

## Multi Drug Resistance & Travellers



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## What is MDR?

- ✦ Antimicrobial resistance includes resistance to antibacterial, antiviral, antiparasitic and antifungal drugs.
- ✦ When microorganisms become resistant to most antimicrobials, they are often referred to as superbugs; over time, these resistant strains may become resistant to all existing antibiotics.
- ✦ Dramatic health and economic impacts. Common infections may become untreatable which could lead to death.
- ✦ According to WHO estimate, annual deaths from superbugs will reach 10 million by 2050.

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## WHO

- ✦ 12 antibiotic-resistant priority pathogens that WHO says pose the greatest threat to human health and kill millions of people yearly
- ✦ The list is divided into three categories, prioritised by the urgency of the need for new antibiotics. The purpose is to guide and promote research and development of new drugs



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## WHO'S WHO

### Priority 1: Critical

1. *Acinetobacter baumannii*, carbapenem-resistant
2. *Pseudomonas aeruginosa*, carbapenem-resistant
3. Enterobacteriaceae, carbapenem-resistant, ESBL-producing

### Priority 2: High

4. *Enterococcus faecium*, vancomycin-resistant
5. *Staphylococcus aureus*, methicillin-resistant, vancomycin-intermediate and resistant
6. *Helicobacter pylori*, clarithromycin-resistant

7. *Campylobacter* spp., fluoroquinolone resistant

8. *Salmonellae*, fluoroquinolone-resistant

9. *Neisseria gonorrhoeae*, cephalosporin-resistant, fluoroquinolone-resistant

### Priority 3: Medium

10. *Streptococcus pneumoniae*, penicillin-non-susceptible

11. *Haemophilus influenzae*, ampicillin-resistant

12. *Shigella* spp., fluoroquinolone-resistant

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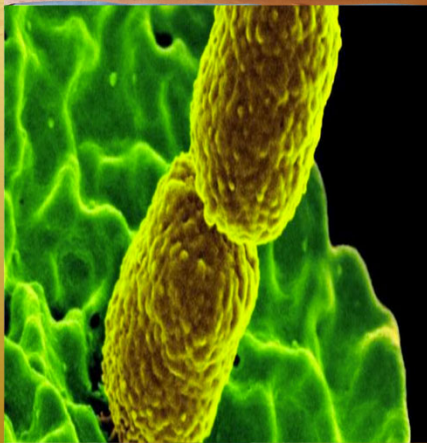
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## Travellers

- ✦ the rate of intestinal carriage of MDR bacteria among patients who have traveled abroad within 6 months prior to being admitted at an intensive care unit was higher (33%) than that of local patients with no traveling records (6.7%)
- ✦ MDR carriage in patients abroad, diabetes mellitus and hospitalization abroad with antibiotic treatment were statistically significant.
- ✦ geographic region, occurrence of travelers' diarrhea (TD), age, and use of antibacterial agents for TD were found to be independent risk factors predisposing to contracting ESBL-producing Enterobacteriaceae.

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## Medical Tourism

- + India
- + Thailand
- + Vietnam
- + Fiji
- + China



higher prevalence of fecal carriers of ESBL was found among patients visiting the Asian continent (29.2%), which further increased to 37.4% for those travelers returning from India

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## Traveller's Diarrhea

- + its occurrence as well as treatment has been associated with increased risk of antimicrobial resistance acquisition
- + in the subgroup of travelers in South Asia, ESBL colonization rate reached 47% in cases of TD and 80% in cases of TD treated with antibiotics.
- + Already there are regional differences to resistance of pathogens – notably fluorquinolone resistance to *Campylobacter*, *ETEC*, *EAEC*, *Shigella* and *Salmonella* in Southeast and South Asia
- + Recent reviewed guidelines for prevention and treatment

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## Sexual Tourism

- ✦ STIs have uneven geographical distribution, and travellers may act as bridges between high-burden and low-burden countries
- ✦ Number of older people having sex with new partners while overseas are increasing with good health, have the financial means to travel, and are now more likely to experience partnership breakdown
- ✦ Higher risk activities while travelling – more likely to engage in unprotected sex while travelling

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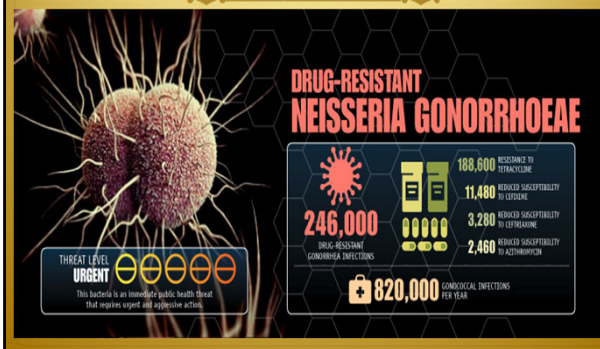
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## Neisseria gonorrhoeae



