | 0% |

* = combined % of penicillin intermediate & resistant isolates

Penicillin MIC:

≤ 0.06mg/l = susceptible

0.12 – 1 mg/l = intermediate resistant

≥ 2mg/l = resistant

Cefotaxime MIC:

≤ 0.5mg/l = susceptible

1 – 2 mg/l = intermediate resistant

≥ 4mg/l = resistant

***Haemophilus influenzae* & *Neisseria meningitidis* Blood Culture Isolates**

| NHLS Laboratories | <i>H influenzae</i> (HI) | | | <i>Neisseria meningitidis</i> (NM) | |
|---|--------------------------|---|---|------------------------------------|---|
| | Total number of HI | Total number of Ampicillin Resistant HI | Total number of beta-lactamase producing HI | Total number of NM | Total number of penicillin reduced susceptible NM |
| Chris Hani Baragwanath Hospital | 23 | 8 | 5 | 8 | 0 |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 6 | 3 | 3 | 0 | 0 |
| Green Point | 5 | 0 | 0 | 5 | 0 |
| Groote Schuur Hospital | 4 | 0 | 0 | 5 | 1 |
| Johannesburg Hospital | 11 | 1 | 1 | 16 | 0 |
| Pretoria Academic Hospital | 0 | 0 | 0 | 0 | 0 |
| Tygerberg Hospital | 4 | 2 | 2 | 1 | 0 |
| Universitas Hospital | 4 | 0 | 0 | 2 | 0 |

***Haemophilus influenzae* & *Neisseria meningitidis* CSF Culture Isolates**

| NHLS Laboratories | <i>H influenzae</i> (HI) | | | <i>Neisseria meningitidis</i> (NM) | |
|---|--------------------------|---|---|------------------------------------|---|
| | Total number of HI | Total number of Ampicillin Resistant HI | Total number of beta-lactamase producing HI | Total number of NM | Total number of penicillin reduced susceptible NM |
| Chris Hani Baragwanath Hospital | 5 | 1 | 1 | 15 | 0 |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 2 | 1 | 1 | 2 | 0 |
| Green Point | 0 | 0 | 0 | 3 | 0 |
| Groote Schuur Hospital | 5 | 0 | 0 | 7 | 0 |
| Johannesburg Hospital | 3 | 1 | 0 | 0 | 0 |
| Pretoria Academic Hospital | 0 | 0 | 0 | 3 | 0 |
| Tygerberg Hospital | 1 | 1 | 1 | 4 | 0 |
| Universitas Hospital | 1 | 0 | 0 | 2 | 0 |

***Streptococcus agalactiae* Streptococcus group B blood culture isolates**

Total number of *Streptococcus agalactiae* isolated from blood culture specimens at Chris Hani Baragwanath, Dr George Mukhari, Greenpoint, Groote Schuur, Johannesburg, Pretoria Academic, Tygerberg and Universitas NHLS laboratories are 72, 22, 9, 26, 29, 8, 16, and 9 respectively. All of these isolates were sensitive to penicillin.

***Enterococcus faecalis* (EF) blood culture isolates**

| NHLS Laboratories | Total isolates | Ampicillin resistant EF | Beta-lactamase producing EF | High level gentamicin resistant EF |
|---|----------------|-------------------------|-----------------------------|------------------------------------|
| Chris Hani Baragwanath Hospital | 83 | 10% | 1% | 33% |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 50 | 48% | 2% | 44% |
| Green Point | 15 | 0% | 0% | 0% |
| Groote Schuur Hospital | 45 | 2% | 0% | 49% |
| Johannesburg Hospital | 43 | 26% | 26% | 5% |
| Pretoria Academic Hospital | 75 | 21% | 19% | 31% |
| Tygerberg Hospital | 16 | 13% | 6% | 13% |
| Universitas Hospital | 16 | 0% | 0% | 31% |

***Staphylococcus aureus* blood culture isolates**

| NHLS Laboratories | Total isolates | MRSA% |
|---|----------------|-------|
| Chris Hani Baragwanath Hospital | 431 | 56% |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 129 | 69% |
| Green Point | 65 | 35% |
| Groote Schuur Hospital | 202 | 57% |
| Johannesburg Hospital | 251 | 37% |
| Pretoria Academic Hospital | 236 | 55% |
| Tygerberg Hospital | 84 | 48% |
| Universitas Hospital | 79 | 53% |

***Salmonella typhi* (STY) blood culture isolates**

| NHLS Laboratories | Total isolates | Ampicillin resistant STY isolates | Co-trimoxazole resistant STY isolates |
|---|----------------|-----------------------------------|---------------------------------------|
| Chris Hani Baragwanath Hospital | 3 | 0 | 0 |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 1 | 0 | 0 |
| Green Point | 2 | 0 | 0 |
| Groote Schuur Hospital | 2 | 1 | 0 |
| Johannesburg Hospital | 0 | 0 | 0 |
| Pretoria Academic Hospital | 6 | 0 | 0 |
| Tygerberg Hospital | 2 | 1 | 1 |
| Universitas Hospital | 0 | 0 | 0 |

All the *Salmonella typhi* isolates were sensitive to ceftriaxone and ciprofloxacin.