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## Super bug Gonococcus

- ✦ For years, gonorrhoea has been easily treated with a single oral dose of antibiotics
- ✦ has progressively acquired resistance to each new agent: sulphonamides in the 1940s, penicillins and tetracyclines in the 1970s and 1980s, and fluoroquinolones in the last decade.
- ✦ Since 2007, third-generation cephalosporins have been the only antibiotics recommended for empirical treatment of gonorrhoea
- ✦ 2009 in Japan a prostitute who tested positive failed to respond to the last-line antibiotic treatment, a cephalosporin, injectable ceftriaxone

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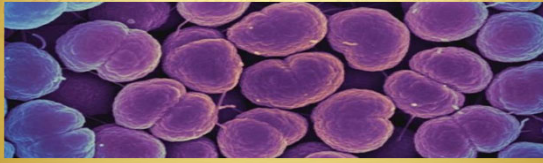
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- ✦ 2012: New Zealand's Ministry of Health alert with a cluster of cases of treatment resistant gonorrhoea that were found amongst gay and bisexual men
- ✦ 2014: - Australian patient was a young female traveller from Central Europe, who contracted the infection in Sydney and travelled to Cairns
- ✦ Three cases of untreatable gonorrhea this year in Japan, France and Spain.

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## Reduce Risk of STIs

- ✦ Always practice safe sex – use a condom correctly and consistently,
- ✦ condoms obtained abroad may have higher breakage rates, may be expired, or may have been stored in hot or humid places compromising their effectiveness.
- ✦ Birth control methods such as oral contraceptives, injections, IUDs, or diaphragms do not prevent STI transmission and condoms are not fully effective from infections acquired through skin-to-skin contact like genital herpes.

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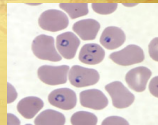
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## Malaria



- ✦ Increasing resistance to anti-malarials including chloroquine (I, PNG) and mefloquine (T, C, V) geographic variation
- ✦ Resistance has already developed to all the antimalarial drug classes with one notable exception — the artemisinins resulting in use of ACTs (similar to combined TB treatment)
- ✦ Importance in ensuring patients are given the correct anti-malarial for the correct prescribed amount of time to protect and also decrease resistance.

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### The Search For ANTIBIOTICS



- ✦ There have been no new classes of antibiotics discovered that have made it to market since 1984
- ✦ There are not enough drugs being developed to meet future needs
- ✦ Of the 40 antibiotics in clinical development in the US, fewer than half even have the potential to treat the pathogens identified by WHO
- ✦ most of those will fail to reach the clinic for reasons of efficacy or safety; generally only one of five drugs that reach the initial phase of testing in humans will receive approval from the FDA

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## Stewardship

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- ✦ Prescribe antibiotics only when necessary, according to evidence-based guidelines. When possible, prescribe a narrow-spectrum antibiotic, not broad-spectrum antibiotic.
- ✦ Advise patients on the importance of taking their treatment correctly as prescribed and completing their courses of treatment.
- ✦ Advise patients how to prevent the spread of infection and the importance of vaccination.
- ✦ Older age groups should also be considered for health promotion messages when consulting for travel advice
- ✦ UTD and informed travel advice is key when it comes to geographic medicine and resistance patterns

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## New Zealand

- WHO Global Antimicrobial Resistance report indicate that NZ has comparatively low rates of antimicrobial resistance, when compared to countries in neighbouring regions such as SEA.
- NZ should not become complacent, as there has been a rise in antibiotic resistance and increasing consumption of antibiotics.
- Travellers: 2.5 million travellers visiting the country yearly and 2.2 million NZers travelling annually.



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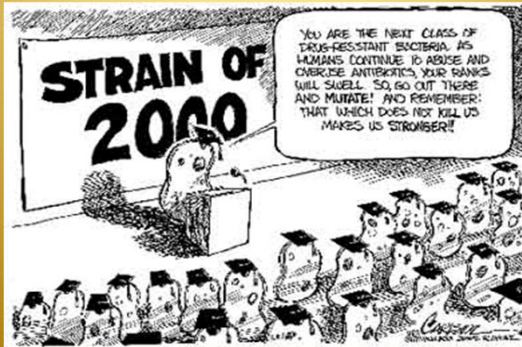
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Thank you!



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