Non-typhoidal *Salmonella* species (S) blood culture isolates

| NHLS Laboratories | Total isolates | Ampicillin resistant S | Co-trimoxazole resistant | Ceftriaxone resistant S | Ciprofloxacin resistant S |
|---|----------------|------------------------|--------------------------|-------------------------|---------------------------|
| Chris Hani Baragwanath Hospital | 216 | 75% | 63% | 39% | 1% |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 52 | 29% | 2% | 4% | 0% |
| Green Point | 17 | 24% | 24% | 0% | 0% |
| Groote Schuur Hospital | 29 | 38% | 38% | 21% | 0% |
| Johannesburg Hospital | 76 | 68% | 63% | 14% | 5% |
| Pretoria Academic Hospital | 14 | 14% | 14% | 0% | 0% |
| Tygerberg Hospital | 1 | 100% | 100% | 0% | 0% |
| Universitas Hospital | 8 | 13% | 13% | 0% | 0% |

***E coli* (EC) blood culture isolates**

| NHLS Laboratories | Total isolates | Ampicillin resistant EC | Ciprofloxacin resistant EC | Gentamicin resistant EC | Extended spectrum beta-lactamase producing EC |
|---|----------------|-------------------------|----------------------------|-------------------------|---|
| Chris Hani Baragwanath Hospital | 329 | 90% | 11% | 21% | 25% |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 72 | 86% | 26% | 31% | 17% |
| Green Point | 39 | 87% | 3% | 15% | 10% |
| Groote Schuur Hospital | 113 | 80% | 7% | 15% | 10% |
| Johannesburg Hospital | 136 | 83% | 13% | 15% | 8% |
| Pretoria Academic Hospital | 122 | 64% | 8% | 4% | 3% |
| Tygerberg Hospital | 51 | 78% | 20% | 18% | 25% |
| Universitas Hospital | 28 | 86% | 11% | 4% | 4% |

***Klebsiella pneumoniae* (KP) blood culture isolates**

| NHLS Laboratories | Total isolates | Gentamicin resistant KP | Ciprofloxacin resistant KP | Extended spectrum beta-lactamase producing KP |
|---|----------------|-------------------------|----------------------------|---|
| Chris Hani Baragwanath Hospital | 248 | 56% | 34% | 50% |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 122 | 76% | 18% | 54% |
| Green Point | 44 | 55% | 20% | 43% |
| Groote Schuur Hospital | 175 | 66% | 45% | 70% |
| Johannesburg Hospital | 130 | 28% | 19% | 25% |
| Pretoria Academic Hospital | 161 | 45% | 27% | 42% |
| Tygerberg Hospital | 53 | 47% | 32% | 58% |
| Universitas Hospital | 55 | 55% | 9% | 53% |

***Enterobacter* species (E) blood culture isolates**

| NHLS Laboratories | Total isolates | Gentamicin resistant E | Ciprofloxacin resistant E | Extended spectrum beta-lactamase producing E |
|---|----------------|------------------------|---------------------------|--|
| Chris Hani Baragwanath Hospital | 94 | 32% | 9% | 30% |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 19 | 37% | 11% | 32% |
| Green Point | 4 | 25% | 0% | 0% |
| Groote Schuur Hospital | 35 | 43% | 9% | 51% |
| Johannesburg Hospital | 83 | 19% | 10% | 6% |
| Pretoria Academic Hospital | 81 | 16% | 12% | 16% |
| Tygerberg Hospital | 28 | 25% | 4% | 7% |
| Universitas Hospital | 20 | 15% | 0% | 10% |

***Pseudomonas aeruginosa* (PA) blood culture isolates**

| NHLS Laboratories | Total isolates | Gentamicin resistant PA | Piperacillin/tazobactam resistant PA | Ciprofloxacin resistant PA | Ceftazidime resistant PA | Imipenem resistant PA | Meropenem resistant PA |
|---|----------------|-------------------------|--------------------------------------|----------------------------|--------------------------|-----------------------|------------------------|
| Chris Hani Baragwanath Hospital | 87 | 33% | 18% | 16% | 14% | 23% | 26% |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 43 | 7% | 5% | 0% | 5% | 5% | 2% |
| Green Point | 5 | 20% | 0% | 0% | 0% | 0% | 0% |
| Groote Schuur Hospital | 28 | 25% | 11% | 0% | 14% | 57% | 50% |
| Johannesburg Hospital | 74 | 22% | 14% | 23% | 16% | 22% | 19% |
| Pretoria Academic Hospital | 141 | 13% | 39% | 40% | 38% | 44% | 41% |
| Tygerberg Hospital | 34 | 44% | 21% | 18% | 9% | 29% | 47% |
| Universitas Hospital | 11 | 9% | 9% | 9% | 0% | 9% | 9% |

***Acinetobacter* species (A) blood culture isolates**

| NHLS Laboratories | Total isolates | Piperacillin/tazobactam resistant A | Ciprofloxacin resistant A | Ceftazidime resistant A | Imipenem resistant A | Meropenem resistant A |
|---|----------------|-------------------------------------|---------------------------|-------------------------|----------------------|-----------------------|
| Chris Hani Baragwanath Hospital | 163 | 72% | 65% | 61% | 63% | 65% |
| Dr George Mukhari Hospital (Ga-Rankuwa/Medunsa) | 88 | 76% | 75% | 82% | 81% | 73% |
| Green Point | 2 | 0% | 0% | 0% | 0% | 0% |
| Groote Schuur Hospital | 104 | 45% | 51% | 37% | 38% | 38% |
| Johannesburg Hospital | 43 | 49% | 40% | 42% | 19% | 19% |
| Pretoria Academic Hospital | 85 | 64% | 69% | 74% | 59% | 67% |
| Tygerberg Hospital | 50 | 68% | 68% | 62% | 64% | 64% |
| Universitas Hospital | 10 | 70% | 70% | 70% | 60% | 60% |